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OF

LONDON.
THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR

1886.

LONDON:

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ERRATA.

At page 271, first line from top, for "Phyticidæ" read "Phyctide." Page 458, first line from top, for "fig. 4" read "fig. 5." Page 459, eleventh line from top, for "fig. 5" read "fig. 4"; lines eleven, thirteen and fourteen from bottom, for "alter" read "niger."
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of the
ENTOMOLOGICAL SOCIETY OF LONDON.
31st December, 1886.

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1863 Hagen, Hermann August, Cambridge, U.S.A.
1884 Müller, Fritz, Blumenau, Santa Catarina, Brazil.
1884 Osten-Sacken, Baron C. R. von, Heidelberg.
1884 Packard, Alpheus S., Providence, Rhode Island, U.S.A.
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1871 Selys-Longchamps, Baron M. E. de, Liége.
1885 Snellen, Pieter C. T., Rotterdam.

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Marked † have compounded for their Annual Subscriptions.

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1886 Archer, F., Little Crosby-road, Crosby, Liverpool.
1886 Atmore, E. A., 3 Haylett-terrace, Exton's-road, King's Lynn, Norfolk.
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1885 Baker, G. T., 16 Clarence-road, Edgbaston, Birmingham.
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1886 Bargagli, Nobile Cavaliere Piero, Piazza S. Maria, Palazzo Tempi No. 1, Florence, Italy.
1884 Barrett, Charles Golding, Norfolk-street, King's Lynn, Norfolk.
1865 Barton, Stephen, 32 St. Michael's Hill, Bristol.
1851 Beaumont, Alfred, 30 Ladywell Park, Lee, S.E.
1882 Berg, C., Museo Publico, Buenos Ayres.
1886 Biddle, F. W., M.A. Lanherne, Foxgrove-road, Beckenham, Kent.
1880 Biggell, George Carter, 7 Clarence-place, Stonehouse, Plymouth.
1879 Billups, T. R., 20 Swiss Villas, Coplestone-road, Peckham, S.E.
1885 Bliss, Arthur, 43 New Broad-street, E.C.
1841 Bond, Frederick, F.Z.S., 5 Fairfield Avenue, Staines.
1875 Borrer, Wm., junr., F.G.S., Parkyns Manor House, Hurstpierpoint, Sussex.
1876 Boscher, Edward, Bellevue House, Twickenham.
1852 Boyd, Thomas, Woodvale Lodge, South Norwood Hill, S.E.
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1877 Briggs, Charles Adolphus, 55 Lincoln's Inn Fields, W.C.; and Surrey House, Leatherhead, Surrey.
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1868 Butler, Arthur Gardiner, F.L.S., F.Z.S., 10 Avington-grove, Penge, S.E.
1883 Butler, Edward Albert, B.A., B.Sc., F.Z.S., Windeyer, Ashley Road, Crouch Hill, N.
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1875 Distant, Wm. Lucas, Memb. Anthropological Institute, 1 *Russell-hill-road, Purley, Surrey.*


1883 Durrant, John Hartley-, *Bancroft House, Hitchin, Herts.*


1885 Edmonds, Thomas, 25 *Sandfield-terrace, Guildford.*

1885 Edwards, James, 136 *Rupert-street, Norwich.*

1884 Edwards, Stanley, *Kidbrook Lodge, Blackheath, S.E.*

1886 Elisa, George, 122 *Shepherdess-walk, City-road.*

1886 Ellis, John W., L.R.C.P., 3 *Brougham Terrace, Liverpool.*


1886 Emich, Gustave d', 6 *Sebastian-place, Budapest, Hungary.*

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1886 Fenwick, Nicholas Percival, *Holmwood, South Bank, Surbiton Hill, Surrey.*

1881 Feredy, R. W., *Christchurch, Canterbury, New Zealand.*

1878 Finzi, John A., 94 *Oxford Gardens, N. Kensington, W.*


1886 Fitch, Frederick, *Hadleigh House, Highbury New Park, N.*

1885 Fletcher, J. E., 26 *McIntyre-road, St. John's, Worcester.*

1883 Fletcher, W. H. B., M.A., 6 *The Steyne, Worthing, Sussex.*

1885 Fokker, A. J. F., *Zierikzee, South Holland, Netherlands.*

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<td>Freeman, Francis Ford</td>
<td>8 Leigham-terrace, Plymouth</td>
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<td>Fry, Alexander</td>
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<td>† Godman, Frederick Du Cane</td>
<td>South Lodge, Lower Beeding, Horsham, Sussex; and 10 Chandos-street, Cavendish-square, W.</td>
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<td>Goodrich, Arthur Mainwaring</td>
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<td>The Chestnuts, Shirley Warren, Southampton</td>
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<td>Rostrevor, Apsley-road, Clifton Bristol</td>
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<td>3 New Inn, Strand, W.C.</td>
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<td>The Grove, Fishponds, Bristol</td>
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<td>38 Wellington-square, Hastings</td>
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<td>† Hillman, Thomas</td>
<td>Eastgate-street, Lewes</td>
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<td>† Hudd, A. E.</td>
<td>94 Pembroke-road, Clifton, Bristol</td>
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<td>† Inchbald, Peter</td>
<td>F.L.S., F.Z.S., Fulwith Grange, Harrogate, Yorks</td>
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<td>30 Delancey-street, Regent's Park, N.W.</td>
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<td>F.Z.S., F.R.G.S., Las Salinas, Valparaiso; and 16 Ashburn-place, S.W.</td>
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<td>Janson, Ed. W.</td>
<td>32 Victoria-road, Finsbury Park, N.; and 35 Little Russell-street, Bloomsbury, W.C.</td>
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<td>Perth-road, Stroud Green, N.; and 35 Little Russell-street, Bloomsbury, W.C.</td>
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1886 John, Evan, Llantrissant, Pontypridd.
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1886 Mutch, J. P., Hornsey-road, N.

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1861 † Saunders, G. S., Cumberland House, Mount Sion, Tunbridge Wells.
1886 Saunders, Wm., London, Ontario, Canada (President of the Entomological Society of Ontario).
1881 Scollick, A. J., Albion Lodge, Putney, S.W.
1875 † Sealy, Alfred Forbes, Cochin, South India.
1864 Semper, George, Altona.
1883 Shaw, A. Eland, 13 Lanhill-road, Paddington, W.
1883 † Shelley, Capt. George E., F.Z.S., 13 Rutland Gate, W.
1877 Slater, John Wm., 36 Wray-crescent, Tollington Park, N.
1883 Smith, Frederick W., Hollywood House, Dartmouth Point, Blackheath, Kent.
1869 Smith, Henley Grose, 20 Finsbury Circus, E.C.
1885 Smith, Sidney Philip, 22 Rylett's-road, Shepherds Bush, W.
1885 South, Richard, 12 Abbey-gardens, St. John's Wood, N.W.
1848 † Spence, William Blundell, Florence, Italy.
1848 † Stainton, Henry Tibbats, F.R.S., F.L.S., F.G.S., &c., Mountsfield, Lewisham, S.E.
1862 Stevens, John S., 38 King-street, Covent Garden, W.C.
1887 Stevens, Samuel, F.L.S., Loanda, Beulah Hill, Upper Norwood, S.E.
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1880 Surrage, J. Lyddon, *Hertford College, Oxford*; and *Saville-place, Clifton, Bristol.*

1882 Swanzy, Francis, *Stanley House, Granville-road, Sevenoaks.*


1876 Swinton, A. H., *Lansdowne, Danes Park, Ramsgate, Kent.*

1886 Theobald, F. V., 12 *Charles-road, St. Leonards-on-Sea; and Chestnut Avenue, Kingston-on-Thames.*

1856 Thomson, Jas., 12 *Rue de Presbourg, Place de l’Etoile, Paris.*

1882 Todd, Richard, 5 *Princes-terrace, Bayswater, W.*

1876 Trimen, Roland, F.R.S., F.L.S. (Curator of South African Museum), *Cape Town, Cape of Good Hope.*

1886 Tutt, J. W., *Rayleigh Villa, Westcombe Park, Blackheath, S.E.*

1869 Vaughan, Howard, 11 *Ospringe-road, Brecknock-road, N.W.; and 55 Lincoln’s Inn Fields, W.C.*

1886 Verrall, G. H., *Sussex Lodge, Newmarket.*


1869 Waterhouse, Charles O., British Museum, South Kensington, S.W.; and Ingleside, Avenue Gardens, Acton, W.

* Waterhouse, George R., F.Z.S., &c., Curton Lodge, Werter-road, Putney, S.W.*


1876 Western, E. Young, 27 *Craven Hill Gardens, Bayswater, W.*

* Westwood, John Obadiah, M.A., F.L.S. (Professor of Zoology in the University of Oxford), Honorary Life President, 67 Woodstock-road, Oxford.*

1882 Weymer, Gustav, 67 *Ost-strasse, Elberfeld, Rhenish Prussia.*
1886 Wheeler, F. D., M.A., Paragon House School, Norwich.
1868 White, F. Buchanan, M.D., F.L.S., Annat Lodge, Perth, N.B.
1884 White, William, Morden House, 55 Highbury Hill, N.
1882 Williams, W. J., Zoological Society, Hanover-square, W.
1874 Wilson, Owen, Cwmffrwd, Carmarthen.
1881 Wood, Theodore, Freeman Lodge, St. Peter's, Thanet, Kent.
1862 Wormald, Percy C., 10 Cromwell-avenue, Highgate, N.
1886 Young, Morris, Free Museum, Paisley.
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1. *On the classification of the Pterophoridae.*

By E. Meyrick, B.A.

[Read August 5th, 1885.]

The following notes include (1) an attempt to settle definitely the systematic position and rank of the group, (2) a partial revision of the genera contained in it, and (3) descriptions of some new exotic species.

The first question does not appear to me to present anything like the difficulty which is popularly expected of it. The suggestions of one writer that the group should be included amongst the *Bombycina*, and of another that it has direct affinity with certain *Hymeno-pterida*, I regard as ridiculous conjectures, quite without any reasonable foundation. Others, again, have confused the issue by classing among the *Pterophoridae* genera which have no real connection with the family. My own conclusion is that the group constitutes a family of *Pyralidina*, of similar value with the *Botyldidae* and other allied families, and that it may be placed, together with the *Tineodidae* and *Oxychirodidae*, as I have elsewhere defined them, next the *Crambidae* and *Scopariidae.*
Omitting the characters which are shared by the *Pterophoridae* with the rest of the *Pyralidina*, the following is a definition of the family:

**PTEROPHORIDÆ.**

No ocelli. No maxillary palpi. Abdominal uncus in male well-developed. Fore wings with vein 7 separate or absent. Hind wings with vein 6 separate from 7, 8 free but closely approximated to 7 on cell, lower median not pectinated. Wings usually fissured (except *Agdistis*).

So far as my investigations go, these characters hold universally, with the exception of the last (which is the least important), and are sufficient to separate the *Pterophoridae* from each of the other families of *Pyralidina*. Lord Walsingham, however, describes the genus *Cenoloha* (with which I am not acquainted) as possessing "drooping maxillary palpi," though he lays no stress on this exception. Considering the remarkable character of the structure attributed to this genus, which was founded on a single much-damaged specimen, I think that, without expressing any doubt of Lord Walsingham's accuracy, it will be wise to avoid basing any definite conclusions upon its alleged abnormal peculiarities, until they are confirmed from further specimens; but some remarks on this genus will be found later.

Now compare with the above definition the characters of *Scoptonoma*, classed by Zeller as an eccentric Pterophorid. I possess a type of *Scoptonoma Peterseni*, kindly communicated by Lord Walsingham; it has conspicuous ocelli, well-developed maxillary palpi, no apparent uncus, and in the hind wings vein 7 rising out of 6 and anastomosing with 8, with all the wings entire. It therefore disagrees with the *Pterophoridae* in almost every point, and cannot possibly have any direct connection with them; whilst on the other hand it agrees in all essential characters with the *Botylidæ*, and should undoubtedly be referred to that family; of the genera with which I am acquainted in nature it approaches nearest to *Rhimpalca*.

Certain authorities have also referred to the *Pterophoridae* the genus *Schreckensteinia* (*Chrysocoris*), a proceeding which appears to me still more unwarranted. In this case the structure of the genus should be compared not so much with the special family characters
given above, as with those shared by all the Pyralidina, since Schrekensteinia does not belong to that group at all, but to the Tineina, with which it is usually correctly placed, ranking under the Elachistidae next Stathmopoda. A comparison of the neuration will be sufficient. In the Pyralidina veins 8 and 9 of the fore wings (vein 8 being always the supra-apical vein) are always stalked; vein 8 of the hind wings is partially closely approximated to 7 (often anastomosing). In Schrekensteinia veins 8 and 9 of the fore wings are separate; vein 8 of the hind wings is widely remote from 7 throughout. These differences are conclusive; the first alone would be amply sufficient. The abdominal uncus seems to be absent (at least I found no trace of it in one specimen dissected), and the wings are not fissured. The hairiness of the larva, which seems to have been the only reason alleged for the transference of Schrekensteinia to the Pterophoridce, is a character of the most trifling importance in classification; it recurs in almost every principal group, and, as usual with dermal appendages, depends mainly on external circumstances of life. Compare the water-breathing gill-apparatus of the larva of certain Hydrocampidae, a much more remarkable structure, yet insufficient even to delimit genera.

I proceed now to state the main characters of the Pyralidina, with the object of showing that the Pterophoridce are justly included in that group; these are as follows;—

Fore wings with normally 12 veins, 1a and 1b present, 1b almost always simple at base, 5 belonging to system of lower median, 6 from middle of transverse vein, independent, 7 belonging to system of upper median, 8 supra-apical, 8 and 9 stalked, 12 free. Hind wings with normally 8 veins, 1a, 1b, and 1c present, 5 belonging to system of lower median, 6 belonging to system of upper median, 8 in part closely approximated to 7, usually anastomosing with it beyond cell, posteriorly divergent.

With the above type the Pterophoridce agree absolutely in every particular, and this combination of characters is not found in any other group, except the Pyralidina. But, in order to distinguish this type of neuration in the Pterophoridce, it is necessary to examine the older and more ancestral genera, in which the fission of the wings has not proceeded far; in the more advanced forms is
found a rapid degradation, causing the obsolescence of most of the veins, so that the affinity of these forms, if they stood alone, could not possibly be demonstrated. The progressive obsolescence of the veins takes place as follows, all the stages occurring in different genera: the fission of the wings, occurring opposite the middle of the cell, causes 5 and 6 in both wings to become very short, but these veins, with the transverse vein, though becoming very indistinct and feeble, do not disappear, except in the extreme type Cosmoeclostis, where the fissure extends more than two-thirds of the length of the wing; in the fore wings 2 and 3 then become gradually coincident with 4, and 7, 9, 10 and 11 with 8; in the hind wings 3 becomes coincident with 4, and in the extreme type 2 also coincides with 4 and 8 with 7. The neuration is thus finally reduced to four simple independent veins in the fore wings, and three in the hind wings. Keeping in mind the principles that a vein once merged by coincidence cannot possibly reappear, and that a fissure once made can never be filled up, there is no difficulty in constructing a genealogical sequence of the genera, which will show, if not certainly the actual, at least a possible order of development. The genealogical connection is indicated, as far as possible, in the generic descriptions hereafter following.

Regarding the connection of the Pterophoridae with the other families of the Pyralidina, it may be pointed out that the development of the uncus shows that they are not derived from the Botydidæ, and the separation of vein 7 of the fore wings that they are not derived from the Pyralidæ, whilst the absence of any pectination of the lower median vein of the hind wings indicates that there is probably no immediate connection with the Crambidae or Phycididae. From the other families they mostly differ by vein 8 of the hind wings not anastomosing with 7, and it is therefore probable that they do not originate from any known existing form, but from an extinct type closely approaching the ancestral form of the Pyralidina, and now apparently most nearly represented by the Tineodidae.

In the foregoing remarks no allusion is made to the Alucitidae. The following is a sufficient definition of the family characters:—
ALUCITIDÆ.


The single known genus has suffered so much degradation that it is in my opinion impossible to locate it with certainty, unless earlier connecting forms are hereafter discovered. The cell and many of the normal veins are obsolete, so that the type of neuration cannot be made out. The genus possesses ocelli, and therefore cannot be derived from the Pterophoridae (on the principle that organs once lost cannot reappear); on the other hand, the excessive fission of the wings shows that the Pterophoridae cannot be derived from Alucita. Notwithstanding, since the neuration of Alucita, though degraded, has nothing in it inconsistent with that of the Pterophoridae, and since fission of the wings is not found in any other group of Lepidoptera except these two, it seems reasonable to refer the Alucitidae also to the Pyralidina, with which they agree in such characters as are not obscured by degradation. I consider, therefore, that we are justified in inferring that the Alucitidae constitute a family of Pyralidina, allied to but distinct from the Pterophoridae and Tineodidae, and that, like these, it originated from an extinct type approaching the ancestral form of the Pyralidina. The actual neuration of Alucita is given hereafter under the generic heading.

For the following partial generic revision I have examined all the species which I have to hand, not a very large number; my results may therefore require extension, but will, I hope, be found accurate so far as they go. I find that the neuration presents the best characters for generic definition, and is here, as usually, the most reliable guide, and my classification is mainly founded on it. The form of the wings I consider an indefinite and unreliable character, but the number of fissures is a good point. The thickening of the legs with scales is practically of no value, as it is impossible to decide where the line is to be drawn, and the same may be said of the difference in length of the spurs. The frontal tuft is again a doubtful character; although so strongly developed in some species, every intermediate
stage down to obsolescence is found, yet it indicates real affinity, and can be employed in certain cases. The form of the palpi does not offer much definite variation, and is rarely of value. The structure of the antennae is practically almost identical throughout the family. The possession of black scales in the cilia of the third segment of the hind wings is a good indication, and seems on the whole to be a fairly reliable character, though it cannot always be employed, and in some cases these scales are very slightly developed.

The following is a tabulation of, so far as I am aware, all the genera known at present to exist; I have omitted *Amblyptilia*, Hb., and *Cnemiophorus*, Wallgr., which I consider not distinct from *Platyptilia*, Hb.:

| 1. Wings entire          | .. | .. | .. | .. | .. | Agdistis. |
| 2. Hind wings bifid     | .. | .. | .. | .. | .. | Cenoloba. |
| 3. Fore wings quadrifid | .. | .. | .. | .. | .. | Heptaloba. |
| 4. Fore wings with vein 9 present | .. | .. | .. | .. | .. | Deuterocopus |
| 5. Hind wings with black scales in dorsal cilia | .. | .. | .. | .. | .. |  |
| 6. Fore wings with vein 3 present | .. | .. | .. | .. | .. |  |
| 7. Fore wings with vein 10 stalked with 11 | .. | .. | .. | .. | .. |  |
| 8. Fore wings with vein 10 present | .. | .. | .. | .. | .. |  |
| 9. Forehead with cone of scales | .. | .. | .. | .. | .. |  |
| 10. Fore wings with vein 7 present | .. | .. | .. | .. | .. |  |
| 11. Posterior tarsi tufted above on joints | .. | .. | .. | .. | .. |  |
| 12. Forehead with cone of scales | .. | .. | .. | .. | .. |  |
| 13. Wings without cell | .. | .. | .. | .. | .. |  |
| 14. Fore wings with vein 11 from near 8, long, parallel | .. | .. | .. | .. | .. |  |

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| 1. Wings entire          | .. | .. | .. | .. | .. | Agdistis. |
| 2. Hind wings bifid     | .. | .. | .. | .. | .. | Cenoloba. |
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| 6. Fore wings with vein 3 present | .. | .. | .. | .. | .. |  |
| 7. Fore wings with vein 10 stalked with 11 | .. | .. | .. | .. | .. |  |
| 8. Fore wings with vein 10 present | .. | .. | .. | .. | .. |  |
| 9. Forehead with cone of scales | .. | .. | .. | .. | .. |  |
| 10. Fore wings with vein 7 present | .. | .. | .. | .. | .. |  |
| 11. Posterior tarsi tufted above on joints | .. | .. | .. | .. | .. |  |
| 12. Forehead with cone of scales | .. | .. | .. | .. | .. |  |
| 13. Wings without cell | .. | .. | .. | .. | .. |  |
| 14. Fore wings with vein 11 from near 8, long, parallel | .. | .. | .. | .. | .. |  |

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Mr. E. Meyrick on the
Cosmoclostis, n. g.

Forehead without tuft; a high scaled transverse ridge between antennæ. Antennæ in male —(?), in female minutely pubescent. Palpi moderately long, very slender, filiform, 2nd joint ascending, terminal joint almost as long as 2nd, porrected, somewhat pointed. Posterior tibiae slightly thickened on origin of spurs. Fore wings bifid, cleft from before one-third; no cell; 2 and 3 absent; 5, 6, 7 absent; 9, 10, 11 absent. Hind wings trifid, 3rd segment without black scales in dorsal cilia; no cell; 2 and 3 absent, 5 and 6 absent, 8 absent.

Founded on the single species described below; the most extreme type known, with the longest fissure and most degraded neuration; it is therefore presumably one of the most recently-developed forms, and apparently originates from Trichoptilus.

Trichoptilus, Wlsm.

Forehead without tuft. Antennæ in male minutely or moderately ciliated (one fifth to two-thirds). Palpi moderate, ascending, 2nd joint with short projecting scales beneath, tending to form a short angular apical tuft, terminal joint short or long, filiform, tolerably pointed. Tibiae thickened with scales on origin of spurs. Fore wings bifid, cleft from before middle; 2 out of 4 or absent, 3 absent, 5 and 6 extremely short, 7 absent, 9 absent, 10 absent or from near 8, long, 11 long. Hind wings trifid, 3rd segment usually with a few black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

I do not certainly know whether the name Trichoptilus justly belongs to the genus here described; Lord Walsingham founded the genus on a single Californian species, T. pygmaeus, which I have not seen, and gives no particulars of the neuration; I believe, however, that the species is congeneric with those described hereafter. Besides the six given here, I have another species from Mauritius, not in a condition to be described; and I consider that to this genus should probably also be referred Aciptilus siceliota, Z., Oxyptilus Kollari, Stt., and Aciptilus californicus, Wlsm. Of the six species examined vein 10 of the fore wings was present in T. compsocochares and T. centetes. The genus is a degenerate development of Oxyptilus.
OXYPTILUS, Z.

Forehead without tuft. Antennæ minutely ciliated (not over $\frac{1}{4}$). Palpi moderate, ascending, 2nd joint with projecting scales beneath, forming a short angular apical tuft, terminal joint moderate, filiform, tolerably acute. Palpi thickened with scales on origin of spurs. Fore wings bifid, cleft from about middle; 2 and 4 stalked, 3 absent, 5 and 6 very short, 7 from below angle of cell, long, 8 and 9 long-stalked, 10 out of 8, 11 from very near angle. Hind wings trifid, 3rd segment with a tuft of black scales in dorsal cilia; 2 from middle of cell, 3 from near angle, very short, 5 and 6 very short, 7 to apex.

The species examined were O. pilosella, O. hieracii, and O. parridactylus. The genus is derivable from Platyptilia.

SPHENARCHES, n. g.

Forehead without tuft. Antennæ minutely ciliated ({$\frac{1}{4}$}). Palpi moderately long, ascending, 2nd joint with appressed scales, terminal joint long, filiform, tolerably pointed. Tibiae thickened with scales on origin of spurs. Fore wings bifid, cleft from middle; 2 and 4 stalked, 3 absent, 5 and 6 very short, 7 from below angle of cell, long, 8 and 9 long-stalked, 10 and 11 stalked. Hind wings trifid, 3rd segment with a tuft of black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Founded on the single species described below; a development of Platyptilia, and intermediate in general characters between Oxyptilus and Deuterocopus.

DEUTEROCOPUS, Z.

Forehead without tuft. Antennæ in male —(?) Palpi moderate, ascending, 2nd joint with appressed scales, terminal joint moderate, acute. Tibiae thickened on origin of spurs with dense spreading whorls of scales; posterior tarsi with similar smaller whorls on apex of two basal joints. Fore wings trifid, cleft centrally from middle and lower segment cleft from two-thirds; 2 and 4 from point of angle of cell, 3 absent, 5 and 6 very short, 7 from below angle, long, 8 and 9 long-stalked, 10 from near angle, 11 from near 10. Hind wings trifid, 3rd segment unusually short, terminating in a tuft of black scales; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

I have examined D. Tengstromi, the only known species. The genus is derived from Platyptilia, and otherwise most allied to Sphenarches.
classification of the Pterophoridae.

**Heptaloba, Wlsm.**

I have not seen this genus, of which the neuration is not given; it appears to be also a development of *Platyptilia*.

**Platyptilia, Hb.**

Forehead with tufts of scales. Antennae in male ciliated (1—1). Palpi rather long, obliquely ascending, 2nd joint loosely scaled, terminal joint moderate, porrected, filiform, tolerably obtuse. Tibiae simple, or rather tufted on origin of spurs and centre of middle tibia. Fore wings bifid, cleft from two-thirds to three-fourths; 2 from considerably below angle of cell, 3 from very near angle, 5 and 6 short, 7 from below angle, 8 and 9 stalked, 10 from near angle, 11 tolerably remote. Hind wings trifid, 3rd segment with black scales in dorsal cilia; 2 from middle of cell, 3 from near angle, 5 and 6 short, 7 and 8 divergent from beyond cleft.

A development of *Mimescoptilus*, with which it agrees in neuration, and differs essentially only by the black scales in the cilia of the hind wings; and even these are sometimes very inconspicuous. In *P. hemimictra* the frontal tuft appears to be absent, and in some other species it is very short. The scaling of the legs differs specifically, as do also the scales in the cilia of fore wings, but these characters appear too indefinite and unreliable for generic subdivision; I therefore regard *Amblyptilia, Hb.*, and *Cnemidophorus, Wallgr.*, as not distinct genera. I have examined about twelve species. I see no sufficient reason for changing the name of this genus (which is not incorrectly formed) to *Platyptilus*, as suggested by Zeller; and the same remark applies to *Aciptilia*.

**Aciptilia, Hb.**

Forehead without tuft. Antennae in male moderately ciliated (1—1). Palpi moderate, more or less ascending, filiform, 2nd joint sometimes loosely scaled, terminal joint moderate or short, acute. Posterior tibia simple. Fore wings bifid, cleft from about middle; 2 from near angle or out of 4 or absent, 3 absent, 5 and 6 very short, 7 absent, 9 absent, 10 absent, 11 from a point with 8 or absent. Hind wings trifid, 3rd segment without black scales in cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Apparently derived from *Lioptilus*. I have examined about a dozen species, of which *A. galactodactyla* was the only one in which vein 11 of the fore wings was present; this is therefore one of the oldest species.
Lioptilus, Wallgr.

Forehead without tuft. Antennæ in male moderately ciliated. Palpi rather short, slender, filiform, obliquely ascending, pointed. Tibiae simple. Fore wings bifid, cleft from about middle; 2 from three-fourths of cell, 3 from a point with 4, 5 and 6 very short, 7 from below angle, 8 and 9 stalked, 10 absent, 11 from near angle. Hind wings trifid, 3rd segment without black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 8 very short, 7 to apex.

I have only been able to examine *L. microdactylus*, and these characters may require some extension; the genus is a development of *Marasmarcha*.

Oedematophorus, Wallgr.

I have not to hand any species of this genus, and am not certain whether it is a good one; according to the structure, as given by other authors, it may be a development of *Pterophorus*.

Pterophorus, Wallgr.

Forehead without tuft. Antennæ in male — (?). Palpi short, ascending, 2nd joint loosely scaled, terminal joint short, pointed. Posterior tarsi thickened with scales on joints. Fore wings bifid, cleft from before two-thirds; 2 from three-fourths of cell, 3 and 4 stalked, 5 and 6 short, 7 from hardly below angle, 9 absent, 10 very closely approximated to 8 at base, 11 from four-fifths of cell. Hind wings trifid, 3rd segment without black scales in cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Characters drawn from *P. monodactylus*, besides which there is no other species certainly referable here; a development of *Mimeseoptilus*.

Doxoesthes, n. g.

Forehead with projecting tuft of scales. Antennæ in male ciliated (1). Palpi moderately long, porrected, 2nd joint loosely scaled, tending to be tufted above towards apex, terminal joint moderate, cylindrical, obtuse. Tibiae simple. Fore wings bifid, cleft from two-thirds; 2 from near angle, 3 and 4 short-stalked, 5 and 6 short, well-defined, 7 absent, 9 absent, 10 from very near angle, 11 from near 10. Hind wings trifid, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 and 4 short-stalked, 5 and 6 very short, 7 and 8 slightly divergent.
Also a development of *Mimeseoptilus*; at present I am acquainted with only one species, *D. canalis*, Walk., Brit. Mus. Cat., 944.

**Maramarcha**, n. g.

Forehead with projecting tuft of scales. Antennae of male ciliated. Palpi moderate, ascending, slender, terminal joint moderate, pointed. Tibiae simple. Fore wings bifid, cleft from before two-thirds; 2 from near angle, 3 and 4 from point of angle or stalked, 5 and 6 short, 7 from near below angle, 8 and 9 stalked, 10 absent, 11 from near angle. Hind wings trifid, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 and 4 short-stalked, 5 and 6 very short, 7 and 8 divergent from beyond cleft.

Derived, like the two preceding, from *Mimeseoptilus*, and formed to include *M. pheadactyla*, Hb., and a second species, described below.

**Mimeseoptilus**, Walgr.

Forehead with projecting tuft of scales. Antennae of male ciliated (?—1). Palpi moderately long, porrected. 2nd joint with loose rough scales, tending to be tufted above towards apex, or tolerably filiform, terminal joint moderate or short, cylindrical, obtuse or tolerably pointed. Tibiae simple. Fore wings bifid, cleft from about two-thirds; 2 from about two-thirds of cell, 3 from near angle, 5 and 6 short, 7 from below angle, 8 and 9 stalked, 10 from rather near 9, 11 tolerably remote or rather near 10. Hind wings trifid, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 from before angle, 5 and 6 very short, 7 and 8 divergent from beyond cleft.

This is without doubt the oldest of all the known cleft-winged genera, and is the true typical form of the family, being itself descended from a common ancestor with *Agdistis*.

**Agdistis**, Hb.

I have here no specimens for examination, and can therefore add nothing to the characters of this genus.

**Cenoloba**, Wlsm.

I have not seen this genus, though stated to be Australian. If the extraordinary characters given for it are
really correct, it would follow from the presence of maxillary palpi that the genus could not be genealogically developed from any other known genus of the family, and must therefore represent a modification (probably much degraded) of a still older type; on the principle that an organ once wholly lost cannot again recur. From the alleged absence of the third segment of the hind wings (if not accidentally broken) no inference could be drawn without investigation of the neuration. In the absence of further material I merely suggest these points for consideration.

**Alucita. Z.**

Ocelli present, concealed. Antennæ in male minutely ciliated (‡). Palpi long, curved, obliquely ascending, 2nd joint with rough projecting scales beneath towards apex, forming a more or less prominent tuft, terminal joint moderate or long, pointed, slender or thickened m front with rough scales. Posterior tibiae sometimes partially rough-haired above, outer spurs half to two-thirds of inner. Fore wings six-cleft; no cell; 5 and 6 absent, 7 free, 9 and 10 absent, 11 out of 8 before or beyond cleft. Hind wings six-cleft; no cell; 5 absent, 6 out of 7, 8 free.

The affinities are discussed above.

In the sixth volume of the 'Linnaea Entomologica' Zeller suggested the name Diacrotricha for a subdivision of *Pterophorus* (as then understood, nearly equivalent to the present family), to contain one species, *P. fasciola*, Z., characterised especially by the terminally dilated and flattened hair-scales of the occiput; although I regard this character as insufficient, it is possible that the genus may be tenable on other grounds: it is, however, unknown to me.

The following species appear to be new:—

**Cosmoclostis aglaodesma**, n. s.

♀, 18 mm. Head and palpi ferruginous, frontal ridge white. Antennæ whitish. Thorax silvery-white, anterior margin very narrowly, posterior margin rather broadly, ferruginous. Abdomen ferruginous, segments marked alternately with a large trapezoidal silvery-white spot dilated behind (four in all), or with two small longitudinal white marks, beneath wholly silvery-white. Legs ferruginous, anterior pair blackish-ferruginous, obscurely banded
with white, middle pair sharply obliquely banded with white. Fore wings cleft from before one-third, segments linear; silvery-white, with ferruginous markings; a narrow streak along costa throughout; a slender line along inner margin, strongly dilated near base; a narrow fascia before one-fourth, interrupted below costa; 1st segment with an interrupted fascia almost at its base, an entire fascia before its middle, and another rather near apex; 2nd segment wholly ferruginous, with a white spot rather near its base, and two white fasciae opposite the two posterior dark fasciae of 1st segment; cilia pale beneath, on costa ferruginous. Hind wings cleft to base, segments linear; ferruginous-fuscous; cilia light brownish.

A conspicuously distinct and handsome species.

Sydney, New South Wales; one specimen on a fence in September.

*Trichoptilus scythodes*, n. s.

♂, ♀, 12–13 mm. Head and thorax brownish ochreous, more or less mixed with white. Palpi ochreous mixed with white. Terminal joint white, with base and apex dark fuscous, 2nd joint reaching middle of face. Antennæ whitish, annulated with dark fuscous, with a blackish line above. Abdomen ochreous, longitudinally striated with irregular obscure white and black lines, apex in male with two obliquely ascending divergent hair-pencils. Tibiae white, longitudinally striped with black, posterior tibiae with dark fuscous median and apical bands, all tarsi with broad blackish bands at apex of joints. Fore wings cleft from before middle, segments linear; brownish ochreous, with scattered dark fuscous scales; one or two white spots on inner margin, and sometimes a suffused irregular white central streak from base to cleft; 1st segment suffused with darker fuscous, with a white bar before its middle and another towards apex, sometimes also a white spot at base; 2nd segment with two corresponding but less distinct white bars: cilia grey, on costa dark grey barred with white opposite fascia and white at base towards apex, on lower margin of 1st segment mixed with white and with some black scales in middle, on upper margin of 2nd segment with a row of black scales towards middle, on lower margin of 2nd segment with five spots of black scales, first before cleft, last subapical, and two or three white bars, last anal. Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia grey, 3rd segment with a fringe of white hair-scales on inner margin from base to middle, without black scales.
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So far as my specimens show, this and the following species are quite destitute of the black scales in the dorsal cilia of the hind wings, possessed by all the other species of the genus; but they certainly do not admit of generic separation; this species is readily recognised by the distinct white markings.

Sydney, New South Wales; Port Lincoln, South Australia; four specimens in November and April.

*Trichoptilus ceramodes*, n. s.

♂, ♀, 14 mm. Head and thorax light ochreous. Antennae ochreous, with a blackish line above. Palpi pale ochreous, base white, second joint reaching above middle of face. Abdomen light ochreous, with an obscure interrupted blackish line on each side of back; apex in male with two white obliquely ascending tolerably appressed hair-pencils, valves small. Legs white, longitudinally lined with dark fuscous; posterior pair banded with brownish ochreous on middle and apex of tibiae, and apex of 1st joint of tarsi. Fore wings cleft from middle, segments linear; light ochreous; a small brown spot near inner margin before one-fourth; a cloudy fuscous spot on base of 2nd segment; 1st segment with broad cloudy fuscous basal, median, and apical bands; costal cilia grey, with white spots between the bands; rest of cilia grey, with a few whitish scales, a white bar at anal angle, and another on lower margin before middle of 2nd segment. Hind wings cleft firstly from before one-third, secondly from base, segments linear; rather dark fuscous; cilia light ochreous-greyish, inner margin of 3rd segment with a row of white hair-scales, without black scales.

This species appears to be destitute of black scales in the cilia of both wings.

Sydney, New South Wales; Port Lincoln, South Australia; two specimens in September and November.

*Trichoptilus xerodes*, n. sp.

♂, ♀, 15—16 mm. Head and thorax light ochreous, apex of patagia snow-white. Palpi ochreous, base white, terminal joint whitish, longitudinally striped with black; 2nd joint reaching middle of face, terminal joint nearly as long. Antennae whitish, annulated with grey, with a grey line above. Abdomen light ochreous, somewhat mixed with white, with a white longitudinal stripe on each side of back, externally bounded by a black line, anal tuft white; apex in male with a small single projecting hair-
pencil, valves large. Legs white, longitudinally striped with black. Fore wings cleft from before middle, segments linear; light ochreous; extreme costal edge slenderly blackish; a white streak along inner margin from base to near cleft; some white scales tending to form obscure bars on both segments about their middle and towards apex; costal cilia blackish, spotted with white on base, with a white basal streak towards apex; rest of cilia dark grey, with a white bar at anal angle, and five small spots of black scales on lower margin of 2nd segment, first close before cleft, last sub-apical. Hind wings cleft firstly from before one-third, secondly from near base, segments linear; dark fuscous; cilia grey, 3rd segment with two or three black scales on inner margin beyond middle, and a fringe of long white hair-scales between this and base.

The black scales in the dorsal cilia of the hind wings are very slight and inconspicuous, yet always perceptible; the fore wings have obscure whitish markings, and are without any black dots, such as are found in the three following species.

Toowoomba, Queensland; Bathurst, New South Wales; Adelaide, Wirrabara, and Port Lincoln, South Australia; rather common from September to November.

*Trichoptilus leptomeres*, n. s.

♂, 14—15 mm. Head, palpi, and thorax light brownish ochreous; palpi with 2nd joint nearly reaching crown, with tolerably long scales, terminal joint nearly as long as 2nd. Antennae whitish, longitudinally lined with dark fuscous. Abdomen light ochreous mixed with whitish, with a longitudinal yellowish white dorsal stripe, bordered with deeper ochreous; apex in male with two long fine obliquely upwards projecting divergent hair-pencils. Legs white, longitudinally lined with black. Fore wings cleft from before middle, segments linear; rather light brownish ochreous; a blackish dot before cleft; some white scales towards apex of both segments; costal cilia brownish ochreous, with a spot at two-thirds, another towards apex, and an apical spot white; rest of cilia grey, somewhat mixed with whitish, with a white bar at anal angle, a row of black towards middle of upper margin of 2nd segment, near base, median, and subapical. Hind wings cleft firstly from one-fourth, secondly from near base, segments linear; dark fuscous; cilia grey. 3rd segment with a small spot of black scales on inner margin beyond middle, and a fringe of long white hair-scales between this and base.
Superficially very similar to *T. xerodes*, but easily separated by the distinct black dot before cleft of fore wings.

St. Denis, Island of Réunion; three specimens taken at the end of April.

*Trichoptilus compsochares*, n.s.

♀, 18 mm.  Head and thorax ochreous. Palpi ochreous mixed with white, 2nd joint reaching rather above middle of face. (Antennae broken.)  Abdomen ochreous, with longitudinal fuscous lines (partially defaced).  Legs white, longitudinally striped with blackish, posterior tibiae and tarsi banded with fuscous.  Fore wings cleft from middle, segments linear; brownish ochreous, 1st segment suffused with fuscous; a minute indistinct blackish dot beneath costa near base; a blackish dot on 1st segment at base; some whitish scales forming obscure bands on 1st segment at about one-third and two-thirds of length; cilia greyish ochreous, on costa barred with whitish on bands, on lower margin of 1st segment with a small subapical spot of black scales, on upper margin of 2nd segment with two or three black scales towards middle and tips white at apex, on lower margin of 2nd segment becoming dark grey on posterior half, with a white anal bar, a white band beneath middle, two or three small spots of black scales towards base, and one beneath apex.  Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia ochreous-grey, 3rd segment with a small spot of black scales on inner margin beyond middle, and a fringe of white hair-scales between this and base.

Differs from any of the preceding by the distinct black dot on base of first segment of fore wings, and by possessing vein 10.

St. Vincent, Cape de Verde Islands; one specimen received from Mr. G. F. Mathew, R.N., who took it in January, amongst a species of *Chenopodium*, with several others.

*Trichoptilus centetes*, n.s.

♂, 16 mm.  Head and thorax light ochreous. Palpi ochreous mixed with white, 2nd joint reaching middle of face. Antennae whitish ochreous, with a dark fuscous line on back. Abdomen ochreous-whitish, longitudinally striated with interrupted fuscous lines, apex with two obliquely ascending hair-pencils, valves small. Legs whitish, longitudinally striped with black, posterior tibiae
banded below middle and at apex with dark fuscous (tarsi broken). Fore wings cleft from before middle, segments linear; ochreous-brown. costa and 1st segment darker brown; a moderately large black dot beneath costa near base, another in disc at one-third, and a third on 1st segment at base; 1st segment with a few ochreous-whitish scales before middle and towards apex, intervening space suffusedly dark fuscous; costal cilia fuscous, becoming whitish before middle and towards apex; rest of cilia light greyish ochreous, on lower margin of 1st segment somewhat mixed with whitish, with a spot of black scales beneath apex, on upper margin of 2nd segment with a white spot before middle, some black scales towards middle, and tips white at apex, on lower margin of 2nd segment with a broad dark grey blotch before anal angle, bordered on each side with a whitish bar, and a small apical spot of black scales. Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia ochreous-grey, 3rd segment with a spot of black scales on inner margin at three-fifths, and a fringe of white hair-scales between this and base.

Principally distinguished from *T. compsochares*, with which it agrees in neurature, by the conspicuous black subcostal and discal dots; there are also some other slight comparative differences; but I think it not unlikely that the discovery of forms from intermediate localities may show that these two are only geographical races of the same species.

Port Moresby, New Guinea; one specimen received from Mr. G. F. Mathew, taken with others in November.

*Sphenarches synaphrys*, n. s.

♂, 16 mm. Head and thorax brownish ochreous, apex of patagia white. Palpi fuscous, base whitish. Antenne fuscous, annulated with whitish. Abdomen whitish ochreous, with a central dark fuscous line, dilated to form small blotches at one-third and apex, and a large angular blotch at two-thirds, and with dark fuscous lateral lines. apex whitish, with two obliquely ascending hair-pencils. Legs white, longitudinally striped with black, posterior tibiae and tarsi banded with blackish. Fore wings cleft from before middle, 1st segment tolerably linear, 2nd segment posteriorly moderately dilated, hind margin concave, anal angle sharply defined; ochreous-brown, costal edge mixed with blackish and whitish scales; a black dot beneath costa near base, another in disc before one-third, and a third on inner margin of 1st segment at base; an indistinctly inwardly oblique whitish band on 1st
segment before its middle, and a less distinct one towards apex, both indicated also on 2nd segment; a black line along hind margin of 2nd segment: costal cilia dark fuscous, barred with white on bands; rest of cilia light greyish ochreous, lower margin of 1st segment with four spots of scattered black scales, 2nd median and largest, upper margin of 2nd segment with some black scales towards middle and apex, lower margin with four small spots of black scales, a dark grey patch before anal angle, and a small apical spot of black scales. Hind wings cleft firstly from one-third, secondly from near base, segments linear; ochreous-fuscous, 3rd segment becoming pale ochreous towards base; cilia light greyish ochreous, 3rd segment on upper margin with a tolerably continuous row of black scales from near base to apex, largest about three-fifths, on lower margin with several black scales about one-third, a large tooth of black scales at three-fourths, and a small apical spot, and with a fringe of white hair-scales on basal half.

New Hebrides and Tonga Islands; several specimens taken by Mr. G. F. Mathew.

*Platyptilia hemimetra*, n. s.

♂, 12 mm. Head, palpi, thorax, abdomen, and legs dark fuscous, mixed with grey-whitish; frontal tuft hardly perceptible; palpi with 2nd joint reaching middle of face, terminal joint very short. Antennæ dark fuscous, annullated with whitish. Fore wings cleft from before two-thirds, 1st segment moderately broad, oblong, hind margin straight, somewhat oblique, 2nd segment posteriorly dilated, broader than 1st, hind margin oblique, tarsi sinuate, so as to project in middle, anal angle sharply defined; greyish fuscous, irregularly mixed with whitish and blackish; basal half of costa obscurely spotted with darker and lighter; a cloudy dark fuscous triangular blotch on costa before cleft, reaching across wing to below cleft; a broad cloudy dark fuscous blotch on 1st segment towards its middle, margined posteriorly by an irregular ochreous-whitish line; a transverse ochreous-whitish line near hind margin of 2nd segment, preceded by a dark fuscous suffusion; costal cilia dark fuscous, with three whitish spots; rest of cilia grey-whitish on hind margin, with a sharp black line near base, on lower margin of 1st and upper margin of 2nd segments each with three very small spots of black scales, on lower margin of 2nd segment with five small spots of black scales. Hind wings cleft firstly from two-fifths, secondly from near base, 1st segment narrow, spatulate, 2nd narrow, caudate, 3rd linear, short, only reaching middle of wing; rather dark greyish fuscous; cilia whitish grey, 3rd segment with
classification of the Pterophoridae.

a tolerably continuous row of very short dark fuscous scales on both margins, and with a large tooth of black scales on lower margin before apex.

Well characterised by its small size, the obsolescence of the frontal tuft, the medium hind-marginal projection of the second segment of fore wings, and the proportionally very short thick segment of hind wings.

St. Denis, Island of Réunion; one specimen at the end of April.

Marasmarcha liophanes, n. s.

♀, 13—14 mm. Head, palpi, antennæ, and thorax pale brownish ochreous, apex of patagia white. Abdomen whitish ochreous, with irregular lateral fuscous lines, anal tuft white. Legs white, longitudinally striped with fuscous. Fore wings cleft from three-fifths, 1st segment parallel-sided, hind margin very oblique, 2nd segment narrower than 1st, not dilated, hind margin very oblique, anal angle indistinct; pale brownish ochreous, posteriorly sometimes more brownish; a small cloudy dark fuscous spot in disc at two-fifths; cilia ochreous-whitish, with a grey spot above apex, a sharp black line near base along hind margin, a grey patch below anal angle, and four small spots of black scales on inner margin. Hind wings cleft firstly from two-fifths, secondly from near base, segments tolerably linear; fuscous; cilia very pale greyish ochreous.

St. Denis, Island of Réunion; two specimens at the end of April.

Mimeseoptilus phenecephes, n. s.

♂, ♀, 16—20 mm. Head, thorax, and abdomen white, with a few ochreous scales; frontal tuft short. Palpi moderate, slender, ochreous mixed with white. Antennæ white, annulated with fuscous. Legs white, anterior and middle femora and tibiae suffused with fuscous. Fore wings cleft from two-thirds, segments rather broad, parallel-sided, hind margin of 1st segment somewhat concave, very oblique, of 2nd segment nearly straight, oblique; white, irregularly sprinkled with dark fuscous; costa spotted with fuscous on basal half; a longitudinal dark fuscous mark on fold near base; a small dark fuscous spot in disc at one-third; a dark fuscous suffusion on costa at two-thirds, touching an oblique transverse strong dark fuscous mark on base of cleft; a dark fuscous suffusion on 1st segment towards apex, separated from a narrow hind marginal suffusion by a cloudy white line, these markings sometimes continued over 2nd segment; costal cilia dark fuscous, with a
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white band above basal half of 1st segment; rest of cilia white, on hind margin of 2nd segment with a dark grey line near base. Hind wings cleft firstly from middle, secondly from near base, 1st segment moderate, somewhat dilated, hind margin oblique, 2nd segment moderate, parallel-sided, hind margin very oblique, 3rd segment linear, above with a pecten of hairs towards base; whitish; cilia white.

A distinct species, intermediate between the following and *M. celidotus*; this and the following species are especially characterised by the whitish hind wings.

Mount Wellington, Tasmania, at about 3000 feet, in February; three specimens.

*Mimeseoptilus leuconepthes*, n. s.

♂, 23 mm. Head, palpi, thorax, and abdomen white, with a few scattered fine fuscous scales; frontal tuft short, palpi moderate, slender. Antennae white, spotted above with dark fuscous. Legs white, anterior and middle pair irroration above with dark fuscous. Fore wings cleft from two-thirds, segments rather broad, parallel-sided, hind margin of 1st segment subconcave, very oblique, of 2nd segment slightly bowed, oblique; white, very faintly yellowish-tinged, with a thin fine fuscous irroration, 1st segment somewhat suffused with light fuscous; a blackish iroration along basal half of costa, tending to form small spots; a row of four or five small similar blackish spots along submedian fold towards base; a blackish dot beneath costa at one-third, and another near before cleft below middle; some scattered dark fuscous scales beyond middle of 1st segment; cilia white, on costa pale whitish-fuscous. Hind wings cleft firstly from middle, secondly from near base, 1st segment moderately dilated, hind margin rounded, oblique, 2nd segment moderate, slightly dilated, hind margin very oblique, 3rd segment narrow, acuminate: whitish; cilia white.

Allied to the preceding, but very distinct.

Mount Kosciusko, New South Wales; one specimen at 4700 feet, in January.

*Alucita phricodes*, n. s.

♂, ♀, 14—17 mm. Head, thorax, and abdomen dark fuscous, sprinkled with whitish, and tuft whitish; abdomen with a narrow white ring at one-third from base. Palpi dark fuscous, internally whitish, 2nd joint obscurely banded with whitish at three-fourths and apex, terminal joint banded with whitish at one-fourth
and three-fourths; 2nd joint long, porrected, beneath with dense projecting scales on apical half, forming a very short broad truncate tuft, terminal joint about three-fourths of 2nd, anteriorly roughened with scales, somewhat thickened in middle, pointed. Antennae dark fuscous. Legs whitish, suffused with dark fuscous above, except on posterior tibiae, of which the basal half is clothed with short rough whitish hairs above. Wings formed as in A. hexadactyla. Fore wings with segments blackish, 1st segment with six ochreous white-margined spots, last two largest, remaining five segments with small white and ochreous spots, and an ochreous subapical band; cilia pale greyish, with dark grey obscurely whitish-margined markings, forming three irregular transverse fasciae; first narrow, about one-fourth; second moderate, angulated outwards above middle, and sinuate inwards below middle; third broader, obsolete near inner margin, towards costa obscurely dilated so as to appear connected with last three antepapical dark costal spots. Hind wings with segments blackish, with small white ochreous spots; cilia pale greyish; markings obscurely whitish-margined; a rather narrow dark grey fascia before middle, extending from vein 1 to 4; on posterior half of wing three indistinct grey regularly dentate narrow fasciae, second becoming double on first two segments, and much darker towards inner margin and on posterior costal branch.

Duaringa, Queensland; Sydney, New South Wales; locally common, especially at rest on fences, in August, September, November, and January.

Note. — Lord Walsingham, who has kindly looked through the proof of this paper, suggests that Cnemidophorus (p. 6) should be Euemidophorus, Wallengren himself having substituted this name for Cnemidophorus, which is preoccupied.—H. G. and W. W. F.

[Read February 3rd, 1886.]

Some time ago I received a small collection of Languriidæ from Mr. G. Lewis, chiefly taken in Assam; among them are several specimens of Tetralanguria pyramidata and one specimen of Pachylanguria collaris; with regard to this latter insect it may be remarked that, through a misprint in Crotch’s revision of the Erotijlidæ (Cist. Ent. i. 377), the length is printed 3 lin. instead of 8 lin.; there is also a single specimen very closely allied to Languriosoma Monhoti, but with rather stronger punctuation than in Crotch’s type, which I compared with it; I believe, however, that it is this species; Languria scutellata, Crotch, is represented by two or three specimens; this species appears to be identical with L. nigrina, Wied.; one of the specimens apparently belongs to the variety “ommino obscure rufa, vel elytris luerter inseo-virentibus,” which is mentioned by Von Harold in his paper on the group (Mithceil. d. Munchener. Ent. Ver. 1879, p. 81); one new species of Languria, represented by two examples, is described below; the most interesting part of the collection, however, consists of three specimens of Doubledaya, one male and two females, which unfortunately are more or less immature or imperfect; one female is 21—22 mm. long, the other 13—14 mm., while the length of the male is only a little over 10 mm.; I believe, however, that they all belong to the same species; and as the larger female is in fair condition, and the male perfect, although slightly immature, I have ventured to describe it. There is in the collection another male of a species of Doubledaya (length 15 mm.) from the Andaman Islands, but it is so immature that it cannot be described, although apparently a new species.

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**Languria Assameusis, n. s.**

Nigra, nitida, capite prothoraceque rufis, antennis et pedibus nigris; capite parceus subtiliter punctato, oculis promnulis antennis modicis, clava 4-articulata; prothorace sat convexo, tenuiter marginito, lateribus leviter rotundatis, ante basim sinuatis, angulis posticis acutis, prominentibus, basi ad medium valde depressa, depressione fortiter punctata, et utrinque lineola longitudinali terminata; scutello sat magno, nigro; elytris humeris distinctis, striato-punctatis, interstitiis punctatis, apicibus subrotundatis; abdomen ad majorem partem glabro, segmento ultimo dense et fortissime punctato. Long. 10—11 mm.

Black, very shiny, head and prothorax clear red; head very diffusely punctured, eyes rather prominent; antennae black, with four-jointed club, the 8th joint considerably narrower than the succeeding; prothorax almost smooth, very feebly punctured on disc, sides gradually and not strongly rounded, sinuate before posterior angles, which are acute and prominent, base with a very strong depressed and punctured furrow, terminated on each side by a short longitudinal stria; elytra with rows of rather strong and close punctures set in rather shallow striae, interstices with rows of fine punctures, apices subtruncate; legs shining black; abdomen mostly smooth, last segment very strongly and closely punctured.

Assam.

**Doubledaya varians, n. s.**

Aenea vel viridi-aenea, prothorace rufo, ad medium metallico; prothorace latitudine dimidio longiori, lateribus leviter rotundatis, ad basim sinuatis, angulis posticis acutis, prominentibus, stria brevi longitudinali utrinque ad basin instructo; scutello sat magno postice acuminato; elytris elongatis, ordinibus punctorum magnorum seriatim dispositis, fortiter transversim rugosis, interstitiis seriatim punctatis, apicibus obtusis, elevatis; pedibus longis, tarsis dilatatis. Long. 21—22 mm, ♂.

Mas duplo-minor, capite latiori, antennis teretioribus, clava triarticulata, prothorace subquadrato latitudine vix longiori. Long. 10—11 mm.

Greenish brassy, prothorax red, with a central fascia metallic; thorax much longer than broad, with the sides slightly rounded, sinuate before base, posterior angles acute and prominent, disc almost impunctate, except for a few scattered punctures on each side of the dorsal furrow, which is shallow, and terminates in a depression at base; on each side of the base there is a short longitudinal stria; scutelhum rather large, almost pentagonal,
acuminate behind; elytra broader at base, with rows of strong punctures, very strongly transversely rugose, interstices with single rows of small punctures, margins continued very plainly along shoulders to scutellum, apices subtruncate, with the exterior extremities bluntly elevated; legs long, tarsi strongly dilated.

Male much smaller; head broad, antennæ slender, with three-jointed club; thorax subquadrate, unicolorous, slightly longer than broad, with no central furrow, but with plain short longitudinal striae at base.

Assam.

I am rather doubtful regarding this species, as the male is so much smaller than the female that I should hardly have united them, had it not been for the smaller female referred to above, which, apart from its immaturity, appears to be structurally identical with the larger one.

In a paper on the group (Trans. Ent. Soc., 1885, Part iii., p. 386) I have named a species Languria femoralis; I find, however, that this name has been preoccupied by Motschulsky for a North American species. I therefore propose to alter my name to L. nigroanea. In the same paper (p. 382) I have said that in Goniolanguria the clypeus has a strong V-shaped emargination; this is very plain in some specimens, but I have since found that it is not constant in all; I believe that it is sexual, and is found in the female only.

Since writing the above, I find that Von Harold (l. c., p. 81) considers L. scutellata, Crotch, as identical with L. nigrina, Wied. I had arrived at this conclusion from an examination of Mr. Crotch’s specimens at Cambridge.
III. Descriptions of new genera and species of Galerucidae.
   By Joseph S. Baly, M.R.C.S., F.L.S.

[Read February 3rd, 1886.]

*Hoplosoma centralis.*

Elongata, parallela, flava, nitida, pectore abdomineque nigris; thorace transverso, lateribus basi subparallelis, antice paullo amplis; disco levii, transversim excavato, elytris tenuiter punctatis.


*Hab.* Borneo, Sarawak (Wallace).

Head prominent; antennæ slender, filiform; eyes black. Thorax one-half as broad again as long; sides parallel, slightly dilated anteriorly; disk impunctate, transversely excavated, more deeply so on either side.

*Hoplosoma ornata.*

Elongata, parallela, rufo-testacea, nitida, antennis, basi exceptis, scutello, pectore pedibusque nigris; thorace transverso, disco utrinque leviter transversim excavato; tenuissime punctatis, faseia lata prope medium metallico-purpurea instructis; disco antico flavo. Long. 4 lin.

*Hab.* Mysol (Wallace).

Antennæ filiform, equal to the body in length; subapical joint of the maxillary palpus not thicker than the apical one. Thorax twice as broad as long; sides nearly straight and parallel; disk shining, nearly impunctate, impressed on either side with a broad shallow transverse excavation. Elytra parallel, very minutely punctured; flavus anteriorly, rufo-testaceons from just below the middle disk to the apex, the two colours being separated by a broad metallic purple band.

The penultimate joint of the maxillary palpus is not thickened in this species.

*Cneoraus rugulipennis.*

Mr. J. S. Baly's descriptions of new
pectore abdomineque viridi-æneis, griseo-sericeis; scutello nigro; thorace convexo, levi. utrinque vix ante medium fovea parva impresso; elytris viridi-æneis, crebre ruguloso-punctatis. Long, 3½—4½ lin.

_Hab._ Northern India.

Head not longer than broad, trigonate; antennae slender, equal to the body in length. Thorax about one-half broader than long; sides obtusely angulate; disk convex, impressed on either side just beyond the middle with a small round fovea. Elytra narrowly oblong, faintly impressed below the basilar space, closely rugulose-punctate.

*Mimastra apicalis._

Angustie elongata, parallela, flava, nitida, pectore abdomineque viridi-æneis, griseo-sericeis, antennis extrorsum, femoribus dorso, tibiis apice tarsisque piccis; capite subtrigonato, vertice viridi-æneo; thorace transverso, lateribus fere rectis; disco levi, utrinque transversim suctato, medio plus minusve distincte longitudinaliter excavato, utrinque piceo maculato; elytris parallelis, sat crebre subruguloso-punctatis, utroque plaga viridi-ænea a paullo infra medium ad apicem extensa, instructo. Long. 4—4½ lin.

_Hab._ India.

Head trigonate; antennae very slender, equal to the body in length; the three or four lower joints flavous, the rest piceous. Thorax nearly twice as broad as long; sides straight and nearly parallel from the base to beyond the middle, thence very slightly converging and rounded to the apex; upper surface transversely excavated on either side; middle disk longitudinally sulcate, the sulcation in some specimens nearly obsolete.

Nearly allied to *Mimastra Sorcelli._

_Cerophysa flava._

Elongata, convexa, fulva, nitida, aureo micans, pectoris lateribus abdomineque viridi-æneis; antennis apice, tarsisque piccis; thorace levi, utrinque obsolete excavato; elytris distincte, subcrebre punctatis, punctis subseriatis.

♂. Antennarum articulo octo magno, incassato. Long. 3 lin.

_Hab._ Birmah.

Antennae half the length of the body, the 2nd joint very short, moniliform; the 3rd twice the length of the 2nd, clavate; the 4th to the 7th short, turbinate; the 8th large, strongly incassate. Thorax half as broad again as long; sides rounded; disk convex,
smooth, impunctate, obsoletely impressed on either side with a transverse fovea. Elytra narrowly oblong, parallel, distinctly punctured.

**Nacrea, n. g.**

Corpus angustae oblongum, convexum. Caput exsertum, antennis filiformibus, articulo secundo minuto, tertio (in ♀) incassato, compreso. Thorax transversus, convexus, disco transversim excavato. Elytra angustae oblonga, convexa, dorso non excavata, confuse subseriato-punctata; epipleuris planis, fere ad apicem extensis. Pedes medioeræ; coxis antecis contiguis; tibis apice inermibus; unguiculis appendiculatis. Acetabula antica integra. Type Nacrea maculata.

The present genus, which has quite the facies of Cerophysa, must, owing to the closed anterior acetabula, be placed near Agetocera; from this latter genus it is separated by the appendiculated claws.

**Nacrea apiipennis.**

Anguste oblonga, convexa, flavæ, nitida, scutello elytrorumque apice nigris; thorace quam longo paullo latori, convexo, disco postico leviter transversim bifoveolato; elytris oblongis, tenuiter subcrebre punctatis.


**Hab.** India.

Clypeus large, transversely convex, obsoletely carinate; antennæ (in the ♀) with the basal joint curved, clavate; the 2nd minute; the 3rd longer, oblong-ovate, compressed and excavated on either side; the 4th and 5th filiform, each equal in length to the basal one (the rest of the joints in the single specimen before me broken off). Elytra oblong, convex, faintly excavated transversely below the basilar space, finely but rather closely punctured.

**Nacrea maculata.**

Anguste oblonga, convexa, flavæ, nitida, scutello, pectore, abdomine, femoribus apice, tibis tarsisque nigris; thorace quam longo paullo latori, lateribus vix ante medium angulatis; disco levii, disco postico bifoveolato; elytris oblongis, convexis, subseriato-punctatis; utrisque apice, macula subbasali prope suturam posita, fasciisque communi, vix pone medium, metallicco-purpureis.

♀. Antennarum articulo primo curvato, clavato, secundo
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minuto, tertio ampliato, compresso, nigro maculato, cæteris cylindricis, filiformibus. Long. 3 lin.

_Hab._ Java.

Head longer than broad; clypeus large, carinate; eyes rotundate, black; antennæ (the dilated 3rd joint excepted) filiform, about three-fourths the length of the body; 4th and following joints nearly equal in length, each about as long as the basal one. Thorax rather broader than long; sides diverging and slightly sinuate from the base to beyond the middle, thence obliquely converging to the apex; hinder disk deeply bifoveolate.

_Luperodes limbella._

Ovata, convexa, flava, nitida, scutello, mesosterno, tibiis tarsisque nigris; thorace transverso, tenuiter punctato, medio transversim excavato; elytris cerebro punctatis, margine basali limboque externo angostrate nigris. Long. 3 lin.

_Hab._ Singapore (Wallace).

2nd and 3rd joints of antennæ short, nearly equal, the basal one flavous, the 2nd to the 4th nigro-piceous (the rest wanting). Thorax transverse; sides rounded, nearly straight and parallel behind the middle; upper surface minutely but not closely punctured; middle disk transversely excavated.

_Luperodes Jacobyi._

Ovata, convexa, fulva, nitida, ocellis, antennis, apice exceptis, scutello, pectore utrinque macula, tibiis tarsisque nigris; thorace levius, utrinque leviter transversim impresso; elytris lavissime punctatis, utrisque limbo externo maculaque vix pone medium positâ, nigris. Long. 4 lin.

_Hab._ Mysol (Wallace).

Eyes large, black; antennæ filiform, the 2nd joint short, the 3rd nearly twice its length, the 4th equal to the preceding two united; the upper two joints fulvous, the rest black. Thorax transverse; sides slightly rounded, nearly straight and parallel behind the middle; upper surface smooth, middle disk impressed on either side with a shallow transverse sulcation.

_Luperodes marginata._

Ovata, convexa, flavo-fulva, nitida, ocellis scutelloque nigris; thorace rufó, minute punctato, medio transversim sulcato; elytris tenuiter, utrinque cerebro, punctatis, angularii nigro-limbatis. Long. 3½ lin.

_Hab._ Sumatra (Wallace).
genera and species of Galerucidce.

Head triangular, antennae slender, nearly equal to the body in length; the 2nd joint short, the 3rd rather longer, the 4th equal in length to the preceding two united. Thorax transverse; sides slightly rounded; upper surface minutely punctured; middle disk transversely sulcate, the sulcation more deeply excavated on either side. Elytra minutely punctured, each elytron narrowly edged with black.

Nadrana bella.

Ovata, convexa, nigra, nitida, antennis flavis, basi nigro-piceis; thorace convexo, laevi, fere impunctato, elytris laevibus, tenuissime punctatis, apice nigris.


Thorax broader than long, sides rounded; convex, remotely impressed with very fine punctures, visible only under a lens. Elytra oblong-ovate, convex, rather more closely but not more strongly punctured than the thorax.

The absence of the transverse sulcation of the thorax will at once separate this species from N. pallidicornis.

Prasyptera nitidipennis.

Oblongo-ovata, postice paullo ampliata, convexa, flava, nitida, vertice, labro, antennis, tibis apice, tarsis, abdominisque maculis, nigris, scutello pectoreque nigro-piceis; thorace transverso, laevi, utrinque obsolete foveolato; elytris oblongis, crebre punctatis, viridi-aneis. Long. 4 lin.

Hab. Mysol (Wallace); a single specimen.

Antennae slender, the 2nd joint very short, the 3rd twice its length, its base fulvous. Thorax nearly twice as broad as long; sides nearly straight and parallel behind the middle, slightly rounded and converging anteriorly; upper surface transversely convex, smooth, impunctate, faintly foveolate on either side. Elytra rather closely and distinctly punctured; on the disk of each elytron are visible two or three faintly-raised longitudinal lines.

Separated from P. Haroldi by the different coloration of the head, by the narrower thorax, and by the brighter-coloured, more strongly punctured elytra.
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Atysa nitidicollis.

Anguste elongata, parallela, nigra, nitida, metallico purpureo tincta, pectore, femoris, apice exceptis, seutello elytrisque fulvis; his opace dense sericeis, crebre punctatis, tertio apicali metallico-purpureo; thorace utrinque profunde excavato, tenuiter subremote punctato. Long. 3 3/4 lin.

Hab. Ké (Wallace).

Head trigonate, not longer than broad; vertex and front finely and remotely punctured. Thorax scarcely one-half broader than long; sides diverging from the base to beyond the middle, thence nearly parallel to the apex; disk finely and subremotely punctured, deeply excavated on either side. Elytra closely but rather strongly punctured.

Atysa Jansoni.

Anguste elongata, parallela, subtus cum capite nigra, subnitida; supra opaca, fulva; thorace transversim depresso, utrinque magis fortiter excavato, crebre punctato; elytris crebre punctatis, dense sericeis, dimidio postico nigro. Long. 2 1/2—3 lin.

Hab. New Guinea (Wallace).

Vertex and front finely rugose-punctate. Thorax one-half broader than long; sides obtusely rounded, diverging at the base; disk concave, more deeply excavated on either side, coarsely and closely granulose-punctate. Elytra closely punctured, densely sericeous, their posterior half black, this colour extending upwards along the suture nearly to the base.

Atysa sulcicollis.

Anguste elongata, parallela, nigra nitida, sericea, capite thoraceque glabris, hoc disci medio, nec non ad basin transversim sulcato; seutello elytrisque fulvis; his opacis, crebre punctatis, dense sericeis, utroque plaga magna, ad marginem adfixa, a basi ad ultra medium extensa fulva ornato. Long. 4 lin.

Hab. Malay Archipelago (Wallace).

Head longer than broad, subcuneiform, clypeus large, shining, impunctate; mouth piceous; antennae nearly equal to the body in length, more robust than in the other species. Thorax twice as broad as long; sides obtusely angulate, sinuate anteriorly; upper surface minutely and subremotely punctured; middle disk with a deep transverse sulcation, which extends on either side nearly to the lateral margin; at the base is a similar groove, which is
genera and species of Galerucidae.

interrupted on either side near the hinder angle by a short piceous ridge. Elytra closely punctured, coarsely sericeous.

**Atysa fulvicornis.**

Anguste elongata, parallela, subitus nigro-carulea, nitida, ore pedibusque fulvis; supra fulva, capite (facie inferiori antennisque exceptis) thoraceque nigris, crebre et fortiter punctatis; elytris parallelis, dense sericcis, crebre punctatis, apice nigro-caruleis. Long. 4 lin.

**Hab. Waigiou (Wallace).**

Vertex and front coarsely and closely punctured; lower face and antennae fulvous. Thorax nearly one-half broader than long; sides diverging from the base to just beyond the middle, thence rounded and converging towards the apex; hinder angle with a small obtuse tooth; upper surface concave, coarsely and closely punctured. Elytra closely but rather more finely punctured than the thorax, densely sericeous.

**Atysa funesta.**

Anguste elongata, parallela, nigra, nitida, thorace inferiori, capite inferiori, femoribusque fulvis, his piceo tinctis; capite thoraceque minus nitidis, crebre et fortiter punctatis; elytris dense nigro-sericcis, crebre punctatis, metallico-purpureis; abdominis segmentis albo-marginatis. Long. 3—4 lin.

**Hab. New Guinea, Dorey (Wallace).**

Head broader than long; eyes large, round; vertex and front flattened, coarsely and closely punctured. Thorax nearly twice as broad as long; sides diverging from the base to just beyond the middle, thence serrate and slightly converging towards the apex; disk depressed, obliquely thickened on either side close to the anterior margin; coarsely and closely punctured. Elytra closely but more finely punctured than the head and thorax.

**Galerucella thoracica.**

Elongata parallela, convexa, fulvo-picea, fusco-sericea, capite thoraceque fere glabris; antennis robustis, scutello, femoribus apice, tibiis tarsisque nigris; thorace transverso; lateribus vix pone medium emarginatis; disco profunde et irregulariter excavato; elytris oblongis, parallelis, crebre punctatis, nigro-piceo plus minusve tinctis. Long. 4 lin.

**Hab. Aru Islands; Celebes; Ternate (Wallace).**

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Front flattened, finely rugulose; antennæ robust, rather more than half the length of the body. Thorax more than twice as broad as long; sides angulate-enmarginate just behind their middle; disk broadly and irregularly excavated across the middle, closely punctured on either side behind the anterior margin. Elytra parallel, closely punctured, more or less stained with nigro-piceous, this colour in some specimens extending over their whole surface.

**Galerucella Wallacei.**

Elongata, convexa, sordide fulva, dense sericea, antennarum articulis intermediiis capitisque macula frontali nigris; thorace transverso, lateribus angulatis, disco late transversim excavato, maculis tribus, transversim positis, nigris; elytris oblongis, crebre punctatis, fuscis, fusco-sericeis; tibiis dorso tarsisque piceis. Long. 4½ lin.

**Hab.** New Guinea, Dorey (Wallace).

Head nearly glabrous, vertex swollen, convex; antennæ rather slender, the 3rd to the 9th joints black or nigro-piceous. Thorax three times as broad as long; anterior margin concave; sides angulate, their anterior angle laterally acute; disk transversely concave. Elytra oblong, very closely punctured, fuscous, densely clothed with concolorous pubescence.

**Strumatea, n. g.**

Corpus oblongum, convexum, dense sericeum. Antennæ graciles, articulo secundo ad plus quam partem dimidiam articuli primi æquilongo. Thorax transversus, dorso profunde excavatus. Elytra convexa, tuberculis magnis, in seriebus longitudinalibus dispositis, instructa; epipleuris planis, ultra elytri medium extensis. Pedes minus robusti; coxis anticiis contiguis; tibiis apice incrini-bus; tarsis posticis articulo basali sequentibus tribus æquilongo. Prosternum inter coxas occultum; acetabulis anticiis clausis. Type *Strumata nodosa.*

Closely allied to *Galeracea,* differing from that genus in the long filiform 2nd joint of the antennæ.

**Strumatea nodosa.**

Oblonga, convexa, fusco-fulva, opaca, dense sericea; capite subcuneiformi, elyceo magno, nitido, glabro; fronte fovea magna. fundo nigra, impresso; thorace transverso, crebre punctato, foveis magnis (circa undecim) superficiem fore amplectentibus. impresso,
genera and species of Galerucidae.

spatiis inter foveas elevatis, foveis discoidalibus fundo nigris; elytris convexis, tuberculis magnis numerosis, in seriebus longitudinalibus dispositis, instructis. Long. 3½ lin.

Hab. Sarawak, a single specimen (Wallace).

Head much longer than broad; clypeus large, smooth, impunctate; vertex shining, impunctate; antennae about three-fourths of the body in length, slender, filiform; the 2nd joint filiform, two-thirds the length of the basal one; the 3rd one-third longer than the 2nd. Thorax transverse; upper surface coarsely and closely punctured, entirely covered with large deeply-excavated foveæ, their interspaces thickened; the foveœ on the middle disk black or nigro-piceous, the four or five excavations on the middle disk stained with black. Elytra convex, closely granulose-punctate; disk with a number of strongly-raised large wart-like tubercles, which cover nearly the whole surface, and are arranged on each elytron in three longitudinal rows, those on the intermediate row being less defined than those on the lateral ones; the tubercles on each row are connected by a faintly-defined longitudinal costa.

Sustra discoidalis.

Subelongata, convexa, fulva, nitida, antennarum articulis intermedii maculaque verticali nigris; thorace transverso, utrinque transversim sulcato; elytris parallelis, parce sericeis, crebre et fortiter punctatis, basi et ad latera metallico-violaceis. Long. 3½—4 lin.

Hab. Borneo (Sarawak; Singapore, Wallace).

Antennae slender, equal to the body in length, 3rd joint twice the length of the 2nd, rather shorter than the 4th, the latter to the 8th black or nigro-piceous. Thorax twice as broad as long; sides rounded, diverging from the base to the middle; disk somewhat irregular, impressed on either side with a transverse groove. Elytra closely and coarsely punctured, the base, together with a broad submarginal stripe, abbreviated before reaching the apex, metallic violaceous.

Nicha pulchella.

Anguste oblonga, convexa, nigra, nitida, capite (antennis exceptis) thoraceque rufo-testaceis; antennis basi, femoribus antieis quattuor subitus, tibiasque basi, rufo-piceis; thorace transverso, profunde transversim excavato; elytris oblongis, postice ampliatis, modice convexis, infra basin leviter transversim excavatis, tenuiter
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punctatis; nigro-cyaneis, basi lata fasciaque pone medium communis versus suturam postice prolongata, rufo-testaceis. Long. 4½ lin.

**Hab.** Dorey (Wallace).

Head longer than broad, subeuneiform; antennae equal to the body in length, filiform. Thorax nearly three times as broad as long; sides subparallel, slightly diverging from the base to beyond the middle; disk broadly and deeply excavated, the excavation extending on either side nearly to the lateral margin.

**Eumeces fasciata.**

Elongata-oblonga, convexa, fulva, nitida, vertice, antennis, pedibus metasternoque nigro-piceis aut nigris; thorace transverso; lateribus rectis, parallelois; disco late transversim excavato; elytris tenerrim punctatis, utroque breviter bicostato, nigris, fascia lata mediali flava. Long. 4—4½ lin.

**Hab.** Dorey, Sulu Islands (Wallace).

Head subtrigonate; antennae longer than the body, slender, attenuated towards the apex. Thorax twice as broad as long; sides straight and parallel; disk smooth, broadly excavated transversely, more deeply impressed on either side. Elytra oblong, convex, transversely depressed below the basilar space, finely punctured; each elytron on the outer disk with two short, nearly parallel, raised longitudinal lines, which extend from below the humeral callus to a short distance beyond the middle of the disk. In some specimens the femora are piceo-fulvous.

**Eumeces albo-fasciata.**

Anguste oblonga, convexa, nigra, nitida, antennis basi pallide piceis; facie inferiori, pedibus, thorace scutelloque sordide albidis; thorace transverso, lateribus rectis, parallelois, disco labei, profunde transversim excavato; elytris oblongis, tenuiter sed distinete punctatis, utroque infra callum humeralum breviter bicostato; nigris, limbis laterali et suturali, apicibus ampliatis, fasciisque duabus latis, una ante, altera pone, medium positis, sordide albidis. Long. 3½ lin.

**Hab.** Mysol (Wallace).

Antennae slender, filiform, not attenuated towards the apex. Thorax rather more than twice as broad as long; sides straight and parallel; upper surface broadly and deeply excavated. Elytra similarly sculptured to *E. fasciata*, rather more strongly punctured.
Eumecia apicippennis.

Subelongata, postice vix ampliata, nigra, nitida; antennis pallide piceis; thorace transverso, lateribus subparallelis, obtuse rotundatis; disco profunde transversim sulcato; elytris anguste oblongis, postice vix ampliatis, nigra, nitida, antennis pallide piceis; thorace transverso, lateribus subparallelis, obtuse rotundatis; disco profunde transversim sulcato; elytris angiiste oblongis, postice vix ampliatis, modice convexis, tenuiter pictatis, flavis, tertio postico nigro. Long. 3—3¼ lin.

IIab. New Guinea, Dorey (Wallace).

Antennae slender, rather longer than the body. Thorax scarcely twice as broad as long; sides nearly straight and diverging from the base to beyond the middle, thence rounded and converging towards the apex; disk smooth, deeply impressed with a transverse sulcation, which extends nearly from side to side of the thorax. Elytra very faintly impressed below the basilar space, very finely punctured.

Eumecia flavippennis.

Subelongata, convexa, viride-anea, nitida, antennis nigris; thorace transverso, disco late transversim excavato, subcrebre punctato; elytris oblongis, flavis, crebre sat fortiter punctatis, utroque lineis elevatis quinque, a paullo infra basin fere ad apicem extensis, instructo. Long. 4 lin.

IIab. Menado, a single specimen (Wallace).

Head prominent, front distinctly punctured, vertex convex, impunctate; antennae slender, equal to the body in length, the 2nd joint short, the 3rd more than twice its length. Thorax more than twice as broad as long; sides nearly straight and parallel posteriorly, slightly converging towards the apex; disk broadly excavated, concave, its surface distinctly punctured. Elytra oblong, closely and strongly punctured; each elytron with five distinctly-raised longitudinal lines, which commence below the base and extend nearly to the apex.

Menippus metallicus.

Elongato-ovatus, sordide fulvus, griseo-sericeus, nitidus, antennis, femoribus apice, tibis tarsisque nigris; caput thoraceque viride-aneo tinctis, hoc subcrebre punctato, irregulariter toruloso, medio longitudinaliter sulcato; elytris sat crebre punctatis, metallico-viridibus. Long. 4 lin.

IIab. Celebes, a single specimen from the collection of the late E. Deyrolle.

Head subrotundate; front impressed with a longitudinal groove, finely granulose-punctate; antennae rather less than half the length of the body, robust, slightly attenuated towards the apex. Thorax
Mr. J. S. Baly's descriptions of new

more than twice as broad as long; sides rounded; upper surface irregularly thickened, impressed on the middle disk with a shallow longitudinal groove. Elytra narrowly oblong, convex, rather closely and strongly punctured, interspaces between the punctures granulose.

_Buphonida puncicollis._

Subelongata, convexa, sordide fulva, antennis, basi exceptis, nigro-piceis; thorace transverso; lateribus a basi ad ultra medium oblique divergentibus; hinc ad apicem rotundatis; disco late transversim excavato, crebre punctato, medio longitudinaliter sulcato; elytris parallelis, anguste oblongis, crebre punctatis, dense sericeis. Long. 2 1/2—3 lin.

_Hab._ Batchian (Wallace).

Head prominent; front flattened and slightly excavated, finely rugose-punctate; antennae rather more than half the length of the body, the 2nd joint oblong, the 3rd nearly twice its length. Thorax twice as broad as long; sides straightened, obliquely diverging from the base to beyond the middle, thence rounded and converging to the apex; disk broadly and deeply excavated, rather strongly and deeply punctured. Elytra parallel, narrowly oblong, closely punctured, densely sericeous.

_Buphonida submarginata._

Anguste oblonga, convexa, flavo-albida, nitida, thorace quam longo plus duplo latiori, transversim sulcato, sulco medio magis fortiter excavato; elytris oblongis, dense sericeis, opacis, granuloso-punctatis; sordide flavis, margine basali, lineae submarginali a basi ad apicem extensa, metallico-purpureis. Long. 3 lin.

_Hab._ Mysol (Wallace).

Head prominent, vertex swollen, impunctate: clypeus very short, transverse; antennae slender, nearly equal to the body in length. Thorax nearly three times as broad as long; sides nearly parallel, sinuate behind the middle; upper surface deeply and broadly sulcate, more deeply excavated on the medial line. Scutellum black. Elytra oblong, slightly flattened along the suture, closely granulose-punctate, densely sericeous.

_Buphonida placida._

Subelongata, convexa, pallide flava, nitida, tibii tarsisque pallide piccis; thorace quam longo plus duplo longiori, disco impunctato, late transversim excavato; elytris dense sericeis, crebre punctatis, antennarum articulo secundo brevissimo. Long. 3 lin.

_Hab._ Sarawak (Wallace).
genera and species of Galerucideæ. 39

Head strongly produced, vertex very convex, shining, impunctate; antennæ very slender, equal to the body in length, the 2nd joint very short, the 3rd more than four times its length. Thorax nearly three times as broad as long; sides slightly diverging from the base to the middle, thence nearly parallel to the apex; upper surface shining, impunctate; disk with a broad transverse concave excavation. Elytra closely punctured, densely sericeous.

Haplosonyx quadriplagiata.

Oblongo-ovata, convexa, fulva, nitida, antennis, basi exceptis, scutello, pectore, abdominis maculis pedibusque nigris; femoris anticus quattuor interdum piceis; thorace transverso, lateribus angulatis; disco utrinque transversim excavato, maculis tribus nigris notato; elyris oblongis, distincte punctato-striatis, striis per paria approximatis; utroque plagis duabus, una transversa, infra basin, altera oblonga, a vix ante medium fere ad apicem extensa, nigris. Long. 4 lin.

Hab. Java.

Antennæ robust, rather more than half the length of the body, three lower joints fulvous, the rest black. Thorax more than twice as broad as long; sides distinctly angulate; disk transversely excavated on either side; hinder disk with three black spots placed transversely on the surface, the middle spot smaller than the lateral ones. Elytra each with nine, at the extreme base with ten, rows of distinct punctures, arranged (the row next the suture excepted) in pairs; lateral margin impressed with a single row of punctures, coarser than those on the disk.

Ochralca fulva.

Elongato-ovata, convexa, late fulva, nitida, oculis nigris; antennis gracilibus, thorace quam longo vix latiori; lateribus leviter rotundatis; convexo, minute, sat crebre punctato; elyris magis distincte, sat crebre punctatis. Long. 4½ lin.

Hab. Himalayas, a single specimen.

Head not broader than long, subrotundate; eyes rotundate; antennæ slender, nearly equal to the body in length, the 2nd and 3rd joints short, nearly equal. Thorax slightly broader than long; sides slightly rounded, obliquely converging from the middle towards the apex; disk convex, closely and minutely punctured. Scutellum trigonate. Elytra oblong-ovate, convex, more strongly but less closely punctured than the thorax.
IV. *A Synopsis of British Homoptera-Cicadina.*

By James Edwards.

[Read February 3rd, 1886.]

The object of the present Synopsis is to provide students of our British *Cicadina* with a concise descriptive catalogue of such species as have hitherto been recorded as occurring in Britain, and, by furnishing the means of identifying their captures, to add to the interest of their pursuit. The study of these insects in this country is still in its infancy, and, seeing that more than twenty years have elapsed since the last attempt to deal with the group collectively, it is felt that little apology is needed for the present undertaking.

The arrangement here adopted, and the characters employed, are simply intended to apply to our British forms; but it is believed that the analytical tables and short descriptions embrace the most reliable characters assigned to the respective species, and will be found as absolute as the difficulty of the subject will permit. Every reasonable care has been taken to insure accuracy in the bibliographical references, but the writer cannot assume any personal responsibility in the matter, being largely indebted in this respect to the Catalogue of Messrs. Douglas and Scott, and the continental works of Sahlberg, Flor, and others. Characters drawn from the genitalia have not been used, except where absolutely necessary, but it is nevertheless imperative that the student should make himself thoroughly acquainted with the structure of the latter, for, although in certain groups (*Acoecphalus, Idiocerus*, &c.), they scarcely present any available differential characters, in others (*Delphacidae, Typhlocybidae*, &c.), the most striking and constant structural differences are observable.

The *crown* is that portion of the head which is visible from above, and the passage from this to the *face* (the obliquely sloping under side of the head considered as a whole) is the *forehead*. The face is generally divided by
more or less distinct sutures into the following, viz., the frons, a large area occupying the greater portion of its disc; the clypeus, a rectangular area joined to the apex of the former; the lara, a pair of small areas occupying the angles formed by the sides of the frons at their junction with the clypeus; and the cheeks, which constitute the remainder of the face. Those portions of the cheeks which lie between the inner margins of the eyes and the frons are sometimes referred to as the temples.

Each elytron is divided into corium, clavus, and membrane, the latter consisting of the apical areas, and frequently having a free membranous margin or appendix; the clavus is the triangular inner portion marked off from the remainder, which constitutes the corium, by a more or less impressed straight line running obliquely from the basal margin to a point on the suture, where the membrane commences. In some groups there exists a pair of small scales (the tegulae) at the base of the elytra. The longitudinal nerves of the corium are the brachial, the simple nerve standing immediately above the claval suture, and the cubital, the forked nerve coming between the brachial nerve and the costa; the branches of the cubital nerve, which are generally forked at the apex, may be designated as inner and outer respectively, according to their position. The nerves forming the inner boundary of the apical areas are best considered as angular nerves, leaving the term transverse to be applied to such other nerves as may occur in a position warranting its application. The longitudinal nerves of the clavus are the anal, immediately below the claval suture and the axillary, standing nearest the scutellum.

The terminal segment of the abdomen, which is modified in order to accommodate the genital apparatus, may be conveniently termed the pygofer; sometimes, as in Liburnia male, it consists of a complete chitinous cylinder, its hind margin exhibiting in different species great diversity of outline; at others it appears as a chitinous plate, folded in a somewhat conical form, so as to leave a slit on its lower side and a small aperture at its apex: in some cases, e.g., Deltacephalus male, the armature of the lower edges of this plate affords striking characters. In the female this segment is always folded
more or less conically, and the slit on its lower side is occupied by the saw-case, the base of which is frequently flanked on either side by a small oblong plate (lateral lobe); in this sex, too, the outline of the hind margin of the last ventral segment frequently presents good distinctive characters. In any reference to the upper or hind margin of the pygofer a side view is to be understood. Normally the genital appendages of the male are as follows, viz., a pair of plates of a more or less triangular form placed side by side, their inner margins contiguous, and their bases covered by a single valve, which is usually triangular; just above the plates, and usually concealed by them, is a pair of smaller appendages (styles), and between these latter is situate the penis. In many groups (Athyssanus, Deltocepalhus, &c.), all these appendages are present, but in others (Idiocerus, &c.) the valve is wanting, while in those in which the pygofer forms a complete cylinder (Liburnia, &c.), the styles and penis are all that are visible. The anal tube, which bears the anal style, is a supplementary piece of apparatus situate on the upper side of the extreme apex of the abdomen, where there is generally a notch in the pygofer for its reception; its lower margin often (Liburnia male, &c.) bears a pair of teeth or other processes. The remaining terms employed do not require special notice.

The specific names made use of in the following pages are, in the main, those of the second edition of Dr. Puton's 'Catalogue'; a circumstance which results less from a conviction on the part of the writer that the names in that publication are always equitably employed than from a great disinclination to disturb the received order of things.

A few remarks on the preservation of these insects may not be out of place. For a working collection they should all be pinned close to the scutellar angle of the right elytron, the larger species with black Vienna pins, the smaller ones, such as Deltocepalhus, Typhlocyba, &c., with the varnished steel pins specially prepared for micro-insects, the fine pin being ultimately stuck into a small block of pith or cork impaled on a strong pin. Neatly-carded specimens are pretty to look at, but when it becomes necessary to examine their under side they prove a nuisance. It is desirable to keep the boxes in
which they are stored well supplied with camphor, which will effectually prevent any inconvenience either from mould or mites. A critical examination of the genitalia of the smaller species is best accomplished when the abdomen has been mounted in Canada balsam, but this should always be preceded by a thorough investigation of the parts in question in an unmounted state.

I have much pleasure here in thanking those who have kindly helped me with the loan of specimens, &c., and especially are my warmest acknowledgments due to my father in Entomology, Mr. J. W. Douglas, for the valuable assistance which he has at all times most readily afforded me for many years past.

HOMOPTERA.
Mouth suctorial. Rostrum springing from the hind margin of the underside of the head.

CICADINA.
From 1—3 basal joints of the antennae thick, the remainder forming a terminal seta. Elytra deflexed, of nearly equally firm consistence throughout. Hind legs generally long, powerful, and formed for jumping. Tarsi 3-jointed.

1 (2). Front thighs thickened, toothed beneath ... ... ... ... ... ... 1. Cicadidae.
2 (1). Front thighs not thickened nor toothed behind. II. Membracidae.
3 (4). Pronotum produced into a process behind ... ... ... ... ... ... 3. Tettigometridae. 4 (3). Pronotum not produced into a process behind.
5 (12). Antennae inserted beneath the eyes. 6 (7). Frons nearly on the same level with the cheeks. Elytra horny ... ... ... ... ... ... 7. Issidae. 7 (6). Frons distinctly projecting from the cheeks, with sharp or keeled side margins.
8 (9). Clypeus without marginal keels. Elytra horny ... ... ... ... ... ... 8. Cixiidae. 9 (8). Clypeus with marginal keels. Elytra membranous. 10 (11). 1st joint of hind tarsi without a spur at the base ... ... ... ... ... ... 9. Delphacidae. 11 (10). 1st joint of hind tarsi with a spur at the base ... ... ... ... ... ...
British Homoptera-Cicadina. 45

12 (5). Antennæ inserted between the eyes.  
13 (14). Hind tibiae cylindric, with two spines  
14 (13). Hind tibiae not cylindric.  
15 (16). Pronotum with a compressed ear-like process on each side  
16 (15). Pronotum without any process.  
17 (20). Hind tibiae unarmed, or only with weak bristles on the angles.  
18 (19). Frons convex, swollen  
19 (18). Frons flat, depressed on its upper half  
20 (17). Hind tibiae multispinose.  
21 (22). Ocelli on the frons  
22 (21). Ocelli not on the frons.  
23 (24). Ocelli on the disc of the crown  
24 (23). Ocelli not on the disc of the crown.  
25 (20). Crown always distinctly separated from the face, generally by a well-defined border, its disc more or less excavated or bearing impressions, frequently rugose in front parallel with the forehead, or at least distinctly sculptured  
26 (25). Crown and face passing gradually the one into the other. Disc of the former never distinctly excavated, nor bearing impressions, nor rugose in front parallel with the forehead, rarely perceptibly sculptured.  
27 (28). Elytra with one or more transverse nerves  
28 (27). Elytra without transverse nerves  

VII. Cercopidae.  
VIII. Ledbilde.  
IX. Ulopide.  
X. Paropide.  
XI. Bithyscopide.  
XII. Tettigonide.  
XIII. Acocephalide.  
XIV. Jasside.  
XV. Typhlocybide.

I. CICADIDÆ.


CICADETTA, Am. (Pl. I., fig. 10).


Antennæ inserted in a strong depression beneath a fold of the temples, apparently 7-jointed, by reason of the articulation of the robust seta. Elytra lanceolate, much longer than the abdomen, membranous, hyaline; apex with a narrow, free margin; nerves strong, raised. Basal area of corium oblong, narrow, the brachial and cubital nerves springing from its lower apical angle; apical areas 8, narrow. 1st reaching further inwards than 2nd, which is
widened behind, 3—7 parallel-sided, increasing in width, 8th trapeziform; subapical areas 5, 4th widened behind. Clavus narrow-lanceolate. Wings hyaline, with 6 apical and 3 basal areas.

1. Cicadetta montana, Scop.


*Cicada ornii*, Sulz., Kenntz. Ins., 24, pl. 10, fig. 65.


*C. anglica* (Leach), Sam. Ent. Comp., 447, pl. 5, fig. 2; Curt., Brit. Ent., p. and pl. 392; Westw., Introd., ii., 421, fig. 114; Marshall, Ent. Mo. Mag., i., 154.


Black, with fine yellow hair-like scales. Crown triangular, apex obtuse, surface very uneven, with a deep transverse impressed line in front. Pronotum with two closely placed parallel fine straight raised lines down the middle in front; disc with three strongly impressed lines on each side, two straight oblique somewhat in front, and one just within its lobate hinder angles, the curve of which it follows. Elytra clear, nerves black, costa and the basal accessory membrane yellow-red. Wings coloured as elytra. Abdomen, dorsal segments black, with yellow-red hind margins, ventral segments in female almost entirely yellow-red. Legs yellow-red; knees, base of front tibiae, trochanters, and some stripes on the femora, black. Front femora with 3 teeth, that nearest the base depressed, its apex obliquely truncate, the other two erect, successively smaller. Length (including elytra), 23—28 mm.

Rare. New Forest; Haselmere, Surrey.

II. MEMBRACIDÆ.

The genera may be thus distinguished:—

**Pronotum with a horn on each side; hind process sinuate**  
**Pronotum without horns at the sides; hind process straight**  

i. **Centrotus**, *Fab.* (Pl. I., fig. 11).


Lateral angles of pronotum acutely produced, hind process long, arching over, but not concealing the scutellum. Elytra with 5 apical areas.

1. **Centrotus cornutus**, *Linn.*


*C. siculus*, *gallicus*, *italicus*, *turcicus*, and *abbreviatus*, *Kirschb.*, *l. c.*, 66 and 67.

Black, roughly punctured, with fine yellow pubescence. Pronotum with a fine central keel; side processes diverging, wide, triangular, deflexed at the apex; hind process bisinuate, acute, nearly as long as the abdomen. Elytra rugose, fuscous-hyaline, nerves dark brown, on the hind margin in the 5th apical area a fuscous spot. Wings hyaline, nerves dark brown. Abdomen above black, with large shallow punctures. Tibiae reddish yellow, edges of hind pair with a close row of black setiferous granules.

♂. Hind margin of pygofer with a strong triangular tooth. Valve wanting. Plates connate, elongate-triangular, with a deep longitudinal impression near the base, and a strong lateral constriction just below their rounded apex. Two last ventral segments with a fine longitudinal keel.

♀. Hind margin of last ventral segment with a wide triangular notch, which reaches quite to its base. Length, 7—8 mm.

Not uncommon in woods.
ii. Gargara, Am. et Serv. (Pl. I., fig. 12).

Am. et Serv., Hém., 587, 480 (1843).
Sides of pronotum angulated, but without a distinct horn; hind process straight, concealing the scutellum.

1. Gargara genistae, Fab.

Oxyrrhachis genistae, Burm., Handb., ii., 133, 2; Flor, Rhyn. Liv., ii., 106, 1; Marsh., Ent. Mo. Mag., ii., 34, 1.


Head and thorax deep black, shiny, very closely and coarsely punctured. Elytra yellow-brown, nerves darker. Thighs and basal half of tibiae black, apical half of the latter and the tarsi piceous. Head, thorax, and nerves of elytra with fine yellowish pubescence. Length, 3 mm.

Rare. On Genista tinctoria, Purfleet, Essex, August; on Genista anglica, Chobham, Kent.

III. TETTIGOMETRIDÆ.
Characters those of the single genus.

Tettigometra, Latr. (Pl. I., fig. 13).

Easily recognised by its Ptyeloid facies, horny elytra with conspicuous tegulae, the want of facial keels, and by the antennal seta situate on the hinder side of the 2nd joint before the apex.

1. Tettigometra impressopunctata, Sign.


T. nitidula, Kirschb., Cicad., 59, 6.

Brown or greenish brown, closely and deeply punctured, abdomen black. Crown obsoletely tricarinate, side keels parallel.
Frons flat above, slightly swollen towards the clypeus; colour above reddish, between the eyes a large ill-defined black spot, from the antennae to the clypeus white, the latter and the loree pitch-brown, rostrum black at the apex. Pronotum and scutellum uneven, the hind angles of the former obliquely truncate to make room for the tegulae. Elytra horny, equally punctured, generally with a short black streak on the suture beyond the apex of the clavus. Wings ample, hyaline, nerves fuscous. Legs concolorous, tibiae with two rows of bristles, claws fuscous. Length, 4 mm.

Sandhills, Freshwater Bay, Pembrokeshire; amongst thyme and short grass; local. Isle of Wight; Folkestone Warren, one from a tuft of Teucrium, August, 1876; Shiere, near Guildford, hybernating in yew, February, and by beating junipers in September.

IV. ISSIDÆ.

Ocelli wanting. Pronotum as long as the crown, hind margin subtruncate. Tegulae large and conspicuous. Represented in the British fauna by the single genus

Issus, Fab. (Pl. I., fig. 14).


Body short, ovate. Head with the eyes distinctly narrower than pronotum. Sides of elytra strongly subangularly dilated before the middle. Outer side of hind tibiae with two spines on the lower half.

1. Issus coleoptratus, Geoffr.

Cicada coleoptrata, Geoffr., Hist. abr. Ins., i., 418, 7.

Very variable in colour and markings. Uniform leaden grey reticulated with black, with or without an ill-defined black patch near the suture of each elytron, or more or less dark brown, with a wide pale band across the widest part. Front pairs of tibiae in
all the forms pale, with the apex and a more or less distinct median ring dark brown; hind tibiae narrowly dark at the extreme apex only. Length, 6—7 mm.

Not uncommon in the south.

V. CIXIIDÆ.

Body wide, depressed. Head with the eyes distinctly narrower than the pronotum. Ocelli 2, on the sides of the head with an indication of a third near the apex of the middle facial keel. Pronotum very short, strongly subangularily notched behind. Elytra ample, hyaline, widely rounded at the apex, subhorizontal nerves strongly raised. First joint of hind tarsi elongate.

The two British genera may be thus distinguished:—

Seutellum with five keels .. .. .. .. i. Oliarus.
Seutellum with three keels .. .. .. .. ii. Cixius.

i. Oliarus, Stal. (Pl. I., fig. 15).


Hind margin of crown angularly notched. Nerves of the elytra without the large black granules so conspicuous in the following genus.

Crown longer than wide .. .. .. .. 1. pallidus.
Crown transverse .. .. .. .. 2. leporinus.

1. Oliarus pallidus, H.-S.

Flata pallida, H.-S., Deuts. Ins., 144, 4.
Oliarus pallidus, Scott, Ent. Mo. Mag., vii., 119, 1;

Crown about one and a half times as long as broad, its breadth somewhat less than the length of the hind margin of the eye; black, with pale keels. Eyes red. Pronotum black, with white keels and hind margin. Scutellum black. Elytra lactee-hyaline, stigma well marked, nerves fine pale fuscous; angular nerves and those beyond much darker, almost black. Legs pale, front pairs of tarsi and the claw-joint of the hind pair black. Length, 5—6 mm.

“Coarse grass by the side of the Avon, Clifton.”—Curtis.
2. *Oliarus leporinus*, Linn.

*Cicada leporina*, Linn., Faun. Suec., 895; Sys. Nat., 711, 43; Schr., En., 501, 260; Panz., F. G., 61, 19


*Pentastira leporina*, Kirschb., Cicad., 44, 2.


Crown broader than long, its length about one and a half times and its breadth about twice the length of the hind margin of the eye; black, with pale keels. Eyes black. Elytra lacteo-hyalme, stigma well marked; nerves fine, fuscous, becoming darker towards the apex. Length, $4\frac{1}{2} - 5$ mm.

On *Tamarix*; Deal, end of June.

ii. *Cixius*, Latr. (Pl. I., fig. 16).

Latr., Gen. Crust et Ins., iii., 166 (1807).

Hind margin of crown roundly notched. Nerves of the elytra more or less closely set with large black setigerous granules.

### Table of Species.

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<td>1</td>
<td>(2). Costal granules not or scarcely larger than those on the other nerves. Costa generally with three short black lines</td>
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<td>2</td>
<td>(1). Costal granules distinctly larger than those on the other nerves.</td>
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<td>3</td>
<td>(4). Elytra entirely brown. Clypeus deep black</td>
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<td>4</td>
<td>(3). Elytra not entirely brown, or, if brown, clypeus not deep black.</td>
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<td>5</td>
<td>(6). Elytra with a broad transverse fuscous band, proceeding from the stigma to the inner margin; an ill-defined fuscous spot in the apex of the wings</td>
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<td>6</td>
<td>(5). Elytra without a transverse band proceeding from the stigma.</td>
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<td>7</td>
<td>(10). All nerve-granules oblong.</td>
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<td>8</td>
<td>(9). Costa with about 15 or 16 rather closely-placed granules</td>
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<td>9</td>
<td>(8). Costa with about 8 or 9 distant granules</td>
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<tr>
<td>10</td>
<td>(7). All nerve-granules round or roundish.</td>
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<td>11</td>
<td>(12). Smaller. Styles reaching somewhat beyond the apex of the yellow anal tube</td>
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<tr>
<td>12</td>
<td>(11). Larger. Styles scarcely exerted, not reaching beyond the basal third of the black anal tube</td>
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1. *pilosus.*

2. *stigmaticus.*

3. *cunicularius.*

4. *simplex.*

5. *similis.*

6. *brachyergus.*

7. *nervosus.*
1. *Cixius pilosus*, Ol.

*F. cuneicularia*, Fall., Hem. Suec., ii., 72, 2.

*Cixius contaminatus*, Flor., Rhyn. Liv., ii., 24, 2;
Marsh., Ent. Mo. Mag., i., 155, 2; Scott, Ent. Mo. Mag., viii., 190, 5; Kirschb., Cicad., 49, 9;

Crown and face black, with brownish-yellow keels. Pronotum brownish yellow, suffused with black behind the eyes. Scutellum black. Elytra pale grey, with feebie traces of various fuscous marks, entirely dark brown, save a pale spot at the stigma, or with a dark brown stripe occupying the sutural half (var. *albicincta*). On the costa are three short black lines, which are very constant in their occurrence. Stigma inconspicuous. Legs brownish yellow, thighs darker. Length, 4—4½ mm.

Common.


*Cixius musivus*, Marsh., Ent. Mo. Mag., i., 155, 3.
*C. stigmaticus*, Scott, Ent. Mo. Mag., viii., 191, 6,
figs. a, b, c, p. 193 (♂ genitalia); Fieb., Cicad. d’Eur., pt. ii., 183, 12.

Crown scarcely twice as broad as long. Face between the keels black. Pronotum pale, scutellum black. Elytra entirely brown, nerves somewhat paler; granules roundish, black. Stigma inconspicuous. Thighs piceous, their extreme apex, the tibiae, and tarsi, brownish yellow; apical joint of the latter black. Apical lobes of styles bluntly triangular, their stalks strongly incurved. Length, 4½—5 mm.

Inverness-shire; Deal, amongst *Hippophæe*; Isle of Wight; Norfolk.
3. *Cixius cunicularius*, Linn.

*Cicita cunicularia*, Burm., Handb., ii., 157, 3.
*Flata nervosa*, var. a., Fall., Hem. Suec, iii., 71, 1.
*C. nervosus*, Kirschb., Cicad., 47, 2; Flor, Rhyn. Liv., ii., 22, 1 (partim); Marsh., Ent. Mo. Mag., i., 154, 1, var. a.

Head and pronotum brownish yellow; crown between the keels, and the scutellum, black. Face more or less suffused with black in its upper half. Elytra hyaline, a narrow band before the middle (more or less interrupted and sometimes entirely obliterated), a broad curved band before the apex, a roundish spot on the costa beyond this, and some of the angular nerves, fuscous; or entirely reddish brown, except a pale space before the base of the stigma (var. *Dionysii*). Length, 4—7 mm.

Widely distributed.

4. *Cixius simplex*, H.-S.

*Flata simplex*, H.-Schäff., Nom. Ent., 1, 64 (1835).
*Cixius distinguendus*, Kirschb., Cicad., 48, 6.

Face black, keels brownish yellow. Pronotum black, side keels and hind margin pale brownish yellow. Scutellum black, side margins at the base and at the junction with the side keels narrowly clear brown. Elytra whitish hyaline, nerves pale yellowish white, their granules eye-shaped; the angular nerves, the apex of the claval suture, and a short streak on the inner margin, black. Thighs pitch-black, apex narrowly yellow; tibiae yellow, with a fine piceous stripe, base of all the pairs with a narrow
blackish ring; tarsi yellow, claw-joint black or brown. Apical lobes of styles obovate, their stalks short, spreading outwards. Length, 5 mm.

Bonchurch, October. Granulation of elytra closer than in *similis*.


*Cixius similis*, Kirschb., Cicad., 49, 7; Scott, Ent. Mo. Mag., vii., 192, 8, fig. k, p. 193 (styles); Fieb., Cicad. d’Eur., pt. ii., 185, 14.

Crown scarcely twice as broad as long; face between the keels black. Elytra lacteo-hyaline, nerves chalk-white, sparingly and somewhat regularly set with oblong black granules, the length of nerve between each granule being about twice the length of the granule. Costal granules and the intervening spaces about equal in length. Stigma conspicuous, black. Thighs piceous, their extreme apex, the tibiae, and tarsi brownish yellow. Apical lobes of styles obovate, their stalks of moderate length, not spreading outwards. Length, 5 mm.

Bonchurch, Isle of Wight; Deal, on *Hippophææ*.


*Cixius intermedius*, Scott, Ent. Mo. Mag., vii., 147, 3, fig. g, p. 193 (styles).


Crown twice as broad as long. Elytra hyaline, with the base, the angular nerves, and a straight band somewhat before the middle, fuscous; granules black, stigma piceous. Face and legs entirely brownish yellow. Length, 5—6 mm.

Gosforth; Penzance; Hirst Wood, Tunbridge Wells; Foxley Wood, Norfolk. Exceedingly like a small *nervosus* in appearance.

7. *Cixius nervosus*, Linn.

*Cicada nervosa*, Linn., Faun. Suec., 882; Fab., Ent. Sys., iv., 442, 64.


Cixia nervosa, Burm., Handb., ii., 157, 2.
Cicada musceformis, Schr., Enum., 253, 482.
Cixius nervosus, Schäff., F. G., 112, 22; Zett., Ins. Lapp., 304, 1; Marsh., Ent. Mo. Mag., i., 154, 1; Scott, Ent. Mo. Mag., vii., 146, 2, fig. h, p. 193 (styles); Fieb., Cicad. d'Eur., pt. ii., 176, 7.
Cixius minor, Kirschb., Cicad., 47, 3.

Head and face as in cunicularia, pronotum brownish yellow more or less suffused with black behind the eyes. Scutellum black, keels sometimes brownish yellow. Elytra hyaline, with faint traces of two fuscous bands, one (broad) at the base, and the other (narrow) before the middle; angular nerves and stigma black; some of the costal granules generally united. Legs brownish yellow, sometimes suffused with darker. Length, 6—7 mm.

Common.

VI. DELPHACIDÆ.

Eyes reniform. Ocelli on the cheeks. Antennæ of moderate length, 2nd joint cylindrical, tuberculate. A large movable spur at the base of the 1st joint of the hind tarsi. Tegulae small.

Table of Genera.

1 (4). Basal joint of antennæ much longer than 2nd.
2 (3). Frons with two middle keels ... ... i. Asiraca.
3 (2). Frons with one middle keel ... ... ii. Delphax.
4 (1). Basal joint of antennæ much shorter than 2nd.
5 (8). Frons with one middle keel.
6 (7). Frontal keel entire or only forked on the forehead ... ... ... iii. Liburnia.
7 (6). Frontal keel forked much before the forehead iv. Dichanotropis.
8 (5). Frons with two middle keels ... ... v. Steroma.

The genus Achorotile, Fieb., has been considered as British, but, as it seems to the writer, upon insufficient evidence. The genus in question is characterised, inter alia, by the possession of certain tubercles in the channels between the sides of the frons and the middle keels, a structure which is also found in the nymph of Liburnia, and no adult insect presenting these facial characters has yet been recorded as British. Scott (Ent. Mo. Mag., vii., 196, 1) described Achorotile albesignata, Dahl., as British from a brachypterous male received from Stal on the strength of six nymphs taken by Dale, but there is nothing in his remarks to show
that these latter did not pertain to some common species of Liburnia. The writer has bred Liburnia Fairmairei, Perris, from Achorotile bivittata, Boh.

i. Asiraca, Latr. (Pl. I., fig. 17).

Latr., Préc., p. xii. et 91 (1796).

First joint of antennae triangular-prismatic, of equal width throughout, about thrice as long as 2nd. Front thighs and tibiae much flattened. Scutellum with four keels. Hind tibiae with three spines on their outer side. Spur at the base of hind tarsi subulate.

1. Asiraca clavicornis, Fab.


Crown pale, about one-half longer than broad, pronotum somewhat darker, scutellum black, the two latter with pale scale-like hairs. Elytra grey, with traces of a white band at base; nerves brown, strongly raised, sparingly set with large setiferous granules, some fuscous markings on the costa towards the apex and on the membrane. Front pairs of legs black, with some band-like spots and the apex of the tibiae broadly white; hind tibiae brown, paler towards the apex. Abdomen above black. Length, 4 mm.

At roots of grass in dry places.

ii. Delphax, Fab. (Pl. I., fig. 18).


First joint of antennae triangular-prismatic, gradually narrowed to the base; 2nd about two-thirds as long as the 1st. Fore legs simple. Scutellum with three keels. Hind tibiae with two spines on their outer side. Spur at the base of hind tarsi flat, triangular.

1. Delphax pulchella, Curt.

*D. pulchella*, Scott, Ent. Mo. Mag., vii., 24, 2.  

Crown nearly square. Pronotum and scutellum pale, narrowly brown at the sides. Elytra pale yellowish, with a stripe just above the claval suture, a broad curved stripe occupying about the lower half of the membrane, and a line along the nerve dividing the 2nd and 3rd apical areas, dark brown. Legs pale, tarsi of the front pairs and claw-joint of the hind pair dark brown. Abdomen above black, its base, the sides narrowly, and a narrow dorsal line brownish yellow.

♀. Generally brachypterous; elytra half as long as the abdomen, yellowish without dark markings. Length, 5½—6 mm.

Marshes; not uncommon.


A somewhat numerous group of small species, the members of which agree in having but one more or less distinct central facial keel, which is never forked for half its length, although sometimes divided on the forehead.

Several well-defined minor groups might be eliminated, but there seems to be no advantage in giving to these sections distinctive names. Some of the species are so excessively similar in appearance that they can only be satisfactorily separated by the characters afforded by the male genital armature, and in most cases the time bestowed in attempting to identify females of this genus would be better employed in endeavouring to discover and capture their respective males. In comparing specimens with Fieber’s figures (‘Grundzüge zur generischen Theilung der Delphacini,’ Taf. viii.) it is important to bear in mind that in his fig. d, “Afterträger von hinten gesehen,” the point of view is such that the base of the styles are visible, because a trifling alteration in the point of view will give rise to a considerable difference in the appearance of the parts; characters derived from the *form* of the styles are much more reliable, but in many instances it is almost impossible to understand their correct form without dissecting them out, a course which should always be resorted to in doubtful cases.

Trans. Ent. Soc. Lond. 1886.—Part II. (June.)
Table of Species.

1 (20). Side keels of pronotum reaching hind margin.

2 (3). Basal joint of antennæ two-thirds as long as 2nd. Basal joint of hind tarsi longer than the other two together

3 (2). Basal joint of antennæ one-third as long as 2nd.

4 (9). Frons more than three times as long as its width in the middle.

5 (8). Front pairs of tibiae simple, not widened towards the apex.

6 (7). Face between the keels pale

7 (9). Face between the keels black or blackish

8 (5). Front pairs of tibiae gradually widened to the apex

9 (4). Frons one and a half to twice as long as its width in the middle.

10 (19). Scutellum yellow or partly yellow.

11 (16). Cheeks with a large round black spot.

12 (15). Elytra with a black or fuscous marking at the apex.

13 (14). Length, $3\frac{3}{4}$—4 mm.

14 (13). Length, $2\frac{3}{4}$—$2\frac{1}{4}$ mm.

15 (12). Elytra entirely pale yellow

16 (11). Cheeks with a small punctiform black spot, or unspotted.

17 (18). Crown distinctly narrowed in front; elytra yellow, with a fine black line or lines

18 (17). Crown parallel-sided; markings of elytra not in the form of fine black lines

19 (10). Scutellum black or pitch-black. Species small, shining black or pitch-black

20 (1). Side-keels of pronotum not reaching hind margin.


22 (25). Species green or greyish green.

23 (21). Frons widest in the middle. Pygofer, seen from behind, almost circular

24 (23). Frons widest in the lower third. Pygofer, seen from behind, transversely oval

25 (22). Species not green or greyish green.

26 (35). Facial keels white.

27 (30). A narrow white stripe down the crown, pronotum, and scutellum. Facial keels margined with black in both sexes.

28 (29). The dark margin of the facial keels continued on the crown. Styles yellowish, diverging, their apex hooked outwards

1. notula.

2. lincola.

3. fuscevitata.

4. longipennis.

5. vittipennis.

6. guttula.

7. perspicillata.

8. pallidula.


10. venosa.

11. unicolor.

12. collina.
29 (28). The dark margin of the facial keels not extending to those of the crown. Styles subulate, their ciliate inner margin with a strong sharp tooth near the base. 13. *sordidula*.

30 (27). No pale stripe down the crown, pronotum, and scutellum. Face black between the keels, or keels margined with black.


32 (31). Hind margin of pygofer not notched.

33 (34). Styles diverging, their apex pointed. 15. *distincta*.

34 (33). Styles incurved, their inner apical angle produced into a sharp tooth; outer apical angle produced and bluntly rounded. 16. *Boldi*.

35 (26). Facial keels not white.

36 (39). Crown yellow or clear brownish yellow.


38 (37). Central facial keel distinct on the forehead. 18. *adela*.


40 (41). Scutellum beyond the side-keels black; face (except the forehead) black (brachypterous male). Nerves non-granulate. 19. *melanopachys*.


42 (43). Elytra clear brownish yellow; nerves strong, with concolorous granules, marginal nerve pale. 20. *similis*.

43 (42). Elytra smoky yellow; nerves brown with concolorous granules. 21. *capnodes*.


45 (90). Crown square.

46 (89). Hind tarsi shorter than the tibiae, basal joint subequal in length to the other two together.

47 (48). Scutellum pale brownish yellow, with a black spot at the base on each side of the middle keel, beyond the side-keels entirely black. 22. *scutellata*.

48 (47). Scutellum not pale, with distinct black markings.

49 (52). Elytra pitch-brown, their truncate hind margin with two white spots.

50 (53). Tibiae brown, with three pale rings. 23. *lepida*.

51 (52). Tibiae brownish, without pale rings. 24. *Fieberi*.

52 (49). Elytra without white spots on the hind margin.

53 (60). Elytra black, hind margin white or yellow.

54 (57). Scutellum yellow.

55 (56). Hind margin of elytra very narrowly whitish yellow; abdomen yellow. 25. *pullula*.

57 (54). Scutellum not yellow.

58 (59). Facial keels equally strong, central one distinct on the forehead .... 27. leptosoma.

59 (58). Central facial keel much more prominent than the side keels, and obsolete on the forehead .... 28. niveimarginata.

60 (53). Elytra not black with pale hind margin.

61 (80). Abdomen black, or chiefly black, at least in the male.

62 (79). Elytra without a dark streak at the apex of the clavus.

63 (72). Scutellum black.

64 (65). Upper notch of pygofer widely yellow .... 29. Dalei.

65 (64). Pygofer entirely black.

66 (71). Central facial keel equally strong throughout.

67 (70). Teeth of anal tube long, perpendicularly connate.

68 (69). Apical angles of upper notch of pygofer right angles or nearly so .... 30. pellucida.

69 (68). Apical angles of upper notch of pygofer very obtuse .... 31. discolor.

70 (67). Teeth of anal tube very small, tuberuliniform 32. obscurella.

71 (66). Central facial keel feebler, or evanescent on the forehead. Apical angles of upper notch of pygofer acute .... 33. forcipata.

72 (63). Scutellum yellow or yellowish.

73 (74). Lower margin of pygofer, when viewed from behind, produced into a sharp tooth .... 34. denticauda.

74 (73). No appearance of a tooth on the lower margin of the pygofer, when viewed from behind.

75 (78). Hind margin of pygofer with a tooth-like projection at its lower extremity.

76 (77). Hind margin of pygofer straight. Abdomen and pygofer entirely black .... 35. exigua.

77 (76). Hind margin of pygofer angular. Abdomen pitchy black, hind margin of the last segment broadly white. Pygofer shining black .... 37. insignis.

78 (75). No tooth-like projection from the lower extremity of the hind margin of pygofer. Abdomen with pale longitudinal markings .... 38. Aubci.

79 (62). Elytra with a dark streak at the apex of the clavus .... 39. striatella.

80 (61). Abdomen yellow or chiefly yellow, sometimes with a dark lateral stripe.

81 (84). Hind margin of pygofer with a large arcuate notch.

82 (83). Inner margin of styles, when viewed from behind, simple .... 10. Fairmairei.
83 (82). Inner margin of styles, when viewed from behind, with a feeble obtuse tooth just above the middle, and another similar at the apex ...... ... 41. brevipennis.

84 (81). Hind margin of pygofer without a notch.

85 (86). Hind margin of pygofer truncate. Styles (viewed from behind) very small and pincer-shaped, occupying little more than one-fourth of the height of the cavity of the pygofer, yellow with the base and tip blackish. Anal tube very large, apparently composed of a pair of pendant lobes, which gradually widen to their truncate apices, where they are generally blackish ...... ... 42. straminea.

86 (85). Hind margin of pygofer widely rounded.

87 (88). Antennae entirely pale ...... ... 43. flavola.

88 (87). Antennae with the base of the 1st joint and apex of the 2nd narrowly black ...... 44. paludosa.

89 (46). Hind tarsi longer than the tibiae; basal joint one-half longer than the other two together ...... ... 45. speciosa.

90 (15). Crown not square.

91 (98). Crown transverse.

92 (93). Nerves of elytra with large dark granules 46. limbata.

93 (92). Nerves of elytra without large dark granules.

94 (97). Face with white spots.

95 (96). Scutellum brown ...... ... 47. Douglasti.

96 (95). Scutellum pale with dark stripes ...... 48. lineata.

97 (94). Face not spotted with white, between the keels black ...... ... 49. uncinata.

98 (91). Crown pentagonal ...... ... 50. mesomela.

1. Liburnia notula, Germ.


D. truncatipennis, Boh., Ofv., 266, 12 (1847); Kirschb., Cicad., 20, 1.

D. lineola, Stal, Ofv., 190, 1 (1854).


Liburnia notula, Scott, Ent. Mo. Mag., vii., 25, 1.

Crown, pronotum, scutellum, and abdomen above yellow or whitish yellow, sides of the three latter widely blackish brown. Scutellum as long as pronotum. Elytra half as long as abdomen
(male), or one-third as long (female), costa gently rounded, apex truncate, brownish yellow streaked with dark brown, or black with the margins narrowly white, nerves elevated, non-granulate. Abdomen above with a fine dorsal line, and a line forming the inner boundary of the dark lateral stripe, white.

Macropterous form. — Scutellum twice as long as pronotum. Elytra one-third longer than abdomen, whitish hyaline; nerves fine, brown, finely granulate, a dark brown line on the inner margin near the apex of the clavus. Length, 3—4 mm.

Marshes; common. Very variable in colour, sometimes wholly dark; at others the dark markings are so faint as to be scarcely perceptible.

2. Liburnia lineola, Germ.

Delphax lineola, Germ., Mag. d'Ent., iii., 209, 1; F. E., 7, 19; Marsh., Ent. Mo. Mag., i., 200, 1.


Stenocranus lineolus, Fieb., Grundz. Delph., 519, 5, t. 8, fig. 3 (details); Cicad. d'Eur., pt. iii., 11, 1.


Elongate, pale brownish yellow; crown, pronotum, and scutellum with a fine white stripe. Crown nearly three times as long as its basal width, narrowed in front, its middle keel strongly raised. Pronotum two-thirds as long as the crown. Scutellum somewhat longer than the crown, its middle keel abbreviated. Elytra narrow, one-half longer than abdomen, yellowish hyaline, finely wrinkled transversely with a dark brown streak at their narrowly rounded apex, sometimes produced inwardly nearly to the base and frequently another just below the claval suture, nerves pale. Legs pale, thighs with a pair of fine black lines. Abdomen above more or less marked with black. Length, 4—5 mm.

Not uncommon.

3. Liburnia fuscovittata, Stal.


D. major and colorata, Kirschb., Cicad., 21, 22, 3 and 4.

Liburnia fuscovittata, Scott, Ent. Mo. Mag., vii., 25, 3.

Stenocranus fuscovenosus, Fieb., Grundz. Delph., t. 8, fig. 3 (style).

Pale yellowish, with a dark brown or black streak at the apex of the elytra. Greatest length of the crown in advance of the eyes nearly equal to one-half the entire length down the centre. Hind margin of pronotum roundly notched. Elytra nearly twice as long as abdomen, hyaline; nerves yellowish, except those of the membrane, which are brown; in the 6th apical area is a brown or black streak, which is sometimes prolonged towards the base. Front pairs of tibiae with a narrow black streak in front, all the tarsi fuscos at the extreme apex. Abdomen black above, side margins yellow. Length, 4½—5½ mm.

Not common.

4. Liburnia longipennis, Curt.

Liburnia longipennis, Scott, Ent. Mo. Mag., vii., 25, 2.

Male, above brown; female, pale yellowish. Greatest length of the crown in advance of the eyes about equal to one-third of the entire length down the centre. Hind margin of pronotum angularly notched. Elytra nearly twice as long as the abdomen, in the male brown, with the clavus and a stripe on the costa yellow; in the female hyaline, with yellowish nerves. Front pairs of tibiae in male black, widely pale at the base, all the tarsi black at the apex; in the female all the tibiae are pale, and the tarsi black at the apex. Length, 4½ mm.

Not common.

5. Liburnia vittipennis, J. Sahl.

D. guttuliferus, Kirschb., Cicad., 25, 12.
Liburnia guttula, Dougli., sec. sp. comm.

Crown, pronotum, and scutellum yellowish white, the sides of the two latter widely, a large round spot on the cheeks, and a small round spot on the sides of the prosternum, black. Crown parallel-sided, about one-half longer than its basal width, projecting but very little in advance of the eyes. Pronotum distinctly shorter
than crown. Scutellum about twice as long as pronotum. Elytra whitish hyaline, slightly widened towards their rounded apex; on the membrane a black or dark brown streak, continued to the base of the elytron as a wide ill-defined brown stripe, which is sometimes very faint, but always discernible on holding the elytron up to the light. Abdomen above blackish, with a narrow pale dorsal line. Styles (Pl. II., fig. 14) oblong, parallel, very distinctly flattened vertically, suddenly acuminate at about the apical third. Insect generally macropterous. Length, 3—4 mm.

Not uncommon. In the brachypterous form the elytra are sublanceolate, but specimens in this state are easily distinguished from *guttula* by their superior size.


*Kelisia guttula*, Fieb., Grundz. Delph., 519, 6, t. 8, fig. 4 (details); Cicad. d' Eur., pt. iii., 22, 6.

*Liburnia guttula*, Scott, Ent. Mo. Mag., vii., 25, 5 ?.


At first sight this species much resembles a very small pale example of the foregoing, but upon examination it proves to be abundantly structurally distinct. Crown, pronotum, and scutellum pale yellow; the sides of the two latter, although sometimes slightly darker than the disc, do not appear to develop the dark stripe so conspicuous in *guttulifera*, at least such is not the case in the twenty examples I have examined. Elytra not widened towards their sublanceolate apex, the dark marking on the membrane rarely more than a small subtriangular black spot. Styles (Pl. II., fig. 13) curved, subparallel, scarcely perceptibly flattened vertically, gradually acuminate from the base. Length, 2½—2¾ mm.

Stratton Strawless, Norfolk; local. Insect very rarely macropterous.


*Liburnia perspicillata*, Scott, Ent. Mo. Mag., x., 270.


Pale yellow, a large round spot on the cheeks, and a smaller one on the sides of the prosternum, black. Crown somewhat longer than wide, obtusely rounded in front, impressions obsolete. Frons convex, slightly rounded, dilated at the lower margin of the eyes, middle keel obsolete. Pronotum somewhat shorter than crown. Scutellum one-half longer than pronotum, keels acute. Elytra whitish hyaline, as long as the abdomen, very finely wrinkled transversely, slightly narrowed towards their narrowly rounded apex, outer cubital nerve forked behind. Wings very short. Abdomen more or less blackish above. Length, 2 mm.

Cheviots, October; one example (Hardy).

8. Liburnia pallidula, Boh.


D. punctulum, Kirschb., l. c., 25, 10.

Liburnia pallidula, Scott, Ent. Mo. Mag., vii., 193, 5 a.


Pale brownish yellow, cheeks generally with a punctiform black spot. Crown a trifle longer than pronotum, distinctly narrowed in front, projecting for about one-fourth of its length beyond the eyes. Scutellum a little longer than crown. Elytra lanceolate, a little longer than the abdomen, yellowish hyaline, with their middle nerve, at least at the apex, and sometimes also the brachial nerve and those of the clavus, black. Middle keel of scutellum and inner margin of elytra narrowly white.

Macropterus form.—Scutellum twice as long as the pronotum. Elytra one-half longer than the abdomen, slightly widened behind, apex obtusely rounded, membrane scarcely half as long as the corium, its middle nerve widely fuscous. Length, 3—3½ mm.

Wet commons, &c. I have a few female examples, taken at Stratton Strawless, in a place where the type-form of this species does not occur, which want the punctiform spot on the cheeks, and have the wings fully
developed, although the elytra are of the same shape as in brachypterous *pallidula*; possibly these will prove to belong to a distinct species.


*Delphax pallidulus*, Marsh., Ent. Mo. Mag., i., 201, 3.
*Liburnia Scotti*, Scott, Ent. Mo. Mag., vii., 67, 6

Pale brownish yellow, cheeks with a small punctiform black spot. Crown somewhat longer than pronotum, parallel-sided, projecting beyond the eyes for about one-third of its length. Scutellum a little longer than crown. Elytra yellowish hyaline, a trifle longer than the abdomen, parallel-sided, their apex obtusely rounded; in the male with a spot at the apex of the clavus, a spot on the costa at the base of the first apical area, and another at the apex of the middle nerve of the membrane, black; in the female with a large irregular patch at the base, another at the apex of the clavus, and an oval patch on the middle nerve of the membrane, black. These markings have a strong tendency either to coalesce, or to disappear leaving only a small black spot at the apex of the middle nerve of the membrane. Upper side of the abdomen occasionally with the base of some of the segments narrowly black.

*Macropterous form.*—Scutellum nearly twice as long as pronotum. Elytra yellowish hyaline, one-third longer than abdomen, apex of the clavus filled up with black. Length, 3—4 mm.

Marshes; local.


*Delphax smaragdula*, Stal, Ofv., 174, 1 (1853); Kirschb., Cicad., 22, 5.
*Chloriona smaragdula*, Fieb., Grundz. Delph., t. 8, fig. 6 (♀ genitalia); Cicad. d'Eur.. pt. iii., 26, 1; J. Sahl., Not. Fenn., xii., 407, 2.

♀. Elongate, pale green. Head strongly keeled, basal keel of crown acute. Scutellum more than twice as long as pronotum. Elytra twice as long as the abdomen, greyish white, opaque, narrowly rounded at the apex, nerves with very fine black hairs, second subapical area nearly twice as long as the fifth. Abdomen black, with reddish side margins. Legs with very fine black hairs, claws black.
Scutellum scarcely one-half longer than the pronotum. Elytra greyish white, about one-third as long as abdomen, separately rounded at the apex. Wings wanting. Apex of the saw-case black. Length, 4\(\frac{1}{2}\)–5 mm.

Not common.

11. *Liburnia unicolor*, H.-S.


Elongate, greenish or yellowish white; brachypterous female pale green.

♀ Basal keel of crown obtuse. Scutellum twice as long as pronotum. Elytra greyish white, opaque, twice as long as the abdomen, apex narrowly rounded, nerves with very fine black hairs, second subapical area somewhat longer than the fifth. Abdomen black, margins of the segments yellowish. Legs as in *smaragdula*. Pygofer sometimes white.

♂ Macropterous form.—Scutellum more than twice as long as pronotum. Elytra one-half longer than abdomen, greyish white, sometimes faintly fumose at the apex. *Brachypterous form.*—Scutellum scarcely one-half longer than pronotum. Elytra one-third as long as abdomen, greyish white, their apex separately rounded. Length, 4–5 mm.

On reeds, June and July.


*D. pallens*, Stal, Ofv., 192, 11 (1854); Fieb., Grundz. Delph., t. 8, fig. 27 (♀ genitalia).


Pale yellow, with fuscous markings; keels of the head white, with black margins. Crown somewhat longer than wide, basal impressions subtriangular, fulvous, about half as long as the crown. Scutellum one-half longer than pronotum, side keels distinct. Elytra
about half as long as abdomen, separately rounded at apex, pale yellow with white margins. Abdomen (male) blackish, with the margins, a dorsal stripe, and a few short lines towards the sides behind, rust-red; female, yellow faintly marked with fuscous, each dorsal segment with a transverse row of dark points interrupted in the middle. Styles hooked outwardly at apex, teeth of anal tube apparently crossing each other. Anal tube and its style entirely pale. Length, 2—2½ mm.

Macropterous form.—Scutellum twice as long as pronotum, side keels obsolete, diverging. Elytra more than one-half longer than abdomen, yellowish hyaline; nerves smooth, whitish yellow behind. Length, 3—3½ mm.


Delphax sordidula, Stal, Ofv., 174, 2 (1853); Kirschb., Cicad., 29, 19; Fieb., Grundz. Delph., t. 8, fig. 26 (♀ genitalia).


Pale yellow; facial keels, a stripe along the crown pronotum and scutellum, and the marginal nerve of elytra, white. Facial keels narrowly and obsoletely margined with fuscous in the male. Scutellum nearly twice as long as pronotum. Elytra yellowish hyaline, narrowly rounded at the apex, one-third (male) or one-half (female) shorter than abdomen, nerves smooth. Abdomen (male) blackish, with the side margins, the dorsal line, and some irregular spots towards the apex, rust-red; female, yellow, sometimes with a row of dark spots on each side, or otherwise marked with black. Styles subulate, their ciliate inner margin with a strong sharp tooth near the base. Length, 3—3½ mm.

Macropterous form.—Scutellum two and a half times as long as pronotum. Elytra two-thirds (male) or one-half (female) longer than the abdomen, nerves darker towards the apex. Length, 4—5 mm.

Female sometimes entirely pale.

14. Liburnia elegantula, Boh.

Delphax elegantula, Boh., Sv. Ak. Handl., 63, 27 (1849); Flor, Rhyn. Liv., ii., 70, 18; Marsh., Ent. Mo. Mag., i., 252, 11; Kirschb., Cicad., 26, 6; Fieb., Grundz. Delph., t. 8, fig. 22 (♀ genitalia).
L. æmulator, Scott, Ent. Mo. Mag., ix., 238, 8a, sec. spec. typ.

Elongate, black; keels of the head, pronotum, with the exception of a black patch behind each eye, and apex of scutellum, white. Crown distinctly longer than wide, basal impressions yellow, apical impression very narrow, continued on to the forehead. Scutellum one-third longer than pronotum, side keels distinct, diverging. Elytra greyish white, pellucid, about half as long as abdomen, apex truncate, with rounded angles, nerves smooth. Abdomen above with a wide brownish yellow central stripe, a narrow whitish dorsal line, and some longitudinal rows of brownish yellow spots on the dark side portions. Legs yellow, femora faintly striped with fuscous. Styles incurved, subequal in width, with a strong triangular tooth at the apex within, and a long process directed backwards at the base. Teeth of anal tube (male) long, acute, diverging, visible from the side.

? Pronotum and scutellum pale brownish or greyish yellow; abdomen brownish yellow, darker towards the sides, where there are some rows of pale spots, dorsal line whitish. Length, 2—2½ mm.

Macropeterous form.—Scutellum convex, twice as long as pronotum, side keels very feeble. Elytra one-half longer than abdomen rounded at the apex, nerves dirty yellow. Length, 3—3½ mm.

15. Liburnia distincta, Flor.

Delphax distincta, Flor, Rhyn. Liv., ii., 68, 17; Fieb., Grundz. Delph., t. 8, fig. 23 (♀ genitalia).
L. cousanguinea, Scott, Ent. Mo. Mag., ix., 239.

Head black, with white keels, the two basal impressions of crown yellow. Pronotum and scutellum yellow, sometimes with fuscous markings, margins and keels white. Elytra one-half shorter than abdomen, yellowish with white margins, hind margin truncate, angles rounded; nerves smooth, whitish. Abdomen (male) black, last segment entirely, and pygofer above, broadly pale; female, black, side margins very narrowly, a fine central line, and the last dorsal segment in the middle, brownish yellow, varying to yellow with a row of dark spots down each side, or entirely yellow except
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the saw-case. Styles elongate-triangular, outer margin straight, inner margin concave in the middle and cut off obliquely to a sharp point. Length, 2—2\(\frac{1}{2}\) mm.

*Macropterus form.*—Scutellum twice as long as pronotum, side keels obsolete, parallel. Elytra more than one-half longer than abdomen, apex rounded. Length, female, 4 mm.

16. *Liburnia Boldi*, Scott ?.


Crown yellow, keels white, interstices black. Face yellow, keels white, the middle one on each side and the side ones inwardly margined with black. Pronotum and scutellum yellow, with a greyish shade, keels distinct, somewhat paler than the disc, side keels of the former almost reaching to the hind margin. Elytra yellowish grey, barely covering half the abdomen, hind margin rounded, nerves not prominent nor granulate, apex of clavus sometimes with a short narrow dark brown streak. Abdomen (male) above black, with a fine rust-red dorsal line, apex of each segment of the connexium yellow-red; female, above brownish yellow, darker on the sides, side margins orange-yellow, outer margins of the segments black, a fine dorsal line and the hind margins of the segments pale. Styles (Pl. II., fig. 17) short and broad, inner margin strongly, outer margin faintly, concave, inner apical angle produced into a pointed tooth, outer apical angle produced and bluntly rounded, thus giving to the style a form very suggestive of a profile view of a bird's head and neck. Length, 2—2\(\frac{1}{2}\) mm.

Sandy coasts. Near Newcastle-on-Tyne and Norfolk. It is impossible to be quite certain that the insect above described is identical with Scott's insect, but his description of the female, the only sex he knew, agrees very well with the female of the insect here characterised.


long as abdomen, rounded at apex; nerves strong, pitch-black, closely and strongly granulate. Legs dirty brownish yellow. Upper notch of pygofer wide, triangular, occupying the entire width of the segment, its margin, viewed from the side, straight, oblique, and forming an obtuse angle with the vertical straight hind margin, which it nearly equals in length; lower notch bluntly triangular, very large and deep, its margin, when viewed from the side, forming an obtuse angle with the hind margin, the length of which it somewhat exceeds. Styles, when viewed in situ under a low magnifying power, scantily pilose, apparently strap-shaped, slightly widened at their subtruncate apex, their lower half parallel with the outline of the lower notch of the pygofer, their upper half upright and slightly curved backward (Pl. I., fig. 7, Pl. II. fig. 15). Anal tube large, exserted, its teeth very short and obtuse.

2. Pale brownish yellow, claws and apex of the saw-case black. Elytra one-third shorter than abdomen. Length, male, 2½ mm.; female, 4 mm.

Marshes, in June; Abbey Wood and Brundall, Norfolk.

18. Liburnia adela, Flor.

Delphax adela, Flor, Rhyn. Liv., ii., 68, 14; Fieb., Grundz. Delph., t. 8, fig. 50 (♂ genitalia).


Brownish yellow, abdomen above black, with white hind margins to the segments. Basal impressions of the crown deeper than the apical. Face between the keels sometimes black, its central keel sharp, nearly evanescent on the forehead. Elytra as long as the abdomen, dirty brown, with a very narrow and indistinct pale margin; nerves strong, brown, distinctly granulate. Legs sometimes with indistinct dark stripes. Pygofer (male) black, viewed from behind, oval, widest in the middle. Upper notch deep, triangular, margined with white, viewed from the side its margin forms a very obtuse angle with the hind margin of the pygofer, which is angularly prominent in the middle; lower notch deep, narrow, somewhat sinuate. Styles long, strap-shaped, reaching about two-thirds the height of the cavity, oblique at the base, afterwards upright and slightly incurved towards their truncate apex, inner margin sinuate, inner apical angle produced into a blunt tooth. Anal tube whitish, scarcely exserted, its teeth short and blunt. Length, 2½ mm.

Female undescribed.


Crown clear brown, the keels acute and prominent. Face (except the forehead) black. Pronotum clear brown, keels acute and prominent, hinder angles broadly black. Scutellum clear brown, keels distinct, sometimes the middle keel and a narrow margin on either side, especially towards the apex, blackish, beyond the side keels black. Elytra about two-thirds as long as abdomen, shining lacquer-yellow, somewhat transparent, hind margin rounded, nerves prominent, unpunctured. Breast black. Legs yellow, front pairs of tarsi brown, hind pair yellow. Abdomen above pitchy brown, beneath black. Pygofer (male) black, seen from behind, slightly arched outwardly below the middle, obtusely narrowed towards the base, widely rounded at the top, viewed from the side forming a triangle, of which the longest side is formed by the oblique hind margin, which is continuous with the margin of the upper notch. Anal tube large, semicircular, not exserted, occupying the entire width of the upper part of the pygofer, but not reaching the middle. Styles brownish yellow, shaped like a pruning-knife, narrow at the base, widened towards the top, strongly arched outwardly above the middle, and ending in a slightly incurved point, which reaches the lower side of the anal tube; their points contiguous. Length, 2 mm.

Gosforth, October. Female undescribed. Larger than *L. venosa*, to which it is said to bear a great resemblance.


*Delphax similis*, Kirschb., Cicad., 30, 22.  

Brownish yellow, last tarsal joint, the saw-case, and a row of spots on the sides of the abdomen above, darker; face, except the keels, black. Facial keels filiform, the middle one distinct on the forehead. Keels of the crown strong, the impressions deep, the basal ones brownish, about one-third as long as the crown. Pronotum not half so long as the scutellum, keels of the latter distinct. Elytra half as long as abdomen, rounded behind, dirty brownish yellow with white margins, nerves strong, with dense concolorous


Head, pronotum, and scutellum brownish yellow; keels of the latter fine, but distinct. Elytra one-third longer than abdomen, pale smoky yellow, almost transparent; all the nerves brown, distinctly and regularly granulate, a blackish streak on the inner margin at the apex of the clavus. Legs pale fuscos-yellow, claws and apex of the claw-joint brown. Abdomen above dark brown, paler towards the apex, beneath brownish yellow, hind margin of the segments more or less broadly black, segments themselves with two or three scattered black punctures, pygofer and saw-case brownish yellow, lateral lobes narrowly and very obliquely truncate at the base, their inner angle slightly rounded, somewhat widened behind, obliquely rounded at the apex. Length, 3 mm.

At once recognisable by the uniform brown nerves and minute but distinct concolorous granules thereon. Male undescribed.


*Macropterous form.* — ♯. Crown brownish yellow, slightly widening from the base to the front margin; keels acute, prominent, slightly paler than the disc, apical impression small, the two basal ones large and deep. Face brownish yellow; keels paler than the disc, central one somewhat more feeble on the frons. Pronotum brownish yellow, darker behind each eye, keels somewhat paler. Scutellum brownish yellow, darker on each side of the middle keel, on either side of which at the base is a black spot, beyond the side keels black, side margins brownish yellow. Elytra whitish hyaline, very finely wrinkled transversely, about one-half longer than abdomen; nerves yellowish, darker behind, non-granulate, marginal nerve round the apex black. Legs fuscos, hind claws and apex of claw-joint black. Abdomen above black, beneath black, hind margin of the two last segments very narrowly yellow. Pygofer and styles black, the latter somewhat billhook-shaped at the apex. Length, 2½ mm.
Similar to the male, but paler and wants the pair of black spots at the base of the scutellum.

This species at first sight bears some resemblance to the macropterous form of *L. Fairmairei*, but it is at least one-third smaller.


*Delphax lepida*, Boh., Sv. Ak. Handl., 39, 10 (1849); Kirschb., Cicad., 35, 34; Fieb., Grundz. Delph., t. 8, fig. 36 (♂ genitalia).


*Liburnia lepida*, Scott, Ent. Mo. Mag., vii., 27, 26;

Blackish brown, face spotted with white; keels of pronotum and scutellum, three broad rings on the tibiae, and the chief part of the tarsi, pale yellow. Apical impression of crown continued on to the frons. Pronotum distinctly shorter than crown. Middle keel of pronotum and scutellum stout. Scutellum three-fourths longer than pronotum; side keels straight, diverging. Elytra (male) one-third (female) one-half as long as abdomen; apex truncate with rounded angles, dark brown, paler at the base, two large semi-circular spots on the hind margin, a small spot at the apex of the clavus, and a streak on the inner margin, white; nerves with large brown granules. Abdomen above black, generally with three lines of small white spots. Pygofer (male), seen from behind, wide, oval; upper notch widely triangular, its margin, seen from the side forming an obtuse angle with the hind margin, which is straight and directed obliquely inwards, lower margin produced into a blunt lobe. Styles erect, approximating at the base and apex, widened above, outer apical angle widely rounded, inner drawn out into a fine sharp point. Length, 2½—3 mm.

*Macropterous form.*—Scutellum two and a half times as long as pronotum; side keels diverging, slightly curved. Elytra nearly twice as long as abdomen, whitish hyaline; nerves strong, with large brown granules, an oblique band before the middle, a band on the angular nerves, a streak at the apex of the clavus, and some small spots at the apex of the nerves of the membrane, brown. Length, 3½ mm.


Blackish brown above, yellow-brown beneath, hind margin of elytra with two white spots separated by a black one. Keels of crown sharp, frons at the apex narrowly pale. Pronotum and scutellum subequal in length, their keels sharp. Elytra (male) one-half (female) one-third as long as abdomen, suffused with pale at the base of the suture, apex truncate with rounded angles; nerves strong, smooth. Abdomen above, male blackish brown, sometimes with three lines of pale spots; female yellow-brown, widely darker on the sides, with three more or less distinct lines of pale spots. Pygofer (male) sparingly set with fine pale hairs, upper notch wide, triangular, reaching the preceding segment, its margin, seen from the side, forming an obtuse angle with the hind margin, which is vertical, and has its lower angle rounded off. Styles (Pl. II., fig. 16) long, narrow, incurved, quite reaching the lower margin of the anal tube, their inner apical angle produced inwardly and hooked. Length, 2—2 ½ mm.

Not uncommon at roots of rushes.

25. **Liburnia pullula**, Boh.

*Delphax pullula*, Boh., Sv. Ak. Handl., 116 (1853); Stal, Ofv., 196, 28 (1854); Fieb., Grundz. Delph., t. 8, fig. 38 (♀ genitalia).


♀. Dirty yellow, elytra and abdomen black, hind margin of the former narrowly white. Crown rounded in front, apical impressions very narrow and obsolete. Frons strongly roundly dilated below the middle, slightly narrowed before the apex, its middle keel evanescent above. Pronotum somewhat shorter than crown. Scutellum one-half longer than pronotum. Elytra coriaceous, half as long as abdomen, widely rounded at the apex; nerves strong, sparingly granulate. Legs slender, pale yellow. Pygofer black, seen from behind elongate-oval, upper notch acutangular, its margin, seen from the side, short, and forming an obtuse angle with the hind margin, which is straight, somewhat oblique, and has its lower angle widely rounded off. Styles yellow, very small, about one-fourth as long as the opening of the pygofer, seen from the side with a large triangular tooth behind at the base,
apex truncate, outer apical angle produced into a wide triangular tooth. Anal tube black, somewhat prominent, its teeth long, vertically connate, curved forwards at the apex, and nearly reaching to the middle of the opening of the pygofer.

♀. Entirely dirty yellow, except some obsolete spots at the base of the abdomen and the saw-case and claws, which are brown. Length, $\frac{1}{4}$—2 mm.

Macropterous form (female).—Scutellum twice as long as the pronotum, side keels distinct and curved outwards. Elytra two-thirds longer than abdomen, yellowish hyaline; nerves pale yellow, sparingly granulate with brown, marginal nerve of membrane brown. Length, $3\frac{1}{2}$ mm.

26. Liburnia lugubrina, Boh.

Delphax lugubrina, Boh., Ofv., 266, 11 (1847); Flor, Rhyn. Liv., ii., 73, 20; Kirschbh., Cicad., 33, 29; Fieb., Grundz. Delph., t. 8, fig. 39 (♀ genitalia).


♀. Pale yellow, elytra black, costal and hind margins narrowly yellowish white, inner margin near the apex of the scutellum broadly yellow; abdomen above yellow with black margins, or with the basal segments entirely dark. Central facial keel sharp, forked, and becoming indistinct on the forehead. Scutellum three-fourths longer than pronotum, its side keels straight, strongly diverging, sometimes with a black spot on each side at the base, or black with the apex yellow. Elytra scarcely two-thirds so long as abdomen, hind margin broadly rounded, nerves finely granulate. Legs slender, spur of hind tibis large and wide. Pygofer, seen from behind, distinctly wider than high, and having three blunt angles, namely, one just below the middle of each side, and one in the middle of the lower margin. Viewed from the side the nearly horizontal margin of the upper notch forms an obtuse angle with the hind margin, which is oblique and nearly straight; the rounded right angles, in which the hind joins the lower margin, coincides with the point of the greatest width of the pygofer, when seen from behind. Styles straight, strongly diverging, narrow-triangular, pointed, reaching half the height of the cavity of the pygofer. Teeth of anal tube distant, slightly curved outwards at the apex. Length, $2\frac{3}{4}$—4 mm.

♀. Entirely pale brownish yellow.

Macropterous form (female).—Scutellum nearly three times as
long as pronotum, side keels distinct, slightly curved outwards. Elytra yellowish, subpellucid, one-half longer than abdomen, rounded at the apex, nerves non-granulate. Length, 5 mm.

27. Liburnia leptosoma, Flor.

Delphax leptosoma, Flor. Rhyn. Liv., ii., 76, 22; Marsh., Ent. Mo. Mag., i., 252, 12; Fieb., Grundz. Delph., t. 8, fig. 34 (♀ genitalia).

D. Heydenii, Kirschb., Ciead., 37, 39 (♀).

D. albolimbata, Kirschb., l. c., 32, 27 (♂).

D. albofimbriata, Fieb., Grundz. Delph., t. 8, fig. 35 (♂ genitalia).


L. albofimbriata, Scott, l. c., 27, 28.

♀. Face pitch-black, keels sometimes pale. Crown dirty brownish yellow, remainder of upper side shining black, with the pronotum, and occasionally the base of the elytra, dirty white, hind margin of the latter pure white. Elytra half as long as abdomen, hind margin truncate with rounded angles; nerves strong, not perceptibly granulate. Pygofer black margined with white, the upper notch very wide and deep, its sides feebly concave, and its base concealed beneath the preceding segment. Styles diverging, straight, pointed, shining black, reaching about half the height of the cavity.

♂. Lighter or darker brownish yellow, hind margin of elytra white. Length, 2—2½ mm.

Common.

28. Liburnia niveimarginata, Scott.

Delphax thoracicus, Marsh., Ent. Mo. Mag., iii., 269, nee Stal.


♀. Face and crown pale brownish yellow. Pronotum and scutellum white. Elytra about half as long as abdomen, apex truncate with rounded angles, hind margin broadly white; nerves strong, but not perceptibly granulate. Abdomen black, last segment in the middle above and margin of pygofer broadly white. Upper notch of pygofer sharply triangular. Teeth of anal tube long, pointed, vertically contiguous. Styles pale, diverging, somewhat lanceolate, reaching the level of the teeth of anal tube.
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♀. Similar to that of the last species, but distinguishable by the difference in the central keel of the face. Length, $2\frac{1}{2}$—3 mm. Apparently not common.


*Liburnia Dalei*, Scott, Ent. Mo. Mag., vii., 72, 33.

♂. Crown yellow, the two basal impressions distinct, the front one appearing as a deep puncture. Central facial keel distinct, but not prominent. Pronotum yellow. Scutellum deep black, shining, sides and apex narrowly yellow. Elytra yellow, not half so long as abdomen, hind margin rounded, nerves non-granulate. Abdomen black, shining, side margins and a very narrow dorsal line yellow, last two segments clear yellow. Pygofer above whitish yellow, sides and beneath black; seen from behind its outline is inversely oval, the sides narrowed below, rounded above. Upper notch triangular, its margin, seen from the side, forming an obtuse angle with the nearly vertical hind margin, lower angle somewhat less obtuse. Lower notch deep, rounded, with sinuate edges. Styles upright, slightly diverging, nearly reaching the teeth of the anal tube, narrow, cuneiform, obliquely truncate on their inner side near the base. Anal tube large, sunken, its teeth short, distant. Length, $1\frac{1}{2}$ mm.

♀. Unknown.

Lulworth, in August.


*Delphax pellucida*, Fab., Sys. Rhyn., 84, 6; Flor, Rhyn. Liv., ii., 65, 16; Marsh., Ent. Mo. Mag., i., 273, 14; Fieb., Grundz. Delph., t. 8, fig. 20 (♂ genitalia).


*D. marginata*, Fab., l. c., 84, 9.

*D. dispar*, Fall., Hem. Suec., ii., 74, 2; Kirschb., Cicad., 27, 16.

*D. hemiptera*, Stal, Ofv., 5, 14 (1854).


*D. dubia*, Kirschb., Cicad., 26, 14.


*Macropterus form. —♂.* Black; facial keels, pronotum (except a patch behind each eye), tegulae, and apex of scutellum, white.
British Homoptera-Cicadina.

Scutellum more than three times as long as pronotum, apex reflexed; side keels fine, parallel, obsolete behind. Elytra whitish hyaline, twice as long as abdomen; nerves pale at the base, darker behind, distinctly and moderately closely granulate throughout, marginal nerve of membrane black. Abdomen black, sides narrowly yellowish. Pygofer large, prominent, black, its hind margin generally edged with white below. Viewed from above the upper notch is wide and deep, scarcely angular at the base, its edges forming a right angle, or nearly a right angle with the hind margin. Styles spreading almost horizontally, their apex reflexed. Teeth of anal tube long, vertically connate. Head, pronotum, and scutellum frequently entirely black or pitch-black.

♀. Black; facial keels, pronotum, scutellum, and sides of the abdomen, pale brownish yellow. Elytra yellowish hyaline. Body frequently entirely yellow, except the upper side of the abdomen near the base. Length, 3½—4½ mm.

Brachypterous form. — ♂, ♀. Varying in colour from pale brownish yellow to pitch-black, but sometimes the coloration of the fore parts mentioned above is developed in the male. Scutellum more than twice as long as pronotum; keels distinct, diverging behind. Elytra about as long as abdomen, apex narrowly rounded, nerves strong, closely set with conspicuous black granules. Length 2½—3 mm.

This excessively variable and abundant species may be readily identified by the characters derived from the male genitalia.

31. Liburnia discolor, Boh.


Black; keels of head and pronotum yellow, hind margin of the latter generally narrowly white in the male; elytra pellucid, pale brown, marginal nerve paler. Scutellum about twice as long as pronotum; side keels strong, divergent. Elytra about one-half as long as abdomen, widely rounded behind; nerves strong, their granulation indistinct. Pygofer (male) large, prominent, black, the upper notch, viewed from above, large, deep, round at the base,
its edges forming at their junction with the hind margin an obtuse angle. Styles and anal tube almost as in *pellucida*. Length, 2¾—3 mm.

*Macropteroiis form.*—Scutellum two and a half times as long as pronotum; side keels distinct, somewhat diverging. Elytra yellowish hyaline, nearly twice as long as abdomen; nerves yellow, at the base afterwards dark, with small setigerous granules towards the apex, costal margin white, that of the membrane and the suture dark. Length, 3½—3¾ mm.

Woods, in spring.


Crown brown, fork of the middle keel evanescent in front. Frontal channels blackish, paler down the middle, keels whitish. Pronotum brownish yellow, somewhat shorter than the crown. Scutellum twice as long as pronotum, brownish yellow, with a large blackish spot on each side and another at the apex, keels sharp, pale. Elytra as long as the abdomen, brownish grey, rounded behind, costal margin and suture yellow-brown, hind margin and clavus brownish; nerves strong yellow-brown, closely set with setigerous granules. Abdomen above, male black, last segment paler; female yellow, more or less widely brown at the base, dorsal line whitish, each segment narrowly black at the base, apical segments frequently entirely pale. Upper notch of pygofer (male), seen from the side, almost vertical, and forming a very obtuse angle with the straight hind margin, which is directed obliquely forwards, lower notch very wide. Styles very short, sub lanceolate, arched forwards. Length, 2—2½ mm.

*Macropteroiis form.*—Scutellum three times as long as pronotum, transversely impressed at the apex; side keels obsolete, subparallel. Elytra twice as long as abdomen, fusco-hyaline; nerves yellow, with black setigerous granules, which are stronger on the corium than on the membrane, margins brown. Length, 3—3½ mm.
33. *Lihurnia forcipata*, Boh.

*Delphax forcipata*, Boh., Sv. Ak. Handl., 57, 23 (1849); Flor, Rhyn. Liv., ii., 60, 12; Kirschb., Cicad., 37, 38; Fieb., Grundz. Delph., t. 8, fig. 33 (♂ genitalia).


Pitch-black, shining; facial keels, crown, hind margin of pronotum, and base of elytra widely, yellowish, marginal nerve of the latter pale. Scutellum one-half longer than pronotum; side keels distinct, diverging. Elytra coriaceous, about one-half as long as abdomen, widely rounded behind; nerves strong, their granulation indistinct. Pygofer (male) large, prominent, black, the upper notch deep, reaching to the preceding segment, viewed from above elliptic, at least one-half wider across the middle than at its opening on the hind margin, its edges forming at their junction with the latter an acute angle. Length, 2—2½ mm.

**Macropterous form.**—Scutellum two and a half times as long as pronotum, flattened towards the apex; side keels obsolete, slightly curved outwards. Elytra about twice as long as the abdomen, fuscous, somewhat pellucid (male), aquo-hyaline (female), base yellowish, nerves with small setigerous granules. Length, 2½—4 mm.

Woods in spring.

34. *Lihurnia denticauda*, Boh.

*Delphax denticauda*, Boh., Sv. Ak. Handl., 64, 28 (1849); Flor, Rhyn. Liv., ii., 59, 11; Fieb., Grundz. Delph., t. 8, fig. 46 (♂ genitalia).


♂. Pale brownish yellow, breast and abdomen black, the latter with the hind margin of the last dorsal segment white. Pronotum distinctly shorter than crown, side keels curved outwards. Scutellum scarcely one-half longer than pronotum; side keels acute, strongly diverging. Elytra about half as long as abdomen, pale yellow, pellucid, very finely wrinkled transversely, hind margin truncate with rounded angles; nerves strong, non-granulate. Margin of upper notch of pygofer, seen from the side, oblique and forming with the sinuate hind margin, which is directed obliquely
forwards, a wide triangular tooth. Middle of the lower margin of pygofer with a long sharp tooth. Teeth of anal tube short, obtuse, vertically connate.

♀. Entirely pale brownish yellow, elytra about one-third as long as abdomen. Length, 2—2\(\frac{1}{2}\) mm.

Macropterous form.—Scutellum two and a half times as long as pronotum; apex reflexed, white; side keels very indistinct, nearly parallel. Elytra, male two-thirds, female one-half, longer than abdomen, yellowish hyaline; nerves dirty yellow, dusky towards the apex. Length, 3—3\(\frac{1}{2}\) mm.

A vernal wood-frequenting species like the preceding.

35. Liburnia exigua, Boh.

Delphax exigua, Boh., Sv. Ak. Handl., 65, 29 (1849); Flor, Rhyn. Liv., ii., 61, 13; Kirsch., Ciacd., 34, 32; Fieb., Grundz. Delph., t. 8, fig. 43 (♀ genitalia).


♂. Greyish yellow, abdomen black with the apical segments sometimes narrowly margined with yellow. Facial keels strong, evanescent on the forehead. Scutellum scarcely one-half longer than pronotum; side keels distinct, strongly diverging. Elytra about half as long as abdomen, pale greyish yellow, pellucid, margins paler, apex truncate with rounded angles; nerves strong, non-granulate. Pygofer black, retracted, upper notch wide, rounded, margined with yellow, lower notch feeble, hind margin straight. Styles narrow, somewhat lanceolate, with a long narrow tooth at the base projecting backward. Anal tube nearly circular, its teeth represented by a long narrow straight process from the middle of its lower margin.

♀. Pale greyish yellow, head, pronotum, scutellum, and elytra whitish, sides of abdomen above with some blackish markings. Length, 1\(\frac{3}{4}\)—2 mm.

Macropterous form, ♂.—Scutellum nearly three times as long as pronotum, transversely impressed before the apex, sides fuscous; side keels fine, subparallel. Elytra nearly twice as long as abdomen, whitish hyaline; nerves non-granulate, pale brown, darker towards the apex. Length, 2\(\frac{1}{2}\) mm.

*D. nitidula*, Kirschb., Cicad., 36, 36.

Fore parts lighter or darker pitch-brown, abdomen black. Elytra and legs yellow-brown; nerves of the former strongly raised, black. Crown rectangular, a little longer than wide, its keels strong. Pronotum a trifle shorter than the crown, its side keels straight, strongly diverging, but reaching the hind margin. Scutellum very little longer than the pronotum. Elytra about two-thirds as long as the abdomen, widely rounded at the apex, entire marginal nerve black (Pl. I., fig. 8).

*Macropterous form.*—Scutellum one and a half times as long as pronotum. Elytra dirty whitish hyaline, finely wrinkled transversely, nearly twice as long as abdomen; nerves dark brown, strongly raised. Length, $1\frac{1}{2}$—2 mm.

At roots of coarse grass and rushes. Easily distinguished from our other black species by its small size, and the side keels of the pronotum reaching the hind margin.


*Liburnia insignis*, Scott, Ent. Mo. Mag., xviii., 270.

♂. Pale yellowish, abdomen pitch-black, shining, with a large yellow or brownish yellow transverse patch on the upper side at the base, hind margin of the last four segments very narrowly brown, down the centre of each a short narrow streak not reaching the front margin, hind margin of the last segment broadly white. Side keels of pronotum somewhat indistinct, disc on each side of the centre somewhat depressed. Keels of scutellum distinct, somewhat acute. Elytra about half as long as abdomen, their apex flatly rounded; nerves fine, non-granulate. Legs yellow, thighs fuscous at the base. Pygofer black, shining; viewed from the side the hind margin is produced into a flat isosceles-angular form, and has a short curved acute tooth at the lower extremity; viewed from behind the pygofer appears almost circular, margins of the upper half folding down inwardly and forming two triangular flaps, leaving a small space between their edges down the centre.
Styles black, forming a wide V-shaped character, apex of the arms white, produced into a point. Length, 3 mm.

♀. Unknown.

Pitlochry, Perthshire.

38. Liburnia Aubei, Perris.


D. cognata, Fieb., Grundz. Delph., 527, t. 8, fig. 42 (♂ genitalia).


♂. Greyish yellow, abdomen black with a whitish dorsal line, each segment with a transverse row of about three short narrow reddish yellow stripes near each side. Middle keel of pronotum and scutellum and marginal nerve of elytra whitish. Elytra pellucid, half as long as abdomen, apex widely rounded; nerves moderately strong, non-granulate. Pygofer black, moderately prominent, the margin of its deep angular notch and a large sub-quadrate spot adjoining its obsolete lower notch yellowish, hind margin straight. Styles pale, sinuate, blunt, nearly reaching the very feebly obtuse teeth of the anal tube.

♀. Abdomen greyish yellow with a whitish dorsal line, each segment with a transverse row of about three short black stripes near each side. Coloration otherwise as in the male. Length, 2½—3 mm.

Sandy coasts; common.

39. Liburnia striatella, Fall.

Delphax striatella, Fall., Hem. Suec., ii., 75, 3; Flor, Rhyt. Liv., ii., 54, 8; Marsh., Ent. Mo. Mag., i., 251, 10; Fieb., Grundz. Delph., t. 8, fig. 21 (♂ genitalia); Kirschb., Cicad., 27, 17.

D. notula, Stal, Ofv., 192, 10 (1854).


♂. Black; facial keels, pronotum (except a large spot behind each eye), and apex of scutellum, whitish, crown pale. Elytra but little longer than abdomen, pale brownish, rounded at the
apex, nerves sparingly granulate. Legs yellow. Aperture of pygofer constricted, its outline sinuate, upper notch semicircular, its margin, seen from the side, oblique; hind margin nearly vertical, sinuate just before it joins the margin of the upper notch. Styles very short, broad at the base, rapidly narrowing towards their somewhat rhomboidal apex. Teeth of anal tube long, vertically subcontiguous. Length, 1\(\frac{1}{2}\)—2\(\frac{3}{4}\) mm.

♀. Pronotum and scutellum widely pale down the middle, their sides and the abdomen above blackish, the latter sometimes with pale spots towards the apex. Length, 2\(\frac{1}{2}\)—3 mm.

**Macropterous form.**—Elytra hyaline, nearly twice as long as abdomen; nerves fine pale brown, darker towards the apex, sparingly granulate, apical third of costal nerve black, sixth apical area fuscous, at least in the female. Length, 3\(\frac{1}{2}\)—4\(\frac{1}{2}\) mm.


*D. neglecta*, Flor, Rhyn. Liv., ii., 57, 10; Fieb., Grundz. Delph., t. 8, fig. 52 (♂ genitalia); Marsh., Ent. Mo. Mag., i., 274, 16 ?.


*L. extrusa*, Scott, l. c., 194, 22 a, see spec. comm.

Pale brownish yellow, sides of pronotum and scutellum and frequently also sides of abdomen widely brown. Elytra in the brachypterous form about two-thirds as long as abdomen, broadly rounded at the apex, inner marginal nerve white; nerves strong, sparingly and indistinctly granulate; in the macropterous form nearly twice as long as abdomen, whitish hyaline; nerves fine, pale, darker towards the apex, very finely and sparingly granulate, marginal nerve of membrane black. Towards the apex of the abdomen each segment has a transverse row of about three black punctures on each side, and a fine pale dorsal line runs down the middle. Upper notch of pygofer (male) rounded at the base, very wide and deep; hind margin, viewed from the side, with a wide and deep arenate notch in the middle, produced above into a strong triangular tooth, lower angle of the notch rectangular or nearly so; styles visible, cleaver-shaped, reaching across the mouth of the notch. Styles (Pl. II., fig. 10), viewed from behind, wide, flat, black, parallel-sided, straight and connivent for a short distance from the base, then suddenly bent outwards and afterwards curved upwards, their apex truncate. Length, 2\(\frac{1}{2}\)—4\(\frac{1}{2}\) mm.
The female of this species is abundant at the roots of grass in the autumn, and varies much in colour, some examples being nearly black, in which case the pale disc of the pronotum and scutellum and the inner marginal nerve of the elytra are very conspicuous. Males are difficult to meet with in company with females, but they occur more freely a little earlier in the season. The nymph of this species is the *Achorotile birittata*, Boh., of Fieber and Puton's catalogues.

41. *Liburnia brevipennis*, Boh.


*D. hyalinipennis*, Stal, Ofr., 6, 19 (1854); Fieb., Grundz. Delph., t. 8, fig. 51 (♂ genitalia); Kirschb., Cicad., 28, 18.


Similar in size and appearance to the last named, but the pale ground colour of the upper side is dirty white, inclining to bluish grey, and the dark stripe on the sides of the pronotum and scutellum is rarely so decided as in that species. Styles (Pl. II., fig. 12), viewed from behind, somewhat cleaver-shaped, wide, flat, black, truncate at the apex, their inner margin faintly concave on its lower half, with a feeble obtuse tooth just above the middle, and another, similar, at the apex, outer margin simple.

Dunston, near Norwich, at roots of coarse grass, September and October; local. The nymph of this species cannot be distinguished from that of the last, except by the evidence afforded by its occurrence in company with the adult form.

42. *Liburnia straminea*, Stal.

*Delphax straminea*, Stal, Sv. Ak. Handl., 358, 11 (1858); Fieb., Grundz. Delph., t. 8, fig. 54 (♂ genitalia).


3. Pale yellow, claws fuscous. Scutellum two-thirds longer than pronotum, its side keels distinct, diverging. Elytra yellowish hyaline, about one-half as long as abdomen, separately rounded at the apex; nerves raised, concolorous. Upper notch of pygofer angular with sinuate sides, its margin, when viewed from the side, forming an obtuse but distinct angle with the vertical hind margin. The styles are really placed horizontally, so that only their ends are visible when viewed in situ behind. (Plate II., figs. 7 and 8).

Macropterous form.—Scutellum two and a half times as long as pronotum, its side keels scarcely perceptible, slightly diverging. Elytra hyaline, nearly twice as long as abdomen, narrowly rounded at the apex, nerves yellowish white.

♀. Similar in colour to the male. Elytra in the macropterous form about two-thirds longer than the abdomen. Length, 2—3½ mm.

Stratton Strawless, Norfolk. The male of this species may be easily recognised by the structure of the genitalia, but the female is hardly to be distinguished from that of the next.

43. Liburnia flaxcola, Flor.

Delphax flaxcola, Flor, Rhyn. Liv., ii., 72, 19; Kirschb., Cicad., 34, 31; Fieb., Grundz. Delph., t. 8, fig. 55 (♀ genitalia).


Yellow or somewhat ferruginous. Central facial keel acute, obsolete on the forehead. Elytra pale yellow, transparent, about one-half as long as abdomen, their apex broadly rounded. Legs yellow, sometimes with a reddish tinge, claws dark brown. Abdomen sometimes brown above. Upper notch of pygofer (male) angular with sinuate sides, its margin, when viewed from the side, passing gradually into the convex hind margin. Styles narrow-lanceolate, obliquely truncate at the apex. Teeth of anal tube large, blunt. Length, 2 mm.

Macropterous form.—Elytra nearly twice as long as abdomen, pale, transparent; nerves pale, finely granulate, marginal nerve of membrane brownish. Length, 3 mm.

London district; in July.
44. *Liburnia paludosa*, Flor.

*Delphax paludosa*, Flor, Rhyn. Liv., ii, 82, 27; Fieb., Grundz. Delph., t. 8, fig. 49.


Pale yellowish or brownish yellow, apex of the 1st and base of the 2nd joint of antennæ narrowly black, tarsi darker towards the apex. Elytra ovate-lanceolate, as long as the abdomen, slightly narrowed towards the apex, nerves somewhat thickly and finely granulate. Pygofer (male) brown, its outline, when viewed from behind, lozenge-shaped with rounded angles, upper notch large; viewed from the side the margins of both the upper and lower notches pass gradually into the hind margin, thereby giving the latter the appearance of being roundly produced at the middle of its height. Styles wide, nearly reaching the teeth of the anal tube, obliquely truncate at the apex, their inner margin with a large notch near the base. Teeth of anal tube short, pointed, divergent. Length, $2\frac{1}{2}-3$ mm.

London district; in June and July.

45. *Liburnia speciosa*, Boh.


*Enides speciosa*, Fieb., Grundz. Delph., t. 8, fig. 7 (details); J. Sahl., Not. Finn., xii., 403, 1; Fieb., Cicad. d’Eur., pt. iii., 32.


*Dicranotropis basilinea*, Kirschb., Cicad., 40, 1.


♂. Dirty yellow, pronotum and scutellum with a whitish central stripe. Elytra yellowish hyaline, twice as long as abdomen, with a large wedge-shaped basal spot, a broad curved band at the inner margin of the membrane, and a streak on the suture near the apex of the clavus, black, nerves very finely granulate. Scutellum more than twice as long as pronotum. Abdomen blackish brown, dorsal segments narrowly margined with whitish. Upper notch of pygofer widely arenate, its margin, seen from the side, forming an obtuse angle with the nearly vertical hind margin; lower notch wide, shallow, obtusangular, and having in the middle a short triangular tooth. Styles short; viewed from behind their apex is apparently expanded into a large rhomboidal plate. Teeth of anal tube long, distant, curved forward at the apex.
♀. Scutellum scarcely twice as long as pronotum. Elytra about one-half as long as abdomen, yellowish hyaline, without black markings, apex obtusely rounded. Abdomen brown or yellow-brown with a darker lateral stripe, sometimes with a pale dorsal line. Length, $3\frac{1}{2}$—5 mm.

On *Phragmites communis*.

46. *Liburnia limbata*, Fab.


*D. signifera*, Boh., Ofv., 164, 30 (1845).


*Conomelus limbatus*, Fieb., Grundz. Delph., t. 8, fig. 10 (details); Cicad. d’Eur., pt. iii., 39, 1.


Fore parts above yellow, elytra whitish hyaline with a faint lilac tinge, hind margin brown, nerves with large remote black granules. Abdomen blackish brown with some transverse rows of pale spots. Crown, pronotum, and scutellum subequal in length. Elytra less than half as long as abdomen, their apex truncate. Length, $2\frac{1}{2}$—3 mm.

Macropterous form.—Crown and pronotum yellow, scutellum yellow-brown, elytra whitish hyaline with a faint lilac tinge; a short line near the apex of the clavus, a broad curved band on the membrane (its convexity to the inner margin), the nerves of the latter, and the conspicuous granulation of all the nerves, black. Scutellum more than twice as long as pronotum, side keels obsolete. Elytra nearly twice as long as abdomen. Length, $3\frac{1}{2}$—4 mm.

Excessively abundant amongst rushes; the macropterous form scarce.

47. *Liburnia Douglassi*, Scott.


♂. Crown, forehead, and pronotum yellow. Face blackish, spotted with white between the keels, middle keel acute, obsolete.

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on the forehead. Scutellum pale brown, beyond the side keels dark brown. Elytra brown, more than half as long as abdomen, hind margin truncate with rounded angles; nerves fine, non-granulate. Abdomen black. Pygofer above brownish yellow, sides black, its outline seen from behind oval. Upper notch semicircular, with incurved angles not occupying the entire width of the segment, its margin, seen from the side, very oblique and forming a very obtuse angle with the vertical hind margin. Lower notch angular with arcuate sides. Styles large, yellowish, reaching the anal tube, upright, somewhat divergent in their lower two-thirds, suddenly narrowed into a short neck, and afterwards expanded into a square plate directed towards the interior of the cavity. Length, 2 mm.

♀. Undescribed.

Folkestone Warren; at roots of rushes.

48. Liburnia lineata, Perris.


D. quadrivittata, Kirschb., Cicad., 40, 45.


E. lineata, Fieb., l. c., t. 8, fig. 9 (details); Cicad. d'Eur., pt. iii., 36, 2.

Liburnia lineata, Scott, Ent. Mo. Mag., vii., 29, 40.

♂. Crown yellow. Face black with two transverse white patches on each side of the middle keel, the latter obtuse obsolete above. Pronotum and scutellum grey, outer angles of both and a streak on each side of the middle keel of the latter brown. Elytra pale, more than half as long as abdomen, apex widely rounded, nerves non-granulate. Abdomen black, the two last dorsal segments more or less widely yellow. Pygofer, seen from the side obtusely angular in the middle at the junction of the shallow arcuate upper notch with the hind margin; lower notch deep, angular. Styles incurved, their inner apical angle produced into a pointed tooth, outer apical angle produced, obliquely truncate, and bearing a few fine hairs, the whole strongly resembling a profile view of a bird's head and neck. Teeth of anal tube, seen from behind, long, pointed, strongly divergent.

♀. Face brown with white patches, abdomen generally pale with blackish stripes.

Macropterous form (male).—Crown brown. Pronotum dark brown, side keels and hind margin more or less grey. Scutellum black, middle keel generally brown. Elytra pale, nearly twice as
long as abdomen, with a more or less broad smoky streak along the inner margin, nerves brown, non-granulate. Length, $\frac{2}{3} - 4$ mm.

Shiere, near Guildford, &c.; in grassy places in spring.


*Delphax uncinata*, Fieb., Grundz. Delph., 524, 1, t. 8, fig. 11 (details).


♂. Face and crown black, keels yellowish. Pronotum and scutellum yellowish grey with white keels. Elytra dusky, in the macropterous form much longer than the abdomen, nerves with brown granules, costa and inner margin pale; membrane slightly darker, its marginal and other nerves brownish yellow. Abdomen orange at the base, the other dorsal segments black with white margins. Outline of pygofer, viewed from behind, roundish; upper notch wide-oval, apical angles acute, strongly incurved, its oblique margin, viewed from the side, forming with the hind margin, which is somewhat sinuate and directed obliquely downwards and forwards, a large angular incurved black-pointed tooth; lower notch semicircular bordered with white. Teeth of anal tube not apparent. Styles brown, nearly reaching the tooth on the hind margin of the pygofer, wide, lanceolate, their outer margin convex, inner margin sinuate, pilose. Length, 3 mm.

♀. This sex was apparently unknown to Fieber, but it is thus characterised by Scott:—"The space between the keels on the crown, face, and clypeus smutty or black, keels of the two latter yellowish white. Elytra sordid yellow, distinctly granulated. Abdomen sordid yellow, the margins of the segments more or less broadly black."

Pitlochry, Perthshire; on grass in woods.


♂. Crown, pronotum, scutellum, and elytra white; abdomen deep black, the last two segments margined with white; legs black,
knees pale. Scutellum one-half longer than pronotum. Elytra about half as long as abdomen, truncate with rounded angles, nerves non-granulate.

♀. Whitish yellow, claws black.

_Macropterus form._—Elytra pellucid, longer than the abdomen, slightly widened behind, their apex narrowly rounded, nerves pale yellow, somewhat infuscated towards the apex, marginal nerve of membrane narrowly blackish. In the male the white margin to the last two abdominal segments is wanting. Length, $2\frac{1}{2}-3\frac{1}{2}$ mm.

Stratton Strawless, Norfolk; Shiere, near Guildford, &c.; in grassy places.

iv. _Dicranotropis, Fieb._ (Pl. I., fig. 20).

Fieb., Grundz. Delph., 521, 16 (1866).

Easily separated from the last genus by the greater length of the bifurcation of the central facial keel, which is equal to or exceeds one-half of its entire length. Of the four described European species one only has hitherto been recorded from Britain.

1. _Dicranotropis hamata, Boh._


_D. striatella_, Stal, Ofv., 191, 19 (1854).

_Dicranotropis hamata_, Fieb., Grundz. Delph., t. 8, fig. 17 (details); Kirschb., Cicad., 41, 2; Scott, Ent. Mo. Mag., vii., 73, 1; J. Sahl., Not. Fenn., xii., 469, 1; Fieb., Cicad. d'Eur., pt. iv., 87, 4.

♀. Pale testaceous, facial keels white, more or less strongly margined with black, pronotum and scutellum with a narrow white central stripe. Elytra more than half as long as abdomen, pellucid greyish white, hind margin white, truncate with rounded angles, inner apical angle with a short black line. Abdomen black with a fine pale dorsal line, and occasionally some rows of pale spots on each side. Pygofer black, down the middle of the upper side broadly white, upper notch deep, angular, hind margin strongly sinuate and directed obliquely downwards and forwards. Legs pale, thighs dusky, hind pair black.

♀. Paler than the male, abdomen pale testaceous, with the sides widely, the hind margin of each segment, and a fine line on
each side of the pale dorsal line black, on the dark side portions a few rows of pale spots. Elytra less than half as long as abdomen. Legs entirely pale. In some examples the dark markings, including the short line at the apex of the clavus, are entirely wanting. Length, $2\frac{3}{4} - 3\frac{1}{4}$ mm.

Macropterus form.—Scutellum nearly three times as long as the pronotum, its keels obsolete. Elytra about twice as long as abdomen, whitish hyaline, inner margin at the apex of the clavus with a short black line; nerves pale brown, darker behind, closely set with fine setigerous granules. Length, 4—4$\frac{1}{2}$ mm.

Very common.

v. Stiroma, Fieb. (Pl. I., fig. 21).

Fieb., Grundz. Delph., 521, 18 (1866).

Frons smooth with two keels on the disc, which, although sometimes obsolete above, are always observable near the clypeus.

Table of Species.

1 (4). Facial keels filiform throughout.
2 (3). Facial keels strong, separate at the clypeus, mouth of pygofer (male) triangular .. 1. albomarginata.
3 (2). Facial keels feeble, confluent at the clypeus, mouth of pygofer (male) wide-oval, widest above the middle .. .. .. 2. borealis.
4 (1). Facial keels obsolete above.
5 (10). Pronotum and scutellum not striped with black.
6 (7). Frons narrow-oblong, entirely yellow .. 3. pteridis.
7 (6). Frons wide, narrowed and marked with black just above the clypeus.
8 (9). Styles obliquely truncate at the apex, each angle produced into a small pointed tooth 4. affinis.
9 (8). Styles acuminata at the apex .. .. .. 5. bicarinata.
10 (5). Pronotum and scutellum yellow, each with two black stripes .. .. .. .. 6. nigrolineata.

1. Stiroma albomarginata, Curt.

Delphax albomarginata, Curt., Ent. Mag., i., 195; Marsh., Ent. Mo. Mag., i., 227, 8.  
D. molest, Boh., Sv. Ak. Handl., 59, 21 (1849); Stal, Ovf., 8, 32 (1854).  
D. collaris, Stal, Ovf., 175, 3 (1853).  
Ditropis adelpha, Fieb., Grundz. Delph., t. 8, fig. 18 (♂ genitalia); Kirschb., Cicad., 43, 5.
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*S. albomarginata*, Scott, Ent. Mo. Mag., vii., 74, 4.

♂. Crown and face brownish yellow, keels white, pronotum white, scutellum dirty yellow, elytra pitch-black, hind margin broadly white, abdomen pitch-black with a fine pale dorsal line. Crown, pronotum, and scutellum subequal in length. Elytra about one-half as long as abdomen, subtruncate at the apex. Styles spreading horizontally, triangular, acuminate.

♀. Similar to the male, but shorter elytra and the black coloration replaced by yellow-brown. Length, 2—2½ mm.

*Macropterus form*.—Scutellum somewhat convex, more than twice as long as pronotum, transversely impressed behind, side keels wanting. Elytra nearly twice as long as abdomen, fusco-lycaline, nerves yellow, the marginal nerve of the membrane brown. Length, 3½—4 mm.

Common.


*Deltopis moesta*, Fieb., Grundz. Delph., t. 8, fig. 18
(♂ genitalia).


♂. Very similar to the last species in size and colour. Styles diverging, moderately curved, pointed, their inner margin strongly bisinuate, outer margin simple.

♀. Pale brownish yellow, facial keels and hind margin of elytra white.

*Macropterus form* (female).—Scutellum pitch-black, its keels obsolete. Elytra much longer than abdomen, hyaline with a faint brownish tinge, nerves brownish. Abdomen black or pitch-black.

In the synonymy of this species and the preceding I follow J. Sahlberg.


*Delphax pteridis*, Boh., Sv. Ak. Handl., 115 (1852); Stal, Ofv., 197, 14 (1854); Marsh., Ent. Mo. Mag., i., 201, 4.

*Deltopis pteridis*, Fieb., Grundz. Delph., t. 8, fig. 18
(♂ genitalia); Kirschb., Cicad., 42, 2.

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ζ. Shining black, head, pronotum, and legs yellow. Elytra rather more than half as long as abdomen. Mouth of pygofer rhomboidal, upper notch angular. Styles black, spreading, acuminate. Anal tube white.

♀. Generally somewhat paler than the male, sometimes entirely brownish yellow. Elytra one-third as long as abdomen. Length, 2½—3 mm.

Macropterous form (female).—Elytra livid, brownish at the base, nerves yellowish. Length, 4½ mm.

On Pteris; common. The macropterous form rare.

4. Stiroma affinis, Fieb.

Stiroma affinis, Fieb., Grundz. Delph., 531, 1, t. 8, fig. 18 (details); Cicad. d’Eur., pt. iv., 96, 5; Scott, Ent. Mo. Mag., vii., 73, 1.

S. nasalis, Doug.1, sec. spec. comm.

ζ. Fore parts dirty greyish yellow, abdomen yellow-brown, darker on the sides, a black patch on each side of the frons adjoining the elyptes (occasionally confluent), and another on each side of the scutellum beyond the side keels, and the claw-joints black. Crown a little longer than pronotum, which is about one-third shorter than the scutellum. Elytra about one-third as long as abdomen, subtruncate behind. Mouth of pygofer pyriform-oval.

♀. Yellowish white, with the usual black markings on the frons and scutellum, and generally a dark stripe down each side of the abdomen.

Macropterous form (female).—Crown and face yellow-brown, the dark marking at the apex of the frons faint and ill-defined, remainder of the body dark piceous. Scutellum at least twice as long as pronotum; its side keels obsolete, subparallel. Elytra one-third longer than abdomen, fusco-hyaline; nerves fine, brown. Length, 3½—4 mm.

Not uncommon in woods.

5. Stiroma bicarinata, H.-Seff.

Delphax bicarinata, H.-Seff., Deuts. Ins., 143, 21.


Stiroma mutabilis, Fieb., Grundz. Delph., 15, 2, t. 8, fig. 18 (♀ genitalia).
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*Stiroma nasalis*, Scott, Ent. Mo. Mag., vii., 73, 2;  

This species so nearly resembles the preceding that it can only be separated from it with certainty by the characters derived from the male genitalia. Mouth of pygofer pyriform-oval.

Hitherto rare, but I have examined one undoubted male from coll. Capron.

*Eurybregma nigrolineata*, Scott, Ent. Mo. Mag., ii., 92.

♂. Crown almost twice as broad as long; brown, impressions black, keel between the two basal ones yellow. Face yellow-brown, its lower half, outside the middle keels, black; keels rudimentary, approximating and uniting at the apex. Pronotum and scutellum yellow, their side margins and a wide stripe down each side of the centre black. Elytra much longer than the abdomen, whitish hyaline; a brown stripe (becoming darker behind) near the costa, and another near the claval suture, round the apex broadly black. Abdomen black, dorsal line and side margins narrowly yellow. Pygofer black, with a somewhat triangular yellow patch on each side near the upper margin, hind margin almost vertical, mouth transverse-ovate. Styles long, aculeate, diverging, almost touching the margin at the height of the anal tube. Legs pale fusco-testaceus, thighs with a black stripe on the inside. Length, nearly 5 mm.

♀. Undescribed.

By sweeping in June, Fawley.

**VII. CERCOPIDÆ.**

Frons strongly convex. Ocelli two, placed on the hind part of the crown. Hind margin of pronotum with a notch in the middle. Elytra coriaceus. Tibiae cylindric, hind pair with two spines on the outer side and a ring of bristles round the apex. Two basal joints of the tarsi denticulate at the apex. Pulvilli between the claws distinct.

**Table of Genera.**

1 (2). Front of pronotum straight . . .  
2 (1). Front of pronotum produced between the eyes.  
3 (1). Crown and pronotum with a middle keel . . .  
i. **Triecphora. Am. et Serv.** (Pl. I., fig. 22).

Am. et Serv., Hém., 561, 458 (1843).

Ocelli much nearer to each other than to the eyes. Rostrum 2-jointed, not reaching beyond the middle coxae. The free side margins of the pronotum as long as the scutellum.

1. **Triecphora vulnerata,** Illig.

*Cercopis sanguinolenta.* Panz., Faun. Germ., 33, 12; Burm., Handb., ii., 125, 7, var. c.


**Triecphora sanguinolenta,** Marsh., Ent. Mo. Mag., ii., 54, 1.

Black, the basal third of the clavalus, an abbreviated band across the middle of the corium, and an outwardly curved band just before the apex of each elytron, blood-red. Pubescence pale and very fine. Punctuation very close and fine. Side keels of the face indistinct, the central one wanting. Length, 10—11 mm.

Woods in the south, on alder; very abundant in Lincolnshire and Derbyshire, usually on long grass.

ii. **Aphrophora. Germ.** (Pl. I., fig. 23).

Germar, Mag. d’Ent., iv., 50 (1821).

Ocelli as in the last genus. Rostrum 3-jointed, reaching or nearly reaching the hind coxae. The free side margins of the pronotum much shorter than the scutellum.

We possess two species of this genus, which may be thus distinguished:—

Costa with an oblique band-like spot near the middle and another (triangular) behind . . . . . . 1. *alni.*

Costa without distinct white markings . . . . . . 2. *salicis.*

1. **Aphrophora alni,** Fall.

*Cercopis alni,* Fall., Hem. Suec., ii., 11, 2.

*C. bijasciata,* Fab., Ent. Sys., iv., 56, 40.

**Aphrophora spumaria,** Germ., Mag. d’Ent., iv., 50, 1; Burm., Handb., ii., 121, 1; Am. et Serv., Hém., 536, 1.
A. alni, Flor, Rhyn. Liv., ii., 135, 1; Marsh., Ent. Mo. Mag., ii., 57, 1; Kirschb., Cicad., 64, 2; Scott, Ent. Mo. Mag., vii., 271, 1; J. Sahl., Not. Fenn., xii., 86, 1.

Pale greyish brown with very short yellow pubescence, closely and deeply punctured with black, except on the white portions of the elytra, where the punctuation is pale. Markings on elytra as above. Abdomen black. Legs pale, dark at the extreme apex. Length, $8\frac{1}{2} - 9\frac{1}{2}$ mm.

Common on alders, &c.

2. Aphrophora salicis, DeG.


Cercopis rustica, Fab., Ent. Sys., iv., 54, 33; Sys. Rhyn., 97, 52.

C. salicis, Fall., Hem. Succ., ii., 11, 1.

Aphrophora salicina, Am. et Serv., Hém., 255, 2.

A. salicis, Flor, Rhyn. Liv., ii., 136, 2; Marsh., Ent. Mo. Mag., ii., 58, 2; Kirschb., Cicad., 63, 1; Scott, Ent. Mo. Mag., vii., 272, 2; J. Sahl., Not. Fenn., xii., 87, 3.

Greyish yellow with short yellow pubescence, closely and finely punctured with black. Elytra occasionally with faint traces of a triangular whitish spot on the costa near the base. Length, $10 - 10\frac{1}{2}$ mm.

Not so common as the preceding.

iii. Philænus, Stal. (Pl. I., fig. 24).


Ocelli nearer to the eyes than to each other. Rostrum 2-jointed, not reaching beyond the middle coxae. The free side margins of the pronotum much shorter than the scutellum.

Table of Species.

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<tr>
<td></td>
<td>1 (2). Sides of elytra distinctly rounded</td>
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<td>1. spumarius</td>
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<td>2</td>
<td>(1). Sides of elytra parallel.</td>
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<tr>
<td>3</td>
<td>(6). Costa with one or more large white spots.</td>
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<td>4</td>
<td>(5). Costa with two white spots</td>
<td></td>
<td>2. campestris</td>
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<td>5</td>
<td>(4). Costa with one white spot and a white streak</td>
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<td>3. exclamationis</td>
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<td>6</td>
<td>(3). Costa with a white streak, without spots, or elytra entirely black</td>
<td></td>
<td>4. lineatus</td>
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</table>
1. Philænus spumarius, Linn.

It is unnecessary to encumber this work with the full synonymy of this abundant and well-known species, which may at all times be readily distinguished from its congeners by the distinctly curved side margins of its elytra. Some of its colour varieties are very constant in pattern, and the following, according to J. Sahlberg, have received distinctive names:—

*spumaria*, Auct. Yellowish brown, costa with two large transverse white spots.

*fasciata*, Fab. Head and pronotum yellow, elytra black with two large transverse white spots on the costa.

*gibba*, Zett. Crown and front half of the pronotum yellow; hind part of the latter, scutellum, and elytra black, the latter with a large white transverse spot before the middle.

*bicutata*, Fab. Black mottled with yellow, elytra with a small round white spot behind.

*leucophthalma*, Linn. Entirely black.

*leucocephala*, Linn. Black with the crown and front of pronotum yellow.

*lateralis*, Linn. Black, sides of elytra widely yellow.

*marginella*, Fab. Black; crown, front of pronotum, and sides of elytra yellow.

*vittata*, Fab. Yellowish; hind part of pronotum, scutellum, and a wide sutural stripe brown.

*ustulata*, Fall. Yellowish; crown, pronotum, and margin of elytra at the base and apex black.

*prausta*, Fab. Yellowish; hind part of pronotum, scutellum, and apex of elytra brown.

*lineata*, Fab. Yellowish; middle of the hind part of pronotum, scutellum, a stripe on the elytra, and the suture blackish brown.

*populi*, Fab. Unicolorous yellow.

Length, 5—6 mm.

2. Philænus campestris, Fall.

*Cercopis campestris*, Fall., Hem. Suec., ii., 20, 7.

*Ptyclus campestris*, Flor, Rhyn. Liv., ii., 125, 3; Kirschb., Cicad., 65, 4; Scott, Ent. Mo. Mag., vii., 243, 2.


Upper side pale yellowish brown or fawn-colour, costa at the base narrowly and two large triangular spots upon it behind white.

The least common of the genus.


*Cercopis exclamationis*, Fall., Hem. Suec., ii., 21, 8.

Lighter or darker yellowish brown with a faint bronzy tinge, costa widely and a large triangular spot upon it just before the apex white. Apex of the clavus sometimes widely pale. Very closely and somewhat strongly punctured, densely clothed with short pale hairs. Length, 3½—4 mm.

Moderately common.

4. *Philœnus lineatus*, Linn.

*Cicada lineata*, Linn., Faun. Suec., 241, 888.
*Ptyelus lineatus*, Flor, Rhyn. Liv., ii., 123, 1; Marsh., Ent. Mo. Mag., ii., 55, 1; Kirschb., Cicad., 65, 2; Scott, Ent. Mo. Mag., vii., 242, 2.

Pale yellow, costa with a white stripe, just within which is a black one, which becomes indistinct on the hinder half of the elytron. Densely clothed with very short pale pubescence, punctuation very close and fine. Length, 4½—6½ mm.

Very common. Through the kindness of Mr. E. A. Butler I have had the opportunity of examining eight examples of a black form of this species, which may be classified as follows:—

a. Pitch-black, costa whitish (three females).
b. Pitch-black, costa whitish on its basal half (male and female).
c. Pitch-black, metasternum and hind coxae yellow (male and female).
d. Entirely pitch-black (one male).
British Homoptera-Cicadina.

One example of var. c was from Scotland, and all the others from Chobham. Although this species is at times excessively abundant here in Norfolk, I have not hitherto met with a variety.

VIII. LEDRIDÆ.
Characters those of the single genus.

Ledra, Fab. (Pl. I. fig. 25).

Crown foliaceous in front, its front margin bluntly angular in the middle and forming a distinct obtuse angle near each eye. Eyes small, globose. Ocelli near the base of the crown nearly twice as far from the eyes as from each other. Elytra subcoriaceous. Outer edge of hind tibiae produced in a flattened knife-like form, serratedentate and densely ciliate.

1. Ledra aurita, Linn.


Lighter or darker brown with a greenish tinge, elytra paler towards the apex, with a broad indistinct pale band before the middle, and traces of a pale subtriangular spot on the costa just before the apex. Abdomen above black (male) or brownish yellow (female). Upper side roughly punctured with brown. Crown tricarinate, the side keels abbreviated. Pronotum in front and between the processes and the scutellum behind transversely wrinkled. Nerves of elytra brown, strongly raised. Length, 13—18 mm.

On oaks; not very common.

IX. ULOPIDÆ.
The characters coincide with those of the single genus.
Mr. James Edwards’ Synopsis of

Ulopa, Fall. (Pl. I., fig. 26).
Fall., Hem. Succ. Cicad., 65 (1826).

Legs subsimilar. Tibiae triangular-prismatic. Front margin of crown acute.

Of the five described European species only two have been detected in Britain, and they may be distinguished as follows:

Front margin of crown forming an obtuse but distinct angle near each eye, straight or faintly concave in the middle .. 1. reticulata.
Curve of front margin of crown continuous .. 2. trivía.

1. Ulopa reticulata, Fab.

Cercopis reticulata, Fab., Sys. Rhyn., 98, 64.
Ulopa obtecta, Fall., Hem. Succ., ii., 66, 2; Germ., Mag. d’Ent., iv., 55, 1; Burm., Handb., ii., 106, 1; Flor, Rhyn. Liv., ii., 140, 1; Marsh., Ent. Mo. Mag., ii., 59, 1; Kirschb., Cicad., 69, 2.

Eulopa cricetorum, St. Farg. et Serv., Enc. Méth., x., 765, 1.

Ulopa macroptera, Kirschb., Cicad., 69, 3.


Brown with a reddish tinge, elytra with two oblique white bands running from the suture to nearly the same point on the costa. Fore parts strongly punctured. Crown with a large depression near each eye. Pronotum with a horseshoe-shaped impression on each side. Elytra convex, parallel-sided, narrowed and deflexed behind, ocellate-punctate; nerves strongly raised, claval suture not apparent.

Macropterous form.—Pronotum wider and more convex behind. Elytra pellucid, not deflexed behind, claval suture distinct, the white bands obsolete. Length, 3—3½ mm.

Common.

2. Ulopa trivía, Germ.

Ulopa trivía, Germ., Faun. Ins., iv., pl. 21, 3; Mag. d’Ent., iv., 56, 4; Burm., Gen. Ins., i., pl. 3; Kirschb., Cicad., 68, 1; Scott, Ent. Mo. Mag., vii., 272, 2.


Similar in form to the preceding, but somewhat smaller. Male
yellowish white; a broad stripe on the crown near each eye, the front and hind margins of pronotum, and three stripes on each elytron, dark brown or black. Female entirely yellowish white. Length, $2\frac{1}{2}-3\frac{1}{4}$ mm.

Macropterous form undescribed. Scarce. Lulworth; Riddlesdown; Shiere, near Guildford; by sweeping, and at the roots of low plants.

**X. PAROPIIDÆ.**

Represented in Britain by the single genus.

**Megophthalmus, Curt.** (Pl. II., fig. 3).

*Curt., Ent. Mag., i., 174 (1832).*

Each end of the keel dividing the crown from the face split into a fork, in the angle of which is placed the ocellus. Legs sub-similar. Front tibiae triangular-prismatic, the hind pair quadrangular-prismatic.

1. *Megophthalmus scanicus*, Fall.

*Cicada scanica*, Fall., Act. Holm., 113 (1806).

*Ulopa scanica*, Fall., Hem. Suec., ii., 65, 1.


*Paropia scutata*, Burm., Gen. Ins., i., pl. 7.

*P. pallidipennis*, Hardy, Trans. Tyneside Field Club, i., 430, 1 ($\varphi$).


Dirty brownish yellow, roughly punctured, nerves of elytra strongly raised. Male, crown with three spots, pronotum with a fine central line and two blotches on each side confluent in front, and the scutellum entirely, except a short pale line at each end of the transverse impression, black; female generally entirely pale, but examples are frequently met with in which the dark markings of the male are strongly indicated, the elytra have the nerves and two short lines on the suture fuscous or black, and the areas, especially towards the apex, are sparingly speckled with fuscous. Length, 3—4 mm.

Common and generally distributed.
XI. BYTHOSCOPIDÆ.

Forehead obtuse. Crown short and very wide. Ocelli on the upper part of the frons much below its upper margin. Face dilated, frons and clypeus somewhat convex. Cubital nerves forked, the inner one joined to the brachial by a transverse nerve. Front tibiae without spines on the outer side.

Table of Genera.

1 (6). Antennæ inserted in a deep cavity beneath a ledge.
2 (5). Striation of pronotum transverse.
3 (4). Side margins of pronotum sharply keeled, of moderate length ... ... ... ... i. Macropsis.
4 (3). Side margins of pronotum not sharply keeled, very short ... ... ... ... ii. Bythoscopus.
5 (2). Striation of pronotum running obliquely from the middle of its front margin towards its hinder angles ... ... ... ... iii. Pediopsis.
6 (1). Antennæ inserted in a feeble cavity, their base free.
7 (8). Head with the eyes wider than the elytra at the base. Membrane with an appendix ... iv. Idiocerus
8 (7). Head with the eyes as wide as the elytra at the base. No appendix to the membrane ... v. Agallia.

i. Macropsis, Lewis. (Pl. II., fig. 2).


Crown with the eyes not wider than the pronotum. Frontal suture not reaching the base of the antennæ. Pronotum finely transversely striate. Elytra subcoriaceous, deeply punctured.

Elytra finely punctured with black ... ... ... ... 1. microcephala.
Punctuation of elytra concolorous ... ... ... 2. lunio.

1. Macropsis microcephala, H.-S.


Batracomorphus irroratus, Lewis, Trans. Ent. Soc. Lond., i., 51, pl. 7, fig. 5.


Macropsis punctuosus, Kirschb., Cicad., 168, 2.


Very pale bluish green, elytra with a fine black punctuation,
which occasionally extends to the crown and pronotum. Crown distinctly longer in the middle than at the sides, at least in the male. Length, 4—5 mm.

Amongst Helianthemum in July, Mickleham Downs, &c.

2. Macropsis lanio, Linn.


Bythoscopus lanio, Burm., Handb., 109, 1.

Cicada brunnea, Fab., Ent. Sys., 43, 68.


Crown, pronotum, and scutellum pale brown, more or less closely speckled with red-brown or black; elytra green or pale reddish brown, with a shallow rugose punctuation and strongly raised nerves. Crown not longer in the middle than at the sides. Length, 7—8 mm.

Very common on oak.

ii. Bythoscopus, Germ. (Pl. II., fig. 1).

Germ., Silb. Revue, i., 180, 43 (1833).

Distinguished from the preceding genus by its impunctate elytra and the much greater obliquity of the ledge which covers the base of the antennae, and from the following by the less angular hind margin of the crown and the transverse sculpture of the pronotum.

Table of Species.

1 (4). Face (seen in profile) somewhat flattened.

2 (3). Face with a deep narrow curved impression on each side, which is distinct in the female. Inhabits alder.

3 (2). Face with a wide shallow impunctate impression on each side, which is only faintly indicated in the female. Inhabits sallow and birch.

4 (1). Face strongly convex, consequently the facial impressions appear much deeper than in our other species.

1. alni.

2. rujusculus.

3. flavicollis.

TRANS. ENT. SOC. LOND. 1886. PART II. (JUNE). 1
1. *Bythoscopus alni*, Schr.


*Pediopsis Heydenii*, Kirschb., Cicad., 171, 2.


*Bythoscopus alni*, Scott, Ent. Mo. Mag., x., 82, 1.

Mr. James Edwards’ *Synopsis of*

*Bythoscopus alni*, Schr.

Crown and face greenish yellow, the former more or less suffused with blackish, but having a pale central line and a black puncture on each side, the latter with a pale central line in its upper half, a black puncture on each side near the eye, the upper part of the curved impression filled up with black and generally a pair of small black points towards the apex. Pronotum greenish yellow, with a large irregular dark patch on each side of the front margin and one or two black punctures behind each eye, the disk having a blackish appearance owing to the channels of the sculpture being mostly black. Scutellum reddish yellow; a large triangle on each side at the base, a linear central stripe, the transverse channel and a pair of small round spots just above it, brown or black. Elytra transparent brownish yellow, the apical two-thirds of the costal and subapical areas, the disc of the subcostal area and that below it, and a broad band at the base of the clavus, whitish hyaline; claval suture and the nerves dark brown or black; cubital nerve as far as the fork, brachial nerve as far as the first transverse nerve, the basal three-fourths of the anal and axillary nerves, the nerve of the inner margin with the exception of a short piece at the apex of the clavus and the part between the apices of the anal and axillary nerves, white. Abdomen above black, hind margin of the segments narrowly reddish. Legs pale, hind tibiae with a black stripe both on the inner and outer sides.

♀. Similar in coloration to the male, but with all the dark markings less pronounced, and the abdomen above entirely reddish yellow-brown. Length, 5½—6 mm.

Abundant on alder.


3. Crown dark brown or black, narrowly greenish yellow in front with a black puncture on each side. Face greenish yellow, generally with a narrow black band above not reaching the ocelli at either end. Pronotum greenish yellow, the channels of the sculpture mostly blackish. Scutellum reddish yellow; a large triangle on each side at the base, a narrow central stripe reaching as far as the transverse channel, and occasionally a pair of minute round spots just above the latter, reddish brown or black. Elytra whitish hyaline, clavus with a faint yellow-brown tinge; the apical areas, an ill-defined spot on the base of the second and third subapical areas, the apex of the clavus, and the space between the apices of the anal and axillary nerves, dark brown, claval suture and the nerves blackish brown, the basal half of the axillary nerve white. Abdomen above black, hind margins of the segments very narrowly yellow. Hind tibiae with a black stripe on the outer edge only.

2. Crown, face, pronotum, scutellum, and upper side of the abdomen reddish yellow-brown, generally without darker markings. Elytra brown, the discs of the subcostal area and the one below it and the apical three-fourths of the subapical areas whitish hyaline. Length, 4—5 mm.

On sallow and birch; somewhat local.

3. Bythoscopus flavicollis, Linn.

Cicada flavicollis, Linn., Faun. Suec., 242, 891.

Pediopsis fruticola, Flor, Rhyn. Liv., ii., 184, 2;
Marsh., Ent. Mo. Mag., ii., 125, 3; Kirschb., Cicad., 170, 1; Thoms., Opusc. Ent., iii., 318, 2.
Bythoscopus fruticola, Fieb., Eur. Bythosc., 457, 2;
Scott, Ent. Mo. Mag., x., 126, 2.

An exceedingly variable species, but always easy to distinguish from its congeners when once the structural characters of the face have been appreciated. The following are some of the more usual colour varieties:

1. Elytra whitish hyaline, nerves blackish brown.
2. Upper side entirely pale brown.
3. Upper side greenish yellow.
4. Crown, pronotum, scutellum, and base of the clavus widely, greenish yellow. Elytra pale yellow-brown, a large ill-defined blotch in the middle and another before the apex white.

5. Closely resembling female alni in the coloration of the elytra. Length, 5—6 mm.

Abundant on birch.

iii. Pediopsis, Burm. (Pl. II., fig. 6).

Burmeister, Genera Insectorum, 16 (1838).

Distinguished from its allies by the direction of the sculpture of the pronotum. This genus as here limited comprises two very natural groups, one consisting of wide species with the crown less angular and the face convex with its upper margin widely rounded, as in tilic, scutellatus, &c., and the other comprising our remaining species, which are narrower and more pointed in front, and have the face flat and rhomboidal in shape. The full complement of black markings on the face of those species which have spotted faces is nine, placed as follows: a pair of moderate size near the upper margin with a dissimilar one between them, a small round one at each ocellus, a large subtriangular or comma-shaped pair just above the clypeus, and between the bases of these a minute punctiform pair. These markings occur in various combinations in different species, and, notwithstanding their liability to vary within certain limits, sometimes afford useful aids to identification.

Table of Species.

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<td>1</td>
<td>(2). Crown linear, scarcely visible from above</td>
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<td>1. tilic.</td>
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<td>2</td>
<td>(1). Crown distinctly visible from above.</td>
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<td>3</td>
<td>(8). Front margin of crown rounded or scarcely angular in front. Face distinctly convex.</td>
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<td>4</td>
<td>(5). Elytra lacteo-hyaline</td>
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<td>2. nanus.</td>
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<td>5</td>
<td>(4). Elytra hyaline with a brownish yellow tinge, nerves dark brown or black.</td>
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<td>6</td>
<td>(7). Inner side of hind tibie pale throughout</td>
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<td>7</td>
<td>(6). Inner side of hind tibie with two short black streaks, one near the base, the other just before the apex</td>
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<td>8</td>
<td>(3). Front margin of crown nearly rectangular. Face flat.</td>
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</table>
9 (20). Species not pale green.
10 (17). Face spotted with black.
11 (14). Nerves darker than the elytra.
12 (13). Nerves not suffused with fuscous
13 (12). Nerves at the base of the subapical areas con-
spicuously suffused with fuscous
14 (11). Nerves concolorous.
15 (16). Wider and less pointed in front; elytra with-
out fuscous bands
16 (15). Narrower and more pointed in front; elytra
with two wide ill-defined fuscous bands
17 (10). Face unspotted.
18 (19). Costa narrowly brown. Inhabits elm
19 (18). Costa concolorous. Inhabits sallow
20 (9). Species pale green

5. nassatus.
6. fuscincervis.
7. impurus.
8. distinctus.
9. ulmi.
10. cecus.
11. virescens.

1. Pediopsis tiliæ, Germ.

_Jassus tiliæ_, Germ., Faun. Eur., 14, 14
_Pediopsis tiliæ_, Flor, Rhyn. Liv., ii., 183, 1; Kirschb.,
Ciead., 176, 9; Fieb., Eur. Bythosc., 457, 1;
Fenn., xii., 118, 1; Scott, Ent. Mo. Mag., x.,
128, 1.

Head and pronotum greenish yellow. Scutellum and elytra
yellow-brown, the latter generally irrorated with darker brown,
especially towards the apex; on the inner margin beyond the apex
of the clavus a whitish spot followed by a dark brown one.
Abdomen above black, hind margin of the segments narrowly pale,
beneath yellow. Legs yellow-brown. Length, 5—5½ mm.

Rare. Esher, in June. Said to occur on _Tilia parvi-
folia._

2. Pediopsis nanus, H.-S.

_Bythoscopus nanus_, H.-Seff., Deuts. Ins., 143, 6.
_Pediopsis nanus_, Flor, Rhyn. Liv., ii., 192, 6; Kirschb.,
Ciead., 173, 5; Fieb., Eur. Bythosc., 461, 12;
J. Sahl., Not. Fenn., xii., 136, 16; Scott, Ent.
Mo. Mag., x., 235, 11.

♂. Body black, face generally with a stripe on its lower half
and the free side margins narrowly yellow. Hind margin of the
crown narrowly, sides and hind margin of the pronotum, and the
hind margin of the scutellum irregularly, whitish. Elytra lacteo-
hyaline; nerves brown, paler on the disc. Legs pale, hind pairs of thighs black except at the apex, all the tibiae with a black spot on the outside at the base.

♀. Face above and the crown more or less yellow. Otherwise as in the male. Length, 2—2½ mm.

On short grass, Boxhill, July.

3. Pediopsis scutellatus, Boh.

_Jassus scutellatus_, Boh., Ofv., 162, 25 (1845); Sv. Ak. Handl., 53, 26 (1847).

_Bythoseopus diadema_, H.-Seff., Deuts. Ins., 143, 11.

_Pediopsis diadema_, Kirschb., Cicad., 172, 3.


_P. fuscicervis_, Scott, l. c., 122, 7, sec. spec. typ.

Head and pronotum pale greyish yellow, the former with from four to nine black spots, of which the uppermost pair are round, and the dissimilar one when present takes the form of a short double stripe, the latter more or less blotched with brown or black so as to leave the sides and front margin irregularly pale. Scutellum yellow, with a black triangle on each side at the base, and frequently a pair of black points before the transverse channel. Elytra hyaline with a faint brownish yellow tinge, claval suture and the nerves brown or black. Abdomen black, hind margins of the segments more or less widely yellow. Legs greyish yellow, hind tibiae with a black spot on the outside at the base. Length, 4½—5½ mm.

On sallows, &c.

4. Pediopsis tibialis, Scott.

_Pediopsis tibialis_, Scott, Ent. Mo. Mag., x., 195, 10.

Very similar in appearance to the preceding, but the two uppermost facial spots have a tendency to become comma-shaped, and have the included space suffused with blackish; the spot at each ocellus, which is seldom developed in _scutellatus_, is almost invariably well marked, while the pair of punctiform spots between the base of the lower comma-shaped pair are wanting; the hind tibiae, too, in addition to the spot on the outside at the base, have two short black streaks on the inner side, which latter markings are
occasionally present on the inner side of the two front pairs. Length, $3\frac{1}{2}$—$4\frac{1}{2}$ mm.

Dartford Heath, Headley Lane, and Bexley road, on poplars in July and August. Not uncommon near Norwich in mixed hedges, especially amongst brambles. Specimens in which the markings on the inner side of the hind tibiae and the upper part of the face wholly or partially disappear are sometimes difficult to separate from *scutellatus*.


*Bythoscopus nitidulus*, H.-Seff., l. c., 143, 12.


♂. Face yellow, the uppermost pair of black spots small and round, with the space between them frequently dusky but no dissimilar spot, the lower comma-shaped pair very large, the pair of points between the bases of the latter distinct, and the spot at each ocellus occasionally present. Pronotum yellow with an ovate black spot behind each eye, its disc more or less suffused with brown or black. Scutellum yellow with a large black triangle on each side at the base. Elytra hyaline with a brown tinge, claval suture and the nerves pale brown. Abdomen above black, hind margins of the segments very narrowly paler. Thighs generally piceous, tibiae with a black stripe on the inner side, hind pair with a black spot on the outer side at the base.

♀. Similar to the male, but with a strong green tinge in the only example which I possess. Length, $4\frac{1}{2}$—$5$ mm.

On sallows, &c. Apparently scarce.


♂. Face (Pl. II., fig. 11) greyish yellow with from three to five black spots, of which the subtriangular dissimilar spot
is the largest and most constant, the uppermost pair are frequently reduced to mere points, and the lower comma-shaped pair are either represented by a pair of black points or absent altogether. Pronotum greyish yellow, its disc more or less suffused with brown, the smooth ovate space behind each eye sometimes filled up with black. Scutellum greyish yellow with a black triangle on each side at the base and a pair of black points just above the transverse channel. Elytra whitish hyaline with a strong brown cloud on the base of the subapical areas, and the apical areas and the clavus below the anal nerve tinged with brown; nerves strong, rust-brown. Abdomen above black, hind margins of the segments narrowly yellow. Legs pale, hind tibiae with a small black spot on the outer side at the base.

♀. General coloration with a bright rust-brown tinge. Length, 4½—5 mm.

On aspen. Stoke Holy Cross, Norfolk.

7. Pediopsis impurus, Boh.

_Pediopsis impurus_, Thoms., Opusc. Ent., iii., 321, 11;

Face greyish yellow, its disc frequently suffused with dusky, the three uppermost spots subequal in size, the lower comma-shaped ones large and well-marked. Pronotum pale brownish grey, the smooth space behind each eye filled up with black. Scutellum greyish yellow, with a black triangle on each side at the base and occasionally a pair of black points just above the transverse channel. Elytra subopaque, pale brownish grey, nerves concolorous. Abdomen above black with the hind margins of the segments more or less widely yellow. Legs as in _fuscinervis_. Length, 3½—4 mm.

On sallows. The colour of this species occasionally varies to blackish grey, in which case the nerves are paler than the elytra.

8. Pediopsis distinctus, Scott.

_Pediopsis distinctus_, Scott, Ent. Mo. Mag., x., 191, 6.

Similar in appearance to the last, but the body is narrower and the angle of the crown more pointed. Elytra pale brownish grey,
subopaque, a stripe along the costa, a wide band across the middle, and another across the base of the membrane, fuscous; apical half of the clavus mottled with fuscous; nerves concolorous. Length (male), 4 mm.

Darenth, July. Examples in which the markings of the elytra are wanting might be mistaken for *P. impurus*, but on comparison of the two the narrower and more pointed form of *distinctus* is very apparent.


*Pediopsis ulmi*, Scott, Ent. Mo. Mag., x., 129, 2.

Fore parts brownish yellow. Scutellum with a brown triangle on each side at the base. Elytra and legs yellow-brown, the former subopaque with the costa narrowly dark brown and the nerves concolorous. Hind tibiae with a black spot on the outer side at the base. Abdomen above (male) black, hind margins of the segments narrowly pale; female brownish yellow. Length, 4—5 mm.

On elm. Lee and Norwich.


*Pediopsis cerea*, Fieb., Eur. Bythosc., 458, 2; Scott, Ent. Mo. Mag., x., 130, 3.

Face greyish yellow. Upper side reddish yellow-brown. Scutellum sometimes with a red-brown triangle on each side at the base. Elytra subopaque, just behind the middle a broad red-brown band, which seldom reaches the inner margin and never the costa, nerves concolorous. Legs concolorous, hind tibiae as in the last. Abdomen above (male) black, hind margins of the segments narrowly pale; (female) brownish yellow. Length, 4—5 mm.

Common on sallows. Very frequently the dark brown band on the elytra is only indicated on the inner margin, though it is rarely entirely wanting, and in this state the species is best distinguished from *ulmi* by its habitat and the want of the brown line next the costa.

*Cicada virescens*, Fab., Ent. Sys., iv., 46, 84.  
*P. virescens*, Flor, Rhyn. Liv., ii., 188, 3; Marsh., Ent. Mo. Mag., ii., 126, 4; Kirschb., Cicad., 175, 8; Fieb., l. c., 458, 5; Thoms., Opusc. Ent., iii., 321, 9; J. Sahl., Not. Fenn., xii., 127, 8; Scott, Ent. Mo. Mag., x., 189, 4.

Pale yellowish green, abdomen above in the male black, the hind margins of the segments very narrowly pale. Elytra whitish hyaline, nerves yellowish green. Length, 4—5 mm.

Common on osiers, &c. A variety is said to occur in which the face has a small black spot in the middle of the upper margin.

iv. Idiocerus, *Lewis*. (Pl. II., fig. 4).


Crown widely rounded in front. Frontal suture reaching the ocellus. Antennal seta in the male generally with an oval black plate immediately before the apex (wanting in *distinguendus*, *tremule*, *vitreus*, and *aurulentus*).

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1. *adustus*.  
2. *varius*.  
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13 (14). Inner edge of the wide pale band on the 
elytra commencing in the middle of the 
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16 (7). Elytra without pale transverse bands.
17 (22). Apex of anal nerve standing in an oval 
white patch.
18 (19). Cubital nerve only marked with white in 
the lower boundary of the second sub-
apical area . . . . . . 9. lituratus.
19 (18). Cubital nerve chequered with black or rust-
colour and white.
20 (21). Frontal suture sharply bent inwards at the 
base of the antennae, the frons therefore 
subtrapezoidal . . . . . . 10. pecilus.
21 (20). Frontal suture evenly curved outwards 
throughout, the frons therefore sub-
orbiculair . . . . . . 11. tibialis.
22 (17). Apex of anal nerve white, but not standing 
in an oval white patch, or nerves entirely 
white.
23 (26). Brachial nerve with a white streak near the 
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tooth on each side of the apex of the 
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24 (25). First transverse nerve white . . . . . . 12. vitreus.
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26 (23). Brachial nerve not marked with white. 
Apex of face simple in both sexes.
27 (32). Elytra green or greenish grey, more or less 
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below the eyes. Inhabits poplars . . . . . . 14. fulgidus.
29 (28). Side margins of face at most faintly sinuate.
30 (31). Male with the face and legs generally much 
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about one-sixth of visible length of saw-
case projecting. Inhabits aspen . . . . . . 15. populi.
31 (30). Male without orange coloration. Female 
with about one-third of visible length of 
saw-case projecting. Inhabits sallow . . 16. confusus.
32 (27). Elytra greenish white or almost milk-white, 
nerves entirely white. Inhabits white 
poplar . . . . . . 17. albicans.


*I. adustus*, Kirschb., Cicad., 153, 2; J. Sahl., Not. Fenn., xii., 140, 2; Scott, Ent. Mo. Mag., x., 24, 1.

♂. Face greyish yellow, cheeks with a dense short silvery pubescence. Crown greyish yellow, more or less suffused with fuscous in the middle, near each eye a dark puncture. Pronotum greyish yellow clouded with fuscous, front margin irregularly spotted with black. Scutellum greyish yellow, along the base three black triangles and in the middle a pair of somewhat comma-shaped black spots. Elytra hyaline with a yellow-brown tinge inclining to orange on the costa, from the inner margin at the apex of the anal nerve to the first apical area a very oblique pale band; nerves punctured, thick and black except in the pale band; first sub-apical area apparently incomplete but really reaching the costa, the latter vertically flattened in its basal two-thirds, yellow at the base, the middle third black and bearing a row of four or five large blunt tubercles. Abdomen above blackish, hind margins of the segments narrowly yellow. Legs pale, inner side of hind tibiae narrowly black.

♀. Face with a black triangle near each eye. Pubescence of the cheeks excessively fine, scarcely perceptible. Elytra hyaline with a yellow-brown tinge, the pale band only faintly indicated; costa but slightly flattened vertically without tubercles, nerves pale brown. Length, 6½—7 mm.

Abundant on willows.

2. *Idiocerus varius*, Fab.


♂. Crown and face as in *adustus*, but the pubescence of the cheeks is less apparent. Pronotum greyish yellow clouded with dark fuscous, front margin irregularly spotted with black. Scutellum as in *adustus*, but the black triangle in the middle of the base is replaced by a linear stripe, and the pair of spots on the disc generally coalesce. Elytra hyaline with a dark brown tinge, which becomes almost black on the costa, from the inner margin at the
apex of the axillary nerve to the first apical area a very oblique pale band; first subapical area subtriangular, reaching the costa; nerves punctured, thick and black except in the pale band; costa slightly flattened vertically, the tubercles scarcely perceptible. Abdomen above black, hind margins of the segments narrowly yellow. Legs pale, hind tibiae narrowly black on both the outer and inner sides, thighs frequently with a black stripe.

♀. Face between the eyes much clouded and speckled with dark brown or black, cheeks bare. Elytra hyaline with a faint yellow-brown tinge, and only faint traces of the pale band; nerves dark brown or black except in the pale band; costa scarcely flattened vertically, without tubercles. Legs pale, all the tibiae generally narrowly black on both the outer and inner sides. Length, 5½—6 mm.

On Salix triandra; local. Kirschbaum is the only author known to me who satisfactorily distinguishes between this species and the last, but his I. similis is, according to types from Dr. Puton, a form of this species, in which the pale portions of the costa in the male, and particularly the roundish spot at the apex of the costal area, are bright yellow: the females of the two insects appear identical. I have not seen native examples of this form.

3. Idiocerus Herrichii, Kirschb.


♀. Face greyish yellow, disc above between the eyes with a dark fuscous cloud, near each eye a black triangle and a few small black spots, edges of the frons below the eyes with a black line, clypeus black, cheeks with a dense long silvery pubescence. Pronotum pale greenish grey mottled with fuscous, a wide central line pale. Scutellum pale greenish grey, marked as in adustus. Elytra hyaline with a greenish grey tinge; nerves stout, chequered with black and white, punctured, and having a row of fine short hairs on each side; costa slightly flattened vertically, but without tubercles. Abdomen above black, hind margins of the segments narrowly pale. Legs pale, femora and tibiae striped with black, intermediate tibiae with a short black line on the outer side at the base.

♀. Differs from the male in having the cheeks scarcely perceptibly pubescent, a row of black points down each side of the
frons below the eyes, the clypeus generally pale, and the costa not flattened vertically. Length, 6–6½ mm.

On *Salix alba*; not common.


Face greenish yellow, more or less suffused with fuscous above, sometimes with pale spots. Pronotum greenish yellow (male) or bluish white (female), more or less suffused with fuscous so as to leave the margins narrowly, a narrow central stripe, and a roundish spot on each side of the disc of the pale ground colour. Scutellum pale with a triangle on each side of the base and a pair of small roundish spots on the disc fuscous. Elytra lacteo-hyaline, with three wide brown bands which do not reach the costa and are placed one at the base, one just behind the middle, and one at the apex; nerves punctured, white except in the brown bands, where they are dark brown, base and apex of the anal nerve white, first subapical area reaching about three-fourths as far as the fourth. Abdomen above black, hind margins of the segments narrowly greenish. Legs pale, apex of the tarsi more or less fuscous.

5. When fresh with the face and legs rather strongly tinged with pink. Length, 4½–5 mm.

On *Populus alba*, Beaufort Gardens, Lewisham; Shiere, near Guildford.

5. *Idiocerus tremula*, Estl.

*Cicada tremula*, Estl., Act. Holm., 129, pl. 5, fig. 3.


Very similar in appearance to the preceding species, and best distinguished therefrom by the brown bands of the elytra reaching the costa. Length, 4½–5 mm.

On *Populus tremula*; not common.

6. *Idiocerus viduatus*, n. s.

7. Crown and face yellow, variously spotted with rust-red and bluish white, a black puncture near each eye. Pronotum red-brown, a central stripe and a spot on each side of the disc bluish
white, hind margin narrowly pale. Scutellum yellow, with a
blackish triangle on each side at the base and a rust-red marking on
the disc in shape like a musical tuning-fork. Elytra (Pl. II. fig. 9)
red-brown, darker behind, from the middle of the inner margin to
the costa a broad oblique white band interrupted at the claval
suture by a streak of the red-brown ground colour, membrane and
appendix smoky hyaline; nerves punctured, dark red-brown, in
the pale band white, those of the membrane dark brown, brachial
nerve with one or two white spots. Abdomen above black, beneath
rust-red. Legs yellow-red, a dark stripe on the outer side of the
middle tibiae. Length, 5½ mm.

Of this fine and very distinct species I have seen but
one female example, which was beaten from sallow in
Foxley Wood on the 10th September, 1885. This sex
may be easily recognised by its fine red-brown colour and
the breadth and obliquity of the pale band on the elytra,
which is similar in these respects to that which we find
in I. varius male. Judging from the description it comes
near I. fasciatus, Fieb. (Eur. Bythosc., 455, 9), but
that species has the nerves of the clavus wholly white.

7. Idiocerus elegans, Flor.

Idiocerus elegans, Flor, Rhyn. Liv., ii., 147, 7; J. Sahl.,
Not. Fenn., xii., 147, 8.

3. Face greyish or reddish yellow, side margins of the frons
below the antennæ, side margins of the clypeus narrowly, and a
wide stripe on the cheeks adjoining the loral, dark brown or black.
Crown more or less clouded with fuscous, with two or three puncti-
form black spots near each eye. Pronotum mottled with rust-red
and brown, its front margin irregularly spotted with black.
Scutellum greyish yellow, a black triangle on each side at the base,
the disc clouded with rust-red. Elytra very shiny pale reddish
brown, a spot at the apex of the anal nerve, two or three spots on
the brachial nerve, and a narrow transverse band at the apex of the
clavus, white; nerves punctured, dark brown, on the pale parts
white. Abdomen above black, hind margins of the segments
narrowly yellow. Legs pale yellow.

2. Face greyish yellow speckled with red-brown, with a large
fuscous spot in the middle above and a black puncture near each
eye. Pronotum generally with a pale central stripe. Scutellum
yellowish, its markings red-brown. Legs reddish or brownish
yellow. Length, 5—5½ mm.

On willows and poplars; not common. I have
examined one female from coll. Capron which is possibly a variety of this species, but, in addition to the pale band across the apex of the elytra, both the transverse nerve and the apex of the anal nerve are white and stand in a round white spot, and the upper side of the abdomen has the basal half black and the apical half brownish yellow. This example was beaten from fir in March or April, 1885.

8. Idiocerus laminatus, Flor.


♂. Crown and face greyish yellow. Pronotum dirty greyish yellow, more or less suffused with fuscous. Scutellum greyish yellow, a black triangle on each side at the base and generally a pair of black points on the disc. Elytra pale brown, a spot at the apex of the anal nerve, the costal, first subapical, and the greater part of the first apical area and a wide band across the apex of the corium, white; nerves punctured, dark brown except in the white parts, where they are concolorous, first subapical area narrow-triangular, very small and indistinct. Abdomen above black, hind margins of the segments narrowly pale. Legs pale, claws black.

♀. Similar to the male, but larger and paler, with some fuscous markings on the middle of the crown. Length, 5½—6 mm.

On poplars; not common.

9. Idiocerus lituratus, Fall.

Jassus lituratus, Fall., Hem. Suec., ii., 60, 2.

♂. Crown greyish yellow, more or less clouded with rust-yellow, with a pair of black punctures (frequently united by a brown line) placed one near each eye. Face greyish yellow, in its upper half a large blackish grey triangle which frequently bears a black central stripe, frons and clypeus reddish yellow. In life the face is dull white with a wide greenish yellow central stripe. Pronotum greyish yellow clouded with fuscous and spotted with bluish white,
the front margin irregularly spotted with black. Scutellum greyish yellow; a triangle on each side of the base, a tuning-fork-shaped marking and a pair of points on the disc, black. Elytra whitish hyaline with a fuscous tinge, which takes the form of a wide central band reaching from the inner margin about half-way across the disc; nerves punctured, black, in the fuscous band much thickened; a small piece at the apex of the anal nerve, sundry pieces of the brachial and lower cubital nerves, and occasionally the first transverse nerve, white; costa yellow, vertically flattened but without tubercles. Abdomen above black, hind margins of the segments very narrowly pale. Legs pale, tibiae generally with a black line on both the outer and inner sides, thighs with a short black line at the apex.

♀. Face greyish yellow mottled with rust-red, the upper half of the disc occupied by a large subquadrate fuscous patch, in the lower half of which are some pale spots. Elytra hyaline with a yellow-brown tinge, a fine black line next the costa; nerves punctured, rust-brown on the corium, on the membrane black, their white markings not so conspicuous as in the male, but similar in position. Length, $6\frac{1}{2}$—$6\frac{3}{4}$ mm.

On sallows; common.

10. Idiocerus pacilus, H.-Scff.

Bythoscopus pacilus, H.-Scff., Deuts. Ins., 144, 8.


Idiocerus pacilus, Kirschb., Cicad., 159, 15.


I. venustus, Scott, Ent. Mo. Mag., x., 239, sec. spec. typ.

♂. Face greyish yellow, its lower half generally with four wide equidistant black stripes, its upper part variously clouded with fuscous; in strongly marked examples there is a short black stripe spotted with white next the inner margin of each eye. Crown with a black puncture on each side. Pronotum greyish yellow clouded with fuscous, speckled with black in front, down the centre a wide bluish white stripe. Scutellum greyish yellow; its base with a short linear stripe between two triangles, and a pair of spots on the disc frequently followed by a pair of stripes, black. Elytra greyish hyaline; nerves dark brown or black, those of the corium chequered with white. Abdomen above varying from pale brown to black. Legs pale, thighs generally striped with black, tibiae with a short black stripe on the outer side at the base, the hind pair with a black stripe down the inner side.

♀. Face greyish yellow, variously clouded and speckled with fuscous or black; the black stripes of the male represented by a
pair of narrow ones on the lower part of the frons. Length, 5½—6 mm.

On Lombardy poplar; not common.

11. *Idiocerus tibialis*, Fieb.


*I. affinis*, Fieb., l. c., 451, 8.

*I. Heydenii*, Kirschb., Cicad., 155, 6; Scott, Ent. Mo. Mag., xi., 228 (?).

*I. vittifrons*, Kirschb., l. c., 159, 14.

*I. rotundifrons*, Kirschb., l. c., 160, 16.

♂. Face greyish yellow, variously clouded and marked with rust-red black and brown, a black puncture near each eye. Pronotum clouded with fuscous, a narrow central stripe and a roundish spot on each side of the disc bluish white. Scutellum greyish yellow, with a black triangle on each side at the base. Elytra greyish hyaline; nerves brown, those of the corium chequered with white. Abdomen above generally brownish yellow, with a brown band across each segment. Legs pale, tibiae with a fine black stripe or stripes, hind thighs with a fine black stripe along the front and hind margins.

♀. Face greyish yellow, variously clouded and speckled with red-brown and black. Crown clouded with fuscous, with a pale central line and a black puncture near each eye. Length, 5½—6 mm.

Darenth, October, 1866 (Douglas). Well distinguished by the shape of the frons.

12. *Idiocerus vitreus*, Fab.


♂. Crown and face dirty whitish yellow, on the former near each eye a dark puncture. Pronotum pale brown, a central stripe and a small spot on each side in front whitish, near the front margin a few black points. Scutellum whitish yellow, a triangle on each side at the base and a pair of points on the disc black. Elytra pale yellow-brown; nerves punctured, dark brown, the transverse nerve and a short piece of the inner cubital and brachial nerves adjoining it, the apical third of the anal nerve, the extreme apex of the clavus, the apex of the brachial nerve, and a piece of
the outer half of the lower boundary of the second subapical area, white. Abdomen above yellow, base of each segment more or less widely black. Legs pale, inner side of hind tibia with a narrow black streak.

♀. Crown and face greyish yellow, the former with a black puncture on each side and between them a large brown patch divided down the middle by a pale stripe, some markings across the middle of the face and a line on each side of the frons rust-red. The nerves of the elytra are paler than in the male, and consequently the white parts are less conspicuous. Length, 5 mm.

On poplars; not uncommon.

13. Idiocerus aurulentus, Kirschb.
Idiocerus aurulentus, Kirschb., Cicad., 165, 29.

♂. Crown and face yellow or greyish yellow, on the former near each eye a dark puncture. Pronotum yellow-brown, with a more or less distinct central stripe and a suboval spot on each side of the disc pale. Scutellum yellow, with a black or red-brown triangle on each side at the base and a pair of dark points on the disc. Elytra shiny reddish brown; nerves punctured, dark brown; apex of the anal nerve, the extreme apex of the clavus, a short piece at the apex of the brachial nerve, and the middle of the lower boundary of the second subapical area, white. Abdomen greenish yellow, dorsal segments widely black at the base. Legs pale, claws black.

♀. Crown yellow, with a dark puncture near each eye. Face yellow, an ill-defined subquadrate blackish spot in its upper half, temples spotted with rust-red. Pronotum and scutellum as in the male, but the ground colour more decidedly yellow and the markings obsolete. Elytra pale yellow-brown; nerves punctured, almost concolorous, the white portions much less sharply defined than in the male. Length, 5 mm.

Lombardy poplar, Cossey, Norfolk. A very variable species and nearly allied to the preceding, but it does not appear ever to develop the white H so conspicuous on the elytra of that species.
14. *Idiocerus fulgidus*, Fab.
*Idiocerus ochroleucus*, Kirschb., Cicad., 163, 22.
*L. minki*, Kirschb., l. c., 163, 23.

♀. Deep yellow. Antennal plate oblong-oval. Apex of the face frequently tinged with red, its upper part generally with a wide dusky central stripe. Scutellum with a black triangle on each side at the base, and occasionally a pair of black spots on the disc. Elytra yellowish hyaline, light yellow-brown towards the inner margin, membrane smoky hyaline; nerves dark yellow, those of the membrane blackish, apex of the anal nerve white. Abdomen above and the claws black.

♂. Similar to the male, but larger and paler, the colour of the body pale green in fresh, yellowish grey in dried, examples, the triangles at the base of the scutellum rust-red or wanting, the upper side of the abdomen black only down the middle. Length, 5\(\frac{1}{2}\)–6\(\frac{1}{2}\) mm.

Abundant on poplars. Readily separated from its allies by the structure of the sides of the face. The insufficient descriptions by English authors of this species and the two following render any reference to them practically useless.

15. *Idiocerus populi*, Linn.

♀. Crown yellowish white. Face yellow, frons and elypeus red. Pronotum fuscous, a large pale space on each side in front, a short black transverse line near each anterior angle sometimes joined to a short oblique line on each side of the disc. Scutellum greyish yellow, a triangle on each side at the base and a pair of points on the disc black. Elytra subopaque, pale brown, darker towards the inner margin; nerves punctured, concolorous or paler than the disc, those of the membrane blackish; inner marginal nerve black, its middle third and the apex of the anal nerve white. Abdomen above black, beneath yellow. Legs red-yellow, claws black.


♂. Crown, face, and legs yellow, frons sometimes dusky. Pronotum and scutellum greenish yellow. Elytra hyaline, with a faint fuscous tinge, which becomes brownish yellow on the inner margin; nerves punctured, concolorous or paler than the disc; costa pale green. Abdomen above black, beneath greenish yellow. Claws black.

♀. Larger and paler. Abdomen above widely black down the middle. Length, 5½—6¼ mm.

On sallows; common. Easily recognised when fresh by its pale greenish grey colour.

17. *Idiocerus albicans*, Kirschb.

*Idiocerus albicans*, Kirschb., Cicad., 165, 27.

Head, pronotum, and scutellum greenish white; face sometimes with a yellow tinge in the male, in which sex also there is sometimes a black puncture near each eye and a black triangle on each side of the base of the scutellum. Elytra whitish hyaline, sometimes with a faint reddish brown tinge near the inner margin in the male; nerves white, the apices of those on the membrane and the marginal nerve of the latter blackish. Dorsal segments of the abdomen narrowly black at the base (male) or entirely pale (female). Length, 5½—6¼ mm.

Common on white poplar.

*Agallia*, Curt. (Pl. II., fig. 5).

Curt., Ent. Mag., i., 193 (1833).

Crown widely rounded in front. Clypeus, cheeks, lora, and frons separated by distinct sutures. Frontal suture not reaching the ocelli. Antennal seta never clavate in the male. Species small, dirty white, with black or brown markings.
1 (4). Pronotum twice or nearly twice as long as crown. Insect macropterous.

2 (3). Pronotum faintly punctured

3 (2). Pronotum transversely striate

1 (1). Pronotum only slightly longer than crown. Insect brachypterous


*A. puncticeps*, Scott, Ent. Mo. Mag., x., 236, 1.

♂. Dirty greyish white. Crown with a round black spot on each side, and in the middle a pair of fine brown parallel lines, which are continued over the forehead beyond the ocelli. Face with a minute black point at each ocellus, from which a brown line runs obliquely outwards and downwards; frons black or dark brown, with a whitish central stripe; clypeus with a fine dark central stripe. Pronotum with a transverse line behind each eye, a pair of points in the middle of the front margin, a central stripe divided longitudinally by a fine pale line, and a large triangle on each side at the base, its base resting on the hind margin, dark brown or black. Scutellum with a triangle on each side at the base, and generally a pair of points on the disc, dark brown or black. Elytra with a fine line just below the claval suture, the nerves of the clavus, the transverse nerve, and the cubital nerve as far as the fork, white; the remaining nerves, and the inner margin narrowly, dark brown, the nerves of the disc much widened. Abdomen above black, widely pale at the sides, beneath pale. Legs more or less striped and banded with black.

♀. Similar to the male, but the dark markings are generally paler. The central stripe on the pronotum is apparently never divided by a pale line, the frons is pale, with a row of closely placed very short black transverse lines down each side, the sides of the abdomen above are more widely pale, and there is a black spot on each side of the ventral segments. Length, $2\frac{1}{2}$—$3\frac{1}{2}$ mm.

Common on low plants.
2. *Agallia venosa*, Fall.

*Agallia venosa*, Flor, Rhyn. Liv., ii., 551, 1; Marsh., Ent. Mo. Mag., iii., 150, 1; Kirschb., Cicad., 150, 4; J. Sahl., Not. Fenn., xii., 153, 2; Scott, Ent. Mo. Mag., x., 237, 2.

♂. Dirty greyish white. Crown with a round spot on each side, a fine central line, which is continued over the forehead as far as the ocelli where it suddenly divides and proceeds in an arcuate form to the base of each antenna, a point at each ocellus, a subtriangular spot, of which one point reaches the ocellus, on each temple, and the lower half of the face almost entirely, black. Pronotum with a curved line from each front angle to the front margin behind the spot on the crown, a linear central stripe, and a large roundish spot on each side at the base, black. Scutellum as in *puncticeps*. Nerves of the membrane and corium dark brown, brachial nerve as far as the transverse nerve and a small piece at the base of the upper cubital nerve pale; claval suture and inner margin narrowly, a stripe just above the anal nerve and extending for half its length, a piece of the anal nerve just before its apex, a stripe just above the axillary nerve and extending for two-thirds of its length, dark brown or black; a linear marking following the course of the anal nerve for about half its length, and then passing to the suture in the form of a blotch, the apex of the anal nerve, and the entire axillary nerve, white. Abdomen black. Legs variously striped and banded with black.

♀. Similar to the male, but larger and with most of the black markings replaced by rust-red. The central line on the crown divides almost immediately on leaving the base. Lower half of the face pale, with sundry dark markings; frons with a rust-red linear central stripe on its lower half, and a row of small black spots down each side. Abdomen above black, narrowly pale at the sides, beneath pale. Legs variously striped and banded with rust-red. Length, $2\frac{1}{2} - 3$ mm.

Very common at the roots of grass, &c.


Dirty yellowish white; two large roundish spots and sometimes a central stripe on the crown, four transverse spots and a central stripe on the pronotum, three stripes on each elytron, and the hind margins of the abdominal segments narrowly, black. Elytra about half as long as the abdomen, truncate, with rounded angles. Length, 2½—3 mm.

North Cliff, Scarborough, amongst newly-cut grass, end of June.

**Explanation of Plates.**

**Plate I.**

Fig. 1. Face of a Jassid; *a* frons, *b* ocellus, *c* antenna, *d* temple, *

c* eye, *f* cheek, *g* clypeus, *h* rostrum, *i* lora.


3. Terminal segments of a ♂ Jassid (under side), *b* valve, *c* plates.

4. The same, viewed from the side; *a* pygofer, *b* valve, *c* plate, *d* anal tube, *e* anal style.

5. Terminal segments of a ♀ Jassid (under side), *a* pygofer, *b* last ventral segment, *c* saw-case.

6. The same, viewed from the side.


8. Pygofer of a ♂ Delphacid (*Liburnia venosa*), seen from behind; *a* pygofer, *b* anal tube, *c* anal style, *d* styles.

9. Terminal segments of a ♀ Delphacid (under side); *a* basal plates.
Fig. 10. Cicadetta, elytron.

11. Centrotus, pronotum and scutellum.
13. Tettigometra, crown, pronotum, and scutellum.
15. Oliarius, crown, pronotum, and scutellum.
16. Cixius
17. Asiraca, a antenna, b fore leg.
18. Delphax, a antenna, b hind leg.
19. Liburnia, face.
20. Dieranotropis, face.
21. Stiroma, face.
22. Tricephora, crown, pronotum, and scutellum.
23. Aphrophora
24. Philænus
25. Ledra, head and pronotum (front view).
26. Ulopa, face.

Plate II.

Fig. 1. Bythoscopus, crown, pronotum, and scutellum.
2. Macropsis, face.
3. Megophthalmus, crown, pronotum, and scutellum.
4. Idiocerus, crown, pronotum, and scutellum.
5. Agallia, face.
6. Pediopsis, crown, pronotum, and scutellum.
7. Liburnia straminea ♂, genital style dissected out and view from the side (the point of view mentioned has in all cases reference to the position of the organs when in situ).
8. Liburnia straminea ♀, anal tube viewed from below.
10. Liburnia Fairmairei ♀, styles viewed from behind.
11. Pediopsis fascinervis, face.
12. Liburnia brevipennis ♂, styles viewed from behind.
13. " guttula ♂, styles viewed from above.
14. " vittipennis ♂, styles viewed from above.
15. " Signoreti ♂, styles viewed from behind.
16. " Fieberi ♂,
17. " Boldi ♂.
V. Descriptions and remarks upon five new Noctuid moths from Japan. By Arthur G. Butler, F.L.S., F.Z.S., &c. [Read April 7th, 1886.]

The species here described have been recently received from Messrs. Henry Pryer and George Lewis, who collected them personally in Japan.

The difficulty of dealing with aberrant types of familiar genera, owing to the present imperfect definition of many groups of Noctuidae, is at once apparent when one has to decide with what genus such a species as the first here described has the highest claim to be associated: that structural characters, as hitherto studied, are insufficient to decide the point, is evident: that characters exist in the present case, which can only be examined by destroying the type-specimen, is probable from the bizarre aspect of the insect; but that this can only be done where there are plenty of specimens to sacrifice, is equally a lamentable fact.

COSMIIDÆ.

Cosmia curvata, n. s.

In form and general coloration like Cerastis spadicea, the outer margin of the primaries even more sinuous; in structure almost identical with Orthosia suspecta; * primaries sericeous, purplish slate-coloured with the exception of a submarginal band and the fringe, which are bronze-brown; ordinary lines black, slender, with whitish inner edges; the first subbasal, angular, the second at basal third, oblique and slightly curved, the third just beyond the external third, nearly straight, but with a slight sinus at the point where it is crossed by the first median branch; a fourth indistinct line, limiting the external border, nearly straight from costal

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* In neuration I can find no difference between Cosmia, Orthosia, and Cerastis, the primaries having five subcostal branches, all but the first starting from a post-discoidal cellule; the lower radial and second and third median branches being also emitted close together.
margin to third median branch, and thence undulated to inner margin; discoidal spots outlined in white; secondaries sericeous bronze-brown, darker towards the outer margin; fringe whitish-brown, traversed by a dark brown line; body brown, the abdomen greyer than the thorax; under surface whitish-brown, sericeous, with golden-bronze reflections; primaries, with the exception of the borders, suffused with blackish, and showing darker indications of the third and fourth lines of the upper surface; secondaries crossed by two irregular ill-defined dusky stripes. Expanse of wings, 29 mm.

Fukushima, 28th July, 1881 (G. Lewis); Yokohama (H. Pryer).

Mr. Pryer regards this as a Noctua: in pattern above it is most like a Mesogona, excepting in the border of the primaries, which is like that of an Orthosia: in some respects it is more like a Cerastis than a Cosmia, but the palpi correspond with those of the latter genus: singularly enough it agrees in most respects with the Notodontid genus Beara, but the flatter thorax, more prominent head, longer palpi, and the little cross-veinlet in the primaries forming the post-discoidal cellule, sufficiently distinguish it.

It is strange that neuration should repeat itself, as it does, in widely distinct families; in the present instance, however, the families are more nearly allied than they sometimes are: neuration, though invaluable as a generic character, cannot be used by itself for the definition of families, for, though it may serve to distinguish some, it will equally unite others which are far more distinct; the little cell above or beyond the discoidal cell, and which has been called "post-discoidal," occurs in many groups of Bombycina, Geometrina, and Noctuina. The number of median branches to the secondaries (the radial when approximated to the third median being called a fourth) is not an invariable character, there being Geometrina, both with three and four so-called "median branches"; whilst Argyria, which appears to be a Drepanulid (as I shall presently attempt to prove), corresponds closely, not only in neuration, but in every other respect, with Somatina, has only the normal Geometrid arrangement of three median branches, and, apart from its great resemblance to Cilir, fully justifies M. Guénéée’s decision that it belonged to the Geometrina; at the same time it possesses the same number of veins
as *Cilix*, has nearly the same arrangement of veins in the primaries, the principal difference consisting in the weak character of the disco-cellular veinlets and, in the secondaries, in the different relative position of the sub-costal and median branches, which thus necessitates an alteration in the form of the discoidal cell; such distinctions, though wide enough to separate some families (as in the case of the *Enochromiidæ* among the *Geometrina*), cannot be admitted to be of sufficient importance to enable one to place *Argyria* and *Cilix* in two tribes so wide apart as the *Geometrina* and *Bombycina*. On the other hand, the genus *Telidonia* (proved by breeding to be a true *Drepanulid*), which is even more Geometriform than *Argyria*, is intermediate in the character of its wing-veins between the latter and *Cilix*, whilst the genera *Macrocilix* and *Auzata*, formerly associated with *Argyria* and placed among the *Geometrina*, are in all their structural characters essentially *Drepanulidæ*.

Whether *Somatina* should also be placed in the latter family or not cannot be decided without breeding it; but, if I am right in locating *Argyria* there, it would indeed be strange that a genus almost identical with it in the imago condition should belong to so widely distinct a tribe as the *Geometrina*; nevertheless, it should be borne in mind that structural characters in the imago stages of the Heterocera have not enabled even the best and most painstaking lepidopterist to assign certain genera to their natural positions, the genus *Euphanessa*, hitherto referred to *Bombycina*, but now proved to belong to the *Geometrina*, being a case in point.

That the number of branches to the median vein of the secondaries should be regarded as *invariably* of the highest importance, will at once be seen to be absurd by anyone who examines the whole of the genera of *Zygaenidæ*, in which the median branches vary from two to four, and the total number of veins in the secondaries from five to eight.

Therefore, although it is as a rule safe to assume, because of a certain combination of characters in the imago, that a moth belongs to such and such a family, the existence of many aberrant forms, of which the life-history is known, and their natural position
therefore finally decided, renders any attempt to found a system of classification upon the external structure of the imago alone wholly futile.

HADENIDÆ.

_Epia claripennis_, n. s.

Allied to _E. echii_ of Europe; of the same size and with nearly the same pattern; the markings of the primaries are, however, more diffused and consequently less sharply defined, the discoidal spots are grey with white margins, the "orbicular" being oval, oblique, and diverging from the "reniform" spot, which is also less angular than in _E. echii_; below the "orbicular" spot and upon the interno-median area is an oblong blackish spot (as in _Dianthecia capsineola_), followed by a small fusiform white spot; below the latter there are no more white markings upon the central belt, the white internal patch which occurs in _E. echii_ being absent; the white maculation of the fringe appears also to be wholly absent; the secondaries are white instead of grey, very glossy, and with a faint golden appearance in certain lights, the discal line and outer border are faintly indicated in grey; the body is sordid whitish, the collar marked on each side with a little arched line; on the under surface the differences are more marked, the primaries being greyish white to beyond the cell, the disc grey, and the outer border pale greyish brown; the disco-cellular lunule is grey; secondaries with the discal lines much less distinct and nearer together than in _E. echii_; tibë and tarsi of front legs greyish in front; not distinctly banded as in the European species. Expanse of wings, 29 mm.

Nikko (_H. Pryer_).

_Dichonia intermissa_, n. s.

Intermediate in some respects between _D. convergens_ and _D. protea_; in pattern, both above and below, most like the former, but in the colouring of the primaries approaching the latter; the form of the discoidal spots, the presence of a pale spot below the "orbicular," and the well-defined marginal black dots also correspond with _D. protea_; the pale scales on the primaries are, however, of a yellowish brown, rather than greenish, tint, and the reniform spot and the disc towards external angle are sprinkled with rust-red scales, somewhat as in _D. convergens_; the lines which bound the central belt are wider apart than in either species, and resemble those of _D. genistæ_; the secondaries are of a smoky-
five new Noctuid moths from Japan.

grey tint, gradually darkening from the base to the outer margin; the fringe white, traversed by a black line; under surface smoky grey, the centre of the secondaries whitish, so as to show clearly a small black disco-cellular crescent; other markings obsolete. Expanse of wings, 38 mm.

Japan (H. Pryer).

In Staudinger's Catalogue I find that the three species above referred to are placed in three separate genera—D. convergens in Dichonia, D. protea in Dryobota, D. genistae in Mamestra, but why is not stated; and, after carefully comparing their structure, I fail to see any justification for such a proceeding. M. Guenee placed all three in Hadena, and indicated H. w-latinum (=genistae) as type, though the latter was not originally recorded as a member of the genus in Schrank's enumeration of the species: the actual type of Hadena appears to be H. cucubali, so far as I have been able to ascertain;* the latter was originally associated by Boisduval with other clearly heterogeneous forms, as representing his genus Dianthæcia, and has subsequently been placed in the latter group.

PLUSIIDÆ.

Plusia humeralis, n. s.

Nearly allied to P. chryson; of the same size, form, and general pattern, but the primaries without the golden patch, with the basal area lilacine grey, crossed close to the base by a blackish line, and just beyond this by a tapering blackish band; central area more purplish in tint, with the three lines much darker, and the outermost of the three less strongly undulated; external and apical areas more bronzy, very glossy; secondaries whiter, the line and border better defined; thorax duller in tint, abdomen whiter; under surface cream-coloured instead of ochreous, but in other respects similar. Expanse of wings, 49 mm.

Yezo (H. Pryer).

POLYDESMIDÆ.

Polydesma vulgaris, n. s.

Primaries above greyish or cupreous-brown, always pale and more or less sericeous, crossed by numerous ill-defined brown or

* Mr. Kirby has kindly assisted me in looking up the probable type of Hadena, but we have not been able to give sufficient time to the matter to come to any final decision.
reddish dentate-sinuate stripes, which, however, frequently are wholly lost in the ground colour; two reversed dentate-sinuate darker lines or two stripes slightly paler than the ground colour indicate the limits of the central belt; the orbicular spot is usually ill-defined or absent, but sometimes represented by a whitish spot; the reniform spot is oblique, large, usually whitish, but sometimes ochreous, though always with a white or whitish external edging; the outer line or stripe bounding the central area occasionally has its dentate character defined by a series of black points at the extremities of the denticles; so far all the characters are variable and inconspicuous; the following characters are always better marked—a dark brown almost semicircular basi-costal patch, an unequally quadrate costal patch of the same colour beyond the cell, an irregular more or less dusky outer border bounded internally by a paler stripe, two more or less defined hastate black dashes on the radial interspaces interrupted by the submarginal pale stripe; a marginal series of black crescentic dots with pale inner edges and several dusky or blackish costal dashes; secondaries varying from grey to brown, always sericeous, and with pale golden or bright cupreous reflections, a more or less distinct darker diffused external border; an ill-defined marginal series of blackish dots; fringe whitish; body whity-brown; head, collar and tegulae dark brown, varying in accordance with the colour of the primaries from greyish to reddish; under surface varying from whitish to bronze-brown; primaries with the central area slightly greyish; all the wings with a blackish disco-cellular spot and two parallel discal lines from costal to inner margins. Expanse of wings, 34—50 mm.

Male and female, Tokei (C. Maries); female, Chekiang (W. B. Pryer); male and female, Yokohama (H. Pryer).

This perfectly typical Polydesma is noted by Mr. H. Pryer as a Xylophasia. It is an unusually variable species.
VI. Notes in 1885 upon lepidopterous larvae and pupae, including an account of the loss of weight in the freshly-formed lepidopterous pupa, &c. By Edward B. Poulton, M.A., F.G.S., F.Z.S., of Jesus and Keble Colleges, Oxford. [Read March 3rd, 1886.]

CONTENTS.
1. Notes upon the larvae of Smerinthus tiliæ and S. ocellatus, and upon the red spots in Smerinthus larvae.
2. Further examination of the newly-hatched Smerinthus larva.
3. Notes upon the adult larva of Acherontia atropos, with suggestions as to its appearance in earlier stages.
4. The relation of the colours of the larva of Sphinx ligustri to those of its food-plants.
5. A new point in the terrifying attitude of the larva of Charocampa elpenor.
6. The terrifying attitude of the larva of Dicranura vinula.
7. The fluid ejected by the larva of D. vinula.
8. The apparent failure of the extreme protection of many larvae.
10. The production of a twig-like appearance in the larva of Hemithoea thymiaria.
11. The darkening of the hairs of the larva of Acronycta leporina before pupation.
12. The method by which the imagines of the Chloephoridae escape from their cocoons.
13. Notes upon the larva of Paniscus cephalotes parasitic upon the larva of Dicranura vinula.
15. On the considerable loss of weight in the pupa immediately after throwing off the larval skin.
stage, and I was very interested to see that the two apical head tubercles still retained traces of a red coloration, thus proving that these tubercles are red in earlier stages, as in *S. ocellatus*. The way in which the colour changed at the beginning of the last stage was exactly as in *S. ocellatus*, the red fading into the cleft between the yellowing tubercles, and soon disappearing entirely. The prothoracic spiracle appears to be white, the others red; the effect being produced by a distinct red line which encircles the latter, while careful examination shows that the former is also surrounded by a very fine red line, which, however, does not play any part in the general appearance of the larva. I expect that the anterior spiracle is concealed during rest, as in *S. ocellatus*. During the past summer (1885) I also found two adult larvæ of this species at Oxford, with the red borders to the stripes spoken of by Weismann. There could not be the least doubt that the red borders represented the violet ones of *Sphinx ligustri*, and the coloured borders of the oblique stripes in other *Sphingidae*, and that Weismann's identification is perfectly correct. But, as I have before stated, I cannot think that in *S. ocellatus* and *S. populi* we have the traces of a similar marking, for there is never any tendency towards the elongation of the spots into borders in these species, and yet the spot system is developed to a much greater extent than in *S. tiliae*. And yet in a larva of *S. ocellatus*, which possessed this character to a very slight extent, there was a very strong resemblance to Weismann's description of the faintest trace of the red borders in *S. tiliae*. Weismann says of the latter larvæ in the fourth stage, on p. 235 of the English translation of his essay on 'The Origin of the Markings of Caterpillars'—"Many of them possess a blood-red spot on the anterior side of the stripes, this spot showing all gradations in size and depth of colour between maximum development and a mere trace." The larva of *S. ocellatus*, to which I allude, was one of two which possessed the spots out of about seventy-five which had been bred from the egg. The spots were only present in the upper row (three rows appearing in extreme varieties) on the first five abdominal segments. The spots, which could only be detected in the last stage, were indicated by a little local darkening of the green anterior border to the stripes,
with the faintest tinge of red in its centre. There was also the slightest trace of red round the spiracles, spreading outwards from the normal red line. Omitting the last feature the description is exactly the same as that quoted from Weismann, referring, of course, to the larva with the "mere trace" of the spots. The other larva of S. ocellatus had the spots rather more developed, and they first appeared in the fourth stage. They were only present in the upper row on the second thoracic segment (very faint) and upon the first five and the seventh abdominal segments. This larva died when it was advanced in the last stage, the spots being the same as in the previous stage, but the chief interest of the larva lay in the fact that it was not a yellowish variety, but intermediate between this and the whitish form. In all the other instances hitherto recorded the spotted varieties of S. ocellatus have always belonged to the yellowish form of the larva (as did the other larva of this species mentioned above). These two larva have been described in a paper read before the Royal Society, and to be published in the Proc. Roy. Soc. in a few weeks. It must be remembered that the purple borders of S. ligustri are linear, and not spot-like in their first appearance, and that the spots of S. tiliæ only appear in one row (as far as I am aware) instead of two or three rows, as in the other Smerinthus larvæ. It seems possible (but this is a mere suggestion) that the coloured borders existed in Smerinthus larvæ, arising in the same manner as in Sphincta ligustri by a linear substitution of a bright colour for the previous border of darkened ground colour, and that the appearances seen in Smerinthus tiliæ are due to the fading away of the character instead of its origin. The borders are fairly complete in some individuals, in others they shorten into spots, but in the large majority they have disappeared. In the other Smerinthus larvæ the shortening borders may have been arrested at the spot stage, which has evidently been made use of as an independent larval marking, and which has received additions in the other rows. The great length of time over which the spots have been made use of as a larval marking (in S. ocellatus and S. populi) may account for the fact that the spots only, and never the coloured borders, appear in the ontogeny of these two Smerinthus larvæ. There is much
in the ontogeny of the larvae of this genus to support the view that they have been brightly and very differently coloured in the past (see my previous paper in the Trans. Ent. Soc. Lond., Part II., August, 1885, p. 281, &c.). Such indications are found in the brightly-coloured tubercles on the top of the head; the occasional suffusion of the light stripes with a reddish tint, and the extraordinary bristles with which the young larvae are covered. At the same time the special explanation of the spots offered above is entirely tentative, for the subject is exceedingly difficult, and many more observations will be necessary before any theory can be considered satisfactory. I have been induced to somewhat modify the view I previously brought before this Society, because of the observation of the two larvae of *S. ocellatus* and the two of *S. tiliae* described above.

In previous papers read before this Society I have described the small "eighth stripe" upon the first abdominal segment of *Smerinthus* larvae and in that of *Sphinx ligustri*. While I was undertaking some extensive breeding experiments upon the larvae of *S. ocellatus* during the summer of 1885, my friend Mr. W. White (who was staying with me at the time) pointed out that my white larvae possessed a trace of a "ninth stripe" on the last thoracic segment. It is parallel with the "eighth stripe," but smaller than the latter, and very obscure. The best way to see it is to take a general view of the larva at a little distance. The marking generally disappeared in the last stage, and was, I think, seen in both the previous stages. In a peculiarly white larva found by me in September, 1885, upon *Salix alba* at Brigue, in Switzerland, the "ninth stripe" was plainly present, although the larva was advanced in the last stage. It seems likely that this obscure marking is due to the tendency towards the transference of serially homologous markings on to those segments upon which they are not present, but, if so, it is improbable that the marking will become distinct, for it would then interfere with the effect of the anterior remnant of the subdorsal in the protective attitude, which the "eighth stripe," on the other hand, rather assists (see Trans. Ent. Soc. Lond., Part I., April, 1884, pp. 32 and 33). The view that this "ninth stripe" is comparatively recent is also supported by the fact that it is only seen on the whitish varieties, for
there are reasons for believing that the yellow variety is phylogenetically older, *viz.*, the fact that the young larvae are always yellow, and that the red spots nearly always occur on this variety.

2. Further examination of the newly-hatched *Smerinthus larva.*—In my last paper communicated to this Society (Trans. Ent. Soc. Lond., 1885, Part II.), I described the newly-hatched larvae of *Sphinx ligustri* and *Smerinthus ocellatus*, and in that paper will be found an account of the hairy covering which these larvae possess in the early stages, and of which traces can be detected as long as the larvae are shagreened (*i.e.*, for the whole life of *Smerinthus* larvae, and in all the stages except the last of *Sphinx ligustri*). In the newly-hatched *S. ligustri* the body was covered with hairs or bristles, which sprang from ordinary shagreen dots, while there were also two lateral and two dorsal rows of longer bristles springing from larger shagreen dots, which bore a special relation to the larval markings which appeared later (see the paper quoted above for details of this relation, &c.). All this was seen with a hand lens (Browning's platyscopic lens, the lowest and the highest powers), or with the naked eye; only the more advanced stages of both larvae being examined with the compound microscope. During the present year (1885) I have carefully examined the newly-hatched larvae of *Smerinthus ocellatus* and *S. populi*, using high powers for the purpose. In correcting the proof of the above-mentioned paper I was able to add a short account of the results of this later work (see p. 296), which gave the chief conclusions arrived at, and in which I pointed out that the young stages of *Smerinthus* and *Sphinx* were brought very near together. I have not yet examined the young stages of *Sphinx* under high powers, for I have not been able to obtain ova since 1884.

I am now able to produce a figure of the apex of the caudal horn in the newly-hatched larva of *Smerinthus populi*, looked at from above and magnified 188 diameters (see the accompanying woodcut, Fig. 1). The numerous short bristles are seen to rise from small bases,—the ordinary shagreen dots,—while the long bristles expand basally into much larger tubercles, and the bifid extremity of the horn is formed of two such tubercles, each bearing a long bristle. The considerable degree of bifidity exhibited
in this stage affords an interesting contrast with the smaller development of this feature in later stages (compare fig. 10, Plate VII., in the above quoted paper, for a representation of the apex of the horn in *Sphinx ligustri* in the third stage). It is noteworthy that the two terminal bristles are larger and much stouter than any of the others, and there is the faintest approach to the development of clavate extremities. None of the longer bristles were forked upon this part of the horn in the individual which was figured, but it is common to find such bristles with a small and simple apical fork (as described in the paper previously mentioned). The small bristles generally end in a remarkable quadrifid expansion, of which the four processes are here comparatively short, although in some parts of the body of the larva they are greatly prolonged, and thus produce a most extraordinary appearance when the profile of the larva is examined under a compound microscope, magnifying 50 or 100 diameters. The figure serves well to indicate the difference between the two kinds of bristles which occur on the body of the young *Smerinthus* and *Sphinx* (and probably other) larvae, and of which the tubercular bases bear an important part in the markings. The long bristles on the part of the horn
figured are similar to those which form the dorsal and lateral rows on the body of these larvæ.

On page 302, &c., of the above-quoted paper I have shown that the caudal horn of many of the young larvæ of Sphinxidae is forked like that of S. populi figured above. Among other instances I quoted that of Anceryx pinastri from Weismann, which is described in his Essay as possessing a forked horn in the first and second stages. On page 266 of the Essay, Weismann states that the horn is "no longer forked" in the third stage. I felt sure that a character so strongly marked as Weismann's figure (plate vi., fig. 53) shows it to be would have persisted for a longer period than the two earliest stages; and in this belief I wrote the following sentence (p. 302):—"The fork is so marked in this species that I have no doubt that it really exists in more advanced stages, but requires a lens for its detection." In the spring of the present year (1886) I had the opportunity of examining three well-preserved specimens of this larvæ in Lord Walsingham's magnificent collection. Two of the larvæ appeared to be mature, and at any rate were in the last (fifth) stage, but in all three the tip of the horn was strongly forked,—very much more so than in the newly-hatched S. populi (Fig. 1). It is thus clear that Weismann was mistaken in thinking that the character disappeared at the third stage. In A. pinastri the feature is not only more prominent, but lasts for a longer period than in any other Sphinx larva yet described.

3. Notes upon the adult larva of Acherontia atropos, with suggestions as to its appearance in earlier stages.—During the past summer (1885) I have had the opportunity of examining several larvæ of this species in the last stage. They were all full-fed, or nearly so, and probably all had come from potato fields (although in one case the adult larva was found in a hedge). The larvæ without exception were of the common yellow variety, and all except one were found near Oxford. It is at once obvious that these larvæ present the closest resemblance to those of Sphinx ligustri. The shape of the head is exactly similar, with the same arrangement of the black marginal line relatively to the face, except that the black borders very
nearly meet at the apex of the head in *S. ligustri*, while they do not come so near to complete fusion in *A. atropos*. In both larvae the black bands attenuate considerably towards the apex of the head. The most striking resemblance, however, is afforded by the appearance and position during the resting attitude of the thoracic segments, which in both species are swollen and transparent, and without a trace of marking. All the larval markings end abruptly at the anterior edge of the first abdominal segment, except the border of the anterior stripe, which just crosses the intersegmental furrow in both species. The resting attitude of both is also exactly similar, the head being retracted and the dorsal surface of the swollen thoracic segments curved into a quarter of a circle, as seen in profile. This is seen in the *Sphinx* attitude of rest, and in other positions also. The difference between the ground colour of the thoracic segments and that of the others is very obvious in both cases. The difference is perhaps best described by saying that the former are yellower and paler, and especially that the colour possesses a peculiar transparency, which is absent from the rest of the body. The thoracic segments are, however, less bright and yellow than the ground colour in the region of the oblique stripes. In a figure of the brown variety of *A. atropos*, painted by Mrs. Owen Wilson, and sent to me by Professor R. Meldola, the ground colour of the thoracic segments is pink, while that of the others is brown; and the contrast is therefore much greater than in the common variety. Mr. Stainton, in his 'Manual,' describes the anterior segments of this variety as whitish, and the rest of the body as brownish olive; I expect that this is more correct than the impression conveyed by the figure, although the specimen which Mrs. Wilson has painted may have been an unusual variety. The black thoracic spiracle of *A. atropos* resembles the ochreous anterior spiracle of *S. ligustri*, and differs from that of *Smerinthus ocellatus*, &c., in being unconcealed when the larva is at rest in the *Sphinx* attitude. The relations of the oblique stripes and borders to those of *Sphinx ligustri* are extremely interesting. In Stainton's 'Manual' the larva of *A. atropos* is described "with seven oblique lateral violet stripes," and that of *S. ligustri" with seven oblique
lateral white streaks, bordered above with lilac.” Certainly this correlation of the markings of the two larvae seems sufficiently obvious, and is the one which is also given in other descriptive works. Recent investigations, however, have shown the relations existing between the oblique stripes and their coloured borders (by a comparison of the ontogenies of Smerinthus and Sphinx larvae). The conclusions arrived at by these investigations suggested a careful examination of the position of the violet bands of A. atropos, which resulted in the proof that these markings do not correspond to the stripes of S. ligustri, but to the coloured borders only,—the latter markings, in fact, have persisted, while the oblique stripes have become inconspicuous. This correspondence is at once seen on comparing the relative positions of the caudal horn and the spiracles to the oblique markings in A. atropos and S. ligustri respectively. The fact is recognised by Weismann on p. 322 of the English translation of his work, where he speaks of the blue “edges” of A. atropos, and compares them with those of S. ligustri, &c. The stripes are also present in A. atropos, but, being only of a lighter yellow than the rest of the ground colour, they are easily passed over. They are narrow in the lower half of their length, becoming broad above, so that they occupy very nearly the whole interval between the coloured borders in the dorsal region. This broadening takes place as each stripe crosses the furrow which separates the two segments in which its course lies. In S. ligustri the ground colour is much brighter in the region of the oblique stripes and borders than elsewhere; in A. atropos this is probably also the case, but the brightened ground colour cannot, of course, be distinguished from the true oblique stripes (which are also brightened ground colour). Hence what is described above as a broadening of the oblique stripes may in reality be due to their fusion with another of the elements of larval colour. The brightness of the ground colour in the region of the oblique markings, due in part to stripes and in part to the ground colour itself, produces an effect which is very like that of S. ligustri. Below this region the ground colour becomes much darker and greener in both larvae, and in both the darkened colour spreads upwards in front of the borders for the lower half of their length.
In *A. atropos* a fine white line runs along the posterior margin of the inferior anterior half of each coloured border, but it seems unlikely that this represents the true stripe. The borders of *A. atropos* are violet for the chief part of their course, shading into blue anteriorly and inferiorly, and also changing abruptly into the same colour above, at the furrow which divides the two segments over which each border extends. The upward blue continuation of the border meets its fellow of the opposite side in a distinct V, of which the apex lies close to the hinder limit of the posterior of the two segments traversed by the border. This backward prolongation of the coloured border (as such) does not take place in *S. ligustri*, but the lilac tint ceases abruptly at the furrow corresponding to that which only divides the border of *A. atropos* into two rather differently coloured halves. Nevertheless, careful examination will show that the borders of *S. ligustri* are carried back, and form a series of Vs, but only as darkened ground colour, and with the loss of all distinctness. Hence each segment, from the first to the seventh abdominal (both inclusive), is crossed by parts of two oblique borders, of which both the upper and lower parts are very conspicuous in *A. atropos*, while the upper in *S. ligustri* can only be detected after careful examination. This is also true of the stripes themselves in *S. ligustri*, while the stripe is altogether inconspicuous in *A. atropos*. The eighth abdominal segment is only crossed by the upper part of one stripe (the last) and its border, and here also the same contrast holds good in the two larvae. In *A. atropos*, however, the border does not become blue, but remains of the same purple as its anterior inferior continuation. This border also becomes much narrower upon the eighth abdominal segment after crossing the furrow which separates it from the seventh segment. The larva of *A. atropos* is peculiar as compared with that of *S. ligustri*, in the persistence of the "eighth stripe" in the last stage; but the latter larva possesses this feature in earlier stages, and it can even be detected immediately after the last ecdysis. In *A. atropos* the "eighth stripe" is conspicuously represented by the bright blue border, which is present upon the first abdominal segment, and ends abruptly at its anterior margin, thus occupying an entirely normal position. On the other hand, this is
the only instance, as far as I am aware, of the "eighth stripe" gaining a coloured border, the exception being doubtless explained by the fact that this stripe consists of an upper part only (upon the first abdominal segment, and never extending downwards upon the third thoracic segment), and such upper parts possess coloured borders in the case of *A. atropos* alone. The shagreen dots form a very remarkable addition to the markings of the adult over the dorsal surface of the abdominal segments (first to eighth, both inclusive). Over an area rigidly limited by the inferior edge of the lower part of an oblique border in each segment the shagreen dots form the centres of relatively large circular patches of purple. These patches are larger upon the borders than elsewhere, and are especially large upon the superior posterior part of each border. The patches are especially small and scarce posterior to the upper part of the sixth border on the seventh abdominal segment, while upon the eighth abdominal segment there are only a very few faint patches, all of which are placed on the upper part of the seventh border, which traverses this segment. The purple patches have evidently spread from the bases of the dots, which are still visible in the centre of each as a small light spot (which, however, is not raised above the general surface of the larva). These dots have entirely lost the hairs in this last stage, but their former presence is probably indicated by a minute central scar-like point. The patches are also seen to be connected with dots because of their arrangement upon the eight annuli into which each abdominal segment is divided (except the first, which is only divided into six or seven annuli). The occurrence of the dots upon the coloured borders is quite exceptional, but then in this larva the former become the centre of patches of the same colour as the latter, although it is noteworthy that the patches are always purple, while the upper parts of the stripes become blue. It may be that the patches point to the origin of the borders upon which they persist; but, if so, such a development of this marking is most unusual, for in other forms the borders arise first by the absence of dots, secondly by the darkening of the ground colour, and finally by its replacement by a different tint. On the other parts of the larva the shagreen dots are more normal when they are present. Thus
upon the underside there are extremely minute hairs borne by exceedingly small traces of dots, exactly as in *S. ligustri* in the last stage. Again, the caudal horn is well known to be rough, and this condition is caused by the persistence of true shagreen dots upon it, many of which bear simple hairs.

Comparing the larva with that of *S. ligustri* in the same stage, *A. atropos* exhibits phyletically older features in the persistence of normal shagreen dots upon the horn, and of (much modified) dots upon the dorsal surface, and in the persistence of the "eighth stripe" (border). On the other hand, it is phyletically younger in the extreme development of the coloured borders, and probably in the fading away of the oblique stripes.

This last point adds another stage to the long history of the oblique stripes and their borders in *Sphingidae*. The history may be recapitulated as follows:

1. A hairy larva with greenish or yellowish ground colour; the hairs springing from light (white or yellow) tubercles.
2. The hairs become inconspicuous and the tubercles more distinct.
3. The tubercles become especially enlarged and approximated along the lines of the oblique stripes, thus forming the first indications of this system of marking.
4. The light colour spreads from the base of each tubercle, and the adjacent areas coalesce, forming a continuous stripe.
5. The tubercles disappear from the ground colour along the anterior edge of each stripe, thus producing a relatively dark border.
6. The border is rendered more distinct by a deepening in the tint of the ground colour.
7. The border becomes a conspicuous feature in the oblique line system, gaining a distinct and generally bright tint, a modification or replacement of the ground colour.
8. The original oblique stripes fade away until they are hardly recognisable, while the bright borders become highly developed, and almost entirely represent the whole system.
This history can be traced up to the end of the seventh stage in the ontogeny of *S. ligustri*, up to the end of the sixth stage in that of *Smerinthus ocellatus*, while *A. atropos* supplies the eighth stage. These stages are arranged successively, but there is no doubt that considerable overlap occurs, and in some ontogenies the stages may follow one another in a different order. Thus stage seven may sometimes succeed the fourth stage, and the second and third stages may take place together. The succession described above is, however, probably true for the phylogeny, although there may be exceptions or omissions in its short recapitulation in certain ontogenies. It is undoubtedly true that the oblique stripes appeared before their borders and in the manner indicated above; and that the borders appeared later, although perhaps earlier than the complete fusion of the areas to form continuous stripes. The ontogenetic evidence upon which the first seven stages have been reconstructed will be found in my two papers in the *Trans. Ent. Soc. of Lond.*, Part I., April, 1884, p. 27; and Part II., August, 1885, p. 281, together with a complete description of the larva of *S. ligustri* in all stages, which may be referred to in confirmation of the comparison instituted above between this larva and that of *A. atropos*.

Since the above was written Lord Walsingham has kindly allowed me to examine and describe two beautiful specimens of the brown variety of this larva from his collection. I was greatly surprised to find that the markings as well as the colours are entirely different from those of the yellow variety. The ground colour of the thoracic segments is light brownish or of a dirty white, and resembles the other variety in being much lighter than that of the rest of the larva, but it is entirely different in the possession of distinct and very dark markings. There is a broad median dorsal band of a very dark brown colour, which is present upon the second and third thoracic segments, and broadens considerably towards the intersegmental furrows, and especially towards that which separates these two segments from each other. Except on the anterior and posterior boundaries of the prothorax the band is replaced on this segment by a rather lighter and much broader patch of a brownish colour with dark spots
upon it. The whole dorsal band upon the three thoracic segments is traversed by a narrow median light-coloured line lying over the dorsal vessel. The sides of the thoracic segments are also dark-coloured, the tint spreading further upwards at the intervening furrows, while in the prothorax the dark lateral tint extends until it is continuous with that of the dorsal patch, so that there is very little of the light ground colour on this segment. This small amount of light ground colour is chiefly on the dorsal aspect of the segment, anterior and posterior to the brown patch, and even over these limited areas it is interrupted by the traces of the continuation of the dark band of the two segments behind. There is also a small lightish patch on the sides of the prothorax in one of the specimens, but even this is clouded with darker markings. Hence nothing could be more unlike than the arrangement of markings on the thoracic segments of these two varieties.

The face is also striped with two additional dark lines, of which those on the same side are continuous inferiorly and superiorly, but do not meet those of the opposite side in a Λ. These are parallel with the margins of the dark borders of the head also present in the yellow variety. In one specimen the nearest line has fused with the dark margin, except for a short section of its length superiority. The elypeüs is also bordered by a fine dark line. Again, the dark borders to the oblique stripes pass backwards, and meet in a V at a point considerably in front of the posterior boundary of each abdominal segment from the first to the seventh inclusive, while in the other variety the borders meet at the boundaries themselves. Posterior to the apex, in the brown variety, the dark borders again diverge in a smaller V, with its apex directed forwards, and thus making an X with the other V. Each side of the smaller V is prolonged backwards to the intersegmental furrow, where it meets with the oblique border behind that with which it is continuous anteriorly. The series of seven X-like marks which are thus seen upon the first seven abdominal segments is exceedingly characteristic, and quite unlike the Vs of the yellow variety. The “eighth border” is quite distinct, and forms the first X, although it is smaller than the others, while the seventh of these markings is the least distinct.
Although there seems to be some difference between the two sections of the oblique borders (being dark brown above and a lighter reddish brown below), there is not so sharp a demarcation as in the other variety. There is apparently no trace of the oblique stripes, although there is the linear light coloured posterior edge to the inferior anterior section of each border (as in the yellow variety).

In one of the specimens I was very interested to find a distinct trace of the subdorsal line, which is present (as in the adult whitish varieties of Smerinthus ocellatus larvae) as the demarcation between a lighter dorsal and a darker lateral tint, the junction being itself slightly lighter than either. Traces of the line were also visible on the thoracic segments, and the whole marking was especially well seen on looking at the larva from a little distance so as to obtain a general impression.

Again, the traces of the shagreen dots on the dorsal surface are far less modified than in the other variety, and are accompanied by less altered dots, which are similar to those upon the lateral and ventral surfaces. Those which are modified are larger than the others and have small circular reddish patches round their centres, which are marked by the scar of the bristle which formerly existed in this position. Below the oblique borders traces of shagreen dots are very abundant and distinct, being especially crowded upon the dark ventral surface. Each is a light-coloured circular patch, which is not raised above the larval surface. Within each patch is the dark scar, with a minute central white point, which appears to be sometimes developed into the rudiment of a bristle. The prominence of these lower patches affords a strong contrast to their condition in the yellow larvae.

Hence this strong contrast between the markings of the two varieties in a dimorphic species (quite apart from their difference in colour) seems to suggest that they may have originally belonged to different stages in the ontogeny. Whatever be the interpretation, it is quite clear that the differences are of a much more strongly marked kind than those usually expressed by the term “dimorphism” as applied to larvae.

I should be extremely glad to be able to work out the ontogeny of the larva of *A. atropos*, but unfortunately
fertile ova must be exceedingly difficult to get, and, I believe, have never yet been obtained.

In the hope of being able to examine the earlier stages of this larva at some future time, I will now give a brief description of what I believe will be the main results of such an investigation. In the early stages the caudal horn will possess a forked apex, with a bristle forming the termination of each prong. It is probable that the horn may be movable like that of *S. ligustri*. The larva in the first stage will prove to be hairy, and will almost certainly possess two dorsal and two lateral rows of longer hairs, and the caudal horn will bear both kinds of hairs; later the larva will be shagreened, the dots being the tubercles at the bases of the hairs, and in all probability the rows of longer hairs will give rise to larger dots, which will have a special relation to the markings as in the early stages of *S. ligustri* and *Smerinthus* larvae (see Trans. Ent. Soc. of Lond., Part II., August, 1885, p. 281). The larva will be shagreened until the end of the penultimate stage (probably the fourth), and probably the special modification of the dots in the dorsal region only takes place in the last stage. The first markings are probably like those of the young *S. ligustri*;—a subdorsal and a line parallel to and above the latter upon the thoracic segments, seven oblique stripes, and an “eighth stripe.” All these markings will be light-coloured (probably white, like those of *S. ligustri*); later the subdorsal will fade, and the stripes become prominent (the reverse conditions obtaining primarily), but the anterior part of the subdorsal may be traceable in the third and perhaps the beginning of the fourth or even fifth stages. Since writing this I have detected traces of the subdorsal in an adult brown variety (see above). It is probable that the extreme prominence of the coloured borders and the fading away of the stripes is a very late feature (perhaps only in the last stage), while the borders were at first represented by darkened ground colour. I am inclined to think that the borders arose in the normal way, as a modification of this darkened ground colour probably in the third stage, and that the accessory aid afforded them by the presence of coloured patches developed from the bases of shagreen dots is a late feature, and has nothing to do with their origin. But at the same time the final
settlement of this question would be one of the most interesting results of the investigation of the ontogeny. The ground colour is known to be greener in the penultimate stage, while it is not uncommon to find individuals in the last stage with a green ground colour (the common form being, of course, yellow. See the English translation of Weismann’s ‘Essay,’ p. 323). It seems certain therefore that the ground colour is green in all stages except the last; the newly-hatched larva being probably of a transparent yellowish tint until after its first meal, while the head may be greener, as in the young S. ligustri, which has just emerged from the egg. The well-marked dimorphism probably arises in the penultimate or in the last stage (in Charocampa elpenor it takes place in the last stage, occasionally in the fourth; in C. porcellus it appears regularly in the fourth stage, occasionally in the third. See translation of Weismann’s ‘Essay,’ pp. 181 and 186).

Since writing the above I am informed by Professor Moseley that he has found the larva before its last stage, and that he distinctly remembers that it was shagreened all over like a Smerinthus larva.

4. The relation of the colours of the larva of Sphinx ligustri to those of its food-plants. — On August 11th, 1885, I found two full-grown larvae of this species upon a tree of the wild guelder-rose upon an island in the River Cherwell, near Oxford. As the food-plant was new to me, I carefully observed the larval colours which were produced after feeding upon it. The ground colour was bright green, like that caused by privet, but the coloured borders to the stripes were of a very bluish lilac, and rather duller than in the larvae found upon the latter plant.

On August 1st, 1885, I found a larva of S. ligustri upon privet in the Oxford University Parks; it was at the beginning of the last stage, and possessed the bright colours which follow the use of this food-plant. I fed the larva upon lilac during the last stage (August 1st—12th), and there was a gradually increasing change towards the duller colours which are always caused by lilac, which, however, were not ultimately produced to such an extent as is seen after feeding the larvae upon this food-plant for their whole life.
5. A new point in the terrifying attitude of the larva of Cilexocampa elpenor. — During the past summer (1885) I obtained two nearly fully-grown larvae of *C. elpenor*, upon which the following observations were made. Both were found near Oxford, one from the Isis and the other from the Cherwell. I found the latter in a bed of *Epilobium hirsutum* (the usual food-plant), in which a few plants of *Lythrum purpureum* were growing. My wife pointed out to me that, although the larva was clinging to a stem of an *Epilobium*, it was actually engaged in eating a leaf of the *Lythrum*. I afterwards offered it both food-plants, and found that the *Lythrum* was eaten quite as readily as the *Epilobium*. I have not seen any instance recorded of the larva eating this food-plant, and I have certainly never noticed it before.

The ontogeny of this larva has been very carefully and completely worked out by Weismann (see English translation by Prof. R. Meldola). Weismann describes the origin of the large eye-like spots on the first and second abdominal segments, and their use in the later stages as terrifying markings. It is especially noteworthy that the terrifying appearance due to these markings would be effective against an enemy approaching from the side or from above, but would produce very little, if any, effect upon an enemy advancing from the front. At the same time it seemed to me that the larva is more sensitive to very slight tactile impressions on its head than elsewhere, and most readily takes up the terrifying attitude on such a stimulus. In other words, the larva readily meets the approach of an enemy in front by taking up a position which defends it from enemies coming from other directions, but which (as far as the well-known eye-spots are concerned) is comparatively unavailing for the actual necessity of the case. However, on looking at the larva from the front, when it assumed the terrifying attitude, I saw at once that it is well protected from this point of view by another pair of eye-like marks, which appear in the defensive attitude only, upon the third thoracic segment. This new eye-spot is produced by modifications in the remains of the light subdorsal line, which persists upon the thoracic segments, and is bordered above and below with a dark margin. Weismann alludes to this line, and, in the case of *C. porcellus* (p. 187), says of the
dark markings (with a median dark line in this species),
"The whole forming a marking which perhaps makes
the caterpillar appear still more alarming to its foes."
In the figure of the larva of *C. elpenor* in the last stage
(fig. 23, pl. iv., of the English translation), Weismann
shows that the black line which forms the lower margin
of the subdorsal is widened into a black patch upon the
third thoracic segment, and curves upwards round the
posterior extremity of the white subdorsal line to meet
the upper dark margin. The figure does not indicate
the undoubted fact that this patch which surrounds the
end of the white line is much blacker than the rest of
the dark margin. The upper margin is also darker
upon this segment, although the difference is less marked
than in the case of the lower margin. The "mirror"
of the eye is formed by the posterior end of the white
subdorsal; the "ground area" by the black patch which
encircles the former in every direction except anteriorly;
there is no trace of a "nucleus," as in the well-known
eyes on the first and second abdominal segments. When
the larva assumes the terrifying attitude, and the head
and thoracic segments are telescoped into the first
abdominal segment, the swollen anterior end of the body
is abruptly truncated, and, when looked at from the
front, appears as a flattish circular face marked by deep
concentric furrows, which are the lines between the
segments, and between the annuli which are upon the
latter. The result of these deep furrows and of the
shortening of the subdorsal is to render the latter and
its dark margins inconspicuous, except in the posterior
part of their length, where they become broadened,
shortened, and rendered very prominent as two eye-like
marks, one on each side of the median line and towards
the upper margin of the face-like extremity of the larva.
Their position is therefore exactly that which better than
any other produces the effect of eyes upon an enemy
approaching from the front. Although the white
"mirror" is not completely encircled by the "ground
area," no impression of imperfection is produced, and
the effect of the furrows and contraction is such as not
to suggest the continuity of the eye-like parts of the
subdorsal and its margins with the rest of these markings
on the anterior thoracic segments. My friend Professor
Meldola was staying with me at the time when I was
keeping one of these larvae, and he was quite convinced that the true significance of these markings upon the third thoracic segment was that which has been described above. These two eye-like marks differ from the others in that they only possess significance in the terrifying attitude, being quite unrecognisable as eyes in any other position. This must certainly add to the effect of the suddenly assumed protective attitude, when, in addition to the changed contour of the larva and the prominence given to the large eye-spots, with equal suddenness new terrifying marks seem, as it were, to spring into existence.

6. The terrifying attitude of the larva of Dicranura vinula.—I think there is no doubt that the anterior view of this larva possesses exactly the same significance as that of the Checracampa larva, but in the former case the effect is less elaborately produced, and is not intensified by the accessory and important eye-like marks on the back. The large head of the larva of D. vinula is withdrawn during rest into the first thoracic segment, so that the latter forms a broad margin round the head, which is coloured differently from the rest of the larval surface, being bright red. Thus a very large flat face appears to extend to the outer edge of the red margin, and superiorly upon this margin, in an appropriate position, are two large intensely black spots, which produce all the effect of eyes. The duct of the gland which secretes the acid defensive fluid opens in a horizontal slit on the red margin below the true head, and is thus placed in such a position that its contents are ejected with an anterior direction. Disturbance causes the larva to withdraw its head still further and to inflate the red margin, especially in the region of the gland duct, and at the same time the head is always turned in the direction of the disturbance. Thus the fluid is thrown towards the cause of the irritation, and the terrifying appearance of the larval full face is also brought to bear upon it. These movements of the head take place before and after the ejection of the fluid, and in those cases when it is not ejected at all. Such terrifying attitudes and markings as these of course apply, and probably only apply, to vertebrate enemies (birds), and the effects produced approximate somewhat to an intensely exaggerated caricature of a sort of
generalised vertebrate appearance, probably of the serpent type (at any rate in Charocampa), such as would be most efficacious in the case of birds. Mr. H. W. Bates gives an instance, also quoted by Mr. A. R. Wallace (see Linn. Soc. Trans., xxiii., 1862, p. 509, for Mr. Bates' paper) of a South American larva which startled him and every one to whom he showed it by its strong resemblance to a venomous serpent, and it is likely that the terrifying appearance of our own larvae in temperate latitudes first arose in the tropics, where the imitated cause of alarm to the enemies of the larva is real and obvious. And it is probable that the success of the same method in countries where the reptilian fauna cannot be said to constitute a source of alarm, is due to inherited memories of a tropical life which live on as that instinctive fear of anything snake-like which is so commonly exhibited by the higher land vertebrates, including ourselves. At the same time the fear is less extravagant than that manifested by the few vertebrates (frogs) that still suffer from the attacks of an ancestral enemy, and to whom the cause of alarm is still a reality.

7. The fluid ejected by the larva of Dicranura vinula.—This defensive fluid, as is well known, is ejected from a transversely placed aperture on the ventral surface of the prothorax immediately below the head. I have long known that it is powerfully acid, affecting litmus-paper in the most marked manner. During the past summer (1885) I found that the fluid causes violent effervescence when allowed to fall upon sodium bicarbonate. With the kind assistance of Prof. Wyndham R. Dunstan I was enabled to prove (by the reduction of silver nitrate) that the fluid is formic acid. The smell is also quite characteristic, and affords an indication of the large proportion of acid present in the secretion. It is also an interesting fact that the freshly-made and moist cocoon of D. vinula is powerfully acid to test-paper.

In September, 1885, I found a few larvae of D. jurcila on willow near Visp, in Switzerland, and I examined them to see if they also would eject a fluid when irritated. It was at once obvious that the aperture was present in the same position as in D. vinula, but, as the larvae did not eject any fluid, I applied gentle pressure (for this is often necessary in the case of D. vinula). To my great
surprise a complex form of "gland" was instantly everted through the aperture, consisting of six diverging processes of a light green colour, divided into two groups of three each. It will be very interesting to investigate the young stages of _D. vinula_ in the light of this observation, for it will then be possible to decide whether the apparatus belonging to the latter is derived from an eversible gland which has ceased to be eversible and has fallen back into the condition with which all such structures must have begun—a simple secretory involution discharging its odoriferous or irritant contents; or whether the arrangement in _D. vinula_ is truly ancestral, while that of _D. furcula_ represents a further advance.

Since the above was written, I have been informed by Lord Walsingham that a simple prothoracic gland is present in the larva of _Melitaea artemis_, and that the structure is everted, and hence becomes very prominent in blown larvae. Lord Walsingham considered that the secretion was of use to the larva in moistening its food. On looking through the collection of preserved larvae we also noticed other instances of the gland (e.g., in the genus _Catocala_, &c.), so that it seems probable that the structure will be found commonly in larvae. Hence it appears that the defensive secretion and modified gland of the genus _Dicranura_ is a specialisation of an organ which is probably used for a very different purpose by many other larvae. Although the gland of _D. vinula_ seems to be intermediate between that of _D. furcula_ and of other larvae, I think it probable that the ontogeny of the former larva will show that its gland at one time possessed all the complexity observed in that of _D. furcula._

8. THE APPARENT FAILURE OF THE EXTREME PROTECTION OF MANY LARVAE.—The larva of _Dicranura vinula_ is extremely well protected from insect-eating vertebrates, and from hymenopterous and dipterous parasites. For the former it has a terrifying attitude, and ejects a very strongly smelling fluid; for the latter it possesses the flagella, and probably uses the fluid also. And yet the larva is very subject to attacks of the latter kind, far more so than many other larvae which are less protected, and Weismann has shown that it is freely eaten by lizards. It seems likely that the larva has been subject to attack from a period anterior to the acquirement of the means
of defence, and that the latter have saved the larva from extermination. A relation grows up between a larva and its parasites similar to that between plants and insects (well exemplified by Mr. A. R. Wallace in his 'Essays on Natural Selection,' 1875, p. 271, &c.), although the benefits are rather one-sided in the former case. Any improvement in the means of larval defence may be met by greater ingenuity or boldness in the attack, and so it comes about that many of the best protected larvae are often those which die in the largest numbers from the attacks of insect-parasites. The exceptional standard of defence was only attained by an exceptional need. Under such circumstances a very sudden advance in the means of defence might cause the entire extermination of the parasitic organism, and if this were achieved it is likely that the special defensive measures would be slowly relaxed. It is thus possible to imagine the conditions under which a larva would preserve a functionless rudiment of a formerly efficient flagellate organ, such as the caudal horn of Sphingidæ has been shown with a great degree of probability to be by Professor Meldola (Appendix to his translation of Weismann's Essay, "On the markings of Caterpillars," p. 527), and myself (Trans. Ent. Soc. Lond., 1885, Part II., August, p. 302, et seq.). But the withdrawal of the means of defence at once leaves the way open for renewed attacks from other parasites, and may render the larva very helpless. In fact the comparative immunity of the large, helpless, and often imperfectly concealed larva of Sphingidæ is often a source of wonder to me, and it would seem that the only explanation can be that the peculiar parasitic enemies are not flourishing and abundant, being themselves overweighted in the struggle with organisms which prey upon them. It would be extremely interesting to compare the proportions which succumb to the attacks of insect-parasites out of large numbers of many species of larvae protected in various ways.

9. An eversible "gland" in the larva of Orgyia pudibunda.—I do not know whether this structure has been previously noticed; it is not mentioned in the well-known text-books. The single gland to which I refer is situated in the median dorsal line of the seventh abdo-
minal segment, and it is everted when the larva rolls up on being disturbed. The larval surface close to the lips of the aperture seems to be extremely sensitive to tactile impressions.

10. The production of a twig-like appearance in the larva of Hemithea thymiaria.—There are many ways in which the twig-like appearance of Geometer larvae is perfected. In the majority the forward-bent notched head gives a very twig-like termination to the body, but in Selénia illunaria (see my last paper in Trans. Ent. Soc. Lond., 1885, Part II., August, p. 309, et seq., and fig. 18, Pl. VII.) the head is unnotched and bent backwards, producing, with the third pair of thoracic legs placed upon a projecting ridge, a very unlarva-like effect, but one which is easily mistaken for some eccentricity of vegetal growth. On the other hand, the larva of H. thymiaria produces an exceedingly perfect resemblance to a twig by a further elaboration of the more normal attitude. The head is notched and bent forward so that the notches become terminal, but the prothorax also possesses a pair of dorsal tubercles, and, as this segment is rotated forwards and downwards in the vertical plane, in the protective attitude, the tubercles become also terminal, and are about equal in size to those formed on the head by the notched crown. Thus there is produced an exceedingly regular quadrifid termination to the anterior end of the body, constituting the most perfect of all the close approximations to vegetable structures which I have yet seen among Geometer larvae.

11. The darkening of the hairs of the larva of Acronycta leporina before pupation.—During the past summer (1885) I noticed that the long white hairs of this larva become dark, as well as its body, before pupation, when the organism is wandering about to find a place in which to burrow. I then remembered that I had often previously observed the same thing with this larva obtained plentifully upon birch and alder in the New Forest. As the larva wanders over the bark, and subsequently burrows in it, the dark colour is of great protective use, and is another instance of the utilisation of the incidental changes of colour before pupation.
Previously, during larval life, the organism rests motionless in a curved position on the under side of the leaf, and the body is almost completely hidden by the long white hairs, and the effect is that of a convex mass of white silk spun on to the under side of the leaf, resembling, in fact, a cocoon, or more probably the convex white egg-case spun by a spider. But such an appearance becomes very much the reverse of protective as soon as the larva moves, especially upon a dark background, and the darkening of the larval body alone would be useless, because the hairs form its most conspicuous feature.

12. The method by which the imagines of the Chloephoridae escape from their cocoons. — The various methods by which imagines escape from hard or tough cocoons would be a most interesting subject of research. In many instances there may be valvular apertures which have hitherto escaped notice, as in the Chloephoridae. The well-known boat-shaped cocoons of the three English species are very compact and tough, one end being rounded and the other terminating in a vertical ridge, which exactly resembles the bow of a boat, but is not, like the latter, continued into a keel. This sharp ridge is the anterior end of the cocoon, and is in reality a valvular opening with the two lips in contact, and fitting so accurately that they give the impression of a single edge, even upon the closest examination. If, however, the cocoon be pressed in the direction of the long axis of the ridge the lips at once separate, and the anterior end of the chrysalis within can be distinctly seen without in any way injuring the cocoon. Such a valve would easily yield to pressure from within, but is practically unassailable from the outside, because, firstly, it is entirely invisible, and secondly, if discovered, it could not be opened by the enemies of the insect. It is very interesting to find such a means of egress from so compact a cocoon, reminding one of the valvular opening to that of S. carpini, but it must be considered as superior to the latter in its perfectly deceptive appearance in addition to at least equal strength. It is well known that the much harder cocoon of D. vinula is in some way pierced by the moth, and it seems to have no weak spot through
which emergence takes place. I believe that other observers will agree with me in the observation (I speak from memory of many years ago) that the moth softens the cocoon before emergence by the chemical action of some fluid. If so, it will be extremely interesting to investigate the nature of the fluid, and to ascertain the part of the body from which it is poured out. As the moth emerges head first, it would seem that the fluid must come from the mouth, but it would be very curious for the fluid to be poured out through the spiral maxillae, especially in this species, where they are very imperfectly developed.

13. Notes upon the larva of Paniscus cephalotes, parasitic upon the larva of Dicranuka vinula.—Twice during the past summer (1885) I have noticed black pedunculated eggs upon the larva of D. vinula captured in the last stage. In one of the instances I allowed the eggs to hatch, and watched the growth of the parasitic larvae, taking the following notes. Through the kindness of Mr. Fitch I was enabled to ascertain that the larvae were those of Paniscus cephalotes, which commonly attacks this lepidopterous larva. Mr. Fitch also gave me a number of references to the literature of the subject, which were of great assistance. I had previously ascertained that DeGeer had given a very accurate and complete account of the parasite more than a hundred years ago. Mr. Fitch has given an account of the life-history with figures (see ‘Entomologist,’ xvii., p. 124, and plate), and Newport has given a long account of Paniscus testaceus, parasitic upon Hadena pisi, with several figures (Linn. Soc. Trans., pp. 71—77, 1852, pl. viii., figs. 13—19). The chief points of interest have been previously recorded, but there remain a few which demand notice. The larva I observed had fourteen eggs firmly attached to its skin. Of these two were implanted in the furrow between the first and second abdominal segments, seven between the second and third, and five between the third and fourth. (The arrangement was very similar in the other larva from which I removed the eggs.) A few were attached along the dorsal line in a nearly median position, but by far the larger number were affixed close to the spiracular level, some being above and some below this
horizon. The number of ova seems to be smaller upon smaller larvae. Thus, in 'Entomologist,' xvi., p. 69, only two eggs are described as occurring upon the larva of *Acronycta psi*: Newport describes eight eggs of *P. testaceus* upon *H. pisi*. It is probable that an excess of ova are generally laid, for a small proportion do not develop, and the way in which they are attached in small groups ensures that of those that do develop a large proportion of the larvae are so crowded by the others that they die at an early stage, as has been also previously observed. If too large a number were laid and all developed it is obvious that none could arrive at maturity, but this is obviated in the manner described above, and it is partly brought about by the limited space on the circumference of the larva attacked. This space of course varies with the size of the latter, and it is more quickly filled in the rapid development of the parasites upon small than upon large larva, so that, if they are too numerous, crowding ensues earlier, and with more fatal results in the former than in the latter case. Thus the smaller surface may compensate for the less amount of food, and may itself ensure that the parasites reach maturity.

The following figures support the conclusions advanced above, that the ichneumon lays a smaller number of eggs on small larvæ than it lays upon large ones, and yet lays more than can develop in nearly all cases, the eggs being laid in such a way that crowding results if all, or nearly all, develop; so that the chance of the eggs being sterile is obviated on the one hand, and of the parasitic larvæ dying immature on the other. On *D. vinula* I found fourteen eggs, of which seven became mature, and an equal number of eggs, which I did not allow to develop, on another larva of the same species. DeGeer speaks of "more than eight or ten eggs" on the same species of larva, and describes nine ichneumons emerging in another case, and six larvæ becoming mature in another, while Geelart speaks of five. Of Newport's eight eggs on *H. pisi* three became mature (but died), while in several cocoons of this larva he found two to three cocoons of the parasite, and four in one instance, when the parasites were dwarfed. In many of the above instances the writers show that the larvæ developed in groups, thus tending towards overcrowding.
The free anterior pointed end of the ovum is marked off from the rest by a distinct line, and after development begins it remains attached to the young larva as a black and shining head-shield. Development began on August 11th, the very day on which the host ceased feeding and darkened. On the next day the host spun a cocoon, which was destroyed in order to watch the development (subsequent attempts to spin being also frustrated). There seems to be some significance in the development of the parasites only beginning when the larva had ceased feeding, for it is likely that a much earlier development would irritate the larva and prevent it from attaining the normal size. A somewhat earlier development has been previously recorded (DeGeer, &c.). I have never seen the eggs attached to the larva before the last stage, and I have not heard of any such instance, although DeGeer implies that this may be the case when he states that the eggs are so firmly implanted that the larva cannot get rid of them by changing its skin. (This statement needs confirmation.) There is another advantage gained by the habit of laying eggs on the large larva in the last stage, for they are then far less active, and have often lost the means of defence especially directed towards warding off the attacks of ichneumons, the power of protruding the pink flagella. It seems that the ichneumons have taken advantage of this weakness, and it would be extremely interesting to observe the varying success of attempts made upon many individual larva possessing the defensive power in different degrees, or even to observe if those upon which the eggs are found have always lost the power. It is very likely that such observations would show that natural selection sets with a strong current towards the survival and ultimate predominance of those individuals which retain the power; for the ichneumons are abundant, and are the chief enemies of the larva, while those individuals which are detected and fail to drive off their hymenopterous foes are doomed, for they can do nothing in the way of self-protection when the eggs are once laid.

The fixation of the larva by both extremities and its early growth have been described especially by Newport. It will be very interesting to make sections of the larval skin with the eggs attached to show the method of fixation (which is described by DeGeer as due to the
expansion of the end of the peduncle into two knobs arranged one after the other), and also after the development of the parasite to show the way in which its posterior end is at first so firmly attached to the egg-shell, and subsequently to the old skins which have been shed and shuffled down to the posterior end of the body. I have not yet found any record of the black shield which is part of the egg-shell covering the head of the parasitic larva (except a doubtful reference to part of one of DeGeer's figures). Its relation to the latter should also be disclosed by sections. As the white larvæ increase in size they become green, from the blood of their host, which fills the digestive tract, and shows through the transparent skin and subcuticular tissues. On this point DeGeer accurately states that the green stripe down the back and green patches on the sides are due to internal substances showing through the transparent skin.

On August 12th seven had shown signs of development, but to a very variable extent. By August 18th two had been already crowded to death, and two more were evidently dwarfed and unable to develop. When once a larva begins to slacken in its rate of growth, as a consequence of crowding, it is sure to die, probably because of the pressure on its body exerted by the increasing size of its neighbours. It is very probable that at first the motive force which drives the blood from the body of the host into the digestive tract of the parasite is entirely supplied by the contracted body walls of the former, which keep the blood under considerable pressure. If this be the case, it is easy to understand how growth must be at once arrested by external pressure on the body of the parasite, which lessens or may even equalise the pressures in its body and in that of the host. Or, if a pumping apparatus is present in the parasite, the same facts would tend to produce the same results, for in the over-crowded larvæ the apparatus would have to pump from a reservoir under high pressure into another also under considerable pressure, instead of into one with much less pressure as in the uncrowded larvæ. That the cause of death in such cases is due to simple physical laws is seen in the fact that the middle larva, out of three side by side, is the one which always perishes, being crowded from both sides; while a larva which develops later in the midst of a group of larger
ones invariably dies when its increasing size brings it into contact with the sides of the more developed larva. Such facts are more consistent with the view that the motive force is at any rate chiefly supplied by the host.

The largest larva were 3.5 mm. long (but really longer because of their curved position), and the contents of the digestive tract were dark green. Minute white dots were very obvious attached to the ramifications of the tracheal system. They are probably fat-cells, and have been described and figured by Newport (in the paper mentioned above). The active contractions of the digestive tract, mentioned by Newport, were very obvious. After the first change of skin the black head-shield is lost, and the head of subsequent stages is white and transparent. Newport accurately describes the mode in which the successive skins are shuffled down to the posterior end of the body. DeGeer certainly recognises the old larval skin attached to the egg-shell upon the shrunken remains of D. vinula, but he does not see that it is made up of more than one skin. The head is somewhat easily detached from the body of the host in the large parasites (3.5 mm. long), but the hold is soon tightly renewed. DeGeer has made a similar observation. After detaching the head a small black scar is seen at the point where it was fixed, but so minute that no loss of fluid takes place through it. The presence of several such scars close together show that the larva sometimes voluntarily vary the point of attack.

By August 20th the largest larva were quite 5 mm. long, allowing for their curved position, and they had changed their skins for the second time. The larva of D. vinula was much enfeebled and flaccid, but still alive. Only seven of the parasites now remained alive. On the evening of the 21st the most advanced larva changed its skin again, and gained a very different appearance, becoming a dull white instead of glistening, and with the intersegmental furrows well marked instead of the previous tense and swollen condition. It also possessed the row of lateral lobes spoken of by many authors. On touching the larva it fell off and rolled about with active but aimless contractions. In the natural state they would be enclosed in the same cocoon with the larva, and in such a narrow space the movements could not take the parasites away from their food. On the 22nd
four more became free, and the two last were also detached upon the 23rd, upon which date the larva was dead and collapsed, having thus lasted through twelve days of attack from the parasites. Newport describes the change in appearance and detachment of the larve of *P. testaceus*, but states that they then cease to feed. This was far from being the case with *P. cephalotes*, for the seven larvae vigorously attacked the dead body, forcing their heads into it to such an extent as to cause pits in the integument. In this way they increased largely in size, and completely finished the larva, except for the dried and empty integument. I cannot find an account of this feeding after detachment in previous descriptions. It would be interesting in the future to supply such larve with another host, and thus to see if their size is modifiable to any great extent by renewing the supply of food, as one might expect from Newport's observation of their small size when too many developed. The parasites grew very rapidly between the time when they became free and August 28th, when they began to spin. Thus the larve fed during a period of from fourteen to seventeen days. In the natural condition within the cocoon of *D. cinula* the parasites spin oval black cocoons so closely pressed together as to render the sides polyhedral. My larve were in a large chip-box, and it seems likely that all their silk was exhausted in making a scaffolding upon which to construct their cocoons. As it was, when they became inactive and could spin no more, the space was very far from being filled up, and all seven larve were left lying close together (in contact) at the bottom of the concave upper surface of the silk which thickly lined the lower side of the box. The top of the box and the sides above the thick concave pad, were only covered with a thin layer of silk (especially thin on the sides). The seven larve still remain alive, but without further indications of change, crowded together at the bottom of a common nest (February 20th, 1886). The silk when first spun was white, but it subsequently darkened, becoming finally black. DeGeer also describes the scaffolding, and points out that it encloses the oval cocoons in a common web. Newport says that he found that his parasitic larve had recently pupated in April, while the perfect insects emerged in May, a week later than the moths of *D. cinula*, which had been subject to the same conditions of temperature. This accords with
what must be a common observation, that ichneumons and dipterous parasites often emerge at the time when we are expecting the lepidopterous imagos. Under such circumstances the parasitic insects must live for a long time before they can deposit their eggs, although it is very likely that many of them do so when their victims are comparatively young, but it is unlikely that such is the case with this species.

I am now able (May 25th) to add to the proof-sheets of the paper an account of the time of pupation in this species. In the first week of May (1886) the seven larvae began to change in shape owing to the development of the pupa beneath the skin, and the outlines of abdomen and thorax were suggested. At this time each larva expelled from the anus a relatively large amount of faeces in the form of a long black nearly solid cord, which was dilated at intervals. Newport states that the anus does not exist when the larva is attached to the egg-shell, but that it, together with the posterior section of the intestine, is formed as soon as the larva becomes free. I did not notice the discharge of faeces at any time before May, and I do not think that it can have taken place, for the larvae were never moved from the chip-box in which they fed upon the D. vinula, and afterwards spun their common cocoon. If any faeces were discharged they must have been spun up in the silk, but no traces of them can be discovered. It thus appears most probable that faeces are only discharged once in the whole period of larval life extending over nine months.

As the pupae developed the brownish eyes became visible beneath the larval skin. Pupation took place on the following dates:—May 17th, one; May 21st, one; May 23rd, one; May 24th, two; May 25th, one. The seventh larva was hardened in a solution of corrosive sublimate for histological investigation.

14. Additional note on the distribution of derived plant-pigments in certain larvae.—In a paper in the Proc. Roy. Soc. (No. 237, 1885, p. 269), I gave an account of the way in which altered plant-pigments take part in larval colouring. The evidence was chiefly derived from an examination of the strongly-coloured blood of many pupae; but some larvae were also investigated, and it was found that the green ground colour of
many species (especially *Noctua*) was due to the derived green pigments dissolved in the blood. At the same time it was argued that in other species (green *Sphingidae*, &c.) the pigments passed from the blood into the hypodermis cells, and so coloured the larva. This latter conclusion seemed certain, although it had not been experimentally investigated, because I was working at the subject at a time of year when I could only obtain *Noctua* larvae. I was therefore uncertain whether the colour of the blood assisted in producing any of the ground colour in those larva in which the colour was also segregated in the hypodermis cells. During the past year I investigated the subject in the larva of *S. ocellatus*, and I found that the blood is only very faintly tinged with derived pigments, and that it cannot produce any effect upon the larval appearance until it has been collected in the superficial cells. It is probable that in such larvae the modified plant-pigments are slowly passing from the digestive tract to the hypodermis cells through the medium of the blood, and that the blood itself at no time contains a large quantity of pigment. Before pupation the pigments are withdrawn from the cells, and are dissolved in the (pupal) blood, which therefore possesses a concentrated solution of all the pigments that have passed through this medium during the whole of larval life, except those which have been destroyed (if any). Such conclusions render it probable that the most complete demonstration of the vegetal origin of the derived pigments will be a matter of great difficulty, for the amount that passes through the digestive tract as the result of any one meal must be very small, and probably even less could be obtained by carrying on artificial digestion outside the body of the larva. And this is likely to be the case with the larvae in which the blood itself retains all the pigments which have passed through the walls of the digestive tract, for in these larvae it is probable that only a minute quantity passes through as the result of any one meal. Furthermore, the fact that the derived pigment is associated with a proteid in the blood renders it almost certain that the processes of modification and association are the direct results of protoplasmic activity, and not the results of ferments, &c., which have themselves been formed by the latter agency. Hence it is far less likely
that artificial digestion could be successfully performed than in the case of higher animals. Nevertheless, there are certain ways in which the problem could be attacked with every prospect of success. (1). There are many larvae which eject a green fluid from the mouth, and this fluid has the same spectrum as that of the blood (in the instance examined). It is probable that such a solution might be made by artificial digestion. (2). The blood of some large larva in which the pigments passed into the hypodermis cells might be investigated at various times after a meal and after fasting, and in this way we might expect to trace corresponding fluctuations in the amount of pigment in the blood, as proved by the spectroscopic examination of equal thicknesses. (3). In the same way the pigments might be examined in newly-hatched larvae, before and also at various times after their first meal, when more extreme fluctuations might be witnessed.

I hope to pursue such a line of investigation during the present summer, and also to attempt the artificial digestion of plant-pigments.

15. On the considerable loss of weight in the pupa immediately after throwing off the larval skin.—I have previously suggested that the rapid darkening of the pupal integument, freshly exposed after throwing off the larval skin, may be partially due to oxidation (Proc. Roy. Soc., No. 297, 1885, p. 295). Believing this to be the case, I determined to weigh some pupae immediately after the change, thinking it possible that there might be some gain in weight due to the absorbed oxygen. To my astonishment I found that there was an immense loss in weight during the darkening. This does not, however, disprove the oxidation, for the loss is mainly due to evaporation, and it is therefore clear that the giving off of water is one important factor in the hardening and darkening of the fluid surface of the pupa. Thus, if the evaporation be checked, the pupa does not darken. I have placed a green undarkened pupa of Gonoptera libatrix in a beaker of water, and have exposed it to the rays of the sun for some hours, and the pupa did not darken in the least. On removing it from the water the pupa recovered and rapidly darkened. Again, I have passed up the green pupa of Smerinthus populi through water in a tube into a small
air-chamber at the top. The pupa rested upon wood, but its surface was of course wet, and the air around it was saturated with moisture. The pupa did not change in colour during the many hours it remained in the air-chamber, but darkened, though more slowly than usual, after being removed. The darkening in this species is normally very rapid and complete, producing a black roughened surface. Hence, if it be desired to examine the surface of a pupa as it is immediately after throwing off the larval skin, such an object could probably be attained by placing the quiescent and contracted larva, before pupation, in a chamber containing air saturated with moisture.

The following are the observations of loss of weight in the pupae of *Smerinthus ocellatus* made during the last summer (1885).

I. A pupa of *Smerinthus ocellatus* which had changed for some days, and of which the surface was thoroughly hard and dark, was weighed upon the following dates:

<table>
<thead>
<tr>
<th>Hour</th>
<th>Day</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.25 p.m.</td>
<td>Aug. 23, 1885</td>
<td>2.322 grams.</td>
</tr>
<tr>
<td>9.25 a.m.</td>
<td>24</td>
<td>2.320</td>
</tr>
<tr>
<td>11.25 p.m.</td>
<td>24</td>
<td>2.318</td>
</tr>
<tr>
<td>9.25 p.m.</td>
<td>25</td>
<td>2.314</td>
</tr>
<tr>
<td>10.15 a.m.</td>
<td>27</td>
<td>2.308</td>
</tr>
<tr>
<td>1.20 p.m.</td>
<td>28</td>
<td>2.305</td>
</tr>
<tr>
<td>10.47 a.m.</td>
<td>29</td>
<td>2.302</td>
</tr>
<tr>
<td>6.40 p.m.</td>
<td>30</td>
<td>2.298</td>
</tr>
<tr>
<td>4.30 p.m.</td>
<td>31</td>
<td>2.295</td>
</tr>
<tr>
<td>2.50 p.m.</td>
<td>Sept. 3</td>
<td>2.291</td>
</tr>
<tr>
<td></td>
<td>Feb. 24, 1886</td>
<td>2.064</td>
</tr>
</tbody>
</table>

The total loss in nearly 11 days (all but 4 hours 35 minutes) is 31 milligrams, on an average about 3 milligrams a day. But even here the loss is larger on the earlier days.

In the 25 weeks between Sept. 3rd 1885, and Feb. 24th, 1886, the pupa lost 227 milligrams, or 5 milligrams a week. This is an immense loss as compared with that shown in other pupae, and is certainly abnormal, and the pupa on investigation was found to be dead. The comparatively rapid loss of weight in dead pupae has been shown by Prof. Meldola (Ann. and Mag. Nat. Hist., Oct., 1873).
II. A pupa of *S. ocellatus* was first weighed very soon after pupation; in fact the larval skin was not completely shuffled off its posterior end. The pupa had only slightly browned in the median dorsal region:

<table>
<thead>
<tr>
<th>Hour</th>
<th>Day</th>
<th>Weight in grams</th>
<th>Periods of 48 min.</th>
<th>Loss in such periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.25 a.m.</td>
<td>Aug. 25, 1885</td>
<td>3.255 (with card tray)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.13</td>
<td></td>
<td>3.253</td>
<td>1</td>
<td>2 milligram</td>
</tr>
<tr>
<td>11.1</td>
<td></td>
<td>3.251</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11.49</td>
<td></td>
<td>3.249</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12.37 p.m.</td>
<td></td>
<td>3.248</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
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<td>1</td>
<td>1</td>
</tr>
<tr>
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<td>3.246</td>
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</tr>
<tr>
<td>3.1</td>
<td></td>
<td>3.245</td>
<td></td>
<td></td>
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<tr>
<td>3.49</td>
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<td></td>
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<td></td>
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<tr>
<td>4.37</td>
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<td>5.25</td>
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<tr>
<td>6.13</td>
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<td></td>
</tr>
<tr>
<td>*7.1</td>
<td></td>
<td>3.243</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7.49</td>
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<td>3.242</td>
<td>1</td>
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<tr>
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<td>1</td>
</tr>
<tr>
<td>9.25</td>
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<td>3.241</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>†10.13</td>
<td></td>
<td>3.241</td>
<td>1</td>
<td>0</td>
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<tr>
<td>11.1</td>
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<td>3.240</td>
<td>1</td>
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</tr>
<tr>
<td>12.37 a.m.</td>
<td>Aug. 26</td>
<td>3.239</td>
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</tr>
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<tr>
<td>3.49</td>
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<tr>
<td>4.37</td>
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<tr>
<td>5.25</td>
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<tr>
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<tr>
<td>7.1</td>
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<tr>
<td>7.49</td>
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<tr>
<td>8.37</td>
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</tr>
<tr>
<td>9.25 a.m.</td>
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<tr>
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</tr>
<tr>
<td>11.1</td>
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<td>11.49</td>
<td></td>
<td>3.235</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12.37 p.m.</td>
<td></td>
<td>3.235</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1.25</td>
<td></td>
<td>3.235</td>
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<td>0</td>
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<tr>
<td>2.13</td>
<td></td>
<td>3.234</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

*The wing-cases are darkened all over thoroughly, though not completely.
†The incomplete darkening is now chiefly confined to the rings between the abdominal segments.
lepidopterous larvae and pupae.

<table>
<thead>
<tr>
<th>Hour.</th>
<th>Day.</th>
<th>Weight in grams.</th>
<th>Periods of 18 min.</th>
<th>Loss in such periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.49 p.m.</td>
<td>Aug. 26</td>
<td>................. (with card tray)</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>4.37</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.25</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.18</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.49</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.37</td>
<td></td>
<td>.................</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.25</td>
<td></td>
<td>3.231</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hour.</th>
<th>Day.</th>
<th>Weight in grams.</th>
<th>Periods of 18 min.</th>
<th>Loss in such periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.43 a.m.</td>
<td>Aug. 27</td>
<td>3.228 (with card tray)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.12 p.m.</td>
<td></td>
<td>3.227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.35</td>
<td>Aug. 28</td>
<td>3.223</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.40 a.m.</td>
<td>29</td>
<td>3.216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.35 p.m.</td>
<td>30</td>
<td>3.209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* 4.35</td>
<td>31</td>
<td>3.208</td>
<td></td>
<td></td>
</tr>
<tr>
<td>† 5.45</td>
<td>Sept. 3</td>
<td>3.201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>—</td>
<td>Feb. 21, 1886</td>
<td>2.6145 (without card tray)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weighed at irregular intervals after this.

Card tray weighed 0.529 grams.

0.533

0.534

The pupa being weighed at regular intervals, the great loss of weight at first and its rapid decrease afterwards is well brought out. But there is no doubt that the most rapid loss is not here recorded, as will be shown by a comparison with subsequent figures. Such a loss took place by evaporation from the moist surface while the skin was being thrown off. The falling off in the loss of weight is well seen by comparing the weighings of a series of periods of 12 hours each:

First period of 12 hours, from 9.25 a.m., Aug. 25th, to 9.25 p.m., Aug. 25th, a loss of 14 milligrams.

Second period of 12 hours, from 9.25 p.m., Aug. 25th, to 9.25 a.m., Aug. 26th, a loss of 5 milligrams.

Third period of 12 hours, from 9.25 a.m., Aug. 26th, to 9.25 p.m., Aug. 26th, a loss of 5 milligrams.

Fourth period of 12 hours (about), from 9.25 p.m., Aug. 26th, to 9.43 a.m., Aug. 27th, a loss of 3 milligrams.

* A damp day.  † A very damp day.
Fifth period of 12 hours (about), from 9.43 a.m., Aug. 27th, to 10.12 p.m., Aug. 27th, a loss of 1 milligram.

Sixth, seventh, and eighth periods of 12 hours (about), from 10.12 p.m., Aug. 27th, to 10.40 a.m., Aug. 29th, a loss of 11 milligrams.

The falling off is here continuous until the end of the fifth period, when it again quickens somewhat. As the loss is chiefly due to evaporation, it is easy to understand how greatly it must be affected by atmospheric conditions. A small error is introduced by the varying weight of the card-tray, which increases when the air is moist, and indicates a difference of 5 milligrams between the extremes of three recorded weighings. It is exceedingly probable that this cause may have assisted in the augmented loss of the latest periods of 12 hours. The weight upon Sept. 3rd, 1885, was 2.667 grams (subtracting the weight of the card-tray), and that upon Feb. 21st, 1886, 2.6145 grams, so that there was a loss of 52.5 milligrams in a period of 24.5 weeks, or rather over 2 milligrams a week. This loss is probably exceptional, because the pupae were kept in the house in earth which was very dry, and for a period of many weeks they were in an average temperature of 55°Fahr. without being moistened.

III. A pupa of *S. ocellatus* had thrown off the larval skin at some time between 3.1 p.m. and 6.55 p.m. on August 25th, 1885; but it had darkened considerably, except upon the wing-cases:

<table>
<thead>
<tr>
<th>Hour</th>
<th>Date</th>
<th>Weight in grams</th>
<th>Periods of 1 hour</th>
<th>Loss in such periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.55 p.m.</td>
<td>Aug. 26, 1885</td>
<td>3.512</td>
<td>1</td>
<td>0 milligram.</td>
</tr>
<tr>
<td>7.55</td>
<td>&quot;</td>
<td>3.512</td>
<td>1</td>
<td>1 &quot;</td>
</tr>
<tr>
<td>8.55</td>
<td>&quot;</td>
<td>3.511</td>
<td>1</td>
<td>2 &quot;</td>
</tr>
<tr>
<td>9.55</td>
<td>&quot;</td>
<td>3.509</td>
<td>1</td>
<td>0 &quot;</td>
</tr>
<tr>
<td>10.55</td>
<td>&quot;</td>
<td>3.509</td>
<td>1</td>
<td>2 &quot;</td>
</tr>
<tr>
<td>11.55</td>
<td>&quot;</td>
<td>3.507</td>
<td>1</td>
<td>2 &quot;</td>
</tr>
<tr>
<td>12.55 a.m.</td>
<td>Aug. 26</td>
<td>3.505</td>
<td>8</td>
<td>5 &quot;</td>
</tr>
<tr>
<td>1.55</td>
<td>&quot;</td>
<td>............</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.55</td>
<td>&quot;</td>
<td>............</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.55</td>
<td>&quot;</td>
<td>............</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this case the pupa, when first weighed, had undergone the rapid decrease immediately following pupation, so that the fall in the rate of loss was gradual, as is shown by a comparison of the weighings at regular periods of one hour. There is also irregularity, which may have been due to atmospheric conditions affecting the pupa and the chip-tray. Nevertheless, the fall in the rate of loss is well seen on comparing the first 10 with the second 10 of the 20 weighings at regular intervals. In the first there was a loss of 9½ milligrams, in the second only 2½ milligrams. Here also subsequent weighings prove that the tray was a source of error. There was a loss of 24 milligrams in the 8 days between Aug. 26th and Sept. 3rd, and a loss of 56 milligrams in the 24½ weeks between Sept. 3rd, 1885, and Feb. 21st, 1886, being at about the same rate as in pupa II., i.e., rather over 2 milligrams a week, under similar conditions as to dryness, &c.

* Air moist, raining all night.
Mr. Poulton's notes in 1885 upon

IV. A pupa of *S. ocellatus* threw off the larval skin upon the pan of the balance, so that the immense loss of the first minutes was obtained:

<table>
<thead>
<tr>
<th>Hour.</th>
<th>Date.</th>
<th>Weight in grams.</th>
<th>Periods of 8½ min.</th>
<th>Loss in such periods.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.30 p.m.</td>
<td>Aug. 26, 1885</td>
<td>3.216 (with larval skin and paper tray)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.38 5 p.m.</td>
<td>&quot;</td>
<td>3.212 &quot;</td>
<td>1</td>
<td>4 milligm.</td>
</tr>
<tr>
<td>9.47 p.m.</td>
<td>&quot;</td>
<td>3.208 &quot;</td>
<td>1</td>
<td>4 &quot;</td>
</tr>
<tr>
<td>9.55 5 p.m.</td>
<td>&quot;</td>
<td>3.206 &quot;</td>
<td>1</td>
<td>2 &quot;</td>
</tr>
<tr>
<td>10.4 p.m.</td>
<td>&quot;</td>
<td>3.201 &quot;</td>
<td>2</td>
<td>5 &quot;</td>
</tr>
<tr>
<td>10.12 5 p.m.</td>
<td>&quot;</td>
<td>3.195 &quot;</td>
<td>2</td>
<td>6 &quot;</td>
</tr>
<tr>
<td>10.29 5 p.m.</td>
<td>&quot;</td>
<td>3.189 &quot;</td>
<td>2</td>
<td>6 &quot;</td>
</tr>
<tr>
<td>9.32 a.m.</td>
<td>Aug. 27 .....</td>
<td>3.111 ”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.30 p.m.</td>
<td>”</td>
<td>3.091 “</td>
<td>Paper tray weighs 0.176 grams.</td>
<td></td>
</tr>
<tr>
<td>12.53 ”</td>
<td>Aug. 28 .....</td>
<td>3.083 “</td>
<td>Paper tray weighs 0.175 grams.</td>
<td></td>
</tr>
<tr>
<td>10.43 a.m.</td>
<td>” 29 .....</td>
<td>3.075 “</td>
<td>Paper tray weighs 0.175 grams.</td>
<td></td>
</tr>
<tr>
<td>6.15 p.m.</td>
<td>” 30 .....</td>
<td>3.066 “</td>
<td>Skin, 0.04 grams.</td>
<td></td>
</tr>
<tr>
<td>4.50 ”</td>
<td>” 31 .....</td>
<td>3.0625 “</td>
<td>Paper tray weighs 0.176 grams.</td>
<td></td>
</tr>
<tr>
<td>3.0 ”</td>
<td>Sept. 3 .....</td>
<td>3.053 “</td>
<td>Paper tray weighs 0.177 grams.</td>
<td></td>
</tr>
<tr>
<td>—</td>
<td>Feb. 21, 1886</td>
<td>2.740 (without larval skin and paper tray)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this case the immense early loss is more nearly obtained than in any of the previous cases, but it is not all recorded here, because there is a great loss during the process of throwing off the larval skin. Nevertheless, the loss was extremely rapid during the first hour in which the pupa was weighed, as a comparison

* The pupa turned over and thus exposed its ventral surface more freely.
† Damp but not raining; rained yesterday,
‡ A very damp day.
§ Very damp, and yesterday also.
of the first weighings at regular intervals will show. There was a loss of 21 milligrams in the first hour, and 105 milligrams in the first 24 hours. The fall in the rate was very rapid, as there was only a loss of 20 milligrams in the next period of 12 hours, and a total loss of 163 milligrams between Aug. 26th and Sept. 3rd. The loss was not entirely that of the pupa, for the larval skin was also drying up at the same time, and there was a paper tray, which introduced a slight error. The loss in the 24½ weeks after Sept. 3rd was much larger than that of the other pupae previously given, being 93.5 milligrams; but in this case the pupa is a very heavy one, and the normal rate of loss was reached at a later date than in the other pupae, because pupation took place rather earlier in the latter, but such considerations cannot explain much of the observed difference. It may be found that the pupae which lose much more rapidly than others under similar conditions are not in a healthy state, and ultimately die or produce deformed moths.

V. The larva of *S. ocellatus* was weighed just before pupation, and then afterwards at various dates with the larval skin, in order to get the total loss of the pupa and the skin. Larva weighed 1.975 grams at 11 p.m., August 26th, 1885. The skin was thrown off before the next weighing, and the results were as follows:—

<table>
<thead>
<tr>
<th>Hour.</th>
<th>Date.</th>
<th>Weights, with skin of the larva.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.25 a.m.</td>
<td>Aug. 27, 1885</td>
<td>1.905 grams.</td>
</tr>
<tr>
<td>10.18 p.m.</td>
<td>Aug. 28</td>
<td>1.848 &quot;</td>
</tr>
<tr>
<td>2.40 &quot;</td>
<td>29</td>
<td>1.817 &quot;</td>
</tr>
<tr>
<td>10.30 a.m.</td>
<td>30</td>
<td>1.799 &quot;</td>
</tr>
<tr>
<td>6.27 p.m.</td>
<td>31</td>
<td>1.789 &quot;</td>
</tr>
<tr>
<td>4.45 &quot;</td>
<td>Sept. 3</td>
<td>1.787 &quot;</td>
</tr>
<tr>
<td>3.10 &quot;</td>
<td>Feb. 21, 1886</td>
<td>1.678 &quot; (without skin)</td>
</tr>
</tbody>
</table>

Darkened, but still reddish, and has evidently changed some hours.

Skin = 0.0510 grams.
Skin = 0.0525 grams—a very damp day.
Skin = 0.0535 grams at 5.40 p.m., Sept. 3; very damp lately.
Skin = 0.04125 grams; dry lately, with east winds.
The object in this case was to ascertain the complete loss of weight during the process of pupation, as well as in the periods immediately after the change. In the following numbers the loss of the skin is included. A contracted larva, evidently very near the change, was selected and weighed, and after an interval of 10½ hours pupation had taken place, and the pupa and larval skin weighed 70 milligrams less than the weight of the larva; in a further period of about 13 hours there was a further loss of 57 milligrams, and a total difference of 193 milligrams between the larva on Aug. 26th and the pupa with the larval skin on Sept. 3rd. This is larger than the loss in the last pupa (IV.), and a much larger percentage of the pupal weight. The difference approximately represents the loss during the actual process of pupation. The loss in the 24½ weeks was 50⅞ milligrams, thus following the most usual result obtained from the previous pupæ.

It must not be supposed that all the immense loss indicated in the tables printed above is due to evaporation from the surface, although doubtless most of it bears this interpretation. The active muscular effort of pupation must mean a large loss of water and carbon dioxide through the tracheal system, but it also must mean a gain of weight in the absorption of oxygen, which is stored up in the body as the oxidised products of nitrogenous metabolism. Such substances fill the digestive tract of the pupa and the imago which is formed within it, and are only discharged on the emergence of the latter. In order to estimate the loss of weight due to surface evaporation alone, and the gain (if any) due to oxidation of the surface, the following experiment might be carried out:—A pupa might be taken immediately after pupation, and the spiracles carefully painted over with daumar varnish or Canada balsam. The pupa should then be placed in a dried and weighed flask, and the weight of the whole ascertained. At intervals air could be drawn through by an aspirator, having been thoroughly freed from water and carbon dioxide by passing through U-tubes before entering the flask, while the water and carbon dioxide (if any) could be estimated by U-tubes on the proximal side of the flask. If the loss of the flask is less than the gain in the latter tubes, the difference represents
the gain due to oxidation of the pupal surface, and this could be confirmed by investigating whether the darkening and hardening and the weight of the flask is affected (in the case of another pupa) by drawing through some harmless gas, such as nitrogen or hydrogen, instead of air. I hope to perform such experiments in the coming season.

The experiments above recorded are not intended to indicate the normal loss of weight in pupae throughout the quiescent period, although it was necessary, for the purpose of comparison, to obtain an approximate average of the rate of normal loss in the species investigated. The normal loss throughout the period (omitting the immense early loss which it has been my object to demonstrate and measure) has been thoroughly investigated by Professor Meldola, and compared with the greater loss in a dead pupa (Ann. and Mag. Nat. Hist., Oct., 1873).
VII. On some proposed transfers of names of genera.
By David Sharp, M.B., F.Z.S.

[Read April 7th, 1886.]

Although much difficulty about generic names has always been experienced by zoologists, and much temporary confusion as to the application of particular names has existed, yet the difficulties have not proved hitherto intolerable. It is true that a name has frequently been proposed, accompanied by very little scientific or systematic definition, and perhaps, as is natural in such a case, has been used by a subsequent writer with a different application; yet in the course of time it has been found that sufficient general assent has been given to some one application of the name; and that this has thus become extremely useful for purposes of reference and for preserving the continuity of systematic zoology during a number of generations. It may be admitted that the treatment of generic names has been unsystematic and loose, even, as some would say, unjust; but it is equally true that consciously or unconsciously a process of natural selection has been at work, and that certain generic names have come to be generally adopted so as to be undoubtedly an aid to reference and an assistance in making ourselves mutually comprehensible.

This practical settlement is not, however, accepted by a few nomenclatorial specialists; and some of those who have drawn up systematic catalogues have ignored the general opinion, and endeavoured to alter the application of some of the commonest names. By their desire to make their catalogue on some exact principle, their insight has been obscured to such an extent as to render them blind to the inconvenience caused to the rest of the world by the inevitable confusion thus introduced. So that they have not only made changes, but have frequently made them in a manner calculated to create
the greatest possible confusion. I may describe it by the following analogy: the names of the letters or signs A, B, C are as well known to us as the letters themselves, but these specialists propose to eliminate the name A altogether, to call the letter A, B, and to provide a new name for B; it would not, I think, be easy to devise a system that should render confusion more complete. The name Procrustes is to cease to exist, and to be replaced by Carabus, while Carabus is to be called Tachypus, and our old friend Tachypus is to have a new name altogether.

It is evident that it would be much less inconvenient to have an entirely new system of names than to be compelled to rearrange, as fresh mental conceptions, these rudely dislocated associations. In the absence of any competitor the 3rd edition of the 'Catalogue of European Coleoptera, recently published at Berlin, must be considered a standard work, and in it certain of these objectionable transfers are unfortunately adopted. Emboldened by this success, M. des Gozis has just published a pamphlet, in which he proposes to carry the confusion of names to its completion. It is well written, and its author from many points of view must be congratulated: I would, indeed, advise every coleopterist to read it, and, having done so, I hope he will conclude to have nothing to do with the changes proposed in it. It is called 'Recherche de l'espèce typique de quelques anciens genres,' and, as it is not accessible to many, I will take the liberty of translating its Introduction as follows:—

"The primary necessity for the progress of a science is that its nomenclature shall be fixed. The necessary condition for a fixed nomenclature is that it shall rest on invariable principles, and nothing be left to the judgment of an individual. For this reason, and surrounded by a constantly increasing flood of synonyms, the most authoritative savants a few years since gave out the principle, now almost unanimously admitted, of Priority. "The first consequence that one can notice from the application of this principle has been naturally a complete turning upside down ('un grand bouleversement'). It was foreseen. It was necessary that justice should be done, and that we should efface even to the last trace the iniquities accumulated by a century of arbitrary
proceedings. This task is so long and rough that it is far from being yet finished, but it moves surely, if slowly, in France as well as in Germany, in spite of the antiquated protests of certain entomologists who are frightened by the momentary chaos into which we are plunging, and who do not see that we must undergo this in order to arrive at stability, that it is indeed the only means of reaching this, while, on the other hand, adherence to what they call prescription or convention leads to the consequence that everyone can do what he likes if he should happen to be supported by a school or scholars who will support him in his absurdities. This is what happened in the case of Fabricius, and it is the cause of all the present mischief.

"Let us, then, be reactionaries.* Away with convention: away with conventional applications of names turned aside from their primitive sense. And do not let us restrict ourselves to the revision of a few specific names: let us frankly take up the huge question of genera, which has been but little attempted hitherto. Reitter has carried it out happily and justly in the last fascicule of his ‘Bestimmung’s-Tabelle.’ He has restored to the true Silphæ of Linnaeus—Necrophorus of Fabricius—their name, and has returned also to the Silphæ of modern authors the name of Peltis that Geoffroy gave to them; and has also distributed in a proper manner the two names Liodes and Anisotoma, which have been interchanged by all authors. This example encourages me to do that which I have long contemplated, and just as I had already recognised the necessity of the changes he has carried out; so I trust those which follow will be equally well received, since they are prompted by the same idea, and are executed by the same law.

"Moreover, though as I have just said, only a few years have elapsed since recognition of the law of Priority became general, it is none the less true (rendering to each the justice that is due to him) that there have always been generous and upright spirits who have diligently proclaimed this primordial principle, and have demanded its practical application. They preached, it is true, in the wilderness, but remained true

* "Reagissons done." It would perhaps render his feeling more correctly to say, "Let us then continue to agitate."
to the standard of a cause now, thanks perhaps to their tenacity, victorious. I must specially mention Marsham; his preface to 'Entomologica Britannica' is but a lengthy plea for Linnaeus against Fabricius, the arch-muddler, as he has been justly styled. . . . . And we also, the entomologists of 1886, partisans by conviction of the law of priority, we are going to restore, wherever we can, the ancient names, as commanded by reason and the laws of our science."

Our talented French contemporary, it must be admitted, expresses himself frankly and well. But if we examine the changes he introduces us to by these words we shall see at once that they are themselves a convention, based on an assumption and carried out by a fictitious artifice: the convention is "Priority"; the assumption is that priority can and should be applied to generic names, and the artifice is the treating a species artificially selected from a genus as if it were the genus itself.

This system of transfers is, in fact, suggested by theory, and, while the practical objections to the transfers are so evident that no attempt to disguise them is made even by des Gozis himself, who frankly tells us he is taking us into chaos, a very little consideration is sufficient to make it clear that the system is theoretically as unsound as it is admitted to be objectionable in practice.

It is based on "Priority." Granted that "Priority" is a good thing as regards trivial or specific names, it still remains to be shown that it is a good thing in the case of generic names. I have myself twelve or fifteen years ago argued strongly for "Priority" in trivial names, and pointed out that it is inapplicable in the case of generic names, because genera themselves are constantly fluctuating. The application of generic names changes naturally whenever a genus is altered or divided, and it is at that moment of transition that the new application of a name formerly applied to the whole should be decided. This is practically the course adopted by naturalists, and it is clearly the only reasonable one. In 'Nature' (vol. ix., p. 260), A. R. Wallace has laid down the following principles:—"1. To adopt absolutely and without exception the principle of priority as regards specific or trivial names. 2. To adopt the same
principle for genera only so long as the generic character, or definition of the genus, remains unaltered; but whenever an original investigator defines a genus more completely than has been done before, he is to be left free to name it as he pleases. Every consideration of utility and common sense will, of course, lead him to retain a name already in use where the new genus does not materially differ from an older one; but of that he is alone the judge, and it should be absolutely forbidden to any third party to say that a name so given must be changed."

This is surely clear, definite, and diametrically opposed to M. des Gozis' assumptions. Indeed, so difficult is it to apply the theory of Priority to genera that it has only been found possible to do so by devising an artifice for the purpose. This consists in saying that the species considered as the type of the genus by its author shall always retain the original generic name; but, as the older writers on Entomology had not the remotest conception of such a thing as this typical species, it is necessary to invent a type for them. This has been done by another convention, viz., by saying that when an author does not mention a type for his genus, the first species he placed in the genus shall be taken as the type. I am not in the least arguing against the utility of these assumptions when properly wielded; they may be found extremely useful by any naturalist who wishes to guide his conduct in such a matter by some generally understood principle; but it is quite ridiculous to take for granted that they are beyond question, that they are free from "convention," and more especially to assume that the next generation will feel itself bound to accept them.

Here we have M. des Gozis refusing to accept the practical conclusions arrived at by past generations and consecrated by use in a century of literature, and yet at the same time taking it for granted that his suggestions and method are so certain to be adopted by a future generation that he invites us to plunge into chaos with only them to buoy us. Is it probable his belief in the harmony between his theory and future generations is well founded? Are the signs of the times such as to make us believe that the next generation will certainly accept a method artificially devised by one or two
individuals of this generation? The answer must be a very doubtful one. It is at any rate clear that we may leave future generations to decide for themselves, and may at present do what is most convenient for the present generation. On the whole history teaches us that this is the sort of decision a future generation is most likely to respect, and that such a course taken by us is more likely to maintain unbroken the continuity between past and future—that is, to secure stability.

But M. des Gozis appeals to another sentiment, and to one that we must all respect—the sense of justice. This part of the question has been frequently discussed, and may therefore be quickly passed over. Let it be granted that had there been in use in the time of Fabricius a system for managing changes of generic names, some injustices would have been avoided; it is none the less true that no such system was in use, and that we cannot go back one hundred years to put it in operation. I respect greatly Mr. Marsham's feelings of indignation and his injured sense of justice, but those feelings have become "portions and parcels of the dreadful past," and cannot now be altered, do what we will. The common sense of mankind may be said to have decided that in no case can a law, even where intended to promote fair dealing between individuals, be made retrospective in its action. By no human means can the iniquities accumulated during a century be effaced, though the accumulation may serve to warn us of what we should avoid in the future.

I will recapitulate my argument by saying that priority cannot be applied to generic names, except by the use of some artifice: that no artifice for the purpose has yet received the general sanction of savants: that should such artifice be generally accepted, it cannot be made retrospective in its operation: that, as we cannot bind future generations to our conclusions, we should adopt such system as is most convenient for the present generation: that it would be exceedingly inconvenient to transfer the names *Carabus*, *Melolontha*, *Bruchus*, *Coccinella*, &c., to any extent greater than that which we cannot possibly avoid.

The difficulty, indeed, may be entirely met by only putting the author's name after a generic name in suitable cases. As regards this, I will quote what I
have recently said elsewhere (Tr. Roy. Dub. Soc. (2), iii., p. 209):—"Considerable difference of opinion prevails at present as to what course should be pursued in citing a name and reference to the genus. Some prefer to refer to the author who first described or defined the genus; while others—looking to the fact that any genus in the lapse of time undergoes great changes—consider we should quote the author who defined the genus in the sense in which the individual now writing uses it. The first of these courses is, it must be admitted, practically of little value except to bibliographers; while the second is unfortunately to a considerable extent impracticable, for the reason that a genus is made what it is at any given moment, not by actual definition, but by definition plus addition and minus subtraction. A defines a genus, say as "Chorazus," making it to consist of ten species; B adds another five species, still calling the aggregate Chorazus; C describes an allied new genus, say Dy-clomus, which consists of certain insects plus two of A's and one of B's Chorazi. E, now coming to the subject, finds that Chorazus, as in actual use, is not the same as it was to either A or B; while C, who has been the last of the defining factors in its shaping, has not defined it in any way whatever. For these reasons it has long appeared to me desirable that no rule should become fixed or conventional as to the use of references to generic names. In point of fact four courses may be adopted: first, no author's name need be given when a generic name is used; and this for many purposes is the truest and most simple thing to do, though very unsatisfactory to amateurs of pedantry; second, the name and reference may be to the maker of the generic name—this may be used in bibliographic and synonymic works; third, the name of the last actual describer may be given: this is perhaps the best course for popular works, where brevity and utility are of predominant importance over consistency and completeness; fourth, a history of the genus and its changes may be given, and the course of events by which it has come to be what it is at the moment of writing may be sketched. This latter is the best course, but it involves more expenditure of time and labour than it is worth while to devote to the object in the present transitional state of zoological nomenclature."
There is yet another consideration which I perhaps ought to mention, though not to rely on it, as it will certainly to many seem unimportant. But I think it quite probable that our present system of zoological nomenclature will not be permanently maintained, but will give place to—or be supplemented by—a system suggested by the experience we have gained during a century and a half of difficulties, and devised as suitable to the Biology of the future; and, if this be at all correct, it is evidently a work of supererogation for us to undergo a vast quantity of inconvenience with a view to rendering the present system permanent.

I hope I have made it clear that so far from being unconventional these transfers are extremely artificial; that there is no ground for supposing they will meet with general assent, or would secure permanency even if they did; and that it is not a wise course for us to go back one hundred years in history with the view of altering our nomenclature, even under the plea that we are by so doing executing justice.
VIII.—*Descriptions of Lepidoptera from the South Pacific*. By Edward Meyrick, B.A.

[Read November 4th, 1885.]

The species described hereafter formed the collections of Mr. Gervase F. Mathew, R.N., F.L.S., &c., of H.M.S. 'Espiegle,' and Dr. Lucas, of Melbourne; and I have given the complete list of the *Geometrina* and Micro-Lepidoptera taken by both these gentlemen. This is interesting in relation to geographical distribution, but must be regarded as very imperfectly illustrating the character of the fauna. Mr. Mathew's collection was formed during three years' stay on the Australian station, and was obtained on short occasional visits to the different islands, whenever an opportunity might occur for landing. Moreover, being especially interested in the *Rhopalocera*, Mr. Mathew at first paid little attention to the groups which form the subject of this paper, until I asked him to obtain all he could; he then collected them more assiduously, but I suspect principally when butterflies were scarce. I am, however, much indebted to him for his labours, and for the liberal gift of types of many of the species; and I should add that his specimens were for the most part in fine condition. Dr. Lucas obtained his collection during a short winter visit to Fiji; I have not seen the entire collection, but types of all the species were submitted to me. Dr. Lucas informs me that many of the specimens were taken under conditions which rendered their preservation a work of great difficulty, much of his collecting being done in a canoe on the rivers with native assistants; for this reason they are often in an imperfect state. In the case of each species in the list I have added the name of the collector.

It would be unwise to enter into generalisations on the basis of an imperfect list like this, but I may direct attention to the great preponderance of the *Botyldiae*,

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which include not much short of half the entire number of species; many of these are very widely distributed, ranging through the Malay Archipelago and India to South Africa, but there are also considerable endemic groups, such as that of Pleonectusa. Owing to the wide range of this family it is possible that I may have failed to recognise some of the species which may have been previously described from other regions, but I have used every effort to identify them.

The principal object of the paper has been the correct classification of the species, in order to the just appreciation of their geographical relations. Such species as have hitherto been described from the South Pacific have been usually classified almost at random, and are at least useless, if not entirely unidentifiable.

In every case the neuration has been fully made out for each species; the normal twelve veins of fore wings and eight of hind wings are reckoned in all instances, and as separate unless otherwise indicated.

GEOMETRINA.

The names of families and genera in this group are used by some writers (following Guenée) in such an extraordinarily loose and indefinite manner that I think it necessary here to give the definitions, as adopted by myself, of all the families and genera mentioned, in order to avoid misapprehension of my own work. I hope shortly to be able to publish my views on the classification of the group in a more comprehensive form. Meanwhile, I may say that the seven families given below are all with which I am acquainted; I do not assert that there are not others, but I do not know of any; all the European species are included in five of these families, the Microniadae and Desmobathridae not being represented in that region. It will be observed that some of these family names are employed in a greatly extended sense; thus the Boarmiadae, as here defined, include Guenée's families Uropterygidae, Ennomiadae, Boarmiidae, Caberidae, Zerenidae, and others.

The following is, I believe, an accurate tabulation of the families in all cases:
Lepidoptera from the South Pacific.

1. Hind wings with vein 5 absent, represented by a fold Boarmiadae.
   " " " present, entire .. .. 2.

2. Hind wings with vein 8 anastomosing with 7 to near end of cell, or rarely only connected with 7 by a bar near transverse vein .. .. .. Larentiadae.

Hind wings with vein 8 free, or anastomosing very shortly with 7 near base only .. .. .. 3.

3. Fore wings with vein 7 separate from 9, stalked with 6 Microniadae.
   " " " rising out of 9 .. .. .. 4.

Hind wings with vein 8 remote from 7, connected with it by a bar near base .. .. .. Desmobathridae.

Hind wings with vein 8 not connected with 7 by a bar 5.

4. Fore wings with vein 10 rising out of 9 .. .. .. 6.
   " " " not rising out of 9 .. .. .. Enochromidae.

5. Fore wings with vein 11 anastomosing with 9 .. Acidaliadae.
   " " " separate from 9 .. .. .. Geometridae.

LARENTIADÆ.

Fore wings: 10 anastomosing with 9, 11 out of or anastomosing with 10. Hind wings: 5 present, 8 anastomosing with 7 from near base to near transverse vein, or rarely only connected with 7 by a bar near transverse vein.

Pasipha, Meyr.

Palpi porrected, roughly scaled. Antennae in male ciliated. Fore wings with vein 6 from a point with or below 9, 7 from or below angle of areole, 10 anastomosing strongly with 9, 11 out of 10, running shortly into 12. Hind wings with veins 6 and 7 stalked or separate, 8 anastomosing with 7 from near base to near transverse vein.

Only known from Australia and New Zealand, where it replaces Eupithecia; it is interesting to find the two genera meeting here.

1. Pasipha lept'a, n. s.

♂, 14—15 mm. Head, palpi, antennae, thorax, abdomen, and legs whitish ochreous, somewhat mixed with dark fuscous; antennae with whorls of scales at apex of joints, very shortly ciliated (♀); posterior tibiae with outer spurs one-fourth of inner. Fore wings moderate, triangular, hind spurs one-fourth of inner. Fore wings moderate, triangular, hind margins gently rounded, slightly waved; vein 6 from below 9; whitish ochreous, with numerous curved waved slightly darker lines, sometimes slightly mixed with blackish; a more distinct blackish line near base; a fine blackish irregularly dentate line at one-third; a waved black line about three-fifths,
angulated beneath costa, and sometimes (in the Tongan specimen) again in middle; three lines towards hind margin more distinct; a fine interrupted blackish hind-marginal line; cilia whitish ochreous, towards tips whitish. Hind wings moderate, hind margin crenulate, bent below middle, between this and anal angle somewhat concave; veins 3 and 4, also 6 and 7, nearly approximated at base; colour, lines, and cilia as in fore wings, but antemedian line nearly obsolete; post-median line slightly angulated outwards below costa and sharply in middle, angulated inwards below middle; posterior line bent in middle.

Tonga and Marshall Islands (Mathew); two specimens.

EUPITHECIA, Curt.

Palpi porrected, roughly scaled. Antennae in male ciliated. Fore wings with vein 6 from a point with or below 9, 7 from angle of areole, 10 anastomosing with 9, 11 out of 10 before 9, 12 free. Hind wings with veins 6 and 7 stalked, 8 anastomosing with 7 from near base to near transverse vein.

Characteristic of the northern hemisphere, especially Europe.

2. Eupithecia erymlna, n. s.

♂, 16 mm. Head, palpi, thorax, and abdomen ochreous-whitish, irregularly mixed with blackish. Antennae with angularly projecting scales at joints, ciliations 1. Fore wings elongate-triangular; costa nearly straight, hind margin very obliquely rounded; whitish, irregularly mixed with grey, and with an irregular very pale green suffusion; about fourteen subdentate transverse blackish-grey lines, alternately more or less defined, irregularly curved, tolerably parallel; one beyond middle stronger and blacker, rectangularly angulated in middle; cilia grey, basal half spotted with grey-whitish. Hind wings rather narrow, hind margin rounded; veins 3 and 4 from a point; colour and markings as in fore wings, but post-median black line more markedly dentate on upper half, its central angulation forming rather an acute tooth.

Tonga (Mathew); two specimens.

CRETHEIS, n. g.

Face smooth. Palpi short, slender, filiform, porrected. Antennae in male (?). Fore wings with vein 6 from a point with 9, 7 from above angle of areole, 10 anastomosing very strongly with 9, 11 rising out of 10 between 7 and 9, 12 free. Hind wings with veins
3 and 4 stalked, 6 and 7 stalked, 8 anastomosing with 7 from near base to near transverse vein.

3. *Crethis cynamodes*, n.s.

♀, 24 mm. Head ferruginous, with a white band between antennæ. Antennæ white. Palpi, thorax, abdomen, and legs ochreous-yellowish. Fore wings moderate, triangular, hind margin rounded, slightly waved; light ochreous-yellow, with about fourteen waved slightly curved purplish brown lines; hind margin with dark reddish fuscous dots on and between veins; cilia pale ochreous-yellow. Hind wings somewhat elongate, hind margin bent below middle, waved; colour, hind-marginal dots, and cilia, as in fore wings; four waved purplish brown lines on posterior half of wing, bent below middle, and indications of lines on anterior half.

New Hebrides (Mathew); one specimen.

**Remodes, Gu.**

Palpi very long, straight, porrected, with appressed scales. Antennæ stout, flattened, simple in both sexes. Middle tibiae in male without spurs; posterior tibiae in male without spurs, tarsi bent, clothed with long hairs, extremity aborted; posterior tibiae in female with middle-spurs absent, end-spurs very short. Fore wings with vein 6 from a point with 9, 7 from angle of areole, 10 anastomosing strongly with 9, 11 rising out of 10 before 9, 12 free. Hind wings with veins 3 and 4 stalked, 6 and 7 stalked, 8 anastomosing with 7 from near base to near transverse vein; inner margin in male folded to form three superposed pockets.

I have not seen a male of this genus, and the character of the inner marginal pockets of the hind wings may probably be variously modified in different species. Two species have been described from the Malay Archipelago; a third is given here, and I have a fourth undescribed from Eastern Australia.


♀, 33 mm. Head, palpi, and thorax light greenish mixed with olive-green. Antennæ greyish ochreous, towards apex blackish. Abdomen and legs ochreous-whitish. Fore wings moderate, triangular, costa sinuate, hind margin rounded, waved; very pale whitish greenish, with numerous waved cloudy olive-green lines, posteriorly becoming rather curved; one almost at base, two near
Mr. E. Meyrick's descriptions of

base, two before middle, three beyond middle, and two about three-fourths, are more or less marked throughout with black; a subterminal line dotted with blackish; a hind-marginal row of small black spots on veins; cilia ochreous-whitish. Hind wings short, narrow, hind margin rounded, waved; ochreous-whitish; cilia ochreous-whitish.

Fiji (Mathew, Lucas); two specimens.

Cidaria, Tr.

Palpi moderate or short, roughly scaled, porrected. Antennae in male stout, shortly ciliated. Fore wings with vein 6 rising out of 9, 7 almost from angle of areole, 10 anastomosing moderately with 9, 11 anastomosing moderately with 10, 12 free. Hind wings with veins 6 and 7 stalked, 8 anastomosing with 7 from near base to near transverse vein.

As thus restricted the genus probably occurs nearly universally. I have not yet met with it myself in Australia; in New Zealand it is fairly represented.

5. Cidaria chlorodesma, n. s.

♀, 23 mm. Head and antenna ochreous-yellow. Palpi blackish, apex of second and terminal joints ochreous-yellow. (Thorax defaced.) Abdomen fuscous, base mixed with yellow. Legs dark fuscous. Fore wings triangular, hind margin moderately bowed; red-brown, suffusedly mixed with black, and irrorated with numerous fine silvery-metallic scales; two ochreous-yellow moderately broad irregular-edged fascia, margined with whitish on discal side, first from one-third of costa to two-fifths of inner margin, slightly curved, outer edge angulated above middle and indented below middle, second from three-fourths of costa to three-fourths of inner margin, parallel to hind margin, inner edge with a shallow excavation below middle; an oblique triangular pale ochreous-yellowish spot on costa before apex; hind-marginal band without blackish suffusion except round this spot; cilia fuscous, basal half dark fuscous. Hind wings moderate, hind margin rounded; grey, irregularly mixed with whitish; cilia grey.

Fiji (Lucas); one specimen.

6. Cidaria lasiospila, n. s.

♂, 42 mm. Head, palpi, thorax, and abdomen dull reddish fuscous mixed with dark fuscous and whitish ochreous; palpi moderately long, terminal joint moderate, somewhat swollen
towards apex, blackish except at base. Antennæ whitish ochreous, ciliations one-sixth. Legs whitish ochreous. Fore wings broad, triangular, costa slightly sinuate, hind margin rounded, crenate; fuscous, somewhat mixed irregularly with whitish ochreous, and with numerous irregular curved subdentate obscure dark fuscous lines; a transverse discal spot before middle, composed of dense erect dark fuscous hairs; a small round whitish ochreous or white spot between veins 3 and 4 posteriorly; a subterminal row of whitish-ochreous dots on veins; cilia fuscous (imperfect). Hind wings moderate, hind margin rounded, crenate, tooth on vein 5 shorter than rest; colour and markings as in fore wings.

A worn female specimen, perhaps referable to this species, is more reddish tinged, the discal spots without erect hairs and indistinct, hind wings with a sub-marginal series of small trapezoidal white spots between veins, terminal joint of palpi very short; these differences are considerable, but it is questionable whether they are sexual or specific.

Fiji (Lucas); one specimen (besides the female referred to). Occurs also in Australia; I am doubtful whether there is not some error of locality.

Cephalissa, Meyr.

Palpi moderate, roughly scaled, porrected. Antennæ in male shortly ciliated. Fore wings with vein 6 from a point with or below 9, 7 from about angle of areole, 10 anastomosing moderately with 9, 11 anastomosing moderately with 10, 12 free. Hind wings with veins 6 and 7 stalked, 8 anastomosing with 7 from near base to near transverse vein.

With this genus is united that for which I have previously (Trans. N. Z. Inst., 1883) employed the name Scotosia, Stph.; but as I find that Lederer (whom I follow) limited the genus Scotosia in a different sense, I adopt the name Cephalissa for the whole. It is very numerously represented in Australia, and there are three New Zealand species; I cannot at present say how widely it may be distributed otherwise.

7. Cephalissa delogramma, n. s.

♀, 16—22 mm. Head, thorax, and abdomen pale ochreous mixed with whitish and reddish fuscous; anterior margin of thorax rather broadly dark fuscous. Palpi dark reddish fuscous. Antennæ
Mr. E. Meyrick's descriptions of

greyish. Fore wings triangular, costa sinuate, hind margin slightly rounded, waved; whitish ochreous, more or less suffused irregularly with fuscous reddish, tending to form irregular waved lines; a streak along costa from base to second line mostly marked with black; first line slender, double, blackish, from one-third of costa to one-third of inner margin, curved outwards; between this and base are three or four similar indistinct blackish lines; second line sharply marked, fine, black, from three-fifths of costa to three-fourths of inner margin, forming a quadrangular projection outwards in middle, between which and inner margin it is twice sharply angulated inwards; an irregular hind-marginal band mostly suffused with fuscous, especially towards apex, containing a pale dentate subterminal line; cilia whitish ochreous, basal half obscurely barred with fuscous. Hind wings rather small, hind margin slightly rounded; whitish, sometimes with indications of blackish lines towards inner margin; cilia whitish.

Fiji and Tonga (Mathew); two specimens.

ENOCHROMIDÆ.

Fore wings: 7 rising out of 9, 10 not rising out of 9. Hind wings: 5 present, 8 free.

Eumelea, Jard.

Face with a slight projection of scales. Palpi moderate, arched, second joint roughly scaled, terminal joint moderate, rectracted, smoothly scaled, slightly swollen towards apex. Antennæ nearly as long as fore wings, in male filiform, simple. Thorax, femora, and posterior tibie hairy beneath; posterior tibie with middle-spurs below five-sixths, equal, terminal spurs shorter. Fore wings with vein 6 from very near 9, 11 anastomosing strongly with 10, 12 anastomosing with 11 to 10. Hind wings with veins 6 and 7 stalked, 8 approximated to 7 towards base.

8. Eumelea rosalia, Cr., Gn.

Solomon Islands and New Britain (Mathew); three specimens. Occurs also in the Malay Archipelago and North-East Australia.

9. Eumelea craspedias, n. s.

♂, 58 mm. Head, thorax, abdomen, and legs light ochreous-yellow; face, collar, palpi, antennæ, and anterior tibie light fuscous-purplish. Fore wings moderate, triangular, costa mode-
rately arched, hind margin moderately rounded, slightly waved; light ochreous-yellow, basal half suffusedly strigulated with deeper ochreous-yellow; costa broadly strigulated with dark grey, more strongly towards base; a deep ochreous-yellow hardly curved streak from centre of disc to inner margin beyond middle; a broad rather dark fuscous-grey hind-marginal band, anterior edge irregular, running from before two-thirds of costa to anal angle; cilia grey (imperfect). Hind wings moderate, apex somewhat prominent, hind margin slightly rounded, waved; colour, strigulation, and cilia as in fore wings; a nearly straight entire deep ochreous-yellow central transverse streak; a moderately narrow dark fuscous-grey hind-marginal band, nearly evenly broad throughout, anterior edge indented above middle.

Port Moresby, New Guinea (*Mathew*); one specimen.

**Celereana, Walk.**

Face smooth. Palpi moderate, porrected, basal joint rough-scaled, second joint smooth-scaled, attenuated at apex, terminal joint moderate, cylindrical. Antennae rather more than half fore wings, in male filiform, towards apex thinly ciliated. Thorax densely hairy beneath, and with a double dense expansible tuft between second and third pairs of legs. Abdomen beneath with basal tuft of long fine hairs, and a large prominence near base, clothed with a dense cushion of long hairs. Posterior tibiae greatly dilated, and with a long expansible tuft of hairs on inner side in middle, their apex produced above into a long horny projection, median spurs below middle, long, slender, crooked, outer about two-thirds of inner, terminal outer spur absent, inner stout; posterior tarsi with basal joint long, its median third dilated beneath into a large rounded projecting plate, second joint very short, somewhat swollen. Fore wings beneath with a fold concealing a deep furrow above posterior half of cell; vein 6 from below 9, 10 and 11 long-stalked, 10 anastomosing at a point with *a* before 8, 12 anastomosing strongly with 11 before 10. Hind wings with veins 6 and 7 separate, approximated to 7 towards base.

It is probable that the various tufts of hair and abnormal structures of the legs are mainly sexual and specific characters, and are not to be considered as essential to the genus, which is sufficiently distinguished otherwise; they are therefore only provisionally included in the generic definition.


♀, 62 mm. Head and palpi deep yellow, apical joint grey. Antennae grey. Thorax deep yellow, with a dark grey anterior transverse stripe. Abdomen yellow, apical half with a dorsal streak and segmental margins grey, basal tuft dark grey in middle, white on sides. Legs dark grey, posterior tibiae yellow, apical projection grey, tarsi greyish. Fore wings moderate, elongate-triangular, costa gently arched, hind margin very oblique, almost straight, slightly sinuate; blackish grey, with two large deep yellow blotches; first extending from base to near middle, not reaching either margin, suffused beneath and posteriorly; second transverse, broad, running from costa beyond middle towards anal angle, but not reaching it; cilia blackish grey. Hind wings moderate, hind margin rounded; deep yellow, with a moderately broad blackish-grey hind-marginal band, rather dilated about apex, sending a slight obscure suffusion along inner margin; cilia blackish grey.

Port Moresby, New Guinea (Mathew); one specimen. Walker’s type was from Celebes.

**DESMOBATHRIDÆ.**

Fore wings: 7 rising out of 9, 10 absent. Hind wings: 5 present, 8 remote from 7, connected with it by a bar near base.

**Desmobathra, n. g.**

Face smooth. Palpi moderate, porrected, second joint shortly scaled above, terminal joint short. Antennæ two-thirds of fore wings, in male (?). Posterior tibiae in female with only one median spur, rather below middle, terminal spurs short. Fore wings with vein 6 remote from 9, 11 anastomosing moderately with 9 before 8, 12 anastomosing strongly with 11 before 9. Hind wings with veins 6 and 7 separate.

11. *Desmobathra hesperias*, n. s.

♀, 23 mm. Head, palpi, thorax, abdomen, and legs orange-yellow. Antennæ grey. Fore wings triangular, hind margin slightly sinuate, rounded in middle; orange-yellow, with numerous small fine scattered purple-brown strigula; these tend to form an irregular curved line beyond middle; cilia ochreous-yellow. Hind wings moderate, hind margin rounded; colour, strigulae, and cilia as in fore wings; a tolerably distinct discal dot; line not indicated.

New Hebrides (Mathew); two specimens.

♀, 22 mm. Head, palpi, thorax, abdomen, and legs orange-yellow. Antennæ greyish ochreous. Fore wings triangular; hind margin slightly sinuate, rounded in middle; bright orange, with small thinly scattered purple-brown strigulae; these tend to form fine irregular lines at one-third and beyond middle; a purplish-brown hind marginal band, on costa extending from near two-thirds to apex, attenuated to a point on anal angle; cilia dark grey. Hind wings moderate, hind margin rounded; bright orange, paler towards anal angle; a narrow cloudy light purplish-brown hind-marginal band; a purple-brown discal dot; lines absent; strigulae and cilia as in fore wings.

Possibly this might be a variety of the preceding, with which it was found.

New Hebrides (Mathew); one specimen.


♀, 30 mm. Head, palpi, antennæ, thorax, abdomen, and legs dark blackish grey. Fore wings moderate, triangular, costa unevenly arched, hind margin rounded; dark blackish grey, with two large transverse oval snow-white blotches, first before middle, second towards apex; the ground colour lightened on three small subterminal spots near lower half of hind margin; cilia dark blackish grey. Hind wings moderate, hind margin rounded; dark blackish grey; a very large irregular trapezoidal snow-white transverse median blotch, nearly reaching inner margin; ground colour lightened between this and a hind-marginal dark band; cilia dark blackish grey.

Solomon Islands (Mathew); one specimen.

**Derxena, Walk.**

Face smooth. Palpi moderate, porrected, loosely scaled. Antennæ rather more than half fore wings, in male filiform, ciliated moderately with fascicles of cilia (2). Middle tibiae with spurs very short, unequal; posterior tibiae in male with spurs wholly absent. Fore wings with vein 6 remote from 9, 12 anastomosing moderately with 11. Hind wings with veins 6 and 7 stalked; basal enclosed area between 7 and 8 hyaline.

Differs from the preceding essentially by vein 11 of fore wings being free from 9, and 6 of hind wings stalked with 7.

Derxena coelivagata, Walk., Suppl., 1615.

♂, 21 mm. Head, thorax, and abdomen whitish blue. Antennae and palpi whitish. Fore wings triangular, hind margin gently rounded; pale silvery blue, thinly scaled; costal edge white; discal dot blackish; cilia whitish blue. Hind wings triangular, hind margin strongly rounded; colour, discal dot, and cilia as in fore wings.

New Britain (Matthew); one specimen. According to Walker, also from New Guinea and Aru.

MICRONIADÆ.

Fore wings: 7 separate from 9, stalked with 6. Hind wings: 5 present, 8 free.

Stesichora, n. g.

Face smooth. Palpi moderately long, obliquely ascending, very slender, linear; second joint very short, terminal joint long, thrice second, obtuse. Antennae less than half fore wings, in male thick, filiform, simple. Middle tibia in male clothed externally with very fine long hairs; posterior tibia flatly dilated towards middle, externally clothed with soft fine hairs, median spurs at three-fourths, outer median spur obsolete, outer apical spur one-fourth of inner. Thorax rather hairy beneath. Fore wings with veins 2 and 3 stalked, rising from lower margin of cell near base, 4 from angle of cell, 10 rising out of 9. Hind wings with veins 3 and 4 short-stalked, 6 and 7 from a point.

15. Stesichora puellaria, Walk.


♂, 53 mm. Head white, face and palpi blackish. Antennae whitish. Thorax, abdomen, and legs white, anterior legs blackish. Fore wings triangular, costa gently arched, hind margin gently rounded, nearly straight beneath middle, slightly waved; white; about eight very small black transverse marks on costa, a double one before apex, and one below apex; a very fine blackish hind-marginal line; cilia white. Hind wings moderate, hind margin waved, in middle forming a short angular projection; white; a small round blackish spot before hind margin in angle; hind-marginal line and cilia as in fore wings.

Port Moresby, New Guinea (Mathew); one specimen.
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Anteia, n. g.

Face smooth. Palpi rather short, slender, obliquely ascending. Antennæ less than half fore wings, in male filiform, simple. Posterior tibiae with median spurs at three-fourths, outer spurs less than half inner. Fore wings with veins 3 and 4 very shortly stalked, 10 rising out of 9. Hind wings with veins 3 and 4 very shortly stalked, 6 and 7 from near together.

16. Anteia ithygramma, n. s.

♂, 52 mm. Head, thorax, and abdomen ochreous-white. Fore wings broad, triangular. costa strongly arched before apex, hind margin slightly rounded; white, towards base faintly striated with pale greyish ochreous; three light greyish ochreous transverse streaks parallel to hind margin, obsolete towards costa; first at about one-third, slender, irregular, second central, broadest, third at about three-fourths; a narrow subterminal band of greyish ochreous striæ; a few minute blackish dots on costa, three or four before apex more conspicuous; a fine dark fuscous hind-marginal line; cilia white. Hind wings moderate, hind margin produced in middle into an acute angular projection, slightly waved; colour, streaks, subterminal striæ, and hind-marginal line as in fore wings; two elongate black dots above base of projection.

New Britain (Matthew); one specimen.

Strophidia, Hb.

Face smooth. Palpi very short, slender, roughly scaled, porrected. Antennæ less than half fore wings, in male filiform, simple. Thorax hairy beneath. Posterior tibiae with median spurs at two-thirds, outer spurs half inner. Fore wings with veins 3 and 4 stalked, 10 separate. Hind wings with veins 3 and 4 stalked, 6 and 7 from near together.

17. Strophidia anercis, n. s.

♀, 54 mm. Head, palpi, thorax, abdomen, and legs white; a black transverse mark on back of crown, and three black dots on forehead; palpi black above. Antennæ fuscous, above blackish, towards base becoming whitish ochreous. Fore wings broad, triangular, costa arched, hind margin nearly straight; white; costa with numerous short fine blackish striæ, longer and scantier towards base; five pale greyish ochreous transverse streaks, obsolete on costa; first from one-sixth of costa to before middle of
inner margin; second slender, at about one-third, crossing cell; third from middle of costa to two-thirds of inner margin; fourth from three-fourths of costa to before anal angle; fifth along hind margin from apex to anal angle; a series of short irregular transverse greyish-ochreous strigulae midway between fourth and fifth; a very fine blackish hind-marginal line; cilia bright greyish ochreous. Hind wings moderate, hind margin produced below middle into a strong round-pointed projection; white; four very pale greyish ochreous transverse streaks; first along inner margin, almost obsolete; second from beneath two-fifths of costa to anal angle; third from beneath two-thirds of costa, nearly parallel to second, but bent round beneath and terminating in anal angle; fourth along hind margin from apex to base of projection; a band of irregular pale greyish-ochreous strigulae before hind margin; a small diffused blackish spot on base of upper side of projection, and two very small approximated blackish spots on base of lower side, lower side of projection also margined narrowly with black; cilia light greyish ochreous.

Fiji (Lucas); one specimen.

18. Strophidia urapterina, Butl.  

Very similar to the preceding, but fore wings with about twelve black dots only on the costa, and third streak more oblique; hind wings with discal streaks more obliquely placed, terminating on hind margin in two black spots, hind margin with a black streak from apex of wing to base of projection.

New Britain (Mattheu); one specimen. Butler’s type was from New Ireland.

**GEOMETRIDÆ.**

Fore wings: 7 rising out of 9, 10 rising out of 9, 11 separate from 9. Hind wings: 5 present, 8 free or anastomosing with 7 very shortly near base only.

**Eucrostis, Hb.**

Face smooth. Palpi short, slender, filiform, porrected. Antennæ in male bipectinated, towards apex simple. Posterior tibiae in both sexes with median spurs absent. Fore wings with vein 6 from a point with 9, 10 rising out of 9 below 7, 11 anastomosing with or
running into 12. Hind wings with veins 3 and 4 stalked, 5 rising nearer to 6 than to 4, 6 and 7 stalked, 8 free, approximated to 7 towards base.

19. Eucrostis erichlora, n. s.

♀, 39 mm. Head and thorax green, space between antennæ snow-white. Palpi whitish ochreous. Antennæ white. Abdomen white, with a suffused green dorsal line. Fore wings triangular, hind margin gently rounded; vein 11 anastomosing with 12; rather deep green; costa narrowly pale brown, spotted with darker; lines hardly darker green, first preceded and second followed by whitish dots on veins; first from one-fourth of costa to before middle of inner margin, curved; second from two-thirds of costa to three-fifths of inner margin, upper three-fourths rather curved outwards; a small brown darker-centred discal spot; an ochreous-brown hind-marginal line; cilia white, towards tips brownish, with dark fuscous dots on veins. Hind wings moderate, hind margin produced in middle into an acute angular projection; colour, lines, discal spot, hind-marginal line, and cilia as in fore wings, but first line absent, second angulated in middle.

Fiji (Mathew); one specimen.

Iodis, Hb.

Face smooth. Palpi short or moderate, porrected, slender, filiform or loosely scaled. Antennæ in male bipectinated, towards apex simple. Posterior tibiae in both sexes with median spurs present. Fore wings with veins 3 and 4 sometimes short-stalked, 6 rising out of 9, 10 rising out of 9 between 6 and 7, 11 free or anastomosing with 12 and sometimes again with 10 also. Hind wings with veins 3 and 4 stalked, 5 rising nearer to 6 than to 4, 6 and 7 stalked, 8 free, approximated to 7 towards base.

This genus is probably widely distributed; in Australia it is well represented. All the species included by Guenée in his genus Chlorochroma, which differs in no structural character from Iodis, are referred here. The variations in structure of vein 11 of the fore wings are of specific value only, occurring most markedly in the most closely allied species.

20. Iodis cheramota, n. s.

♂, 21—22 mm. Head green. Palpi crimson, mixed with white. Antennæ ochreous-whitish. Thorax green, with a straight transverse ochreous-whitish line before anterior margin. Abdomen
whitish, somewhat mixed with ochreous, towards base green. 
Fore wings broad, triangular, hind margin gently rounded; veins 
3 and 4 separate, 11 anastomosing with 12, free from 10; rather 
dull green; costa narrowly white, beneath ochreous-tinged; lines 
distinct, very slender, whitish, denticulate; first from one-third 
of costa to middle of inner margin, where it forms a small spot; 
second from three-fourths of costa to hind margin above anal 
angle; a small dark reddish fuscous discal spot; a small snow-
white semicircular spot on anal angle, bordered with fuscous-
crimson; a small dark reddish fuscous apical spot; cilia whitish 
ochreous, with a waved dark fuscous-crimson subbasal line which 
encloses white dots on veins. Hind wings moderate, hind margin 
evenly rounded; colour, discal dot, and cilia as in fore wings 
lines absent.

Fiji (Mathew, Lucas); two specimens.

**Thalassodes, Gn.**

Face smooth. Palpi moderate, second joint obliquely ascending, 
with short rough projecting scales beneath, terminal joint rather 
long, cylindrical, obtuse. Antennae in male bipectinated, towards 
apex simple. Thorax hairy beneath. Fore wings with vein 6 
rising out of 9, 10 rising out of 9 between 6 and 7, 11 free. Hind 
wings with veins 3 and 4 stalked, 5 rising nearer to 6 than to 4, 
6 and 7 stalked, 8 very closely appressed to 7 towards base or 
approximated.


♀, 36—40 mm. Head and antenna whitish ochreous. Palpi 
pale green, beneath whitish. Thorax and abdomen light sea-
green, abdomen with an obscure whitish dorsal line. Legs whitish 
ochreous, anterior tibiae reddish. Fore wings broad, triangular, 
hind margin slightly rounded; rather light sea-green, with 
numerous very obscure small irregular green-whitish strigulae; 
costal edge very pale whitish ochreous; a straight slender obscure 
whitish line from beneath middle of costa to three-fifths of inner 
margin; cilia ochreous-whitish. Hind wings broad, hind margin 
very obtusely angulated in middle; veins 7 and 8 closely appressed 
near base; colour, strigulae, and cilia as in fore wings; a straight 
slender obscure whitish line from beyond middle of costa to vein 3 
midway between its origin and hind margin.

Appears very closely allied to *T. pilaria*, Gn., and the 
group of similar species, but is probably sufficiently
distinguished by the whitish ochreous face; the face in the other species is brown or green.

Fiji (Lucas); two specimens.

ACIDALIADÆ.

Fore wings: 7 rising out of 9, 10 rising out of 9, 11 anastomosing or connected by a short bar with 9. Hind wings: 5 present 8 anastomosing with 7 very shortly near base, or rarely free.

PYTHODORA, n. g.

Face smooth. Palpi rather short, very slender, arched, ascending, terminal joint extremely short. Antennæ two-thirds of fore wings, in male with two tufts of long cilia (2½) on each joint. Posterior legs in male with tibæ and tarsi wholly absent, femora with a fan of extremely long projecting scales from whole length. Fore wings with vein 6 remote from 9, 10 rising out of 9 between 7 and 8, 11 anastomosing with 9 from 7 to below 10. Hind wings with veins 3 and 4 from a point, 6 and 7 stalked, 8 anastomosing with 7 very shortly near base.

22. Pythodora rhipistis, n. s.

♂, 21 mm. Head, palpi, antennæ, thorax, abdomen, and legs light brownish ochreous; face dark crimson-fuscous. Fore wings moderate, triangular, hind margin rounded; light brownish ochreous, finely sprinkled with fuscous, with five ill-defined irregularly waved slightly curved fuscous lines; first about one-third, bent beneath costa, second central, fifth marginal; discal dot black, preceding second line; a hind-marginal row of fine black dots; cilia light brownish ochreous. Hind wings moderate, hind margin bent in middle, rounded above; colour and markings as in fore wings, but first line obsolete.

Fiji (Matheu); one specimen.

ACIDALIA, Tr.

Face smooth. Palpi moderate or rather short, loosely rough-scaled or filiform, porrected or somewhat ascending. Antennæ two-thirds of fore wings, in male ciliated. Posterior tibiae in male swollen, without spurs, tarsi in male more or less aborted, shorter than tibæ. Fore wings with vein 6 remote from 9, 10 rising out of 9 between 7 and 8, 11 anastomosing shortly with 9 or connected with it by a short bar. Hind wings with veins 3 and 4 separate,
6 and 7 separate or stalked, 8 anastomosing with 7 very shortly near base.

A cosmopolitan genus, but in New Zealand only represented by the wide-ranging *A. rubraria*, which cannot be regarded as indigenous. The separation or stalking of veins 6 and 7 of the hind wings is an unreliable character specifically, both forms occurring sometimes in the same species (as in *A. homodoxa*).


Norfolk Island (*Mathew*); abundant throughout Eastern Australia and New Zealand.

24. *Acidalia crossohragma*, n. s.

♂, ♀, 19—20 mm. Head and palpi ochreous-brown, band between antennæ white. Antennæ whitish, ciliations in male 2. Thorax and abdomen whitish ochreous. Posterior tibiae in male with a dense tuft of long white hairs from middle above, tarsi one-fourth of tibiae. Fore wings moderate, triangular, hind margin slightly bowed; whitish ochreous, sometimes thinly irrorated with fuscous; five obscure pale greyish ochreous waved slightly curved parallel lines, first before middle, nearly obsolete, rest between middle and hind margin; a black discal spot between first and second; a hind-marginal row of black dots, connected by a very fine blackish line; cilia ochreous-whitish, with two sharply marked dark fuscous lines, second strongest. Hind wings moderate, hind margin rounded; colour and markings as in fore wings, but first line absent, discal dot larger and placed on posterior edge of second line, which is somewhat before middle.

Easily recognisable by the two sharply marked dark fuscous lines in cilia.

Port Moresby, New Guinea (*Mathew*); occurs also in North-East Australia.

*A. recessata*, Walk., 777; *A. despoliata*, ib., 778; *A. optivata*, ib., 780.

♀, ♂, 19–23 mm. Head and palpi blackish, band between antennae white, collar ochreous. Antennae whitish, ciliations in male 2½. Thorax and abdomen ochreous-whitish. Posterior tibiae in male with a dense tuft of very long white hairs from base above, tarsi three-fourths of tibiae. Fore wings moderate, triangular, hind margin gently rounded; pale whitish ochreous, with fine scattered black scales, sometimes rather dense; five somewhat irregular dentate grey lines, variable in intensity; first before middle, partially obsolete; a black discal dot between first and second; second thick, conspicuous, rather cloudy, from beyond two-thirds of costa to middle of inner margin; third, fourth, and fifth parallel, forming a hind-marginal band, third generally strongly marked, fourth and fifth cloudy, sometimes interrupted into spots; a hind-marginal row of black dots; cilia pale whitish ochreous. Hind wings moderate, hind margin rounded, somewhat waved, bent in middle; colour and markings as in fore wings, but first line absent, discal dot larger and placed on posterior edge of an indentation in second line, which is somewhat before middle.

Port Moresby, New Guinea (Mathew); common also throughout Eastern Australia.


♀, 18 mm. Head and palpi blackish, band between antennae white, collar ochreous. Antennae ochreous-whitish, ciliations in male 1½. Thorax and abdomen ochreous-whitish. Posterior tibiae in male with a dense tuft of very long white hairs from near base above, tarsi two-thirds of tibiae. Fore wings moderate, triangular, hind margin gently rounded; very pale whitish ochreous; five irregular waved pale ochreous lines, first before middle, rest between middle and hind margin; a black discal dot between first and second; a hind-marginal row of black dots; cilia ochreous-whitish. Hind wings moderate, hind margin rounded, somewhat bent in middle; colour and markings as in fore wings, but first line absent, discal dot a little beyond second line, which is somewhat before middle.

Port Moresby, New Guinea (Mathew); two specimens.
27. *Acidalia homodoxa*, n. s.

♂, ♀, 18 mm. Face and palpi blackish, band between antennae white, collar ochreous. Antennae, thorax, abdomen, and legs whitish ochreous; antennal ciliations in male 1½; posterior tibiae in male without tuft, tarsi one-third of tibiae. Fore wings moderate, triangular, hind margin gently rounded; whitish ochreous, with a few scattered black scales; costal edge narrowly ochreous; five indistinct ochreous lines; first before middle, nearly straight, second slightly irregular, beyond middle, third, fourth, and fifth irregularly dentate; a black discal dot between first and second; a hind-marginal row of black dots; cilia whitish ochreous. Hind wings moderate, hind margin rounded, bent in middle, slightly waved; colour and markings as in fore wings, but first line absent, discal dot placed on second line, which is somewhat before middle.

Port Moresby, New Guinea, and Tonga (Mathew); Fiji (Lucas); five specimens.

**Trichoclada, n. g.**

Face smooth. Palpi moderate, arched, ascending, shortly rough-scaled beneath, terminal joint very short. Antennae two-thirds of fore wings, in male stout, bipectinated (1½), pectinations terminating in a tuft of very long cilia (2½). Posterior tibiae in male considerably swollen, without spurs, tarsi considerably aborted. Fore wings with vein 5 rising nearer to 6 than to 4, 6 widely remote from 9, 10 rising out of 9 between 7 and 8, 11 anastomosing with 9 at a point below 7. Hind wings with veins 6 and 7 separate, 8 anastomosing with 7 at a point near base.


♂, 24 mm. Face dark fuscous, band between antennae white, collar ferruginous. Palpi dark fuscous, beneath white. Antennae dark fuscous. Thorax, abdomen, and legs white, anterior legs fuscous, posterior tarsi one-half of tibiae. Fore wings rather broad, triangular, hind margin hardly rounded; white; costal edge narrowly ochreous-yellow; a minute black discal dot; two very indistinct irregular fine dentate grey lines before and beyond three-fourths, marked with obscure blackish dots on veins, second more distinct; two irregular series of fine scattered black scales between these and hind margin; a hind-marginal row of elongate black dots; cilia white. Hind wings moderate, hind margin rounded, bent in middle; colour and markings as in fore wings.

Fiji (Lucas); one specimen.
Perixera, n. g.

Face smooth. Palpi moderate, porrected, second joint shortly rough-scaled above, terminal joint very long, as long as second, slender, filiform, obliquely drooping. Antennæ two-thirds of fore wings, in male very strongly bipectinated, apical one-fourth simple, in female thickened with scales towards base. Posterior femora in male with dense brush of long hairs above, tibiae in male with median spurs absent. Fore wings with vein 6 widely remote from 9, 10 and 11 both rising out of 9 between 7 and 8. Hind wings with veins 3 and 4 almost from a point, 6 and 7 separate, 8 anastomosing with 7 at a point near base.

Besides the species described below, I have two or three from Australia.

29. Perixera ceramis, n. s.

♀, 32 mm. Head and palpi deep fuscous-crimson, band between antennæ white. Antennæ ochreous-white. Thorax and abdomen pale reddish brown, towards anal extremity more whitish. Legs light pink. Fore wings moderate, triangular, hind margin rounded, waved; pale reddish brown, finely irrorated with dark grey; costal edge whitish ochreous; three indistinct obscure greyish lines, first at one-fourth, somewhat curved, second in middle, tolerably straight, third from two-thirds of costa to three-fourths of inner margin, unevenly curved, dotted with darker on veins; a hind-marginal row of dark grey dots on veins; cilia pale reddish brown. Hind wings moderate, hind margin rounded, waved, slightly bent in middle; colour and cilia as in fore wings; middle line obscurely indicated, others obsolete; a blackish oval discal spot, containing a white dot.

Solomon Islands (Mathew); one specimen.

30. Perixera prionodes, n. s.

♂, 40 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish ochreous, with scattered dark fuscous scales; second joint of palpi blackish above; antennal pectinations 14; tuft of posterior femora light purplish. Fore wings triangular, moderate, costa somewhat sinuate, hind margin rounded, crenate; whitish ochreous, irregularly irrorated with purplish fuscous; a black dot near costa at one-fifth; first line represented by four black dots in a rectangularly angulated series, fourth above inner margin at one-fourth; a black discal dot; a very faintly indicated irregular fuscous
Mr. E. Meyrick's descriptions of

median shade; second line at three-fourths, slender, indistinct, irregular, sharply dentate, fuscous, marked with black dots on veins; a hind-marginal row of black dots; cilia whitish ochreous. Hind wings moderate, hind margin rounded, crenate, tooth on vein 5 much smaller than rest; colour and markings as in fore wings, except discal spot, which is rather small, suboval, black, with a white centre.

Fiji (Lucas); one specimen.

BOARMIADÆ.

Fore wings: 7 rising out of 9. Hind wings: 5 absent, 8 usually free.

Euippe, n. g.

Face smooth. Palpi moderate, slender, smooth, ascending, terminal joint very short, porrected. Antennæ two-thirds of fore wings, in male (?). Thorax somewhat hairy beneath. Posterior tibiae (in female) with median spurs at three-fifths, short, terminal spurs wholly absent; posterior tarsi with four pairs of fine spines on basal joint (at base, one-fifth, three-fifths, and apex). Fore wings with vein 6 almost from a point with 9, 10 absent, 11 free. Hind wings with veins 3 and 4 short-stalked, 6 and 7 from near together, 8 with a strong basal fork, and connected with 7 near base above this by a short bar.

The structure of vein 8 of the hind wings is exceedingly curious, and the origin of its basal furecation remains to be explained.

31. Euippe phalarota, n. s.

♀, 30 mm. Head, palpi, antennæ, thorax, abdomen, and legs dark fuscous grey. Fore wings very broad, triangular, costa straight, on apical one-fourth strongly arched, hind margin nearly straight, crenulate; dark fuscous grey, with a large white trapezoidal dorsal patch, extending from two-fifths to four-fifths, and reaching half across wing, upper edge suffused, parallel to costa; under a lens the apex of all scales is very narrowly pale metallic blue; three dark brown obscure lines, nearly parallel to hind margin, first before one-fourth, second before middle, third beyond middle; first two very shortly angulated beneath costa; a dentate white subterminal line, indistinct on upper half; cilia white, with a suffused fuscous line, and barred with dark fuscous. Hind wings moderate, hind margin rounded, crenate, middle tooth rather more prominent; dark fuscous grey; a broad snow-white median band,
extending from one-fourth to two-thirds, anterior edge bounded by a straight dark brown line continuous with the second line of fore wings; posterior edge parallel to hind margin, strigulated with dark grey; within this band are two or three short confluent streaks from inner margin beyond middle; apex mixed with white; subterminal line and cilia as in fore wings.

Solomon Islands (Mathew); one specimen.

Boarmia, Tr.

Face with somewhat projecting scales. Palpi moderate, densely scaled, porrected. Antennae in male bipectinated. Fore wings in male with a circular impression near inner margin towards base; vein 6 remote from 9, 10 and 11 separate. Hind wings with veins 6 and 7 separate, 8 free, approximated to 7 towards base.

32. Boarmia psychastis, n. s.

♀, 38 mm. Head, palpi, and antennæ white. Thorax and abdomen white, finely sprinkled with black. Legs white, apex of femora and base of tarsal joints blackish, coxae hairy beneath. Fore wings rather elongate, triangular, costa slightly sinuate, hind margin rounded, waved; white, with fine scattered black scales, veins posteriorly suffused with whitish ochreous; costa, lower half of wing between first and second lines, and margins of a white dentate subterminal line suffused with grey; lines fine, black, dentate, first from beyond one-fourth of costa to one-third of inner margin, angulated a little below costa, second from beyond two-thirds of costa to two-thirds of inner margin, somewhat bent above middle; a pale ochreous spot beyond this below costa; discal spot transverse, suboval, pale, margined with blackish; hind margin with rather large black dots between veins; cilia white, slightly mixed with grey. Hind wings moderate, hind margin rounded, crenulate; colour, discal spot, second and subterminal lines, hind-marginal dots, and cilia as in fore wings; towards base suffused with grey; first line obsolete; second line curved outwards from one-fourth to three-fourths. Under surface white; discal spots large, black; second lines blackish; a subterminal blackish band, on fore wings touching a large blackish blotch on hind margin above middle.

New Hebrides (Mathew); one specimen.

A second female specimen, taken by Mr. Mathew in Samoa, is probably to be referred to the same species, but differs in some respects: size, 34 mm.; fore wings
with a conspicuous black dot in disc near base, dorsal suffusion obsolete, second line followed by a cloudy grey similar line; hind wings with discal spot hardly discernible, second line more dentate, basal suffusion obsolete; vein 10 of fore wings touching 9 between 7 and 8; otherwise similar.

**Hyperythra, Gn.**

Face with projecting scales. Palpi moderate, porrected, roughly scaled, terminal joint moderate, smooth, cylindrical. Antennae in male bipectinated, apex simple. Fore wings in male with a circular impression near inner margin towards base; vein 6 separate from 9, 10 rising out of 9 between 7 and 8, 11 separate. Hind wings in male with a pencil of hairs on costa near base; veins 3 and 4 from near together, 6 and 7 separate, 8 free, somewhat approximated to 7 towards base.


A female specimen agrees with Guenée's description, but the median line is much less distinct, posterior spots of fore wings obsolete; the two spots of hind wings rather large, very distinct; cilia without rosy tinge.

Port Moresby, New Guinea (*Mathew*); occurs also in the Malay Archipelago and India.

**PYRALIDINA.**

The families of this group are defined as in my papers on the Australian species; except that the definition of the *Musotimidae* is somewhat altered, and the family *Siculodidae* is added to the group, from which I find that it cannot be naturally separated.

**PYRALIDIDÆ.**

Vitesse, *Moore*.

Forehead vertical; no ocelli; tongue well developed. Antennae two-thirds of fore wings, in male bipectinated, apex filiform. Labial palpi long, curved, ascending, second joint with loosely appressed scales, terminal joint long, cylindrical, pointed. Maxillary palpi very short, rudimentary. Abdomen elongate, posteriorly dilated; anal valves in male exserted, densely scaled. Posterior tibiae with
outer spurs half inner. Fore wings with veins 4 and 5 short-stalked. Hind wings broader by one-fourth than fore wings; veins 4 and 5 short-stalked, 6, 7, and 8 stalked from base of wing, 6 out of 7 near beyond angle of cell, 8 out of 7 before half-way between cell and apex.

The structure of veins 6, 7, 8 of hind wings is different from any other genus known to me, and is not noticed by Lederer; but I cannot say whether it is identical in all the species.

34. Vitessa pyraliata, Walk.

Vitessa pyraliata, Walk., Suppl., 221.

♂, ♀, 40 mm. Head deep yellow, face blackish. Palpi deep yellow, terminal joint blackish. Antennae black, apical third white. Thorax deep ochreous-yellow, centre and a broad stripe down patagia blue-black. Abdomen blue-black, apex ochreous-yellow, segmental margins white. Legs blackish, apex of tibia whitish. Fore wings elongate-triangular, narrow towards base, costa sinuate, apex rounded, hind margin obliquely rounded; blue-black; an ochreous-yellow spot near base, in female larger and more transverse; a moderately broad yellowish white band at one-third, not quite touching margins, anterior edge straight, posterior edge deeply indented above middle and rather suffused; a large dull white transverse oval spot beyond middle, faintly yellowish tinged, nearly reaching both margins; veins posteriorly marked with obscure whitish streaks not touching transverse spot or hind margin; cilia blackish. Hind wings dull white; base blackish; a broad purple-black border along hind margin, broadest at apex, continued narrowly along costa to base; cilia blackish, tips grey-whitish.

Nearest to V. suradeva, Moore, but quite distinct.

Port Moresby, New Guinea (Matlicw); two specimens. Walker's type (identified from description, but I think correctly) is from Celebes.

Asopia, Tr.

35. Asopia fuscicostalis, Snell.


Fiji (Lucas); one specimen. Occurs also in Java and Celebes.
Endotricha, Z.

Fiji (Lucas); one specimen. Also from Eastern Australia, Celebes, and Java.

37. Endotricha plinthopa, n. s.
♀, 23 mm. Head, palpi, thorax, and abdomen brownish ochreous, irregularly mixed with dull crimson. Antennae whitish ochreous. Legs pale ochreous, anterior and middle pair above mixed with crimson and blackish. Fore wings elongate-triangular, costa somewhat sinuate, moderately arched towards apex, apex obtuse, hind margin oblique, somewhat bowed; veins 4 and 5 as long-stalked as in E. ethopa; brownish ochreous, irrorated with dull crimson and posteriorly with blackish except towards costa; costal edge spotted with black; markings indistinct, formed by a blackish iroration; a line from one-third of costa to two-fifths of inner margin, bent outwards beneath costa, followed by a faint pale line: a small transverse discal spot; a double dentate line, enclosing an indistinct pale line, from costa near apex to anal angle; an interrupted black hind-marginal line; cilia whitish ochreous, above apex and on a broad space above middle of hind margin dark grey, with an irregularly interrupted blackish grey line near base. Hind wings dark purplish grey, costal half wholly suffused with whitish ochreous; a broad whitish ochreous median band, margined throughout by dark grey lines and containing on lower half slender grey lines near and parallel to each margin, anterior edge curved, posterior edge sinuate; a clear whitish ochreous narrow hind-marginal streak; cilia whitish ochreous, above apex grey, with three grey dots on hind margin above middle.

Nearest E. ethopa, Meyr., but quite different; median band of hind wings broader and approaching nearer hind margin than in any Australian species.

Samoa (Mathew); one specimen.

Diplopseustis, Meyr.

38. Diplopseustis minima, Butl.
Fiji (Lucas); one specimen. Also occurs in Formosa, Eastern Australia, and New Zealand.
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SICULODIDÆ.

Fore wings with vein 7 separate, 8 or 9 stalked or separate, 10 present, separate. Hind wings with veins 6 and 7 remote at origin, lower median not pectinated.

Although some forms of this family differ from all other *Pyralidina* in having veins 8 and 9 of the fore wings separate, it is impossible in this instance to lay stress on the character, since these veins are found both stalked and separate in different specimens of the same species; the group must therefore be regarded as an abnormal family of *Pyralidina*, probably ancestral in character; it verges on the *Musotimide*, from which it is distinguished in the nearest allied genera only by the presence of vein 11 in the fore wings.

**Siculodes, II.-S.**

Forehead rounded, vertical; ocelli present; tongue well developed. Antennæ two-thirds of fore wings, in male strongly lamellate-dentate, shortly ciliated. Labial palpi moderate, obliquely ascending, second joint with appressed or projecting scales, terminal joint moderate or short, cylindrical, obtuse. Maxillary palpi absent. Posterior tibiae with outer spurs less than half inner. Fore wings with veins 8 and 9 separate or stalked, 10 approximated to 9 at base. Hind wings as broad as fore wings; veins 4 and 5 rising near together, 6 from angle of cell, 7 from rather before angle, 8 free, approximated to 7 to rather beyond cell.


*Pyralis anticalis*, Walk., Suppl., 1238.

♂, 22 mm. Head, palpi, thorax, abdomen, and legs white, somewhat mixed with pale ochreous; anterior tibiae and tarsi banded with fuscous. Antennæ whitish ochreous. Fore wings rather elongate-triangular, narrow at base, costa posteriorly arched, apex obtuse, hind margin bowed, oblique; veins 8 and 9 separate, approximated at base; white, with numerous scattered brownish ochreous fine transverse strigulae, which partially coalesce to form about six fine irregular transverse lines; a small fuscous spot above inner margin beyond middle; a black subapical dot; one or two strigulae beneath apex somewhat marked with black; cilia white. Hind wings white; strigulae as in fore wings; cilia white. Fore wings beneath with an irregular ochreous-brown streak along
costa, below which towards disc are some irregular raised black and prismatic-metallic scales.

Fiji (Lucas); one specimen. Walker's type was from Mysol. I have a very similar closely allied species from North Australia, and Felder figures another from South America.

40. Siculodes hemicycla, n. s.

♀, 23 mm. Head, palpi, thorax, abdomen, and legs light ochreous, densely irrorated with reddish fuscous; antennae light ochreous; posterior tibiae whitish ochreous. Fore wings elongate-triangular, costa posteriorly arched, apex obtuse, hind margin strongly rounded, very oblique, inner margin rounded, continuous with hind margin; veins 8 and 9 stalked; light ochreous, broadly suffused with reddish fuscous along costa except towards apex, along inner margin to anal angle, and on an elongate triangular patch resting on middle of hind margin, of which apex is in centre of wing; some fine scattered fuscous strigulae; four pairs of irregular transverse tolerably well-defined reddish fuscous lines, first near base, second widest apart, from two-fifths of costa to middle of inner margin, enclosing a quadrate dark spot on costa, third from two-thirds of costa to before anal angle, filled in with reddish fuscous on upper half, fourth from five-sixths of costa to anal angle; a single similar line near hind margin, before which are some scattered darker fuscous strigulae; cilia brownish ochreous, tips whitish. Hind wings whitish ochreous, lower half suffused with reddish fuscous and marked with scattered dark fuscous strigulae; cilia fuscous, tips whitish. Hind wings beneath suffused posteriorly with light purple-bluish.

Fiji (Lucas); one specimen.

41. Siculodes subfasciata, Walk.


Fiji (Lucas); one specimen. Occurs also in New Zealand.

The single Fijian specimen is a male; compared with two female specimens from New Zealand it is rather smaller and lighter, the palpi are longer and more slender, and veins 8 and 9 of the fore wings are separate but closely approximated at base, whilst in the New
Zealand specimens these veins are very shortly stalked; in all other respects the specimens agree exactly, and I believe that these differences are merely sexual or perhaps individual only.

**Mesopempta, n. g.**

Forehead rounded, vertical; ocelli absent (?); tongue well developed. Antennae three-fourths of fore wings, in male (?). Labial palpi moderate, arched, rather ascending, second joint with dense projecting scales beneath, terminal joint very short, cylindrical. Maxillary palpi absent. Posterior tibiae in female with outer spurs half inner. Fore wings with veins 8 and 9 stalked, 10 very closely approximated to 9 towards base. Hind wings as broad as fore wings; vein 4 rising from lower angle of cell, 5 from middle of transverse vein, parallel to 4 and 6, 6 from upper angle, 7 from before angle, 8 anastomosing with 7 from middle of cell to considerably beyond cell.

Diffsers from *Siculodes* by the peculiar position of vein 5 of the hind wings, and the anastomosing of veins 7 and 8.

42. **Mesopempta heliopsamma**, n. s.

♀, 16 mm. Head, palpi, and thorax light reddish ochreous; antennae, abdomen, and legs whitish ochreous; antennae obscurely annulated with darker; tarsi darker, with pale rings at apex of joints. Fore wings triangular, costa almost straight, apex tolerably rectangular, hind margin obliquely rounded, slightly sinuate beneath apex; reddish ochreous, with numerous irregular tolerably straight pale transverse strigulae; costa with some pairs of whitish dots, and partially finely dotted with dark fuscous; hind margin beneath apex obformely dark fuscous; cilia reddish ochreous, tips paler. Hind wings with colour, strigulae, and cilia as in fore wings.

Port Moresby, New Guinea (Mathew); one specimen.

**MUSOTIMIDÆ.**

The modified definition of this family should be: Fore wings with vein 10 absent, 8 and 9 stalked, sometimes also 7 out of 8. Hind wings with vein 6 from upper angle of cell, 7 from upper margin of cell before angle (or rarely out of 6), anastomosing with 8. Abdomen in male with uncus strongly developed, complex.

The subjoined new genus is so closely allied to *Trichophysetis* in nearly all structural characters, especially in the family character of the absence of vein 10.
of the fore wings, that it is impossible to separate it from the family, though it does not possess the distinguishing characteristic of the neuration of the hind wings; the definition has therefore been recast to allow of its inclusion.

**Trichophysetis, Meyr.**

43. *Trichophysetis neophyla, Meyr.*

Norfolk Island (*Mathew*); one specimen. Occurs also in Eastern Australia.

**Trieropis, n. g.**

Forehead with a short flat projection; ocelli absent; tongue well developed. Antennae two-thirds of fore wings, in male stout, filiform, ciliated-pubescent, with angularly projecting scales at joints. Labial palpi very long, straight, porrected, with dense appressed scales, attenuated to apex. Maxillary palpi dilated with scales, terminating in a very long fine pencil of hairs as long as labial palpi, and resting on and between them. Abdomen in male with uncus moderate, bent, beneath set with stiff bristles, especially towards apex, with a stout obliquely truncate process from base beneath; claspers short, slender (?). Posterior tibiae with spurs all very long and nearly equal. Fore wings with veins 7 and 8 stalked out of 9, 11 oblique. Hind wings with veins 3 and 4 from point of angle, 5 rather approximated to 4 at base, 7 out of 6 near origin, anastomosing with 8 to near middle; lower median not pectinated.

Differs from *Trichophysetis* by the structure of the labial palpi, and the origin of vein 7 of the hind wings from 6.

44. *Trieropis nesias, n. s.*

♂, 16 mm. Head, antennae, and thorax white. Labial palpi dark fuscous, with a yellow-ochreous longitudinal line on side. Maxillary palpi dark fuscous mixed with ochreous, terminal pencil pale yellowish. Abdomen whitish ochreous, base and segmental margins white, with two blackish rings above middle. Legs whitish ochreous. Fore wings triangular, costa gently arched, apex round-pointed, hind margin waved, rather oblique, somewhat sinuate below apex, strongly bowed outwards in middle; pale whitish ochreous, brownish-tinged; a yellow-ochreous streak along basal third of costa, beneath suffusedly margined with white; a slender fuscous line from two-fifths of costa to two-fifths of inner
margin, obsoletely angulated beneath costa, where it is double, and marked with two black dots in and above middle; a double waved fuscous line, dilated and yellow-ochreous on costa, from two-thirds of costa to four-fifths of inner margin, very strongly curved outwards on upper two-thirds; an elongate-crescentic yellow-ochreous mark extending along upper half of hind margin, anteriorly black-marginated and outside that edged with white, before which is an obscure greyish suffusion; cilia whitish ochreous (imperfect). Hind wings pale whitish ochreous, brownish-tinged, costal half suffused with pale ochreous-yellowish except on hind margin; two pairs of dark fuscous lines only visible on dorsal half except first of second pair; first at one-third, second at two-thirds, somewhat curved; a greyish hind-marginal shade; a dark fuscous hind-marginal line; cilia whitish ochreous.

Tonga (Mathew); one specimen.

HYDROCAMPIDÆ.

Cataclysta, Hb.

Forehead vertical; ocelli absent; tongue well developed. Antennae two-thirds of fore wings, in male rather stout, filiform, pubescent-ciliated (¿), towards apex with projecting scales at joints. Labial palpi moderately long, curved, ascending, second joint with appressed scales or roughly haired beneath, terminal joint moderate, rather obtuse or pointed. Maxillary palpi moderate, filiform. Abdomen in male with valves large, exserted, scaled; uncus long, curved, beneath with a rather shorter downward-curved process from base. Posterior tibiae with outer spurs three-fourths of inner. Fore wings with veins 3, 4, 5 approximated, 10 rising out of stalk of 8 and 9, 11 short. Hind wings with veins 3 and 4 approximated, 5 from a point or stalked with 4 or absent (coincident with 4), 7 out of 6 near origin, 8 anastomosing with 7 beyond cell or wholly coincident with 7 from its origin to apex.

45. Cataclysta hexalitha, n. s.

♀, 26 mm. Head, thorax, and abdomen ochreous-whitish, somewhat mixed with ochreous. Antennae whitish ochreous. Palpi with second joint rough-haired beneath, terminal joint rather obtuse; whitish ochreous, mixed with dark fuscous, towards base white beneath. Legs ochreous-whitish. Fore wings very elongate-triangular, costa slightly sinuate, apex obtuse, hind margin nearly straight, oblique, rounded beneath; white, irregularly and suffusedly irrigated with ochreous-yellowish; an ochreous-yellow basal
suffusion; a thick ochrous-yellow rather suffused streak from inner margin at one-third to disc at two-fifths, continued irregularly through disc to three-fourths, thence bent downwards to above anal angle, and again curved abruptly upwards, becoming narrower and dark-margined, and continued nearly parallel to hind margin to costa at five-sixths; a subquadrate deep ochrous-yellow spot in disc beyond middle, connected with costa by a fuscous suffusion, and suffused beneath into discal streak; a short very inwardly oblique ochrous-yellow streak from anal angle, touching curve of discal streak, surrounded anteriorly by an obscure fuscous suffusion; an ochrous-yellow hind-marginal fascia, anteriorly blackish-edged; a hind-marginal row of black dots; cilia whitish, with an interrupted fuscous line. Hind wings with vein 5 from a point with 4, 8 anastomosing with 7 to middle; white; a thick anteriorly much suffused deep ochrous-yellow fascia from beneath costa at two-fifths to middle of inner margin, sharply angulated in middle; an irregularly curved ochrous-yellow fascia from disc beyond middle to anal angle, bent to touch hind-marginal streak above anal angle; beyond this the entire apical area strewn with sharply defined black speckles; an ochrous hind-marginal fascia, becoming yellow towards anal angle, marked between apex and three-fourths with six small semicircular deep black spots; cilia whitish, with a shining grey line.

Fiji (Lucas); one specimen.

Anydraula, Meyr.

46. Anydraula cyanolitha, n. s.

♀, 15 mm. Head, thorax, and abdomen ochrous-yellowish, shoulders mixed with blackish. Palpi with second joint irregularly rough-haired beneath; whitish, somewhat mixed with blackish. Antennae whitish, annulated with fuscous. Legs ochrous-whitish, anterior femora and tibie blackish above. Fore wings very elongate-triangular, narrow, costa hardly arched, apex round-pointed, hind margin obliquely rounded; deep ochrous-yellow; a fuscous basal patch, limited by a straight whitish line from one-fourth of inner margin to one-third of costa, thence produced narrowly along costa to middle; a large triangular patch, mixed with dark grey and white scales, extending on inner margin from before middle to near anal angle, its apex touching middle of costa; a triangular pearly white blotch on costa at two-thirds, reaching half across wing; a triangular white spot on costa before apex, giving rise to a steel-blue-metallic blackish-edged streak near hind margin, reaching two-thirds across wing; a steel-blue-metallic oblique spot
above anal angle; a fine black hind-marginal line; cilia shining grey, with a dark grey line near base. Hind wings black, base suffused with pearly white; a deep ochreous-yellow erect spot on inner margin beyond middle, reaching half across wing; three parallel ill-defined straight streaks from two-thirds of costa to posterior side of this spot, violet-blue-metallic, becoming whitish towards costa; a series of five roundish violet-blue-metallic spots before hind margin, two lowest approximated, four upper connected with hind margin by small ochreous-brown spots; cilia as in fore wings.

Fiji (Lucas); one specimen.

47. Anydraula drusialis, Walk.
Fiji (Mathew, Lucas); several specimens. Occurs also in North-East Australia and Borneo.

48. Anydraula unilinealis, Snell.
Oligostigma unilinealis, Snell., Tijd. v. Ent., 1875, pl. viii., 2.
Fiji (Lucas); one specimen. Occurs also in Java.
Snellen includes in the genus Oligostigma several species of discordant structure which cannot be kept together.

Paraponyx, IIb.

49. Paraponyx polydectalis, Walk.
Fiji (Mathew, Lucas); several specimens. Occurs also in Eastern Australia.

50. Paraponyx chrysota, n. s.
♂, 19 mm. Head, palpi, antennae, thorax, and abdomen ochreous-yellow; palpi white towards base beneath, second joint rough-haired beneath, terminal joint swollen towards apex. Legs whitish, anterior pair ochreous-yellow. Fore wings very elongate-triangular, costa gently arched posteriorly, apex obtuse, hind margin slightly rounded, rather strongly oblique; vein 11 closely approximated to 9 at base; pearly white, suffusedly irrorated with ochreous-yellow except on subterminal fascia; markings deep ochreous-yellow; a suffused streak along costa from base to two-thirds, a broader suffused streak along inner margin from base to near anal angle, and a straight suffused fascia connecting posterior extremities of these; a suffused fuscous spot in disc before middle;
Mr. E. Meyrick's descriptions of

a straight fascia from five-sixths of costa to apex of dorsal streak; a moderate hind-marginal fascia, anteriorly margined with an interrupted black line; a hind-marginal row of black dots; cilia pale whitish ochreous. Hind wings white, tinged with ochreous-yellowish; a deep ochreous-yellow fascia beyond middle parallel to hind margin, anteriorly partially blackish-margined towards disc; an ochreous-yellow partially black-margined hind-marginal fascia; three small round black spots on hind margin above middle, two upper semicircularly margined with white anteriorly, and preceded by some scattered black speckles; cilia pale whitish ochreous.

Nearer \textit{P. polydectalis} than any other species known to me.

Fiji (Lucas); one specimen.

\textit{Schænobius, Dup.}


Fiji (Lucas); one female specimen, rather narrower-winged than usual, but not different otherwise. Occurs also in Eastern Australia.

\textbf{BOTYDIDÆ.}

\textit{Margarodes, Gn.}

52. \textit{Margarodes oceanitis}, n. s.

3', ?, 44—46 mm. Head, antennæ, thorax, abdomen, and legs greenish white; collar very narrowly ochreous; shoulders ferruginous; anal tuft greyish ochreous mixed with black, expansible; anterior and middle tibiae ferruginous above. Maxillary palpi ferruginous, apex and base white. Labial palpi ferruginous, basal half greenish white. Fore wings elongate-triangular, costa somewhat sinuate, posteriorly moderately arched, apex obtuse, hind margin slightly rounded, oblique; pale green, irregularly suffusedly irrorated with white; a narrow ferruginous costal streak, finely attenuated posteriorly, beneath margined by a suffused white streak; a row of dark grey dots on hind margin, often indistinct; rarely a grey hind-marginal line; cilia grey, base and tips whitish. Hind wings with colour, hind-marginal dots, and cilia as in fore wings; vein 1b not clothed with hairs beneath.

Nearest \textit{M. glauculalis}, Gn., which I have not seen, but according to the description it should be sufficiently distinct.

New Hebrides (Matthew); Fiji (Matthew, Lucas); about ten specimens.
Cydalima, \textit{Ld.}

Forehead rather oblique; ocelli present; tongue well developed. Antennae four-fifths of fore wings, in male shortly ciliated (\text{?}), with a marked sinuation at about one-fifth, thence to base rough-scaled above, basal joint thickened, with a short tooth of scales above in front. Labial palpi moderate, perforated, broadly dilated beneath with dense projecting scales, anteriorly truncate, terminal joint concealed. Maxillary palpi rather short, dilated towards apex with dense scales, truncate. Abdomen in male with dense exsertible anal tuft, valves retracted. Posterior tibiae with outer spurs one-fourth of inner. Fore wings with veins 7 and 10 closely approximated to 9 towards base, 11 very oblique. Hind wings somewhat broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to one-third.

53. \textit{Cydalima mysteris}, n. s.

\text{?}, 40 mm. Head brownish ochreous, face dark fuscous with purple-blue reflections. Palpi dark fuscous with purple-blue reflections, basal half pearly white. Antennae white, basal fifth ochreous-brown. Thorax with a broad raised scaled hood in front; anterior half dark fuscous, with brilliant prismatic reflections, posterior half white. Abdomen and legs white, anterior tibiae and basal half of middle tibiae dark fuscous. Fore wings elongate-triangular, narrow towards base, costa posteriorly strongly arched, apex obtuse, hind margin slightly sinuate, very oblique; shining violet-white; a broad dark shining violet-fuscous stripe along costa, lower edge before middle with a small projecting tooth, preceded by a similar small indentation; rarely a row of minute black dots on hind margin; cilia silvery white. Hind wings shining violet-white; cilia silvery white.

New Hebrides (Mathew); several specimens.

Phacellura, Guild.

54. \textit{Phacellura indica}, Saund.

New Hebrides and Samoa (Mathew); Fiji (Lucas); common. Occurs also in Eastern Australia, Malay Archipelago, China, India, South Africa, and Cape Verde Islands.
Mr. E. Meyrick's descriptions of

**Glyphodes, Gn.**

55. *Glyphodes actgorionalis*, Walk.


γ. Antennae five-sixths of fore wings, ciliations two-thirds. Posterior tibiae with outer spurs one-third of inner. Hind wings with veins 3 and 4 from a point.

New Hebrides (Mathew); one specimen. Also from Celebes and India.


*Glyphodes stolalis*, Gn., 293, pl. iii., 11.

New Hebrides (Mathew); Fiji (Lucas); about ten specimens. Also from Celebes.


γ, 18 mm. Head, palpi, antennae, thorax, abdomen, and legs whitish; thorax with scattered fuscous spots; anal tuft blackish; antennal cilia one-fourth; anterior femora and tibiae with apex dark fuscous, posterior tibiae with outer spurs one-third of inner. Fore wings elongate-triangular, much narrowed towards base, costa somewhat sinuate, apex round-pointed, hind margin rather bowed, oblique; white, with fuscous markings, forming ten transverse lines perpendicular to costa, and a hind-marginal band; one almost at base, two together near beyond it, a pair at one-third, three together forming a median band dilated beneath, and two from costa about two-thirds converging and meeting hind-marginal band in middle; hind-marginal band moderate, evenly broad, containing an interrupted white line, and two white spots on middle of hind margin; cilia fuscous, with a broad white space beneath apex and another above anal angle. Hind wings white, semi-transparent, with fuscous markings; a somewhat curved narrow fascia before middle, containing a white median dot; a moderate irregular hind-marginal band, containing a very irregularly interrupted white line, and receiving below middle an irregular fuscous line from costa at three-fifths; cilia white, with a dark fuscous line, and with fuscous patches at apex, middle, and below anal angle.

Port Moresby, New Guinea (Mathew); one specimen.
Lepidoptera from the South Pacific.

Felder's species is said to be from South Africa; his figure is coarse, but I believe it is correctly identified.

Siriocauta, Ld.

58. Siriocauta testulalis, Hb.

Fiji (Lucas); one specimen. Occurs also in Eastern Australia, Malay Archipelago, Japan, India, Africa, West Indies, and South America.

Euclasta, Ld.

Forehead oblique; ocelli present; tongue well developed. Antennæ longer than fore wings, filiform, in male shortly ciliated, with angularly projecting scales at joints. Labial palpi moderate, porrected, with dense projecting scales beneath, anteriorly truncate, terminal joint concealed. Maxillary palpi very short, filiform. Fore wings with vein 10 closely approximated to 9, 11 oblique. Hind wings broader by one-fourth than fore wings; veins 4 and 5 from a point, 7 out of 6 near origin, anastomosing with 8 to middle.

59. Euclasta macratalis, Ld.

Euclasta macratalis, Ld., 189, pl. xv., 11.

Port Moresby, New Guinea (Mathew); one specimen. Also from North-East Australia and Celebes.

Hymenoptychis, Z.

Forehead rounded, vertical; ocelli present; tongue well developed. Antennæ nearly as long as fore wings, in male filiform, compressed, minutely ciliated. Labial palpi moderate, arched, ascending, second joint with short projecting scales beneath terminal joint very short, cylindrical. Maxillary palpi extremely short, rudimentary. Abdomen in male very long, anal segment extremely elongate, valves retracted. Posterior tibiae with outer spurs less than half inner. Fore wings without transverse vein, veins 6 and 7 continued as independent veins almost to base, 7 sinuate in middle, 10 rising from before normal position of transverse vein (therefore not truly out of 9), 11 oblique; above with a naked longitudinal space in disc, including an impression in sinuation of 7, beneath which is a short ridge of erect scales on 6; beneath with a loose brush of hairs directed inwards from near costa towards base. Hind wings as broad as fore wings; cell
short, transverse vein strongly bent, veins 3, 4, 5 closely approximated at base, 7 out of 6 rather near origin, anastomosing with 8 to middle.

60. Hymenoptychis sordida, Z.

Hymenoptychis sordida, Z., Caff., 65; Ld., pl. xvi., 2.

Fiji (Mathew, Lucas); several specimens. Occurs also in Celebes, India, and South Africa.

Cometura, n. g.

Forehead rounded, vertical; ocelli present; tongue well developed. Antennae four-fifths of fore wings, in male filiform, shortly ciliated (†). Labial palpi moderate, arched, ascending, second joint with short projecting scales beneath, terminal joint short, cylindrical. Maxillary palpi minute, filiform. Abdomen in male very long, with a long exsertible anal tuft, valves retracted. Posterior tibiae with outer spurs half inner. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle.

61. Cometura picrogramma, n. s.

♂, ♀, 18—20 mm. Head, antenna, thorax, abdomen, and legs pale yellow-ochreous; shoulders suffused with dark grey. Palpi dark grey, basal half white. Fore wings elongate-triangular, costa somewhat sinuate, posteriorly arched, apex obtuse, hind margin rounded, rather strongly oblique; light yellow-ochreous, towards costa and hind margin brownish-tinged; costa suffused with grey, costal edge dark grey; a dark fuscous dot beneath costa at one-fourth; two dark fuscous transverse parallel marks in middle of disc, indicating sides of a quadrate spot; second line dark fuscous, indistinct, sharply irregularly dentate, from three-fourths of costa to two-thirds of inner margin, middle third irregularly curved outwards; a dark grey hind-marginal line; cilia whitish, with a sharply marked dark grey line. Hind wings with colour, second and hind-marginal lines, and cilia as in fore wings.

Fiji (Mathew, Lucas); several specimens.

Spanista, Ld.

62. Spanista ornatalis, Dup.

It is this species which is described by me in an earlier paper as new under the name of Hydriris chalybitis.
I should explain that this mistake was due to an error of Lederer, who in his tabulation of genera includes *Spanista* amongst those which possess maxillary palpi, which is incorrect, and led me to overlook the identification.

New Hebrides and Tonga (*Mathew*); Fiji (*Lucas*). Occurs also in Eastern Australia, Celebes, Java, Africa, and Southern Europe.

**Dracænura, n. g.**

Forehead rounded, oblique; ocelli present; tongue well developed. Antennæ from four-fifths to almost as long as fore wings, in male filiform, very shortly ciliated (†), with projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense projecting scales beneath, terminal joint very short, cylindrical, obtuse. Maxillary palpi moderately long, slender, filiform. Abdomen in male very long, anal segment elongate, with small anal tuft, valves retracted. Posterior tibiae with outer middle-spur one-fourth to one-half, outer end-spur one-half of inner. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base, 7 rising in male out of 6 almost at origin and connected with 8 very near origin at a point only or by a short transverse bar, in female out of 6 near origin and anastomosing shortly with 8.

Closely allied to *Pleonectusa*, from which it is distinguished by the peculiar form of anastomosis of veins 7 and 8 of the hind wings in male.


♀ 49—53 mm., ♀ 38—40 mm. Head rather dark fusceous, crown mixed with light ochreous. Palpi fusceous, base white. Antennæ whitish ochreous. Thorax light yellow-ochreous, anterior margin suffused with dark fusceous. Abdomen pale ochreous-yellowish, in male apical half suffused with dark fusceous, purple-shining. Legs pale whitish ochreous, anterior tibiae fusceous. Fore wings very elongate-triangular, more elongate in male, costa posteriorly strongly arched, apex obtuse, hind margin slightly rounded, in male extremely oblique, in female rather strongly oblique, inner margin in male sinuate outwardly before middle;
lower median vein in male clothed with long hairs on under surface; fuscous, violet-shining; inner margin in male broadly, in female very narrowly, suffused with pale whitish yellowish; lines slender, somewhat darker, indistinct, slightly waved; first from one-sixth of costa to one-fourth of inner margin, straight, sometimes obsolete; second from two-thirds of costa to three-fourths of inner margin, slightly curved outwards, somewhat irregular; a small round dark fuscous discal spot near costa at one-third, and a narrow transverse spot before middle; cilia fuscous. Hind wings with inner margin in male longitudinally folded, fold clothed with hairs; shining whitish yellowish; a dark fuscous transverse discal spot considerably before middle; a moderate fuscous violet-shining hind-marginal band, in male darker and more violet but obsolete at apex; in female an indistinct or faint fuscous irregular line, near and tolerably parallel to anterior edge of hind-marginal band; cilia in male dark fuscous, in female ochreous-yellowish with a fuscous line.

This is the extreme form of the genus; the inner-marginal fold in the hind wings of male is more or less indicated in the other species, but not in such a pronounced form.

Fiji (Mathew, Lucas); about a dozen specimens.

64. Dracenaura pelochra, n. s.

♂ , ♀ , 23—24 mm. Head yellow-ochreous, crown mixed with whitish. Palpi yellow-ochreous, beneath broadly white. Antennæ whitish ochreous. Thorax yellow-ochreous, on back mixed with whitish. Abdomen yellow-ochreous, towards base more whitish, segmental margins white, anal segment wholly snow-white. Legs ochreous-whitish. Fore wings rather elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin slightly rounded, oblique; yellow-ochreous, becoming deeper ochreous towards costa, especially towards base; markings ochreous-brown, distinct; first line from one-fifth of costa to one-third of inner margin, somewhat curved outwards; a very small round discal spot at one-third, and a narrow transverse spot in middle; second line from two-thirds of costa to beyond two-thirds of inner margin, rather irregular, upper two-thirds slightly curved outwards; cilia whitish, with a grey basal line. Hind wings with hind margin waved; whitish yellowish; a slightly curved fuscous line from middle of disc to inner margin before anal angle; a suffused brownish ochreous hind-marginal band; cilia whitish.

Fiji (Mathew); several specimens.
65. *Draccenura athenota*, n. s.

♀, 27—28 mm. Head, antennae, thorax, abdomen, and legs ochreous-white; face and margin of shoulders fuscous. Palpi fuscous, beneath broadly white. Fore wings elongate-triangular, costa slightly sinuate, posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; ochreous-whitish; a fuscous streak along costa from base, becoming pale ochreous on apical third, and somewhat suffused with pale ochreous beneath; a fuscous dot beneath this at one-fifth, and another above inner margin at one-third, representing first line; a round dark fuscous dot beneath costal streak beyond one-fourth, and a transverse dark fuscous mark at one-half; a slightly curved row of transverse fuscous dots, darker on margins, from three-fourths of costa to three-fourths of inner margin, slightly indented below costa and above inner margin; cilia ochreous-whitish. Hind wings and cilia whitish.

The male being unknown, it is of course possible that the species might belong to *Plconectusa*.

Fiji (*Mathew, Lucas*); two specimens.

66. *Draccenura agramma*, n. s.

♂ 27 mm., ♀ 23 mm. Head, antennae, thorax, and abdomen ochreous-yellowish; face and shoulders suffused with dark fuscous; anal segment in male yellow-whitish. Palpi fuscous, beneath broadly white. Legs whitish yellowish. Fore wings elongate-triangular, more elongate in male, costa posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; ochreous-yellow; basal half of costa suffused with fuscous; in female costal edge dark grey throughout, a dark fuscous dot in disc at one-fourth, a dark fuscous transverse mark before middle, and a dark grey hind-marginal line, but in male these are not indicated; cilia in male yellow-whitish, in female grey, tips whitish. Hind wings with colour and cilia as in fore wings; in female a narrow dark fuscous streak along hind margin, not indicated in male.

Samoa (*Mathew*); several specimens.

67. *Draccenura horochroua*, n. s.

♂, 20—21 mm. Head, antennae, thorax, and abdomen ochreous-yellowish; face and shoulders blackish. Palpi blackish, beneath broadly white. Legs whitish yellowish. Fore wings elongate-triangular, costa posteriorly gently arched, apex round-pointed,
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hind margin straight, very oblique; deep ochreous-yellow; basal half of costa suffused with dark purplish fuscous; lines slender, dark fuscous; first from one-fifth of costa to one-fourth of inner margin, ill-defined, nearly straight; second from two-thirds of costa to beyond two-thirds of inner margin, straight, slightly indented towards costa; a dark fuscous discal dot in middle; cilia white, with a strong sharply marked dark fuscous basal line. Hind wings deep ochreous-yellow, towards base paler; a slender dark fuscous line from beneath costa beyond middle to above inner margin before anal angle, nearly straight, slightly irregular; cilia as in fore wings.

Port Moresby, New Guinea (Mathew); several specimens.

68. Dracænura myota, n. s.

♂, 24 mm. Head, thorax, and abdomen pale shining grey; anal segment snow-white. Palpi dark grey, beneath broadly white. Antenna grey-whitish. Legs white, anterior and middle pair grey above. Fore wings elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin slightly rounded, very oblique; rather light shining grey, with pale bluish reflections; lines and spots hardly darker, very indistinct; first line from one-fifth of costa to one-third of inner margin, nearly straight; second from two-thirds of costa to three-fourths of inner margin, irregularly curved; a small round discal spot at one-third, and a transverse spot in middle; cilia grey, apical half whitish. Hind wings with hind margin waved; pale grey, bluish-shining, paler towards base; hind margin very slenderly suffused with blackish grey; cilia whitish.

New Hebrides (Mathew); Fiji (Lucas); several specimens.

Pleonectusa, Ld.

Forehead rounded, oblique; ocelli present; tongue well developed. Antenna almost as long as fore wings, in male filiform, very shortly ciliated (\( \frac{1}{4} \)), with projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense projecting scales beneath, terminal joint very short, cylindrical, obtuse. Maxillary palpi moderately long, slender, filiform. Abdomen in male very long, anal segment elongate, with small anal tuft, valves retracted. Posterior tibiae with outer middle-spur one-third, outer end-spur one-half of inner. Fore wings with veins 4 and 5 sometimes short-stalked, 10 rising out of 9. 11 oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base,
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7 out of 6 near origin, anastomosing with 8 to one-third to three-fourths.

The anastomosis of veins 7 and 8 of the hind wings varies specifically, and in P. chalinota veins 4 and 5 of the fore wings are stalked, whilst in the other species they are separate, but I do not consider these differences here of generic importance.

69. Pleonectusa metaleuca/is, Walk.

Bradina metaleuca/is, Walk., Suppl., 1372.

♂, 24 mm. Head and thorax fuscous-grey. Palpi dark fuscous, beneath broadly white. Antennæ whitish. Abdomen grey, segmental margins white. Legs whitish, anterior and middle pairs grey above. Fore wings elongate-triangular, costa slightly sinuate, posteriorly gently arched, apex round-pointed, hind margin straight, very oblique; shining violet-fuscous; lines and spots darker, tolerably distinct; first line from one-fourth of costa to two-fifths of inner margin, rather curved; second from two-thirds of costa to four-fifths of inner margin, nearly straight, somewhat irregular; space between first and second lines clear white on dorsal half, forming a quadrate blotch; a small round discal spot at one-third, and a transverse spot in middle; cilia fuscous. Hind wings with vein 7 anastomosing with 8 to three-fourths; snow-white; a moderate rather dark violet-fuscous hind-marginal band; cilia fuscous.

Fiji (Mathew, Lucas); several specimens.

70. Pleonectusa parallela, n. s.

♂, 19 mm. Head, palpi, antennæ, thorax, abdomen, and legs deep ochreous-yellow; palpi broadly white beneath. Fore wings triangular, narrow at base, costa posteriorly moderately arched, apex obtuse. hind margin slightly rounded, rather strongly oblique; deep ochreous-yellow; extreme costal edge very slenderly blackish; a short black very oblique streak or small spot from base of costa; first line blackish, from one-fourth of costa to one-third of inner margin, slightly curved; a short transverse linear blackish mark in middle of disc; second line blackish, from two-thirds of costa to inner margin before anal angle, somewhat curved outwards from one-fourth to three-fourths, with a short acute indentation at three-fourths; an interrupted blackish hind-marginal line; cilia dark fuscous. Hind wings with vein 7 anastomosing with 8 to one-third; ochreous-yellow, becoming much paler towards base;
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an irregular fuscous line from middle of disc to anal angle; cilia ochreous-yellow, tips paler.

Fiji (Mathew, Lucas); two specimens.

71. Pleonectusa chloroscia, n. s.

♂, 25 mm. Head, palpi, antennae, thorax, abdomen, and legs whitish ochreous; palpi broadly white beneath; shoulders fuscous; anal segment white, preceded by a fuscous suffusion. Fore wings rather elongate-triangular, costa hardly sinuate, posteriorly gently arched, apex obtuse, hind margin gently rounded, oblique; pale whitish ochreous; basal half of costa narrowly suffused with fuscous; first line fuscous, very slender, indistinct, from one-fifth of costa to before one-third of inner margin, hardly curved; a dark fuscous dot in disc at one-third, and a dark fuscous narrow transverse spot in middle; second line fuscous, somewhat irregular, from beyond two-thirds of costa to four-fifths of inner margin, tolerably straight, slightly indented near costa and inner margin; cilia ochreous-whitish. Hind wings with vein 7 anastomosing with 8 to one-third; pale whitish ochreous; a fuscous line from beneath costa at three-fifths to near anal angle, obsolete at lower extremity, somewhat curved; cilia ochreous-whitish.

Tonga (Mathew); several specimens.

72. Pleonectusa trispila, n. s.

♂, 17 mm. Head, antennae, thorax, and legs white; anterior tibiae ochreous with a suffused blackish band. Palpi dark fuscous, beneath broadly white. Abdomen white, base of two apical segments ochreous mixed with black. Fore wings triangular, costa posteriorly gently arched, apex obtuse, hind margin slightly rounded, oblique; white; an ochreous streak along costa, becoming fuscous at base; a small round dark fuscous spot touching lower edge of costal streak beyond one-sixth, a second beyond one-fourth, and a third in middle, the last giving rise to a short ochreous-yellow transverse streak which reaches half across wing; second line yellow-ochreous, irregularly spotted with blackish, running from four-fifths of costa to inner margin close before anal angle, twice irregularly sinuate; a pale yellow-ochreous hind-marginal line; cilia white. Hind wings with vein 7 anastomosing with 8 to one-third; white; a small round dark fuscous spot in disc beyond middle, giving rise to a slightly curved pale ochreous line, obscurely dotted with dark fuscous, running to anal angle; a pale ochreous hind-marginal line; cilia white.

Fiji (Lucas); one specimen.
73. Plconectusa chalinota, n. s.

♂, 21 mm. Head, palpi, antennæ, thorax, abdomen, and legs snow-white; three apical segments of abdomen sharply blackish above. Fore wings triangular, costa posteriorly gently arched, apex tolerably rectangular, hind margin somewhat sinuate, oblique; snow-white; a blackish discal dot before one-third; a transverse oval blackish discal spot before middle; a similar spot on costa at three-fourths, whence proceeds a nearly straight light ochreous line to inner margin at four-fifths; a small blackish apical spot, connected with a slender interrupted dark fuscous streak along hind margin, finely attenuated beneath; cilia white, basal half whitish ochreous, separated by an indistinct fuscous line; veins 4 and 5 short-stalked. Hind wings with vein 7 anastomosing with 8 to beyond one-third; snow-white; a straight pale ochreous line from costa beyond two-thirds to anal angle; a dark fuscous hind-marginal line, dilated at apex, not reaching anal angle; cilia as in fore wings.

Solomon Islands and Ellice Islands (Mathew); several specimens.

Trematarcha, n. g.

Forehead rounded, oblique; ocelli present; tongue well developed. Antennæ five-sixths of fore wings, in male filiform, shortly ciliated (¼), with projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense projecting scales beneath, terminal joint very short, cylindrical, obtuse, sometimes concealed. Maxillary palpi moderately long, slender, filiform. Abdomen in male elongate, anal segment long, with small anal tuft, valves retracted. Posterior tibiae with outer spurs about half inner. Fore wings with vein 10 rising out of 9, 11 oblique; in male 4 and 5 closely appressed towards base, a circular impression above in disc immediately beyond cell, 6 bent and shortly furcate at base in this, beneath with a longitudinal comb of dense scales from beneath costa before middle directed towards disc. Hind wings somewhat broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle.

Closely allied to Plconectusa, from which it differs especially by the peculiar structure of the fore wings in male. Bradina, Ld., must approach this very nearly, but Lederer makes no mention of the conspicuous comb or fold of scales on the under surface of fore wings, which he could not fail to have noticed.
74. Trematarcha erilitalis, Feld.


♂, 26 mm. Head white, on sides dark fuscous. Palpi dark fuscous, beneath broadly white. Antennae whitish. Thorax white, shoulders dark fuscous. Abdomen white, anal segment sharply dark fuscous above. Legs white. Fore wings triangular, costa posteriorly gently arched, apex obtuse, hind margin slightly waved, gently rounded, oblique; white, towards hind margin and apical part of costa tinged with pale brownish ochreous; a dark fuscous streak along costa from base to two-thirds, posteriorly suffused, sometimes continued to apex; a slender dark fuscous line from before three-fourths of costa to before three-fourths of inner margin, very slightly curved outwards, somewhat indented below costa; a dark fuscous hind-marginal line; cilia white, basal half whitish ochreous, separated by an indistinct fuscous line. Hind wings white, towards hind margin tinged with pale brownish ochreous; an indistinct oblique transverse fuscous mark in disc at one-fourth; a straight dark fuscous line from costa at three-fifths to anal angle, obsoletely bent at lower extremity; hind-marginal line and cilia as in fore wings.

New Hebrides (Mathew); Fiji (Lucas); several specimens.

75. Trematarcha semnopa, n. s.

♂, 26 mm. Head greyish fuscous, face darker. Palpi dark fuscous, beneath broadly white. Antennae greyish ochreous. Thorax greyish ochreous, shoulders fuscous. Abdomen greyish ochreous, becoming blackish posteriorly, with pale segmental margins, anal segment wholly snow-white. Legs ochreous-whitish. Fore wings rather elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin rather oblique, slightly rounded; greyish fuscous, towards inner margin somewhat lighter; costa suffused with darker fuscous from base to two-thirds, the suffusion extending itself round discal impression, in centre of which is a round white dot; a cloudy dark fuscous line, posteriorly edged with paler, from three-fourths of costa to inner margin before anal angle, rather curved outwards, shortly indented beneath costa; a dark fuscous hind-marginal line; cilia snow-white, with a fuscous basal line. Hind wings greyish fuscous, becoming lighter towards base; an outwards-curved dark fuscous line, posteriorly edged with paler, from three-fourths of costa to anal angle; hind-marginal line and cilia as in fore wings.

Rotumah Island (Mathew); one specimen.
**Cnaphalocrocis, Ld.**

*76. Cnaphalocrocis rutilalis,* Walk.

Port Moresby, New Guinea (*Mathew*). Occurs also in North-East Australia, Malay Archipelago, Ceylon, India, and Central America.

**Marasmia, Ld.**

Forehead flat, oblique; ocelli present; tongue well developed. Antennæ four-fifths of fore wings, in male filiform, shortly ciliated (§), with angularly projecting scales towards apex. Labial palpi moderate, somewhat ascending, second joint with long dense projecting scales beneath, forming a quadrate tuft, terminal joint very short, concealed. Maxillary palpi moderate, dilated with scales towards apex. Abdomen in male with moderate exsertible anal tuft, valves retracted. Posterior tibiae with outer spurs about half inner. Fore wings with vein 10 very closely approximated to 9 towards base, 11 oblique; in male with a bladder-like inflation in posterior half of cell beneath upper margin, under surface densely scaled, upper surface covered by an irregular comb of dense scales from beneath costa. Hind wings somewhat broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 almost to apex.

*77. Marasmia ruralis,* Walk.

*Botys ruralis,* Walk., 666, 994; *Marasmia cicatricosa,* Ld., pl. xii., 8.

Fiji (*Mathew, Lucas*); several specimens. Occurs also in Celebes, Java, Ceylon, and Mauritius.

**Epimima, n. g.**

Forehead flat, oblique; ocelli present; tongue well developed. Antennæ four-fifths of fore wings, in male filiform, shortly ciliated (§), with angularly projecting scales at joints. Labial palpi moderate, somewhat ascending, second joint with long dense projecting scales beneath, forming a quadrate tuft, terminal joint very short, concealed. Maxillary palpi moderate, tolerably filiform. Abdomen in male with a dense exsertible anal tuft, valves exsertible (probably usually retracted). Posterior tibiae with outer median spur one-half, outer end-spur three-fourths of inner. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings somewhat broader than
fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 almost to base.

Separated from *Dolichosticha* by vein 10 of fore wings rising out of 9.

78. *Epimima stercogona*, n. s.

♂, ♀, 15—16 mm. Head, antennæ, thorax, abdomen, and legs whitish ochreous; anterior tibiae fuscous; anal segment in male above fuscous with five white longitudinal stripes. Palpi fuscous, beneath white towards base. Fore wings triangular, costa posteriorly gently arched, apex obtuse, hind margin bowed, oblique; very pale whitish ochreous, towards costa broadly and suffusedly irrorated with fuscous-grey; costal edge between first and second lines pale whitish ochreous, marked with about seven small dark fuscous spots; lines slender, dark fuscous-grey; first from one-fourth of costa to beyond one-third of inner margin, slightly curved; second from a small spot on costa at two-thirds, almost acutely angulated at two-thirds to beneath middle of disc, thence again rectangularly bent to inner margin beyond middle; a transverse-linear dark fuscous-grey discal spot in middle; a moderately broad fuscous-grey hind-marginal band, somewhat excavated irregularly from one-fourth to three-fourths, where it touches angle of second line; cilia whitish, with a strong dark fuscous line near base, and indistinct grey posterior line. Hind wings ochreous-whitish; a nearly straight slender dark fuscous-grey line from beneath costa at one-third to anal angle; a similar line from beyond middle of costa to inner edge of hind-marginal band below middle; a moderately broad fuscous-grey hind-marginal band, shortly attenuated to a point at anal angle; cilia whitish, with a dark fuscous line near base.

Fiji (*Lucas*); two specimens.

*Dolichosticha*, Meyr.

79. *Dolichosticha perinephes*, n. s.

♂, 18—20 mm. Head, antennæ, thorax, abdomen, and legs whitish ochreous; face and shoulders suffused with fuscous; a white black-margined line above each eye, and on basal joint of antenna; antennæ with angularly projecting scales at joints, ciliations one-half; anal segment with a white streak on each side, bordered beneath with black, penultimate segment black at base. Palpi fuscous, beneath white at base. Fore wings rather elongate-triangular, costa posteriorly gently arched, apex tolerably obtuse,
hind margin slightly rounded, oblique; whitish ochreous, brownish-tinted except towards inner margin; costa suffused with fuscous from base to second line; lines slender, dark fuscous; first from one-fourth of costa to one-third of inner margin, somewhat curved above middle; second from beyond two-thirds of costa, somewhat curved on upper half, below middle rectangularly bent inwards to beneath discal spot, thence again rectangularly bent to inner margin beyond middle; a transverse linear dark fuscous discal spot; a very indistinct fuscous shade near and tolerably parallel to second line, but more remote on inner margin, indicating a hardly perceptibly greyer hind-marginal band; a dark fuscous hind-marginal line; cilia grey-whitish, with two grey lines. Hind wings ochreous-whitish, more whitish towards base; two straight slightly irregular slender dark fuscous lines; first from one-third of costa to anal angle; second from before two-thirds of costa also to anal angle, very shortly interrupted below middle; an indistinct grey shade from costa at three-fourths towards anal angle, becoming obsolete beneath, towards costa suffused to apex; a dark fuscous hind-marginal line; cilia white, with a dark fuscous line near base.

Fiji (Mathew, Lucas); several specimens.

80. Dolichosticha bifurcalis, Snell.


I have no doubt that this species is correctly identified; Snellen, however, remarks incidentally that vein 10 of the fore wings is stalked with 9, which would indicate a species of Epimima, but it is fair to presume that this is an inaccuracy, for he adds "as in the other species"; now of the four other species which he includes with this in Cuaphalocrocis two are unknown to me, but the other two are C. rutilalis and Mar. ruralis, of which the former has vein 10 stalked with 11 and not with 9, and the latter has 10 separate from both 11 and 9.

Ellice Islands and Fiji (Mathew); two specimens. Occurs also in Celebes, Java, and India.

Chnaura, Ld.

Forehead flat, oblique; ocelli present; tongue well-developed. Antennæ four-fifths of fore wings, in male filiform, shortly ciliated (§), with angularly projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense projecting scales.
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beneath, terminal joint very short, thick, truncate. Maxillary palpi moderately long, thick, filiform, somewhat thickened terminally, truncate. Abdomen in male with small anal tuft, valves retracted. Posterior tibiae with outer spurs half inner. Fore wings with vein 10 rising out of 9, 11 very oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

81. Chnaura octavialis, Ld.


Apart from structure, this species may be immediately distinguished from the following by the absence of the black basal band of the abdomen. Lederer was mistaken in identifying this with octavialis, Walk., which is a synonym of Syngamia merionalis, Walk., as explained below, and some of the localities quoted by him are therefore also erroneous.

New Hebrides (Mathew); several specimens. Occurs also in New Guinea, Amboina, Aru, and Siam.

Syngamia, Gr.

Forehead somewhat rounded, oblique; ocelli present; tongue well developed. Antennæ four-fifths, in male filiform, moderately or shortly ciliated (\(\frac{3}{4}-1\)), with angularly projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense projecting scales beneath, terminal joint very short, almost concealed. Maxillary palpi moderate, rather thick, filiform. Abdomen in male with small anal tuft, valves retracted. Posterior tibiae with outer spurs half inner. Fore wings with vein 10 approximated to 9 towards base, 11 oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle.

Aethaloessa, Ld., cannot be maintained as a distinct genus; Lederer founded it on floridalis, Z., alleging as characters to distinguish it from Syngamia the porrected (not ascending) palpi and the longer ciliations of antennæ, but the first character is non-existent, the palpi being quite as in Syngamia and Chnaura, whilst the second is merely specific and certainly affords no basis for generic separation.
82. *Syngamia floridalis*, Z.

*Stenia floridalis*, Z., Caff., 60; Ld., pl. xvii., 2;

Fiji (*Mathew, Lucas*); several specimens. Occurs also in Celebes, India, and South Africa.

Note.—The species of this and the preceding genus are liable to confusion through their considerable superficial resemblance. There is a second Indian species of *Syngamia*, *S. merionalis* (*nealis*), Walk., 334, of which *S. octarialis*, Walk., 334, is a synonym, occurring in Sumatra, Ceylon, India, and South Africa; it is a true *Syngamia*, closely resembling *S. floridalis*, but separated by the dark fuscous costal streak extending only to the first transverse bar, so that the costal space between the anterior bar and median fascia is wholly orange.

**Diasemia, Gn.**


Norfolk Island (*Mathew*); one specimen, in which the character of the posterior line appears to resemble the Celebes type rather than that of New Zealand; perhaps no stress need be laid on this. Occurs in New Zealand, Celebes, Sumatra, and Java.

84. *Diasemia ramburialis*, Dup.

Fiji (*Lucas*); one specimen. Occurs also in Eastern Australia, Celebes, Java, Ceylon, South Europe, and South Africa.

**Neso-locha, n. g.**

Forehead tolerably flat, oblique; ocelli present; tongue well developed. Antennae four-fifths of fore wings, in male filiform, shortly ciliated (½), with angularly projecting scales at joints. Labial palpi moderate, straight, porrected, triangularly scaled, attenuated to apex, terminal joint concealed. Maxillary palpi short, filiform. Abdomen in male with short anal tuft, valves short, exserted. Fore wings with vein 10 approximated to 9 towards base, 11 oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to one-third.
Of somewhat doubtful affinity, and perhaps not really near *Diasemia*, which, however, it resembles superficially; differs from *Botys* principally by the antennae reaching four-fifths of fore wings. In the specimens examined the posterior legs were broken.

85. *Nesolocha autolitha*, n. s.

♂, 21 mm. Head light ochreous, face fuscous, sides whitish. Palpi dark fuscous, lower longitudinal half white, bisected transversely by an oblique dark fuscous bar. Antennae whitish ochreous. Thorax whitish ochreous, irroration with fuscous. Abdomen whitish ochreous, suffusedly irroration with fuscous, segmental margins white. Legs ochreous-whitish, anterior tibias fuscous (posterior pair broken). Fore wings elongate-triangular, costa sinuate, posteriorly moderately arched, apex tolerably rectangular, hind margin straight, oblique, rounded beneath; fuscous, irregularly mixed with whitish ochreous and dark fuscous, more ochreous beneath costa; markings white, thinly scaled, edges irregularly whitish ochreous, margined irregularly with dark fuscous; six discal spots; first at one-fourth, small, quadrate; second very small, triangular, near and above first; third moderate, oblong, before middle; fourth moderate, irregular, transverse, above posterior extremity of third; fifth very small, irregular, beyond and rather below third; sixth very small, triangular, beyond and above fifth; a slightly inwards-curved transverse streak from beneath costa at three-fourths, reaching two-thirds across wing, tending to be divided into five spots; a series of seven small spots towards hind margin, two upper roundish, ante-apical, three middle crescentic, closely following lower part of transverse streak, two lower curved, linear, connected, surrounding lower extremity of transverse streak; cilia grey-whitish, with a thick dark grey line, interrupted by whitish ochreous spots, basal line whitish ochreous. Hind wings with hind margin rather protuberant in middle; colour of ground and of markings as in fore wings; a moderately broad fascia near base, bent in middle, broadest above and including a roundish fuscous spot on costa; a moderate fascia from two-thirds of costa to inner margin before anal angle, towards costa bisected by a suffused fuscous striga, on lower two-fifths much narrowed, almost linear; four rounded spots arranged in a diamond-shaped patch and almost confluent before hind margin in middle; cilia as in fore wings.

Port Moresby, New Guinea (*Mathew*); two specimens.
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Sameodes, Snell.
86. Sameodes cancellalis, Z.


Fiji (Lucas); one specimen. Occurs also in Eastern Australia, Celebes, Java, Ceylon, India, Mauritius, and Africa.

Genus (?).

Forehead rounded, oblique; ocelli present; tongue well developed. Antennæ four-fifths of fore wings (?), in male (?). Labial palpi rather long, straight, porrected, second joint stout, with appressed scales, terminal joint rather short, stout, cylindrical, obtuse. Maxillary palpi moderate, filiform. Posterior tibæ in female with outer spurs half inner. Fore wings with vein 10 approximated to 9. 11 very oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin. anastomosing with 8 to near middle.

In the absence of the male it is impossible to locate the following species with certainty; the palpi are rather peculiar, and the genus may be distinct; at present it seems sufficient to indicate the generic characters so far as they can be discerned from the female, without adding a name.

87. — octoguttalis, Feld.


?, 22 mm. Head, palpi, antennæ, thorax, and legs whitish ochreous; palpi suffused with fuscous except towards base. Legs ochreous-white. Fore wings elongate-triangular, costa sinuate, apex rounded, hind margin very oblique, slightly rounded; greyish fuscous; costa narrowly suffused with ochreous-yellow; four semi-hyaline white spots, laterally margined with dark fuscous; first small, subquadrat, beneath costa at one-fourth; second larger, trapezoidal, beneath costa before middle, its anterior margin united above with that of first; third suboval, transverse, beneath and obliquely beyond second, touching lower margin of second; fourth oblong, transverse, beneath costa at two-thirds, its posterior dark margin produced to costa; a moderately broad ochreous-yellow hind-marginal band. upper two-fifths suddenly much narrower and anteriorly suffused; cilia light yellow. Hind wings greyish fuscous; an irregular darker median line, about which are two or three very
obscure yellowish spots; a moderately broad ochreous-yellow hind-marginal band, attenuated to anal angle; cilia light yellow.

Felder's figure is reasonably good.

Fiji (*Lucas*); one specimen. According to Felder, also from Amboina.

**Semioceros, Meyr.**

88. *Semioceros allocosma*, n. s.

♂. 23 mm. Head and thorax fuscous mixed with whitish, collar reddish ochreous. Palpi white, upper edge blackish, apex reddish brown. Antennae very shortly ciliated (§), not bent before middle; whitish ochreous, tuft dark grey. Abdomen fuscous, beneath white, with a black lateral line on basal half. Legs snow-white; anterior tibiae, basal half and apex of anterior femora, a median ring of middle and posterior femora, and an apical spot on middle and posterior femora and tibiae black; posterior tibiae with outer spurs half inner. Fore wings elongate-triangular, costa sinuate, posteriorly moderately arched, apex obtuse, hind margin sinuate, oblique; rather dark fuscous; a light yellowish ochreous streak along costa, beneath somewhat suffused and reddish-tinged, interrupted at five-sixths by a narrow dark fuscous bar; about thirteen prismatic violet-white spots, margined with a darker suffusion; a small round one in disc at one-fourth, and a larger round one before middle; two small ones placed longitudinally close together above inner margin at one-fourth; a roundish one below middle of disc, followed by two small ones placed transversely; a rather large transverse curved-oblong one in disc at two-thirds; a sinuate transverse row of five small ones, three of which closely follow the large posterior spot, the other two being lower down; cilia whitish ochreous, with a fuscous line and barred with dark fuscous, and with a clear white spot above anal angle. Hind wings rather dark fuscous, with prismatic violet-white markings; a broad basal band, outer edge straight; a moderately broad central fascia, attenuated beneath, anterior edge rather irregular and separated from basal band only by a narrow fascia of ground colour, which is somewhat expanded and internally whitish towards costa, posterior edge forming a short broad projection in middle; a curved series of four small spots close beyond this projection; cilia as in fore wings.

The structure of the antennae approaches nearest to *S. amphicedalis*.

Fiji (*Matthew*); one specimen.
89. *Semioceros tricrossa*, n. s.

♂, 14 mm. Head, antennae, and thorax ochreous-yellowish; antennae filiform, shortly ciliate (½), bent before middle and again at three-fourths, with a tuft of scales on back of each bend. Palpi white, apex black, terminal joint moderate, slender. Abdomen ochreous-yellow, segmental margins blackish. Legs white; posterior tibiae with outer middle-spur one-half, outer end-spur two-thirds of inner. Fore wings triangular, costa hardly sinuate, apex obtuse, hind margin straight, oblique; ochreous-yellow; a small transverse blackish spot on base of costa; a curved fuscous shade between base and first line; first line thick, dark fuscous, from one-fifth of costa to one-fifth of inner margin, curved outwards; a moderately large quadrate discal spot at two-fifths, thickly outlined with dark fuscous, beneath connected with inner margin at two-fifths by a thick dark fuscous line; a second similar discal spot slightly beyond middle, open above and beneath; second line thick, dark fuscous, from costa at four-fifths parallel to hind margin, obtusely bent inwards at two-thirds to beneath discal spot, thence acutely angulated to inner margin at three-fourths; a similar parallel line midway between second line and hind margin, inner angle touching bend of second line; a strong dark fuscous hind-marginal line; cilia whitish, with a dark fuscous line. Hind wings ochreous-yellow, base paler; a quadrate discal spot at one-third thickly outlined with dark fuscous; a thick dark fuscous line from two-thirds of costa to two-thirds of inner margin, parallel to hind margin, somewhat sinuate inwards to touch discal spot beneath; a similar line midway between this and hind margin; hind-marginal line and cilia as in fore wings.

Probably most allied to *S. chrysorycta*.

Port Moresby, New Guinea (Mathew); two specimens.

90. *Semioceros dactyloptila*, n. s.

♂, 2. 17 mm. Head yellow, face suffused with fuscous. Palpi bright ochreous-yellow. apex fuscous, terminal joint rather slender, short. Antennae in male dentate, strongly ciliate (1½), bent before middle, with a tuft of very long hair scales on back of bend, separated into five radiating hair-pencils; pale ochreous, tuft greyish. Thorax dark fuscous, posteriorly mixed with deep yellow-ochreous, collar ochreous-yellow. Abdomen ochreous-orange, anal segment dark fuscous. Legs light ochreous-yellowish, apical half
of anterior tibiae dark fuscous; posterior tibiae with outer middle-spur one-half, outer end-spur two-thirds of inner. Fore wings triangular, costa sinuate, posteriorly gently arched, apex obtuse, hind margin faintly sinuate, oblique; ochreous-orange; a fuscous streak along anterior half of costa; base and a curved shade near base fuscous; first line dark fuscous, from one-fourth of costa to beyond one-third of inner margin, rather irregular; three fuscous discal spots, margined with dark fuscous; first moderate, round, anteriorly margined by first line, above suffused into costal streak; second large, transverse-oblong, somewhat curved, touching costal streak at one-half, reaching half across wing; third small, round, beneath and between first and second, touching each; two indistinct fuscous suffusions transversely placed between middle and second line; second line dark fuscous, somewhat irregular, from costa at four-fifths, indented above middle, to near anal angle, thence widely broken, recommencing beneath lower margin of second discal spot at two-thirds from costa, and continued to inner margin at four-fifths; an irregular fuscous hind-marginal band, its anterior edge near and parallel throughout to second line; a darker fuscous hind-marginal line; cilia grey, with a dark grey line near base. Hind wings ochreous-orange; a round spot outlined with dark fuscous beneath costa at one-third, connected with inner margin before anal angle by a straight dark fuscous line; second line dark fuscous, from two-thirds of costa to hind margin below middle, rather strongly indented above middle, and again less strongly near lower extremity, preceded by a broad fuscous suffusion, and followed by an ochreous-orange line, beyond which the hind-marginal space is wholly fuscous; hind-marginal line and cilia as in fore wings.

The antennal characters, though of the same general type, are quite distinct from those of any other species.

Fiji (Mathew, Lucas); several specimens.

PTILEOLA, n. g.

Forehead rounded, tolerably vertical; ocelli present; tongue well developed. Antennae three-fourths of fore wings, in male dentate, ciliated with fascieles (†), bent before middle, back of bend clothed with a tuft of hairs, basal joint swollen. Labial palpi moderate, somewhat ascending, second joint with dense projecting scales beneath, terminal joint short, thick, obtuse. Maxillary palpi very short, filiform. Abdomen in male with small anal tuft, valves retracted. Posterior tibiae in male with outer middle-spur
one-third, outer end-spur one-half of inner. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

91. *Ptilœola ulophanes*, n. s.

♂ ♀, 17—20 mm. Head, palpi, antennæ, thorax, abdomen, and legs dark fuscous; palpi broadly ochreous-whitish beneath; posterior tarsi ochreous-whitish. Fore wings triangular, costa hardly sinuate, posteriorly gently arched, apex obtuse, hind margin slightly sinuate, oblique; dark fuscous; first line obsoletely darker, from one-fifth of costa to one-third of inner margin; two discal spots hardly paler, margined with dark fuscous, separated by a paler spot; first roundish, touching first line; second quadrate, before middle, followed by some pale scales; second line darker fuscous, followed by an ochreous-whitish line, in male partially obsolete, in female distinct, forming a small spot on costa, running from four-fifths of costa, indented above middle, to near anal angle, thence widely broken inwards to beneath disc at two-thirds, and continued to inner margin at three-fourths; cilia dark fuscous. Hind wings dark fuscous; a quadrate discal spot outlined with darker at one-third, preceded and followed by small paler suffusions, connected with inner margin before anal angle by a nearly straight darker line, posteriorly more or less distinctly margined with ochreous-whitish; second line from two-thirds of costa to hind margin below middle, somewhat darker, posteriorly in male obscurely, in female distinctly margined with ochreous-whitish, twice sinuate; cilia dark fuscous.

The female is smaller and more sharply marked than the male.

Fiji (*Mathew, Lucas*); several specimens.

Erebanga, n. g.

Forehead rounded, vertical; ocelli present; tongue well developed. Antennæ four-fifths of fore wings, in male stout, dentate, ciliated (3), with a notch on back before middle, covered by a tuft of scales, basal joint swollen. Labial palpi moderate, somewhat arched, obliquely ascending, second joint with short dense projecting scales beneath, terminal joint short, filiform, blunt-pointed. Maxillary palpi very short, filiform. Abdomen in male with small anal tuft, valves retracted. Anterior femora in male with a dense tuft of hair-scales projecting forward from inner side towards apex;
middle tibiae in male with outer spur terminating in a long tuft of dense hair-scales, inner spur very long; posterior tibiae with outer middle-spur one-third, outer end-spur one-half of inner. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle.

92. Erebangela melanauges, n. s.

♂, 22—24 mm. Head yellow-ochreous, face and a spot on crown dark fuscous. Palpi dark fuscous, beneath broadly ochreous-whitish. Antennae, thorax, abdomen, and legs dark fuscous; abdomen and legs beneath ochreous-whitish. Fore wings rather elongate-triangular, costa somewhat sinuate, posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; deep blackish fuscous, slightly purplish-tinged, without markings; cilia dark fuscous. Hind wings and cilia deep blackish fuscous; faint indications of a straight ferruginous line before middle.

♀, 21 mm. Head, &c., as in male; thorax mixed with ferruginous-yellow. Fore wings dark purplish fuscous; two small ferruginous-yellow spots transversely placed near base; first line absolutely darker, from one-fifth of costa to one-third of inner margin, on inner margin preceded by a yellowish suffusion; two discal spots absolutely margined with darker, separated by a small bright ferruginous spot, first roundish, touching first line, second quadrate, before middle; second line absolutely darker, followed by an indistinct pale ochreous line which forms a bright ochreous-yellow spot on costa, running from costa at four-fifths, indented above middle, nearly to anal angle, thence widely broken inwards to beneath two-thirds, and continued to inner margin at three-fourths; cilia dark fuscous. Hind wings dark purplish fuscous; a quadrate ferruginous spot near base; a nearly straight ferruginous line from costa at two-fifths, to inner margin before anal angle; a very indistinct sinuate ferruginous line from two-thirds of costa to hind margin below middle; cilia dark fuscous.

The female is very like the male of Ptilcola ulophanes, but differs by the ferruginous-yellow crown of head and markings.

Tonga (Mathew); Fiji (Mathew, Lucas); several specimens.

Diplotyla, n. g.

Forehead rounded, vertical; ocelli present; tongue well developed. Antennae three-fourths of fore wings, in male stout, subdentate, ciliated (\(\frac{1}{4} - \frac{1}{2}\)), sinuate before and again beyond middle,
with a tuft of scales from base of each situation covering it, basal joint swollen. Labial palpi moderately long, somewhat arched, ascending, second joint with short dense projecting scales beneath, terminal joint moderate, filiform, obtuse. Maxillary palpi very short, filiform. Abdomen in male with moderate anal tuft, valves retracted. Posterior tibiae in male with outer middle-spur one-half to three-fourths of inner, end-spurs short, nearly equal. Fore wings with vein 10 rising out of 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

This is probably a considerable genus; Walker describes several species which belong to it under Desmia, and Snellen's *Aediodes orientalis* is clearly referable here, the antennae being specially figured (the reference to *Aediodes* seems quite unreasonable, the antennae in that genus being simple).

93. *Diplotyla ochromata*, n. s.

♂, 30 mm. Head and thorax ochreous mixed with whitish, shoulders fuscous. Palpi dark fuscous, beneath broadly white. Antennae fuscous. Abdomen fuscous, irrated with whitish, anal segment white, with a small fuscous apical spot. Legs ochreous-whitish, anterior tibiae with a broad dark fuscous band towards apex; posterior tibiae with outer middle-spur moderately long. Fore wings elongate-triangular, costa sinuate, posteriorly gently arched, apex obtuse, hind margin obliquely rounded; fuscous, slightly purplish-tinged; first line obsolete; two quadrate discal spots, obscurely outlined with darker, separated only by a linear whitish mark, first moderate, preceded by a very small whitish spot, second larger, followed by a narrow or irregular transverse white spot; second line obscure, dark fuscous, waved, obscurely margined posteriorly with whitish ochreous, forming a distinct whitish ochreous spot on costa, running from costa at three-fourths towards anal angle, angulated beneath costa and indented above middle, near anal angle bent round and indented inwards, terminating on inner margin at three-fourths; cilia ochreous-whitish, with a grey line. Hind wings fuscous, purplish-tinged; an oblique quadrate somewhat paler discal spot before one-third, laterally margined with dark fuscous, and preceded and followed by transverse linear whitish marks; second line obscure, dark fuscous, waved, posteriorly obscurely margined with ochreous-whitish, more distinctly towards inner margin, running from two-thirds of costa, sinuate inwards above middle, at two-thirds rectangularly bent
Mr. E. Meyrick's descriptions of

inwards to beneath middle of disc, thence again rectangularly bent to inner margin before anal angle; cilia whitish, with a grey line.

New Hebrides (Matheiv); Fiji (Lucas); several specimens.

94. Diplotyla cyclospila, n. s.

♂, 30 mm. Head fuscous, tufts of crown whitish. Palpi dark fuscous, beneath broadly white. Antennae fuscous. Thorax whitish fuscous. Abdomen grey, becoming white on sides posteriorly, anal segment wholly white. Legs white, anterior tibiae dark grey; posterior tibiae with all spurs very short. Fore wings elongate-triangular, costa sinuate, posteriorly gently arched, apex obtuse, hind margin slightly rounded, oblique; greyish fuscous, rather lighter towards inner margin anteriorly; two clear white discal spots, first small, round, before one-third, second moderate, transverse-oval, at one-half; second line obsolete, hardly perceptibly darker, irregular, from costa at three-fourths, where it is followed by an obscure cloudy whitish dot, towards anal angle, indented above middle, at three-fourths rectangularly bent inwards to beneath second discal spot, thence again rectangularly bent to inner margin at two-thirds; cilia fuscous, tips paler. Hind wings fuscous, paler and more thinly scaled towards base; an obscure oblique transverse whitish mark in disc beyond one-third; cilia fuscous, tips paler, with a suffused white patch between middle of hind margin and anal angle.

Samoa (Matheiv); several specimens.

95. Diplotyla argopis, n. s.

♀, 22 mm. Head, antennæ, thorax, abdomen, and legs dark fuscous, apex of tarsal joints whitish ochreous. Palpi dark fuscous, beneath broadly white. Fore wings triangular, costa posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; a moderate irregularly subquadrate clear white spot in disc beyond middle; an ochreous-whitish dot on costa at four-fifths, whence proceeds an irregular series of several very indistinct similar dots towards anal angle; cilia dark fuscous. Hind wings and cilia dark fuscous.

In the absence of the male the generic location is of course uncertain.

Fiji (Lucas); one specimen.
Strepsimela, n. g.

Forehead vertical; ocelli present; tongue well developed. Antennæ four-fifths of fore wings, in male subdentate, ciliated (†), with a tuft of scales on back before middle, and a sinuation clothed with a tuft of dense scales beyond middle, basal joint large, swollen. Labial palpi moderate, obliquely ascending, second joint with short dense projecting scales beneath, terminal joint short, obtuse. Maxillary palpi very short, filiform. Abdomen in male with moderate anal tuft, valves retracted. Anterior femora in male with a projecting tuft of scales from apex above, and a long tuft of hairs from beneath, curving upwards in front; posterior tibiae with outer middle-spur one-third to one-half, outer end-spur one-half of inner. Fore wings with vein 10 rising out of 9, 11 oblique, in male sometimes bent and widely remote from 10. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to one-third.

96. Strepsimela (†) microcentra, n. s.

♀, 22 mm. Head, palpi, antennæ, thorax, abdomen, and legs dark fuscous; palpi white beneath. Fore wings triangular, costa posteriorly gently arched, apex obtuse, hind margin obliquely rounded; dark fuscous; a small darker discal suffusion, in which is a white dot before middle; second line represented by four small confluent white spots in a straight transverse series from costa before three-fourths, a fifth near hind margin at three-fourths from apex, surmounted by an obscure whitish dot, and a sixth towards inner margin at three-fourths, beneath which is an obscure whitish dot on inner margin; cilia dark fuscous. Hind wings dark fuscous; second line represented by an irregular whitish streak from costa at three-fifths, a small somewhat double spot near hind margin below middle, and an irregular whitish line from middle of disc to anal angle; cilia dark fuscous.

The generic position cannot be determined without the male.

Fiji (Lucas); one specimen.

97. Strepsimela ranthosoma, n. s.

♂, ♀, 17—18 mm. Head orange, more or less mixed with dark fuscous. Palpi yellow-whitish, terminal joint and upper scales of second blackish. Antennæ pale yellowish, basal half and tufts in male dark fuscous, in female mixed with dark fuscous. Thorax
dark fuscous. Abdomen orange-yellow, in male with two dark fuscous spots at base of anal segment, in female somewhat mixed with dark fuscous. Legs in male wholly pale yellowish, tuft of anterior femora mixed with grey; in female dark fuscous, apex of all joints pale yellowish. Fore wings rather elongate-triangular, costa sinuate, posteriorly moderately arched, apex obtuse, hind margin bowed, oblique; dark fuscous; lines hardly paler, obscurely margined on discal side with darker; first line hardly perceptible; a yellowish dot beneath costa at one-fourth, and a second beneath costa before middle; an obscure dark discal suffusion; second line starting from a very small yellowish spot on costa at three-fourths, somewhat sinuate, running to near anal angle, thence widely broken inwards to below middle of disc, terminating on inner margin at two-thirds; cilia dark fuscous. Hind wings and cilia dark fuscous; second line much as in fore wings, but not forming a costal spot.

The yellow abdomen is a characteristic feature.

Samoa (Matheu); two specimens.

98. Strepsimela signiferalis, Wallgr.


♂ 21—22 mm., ♀ 19 mm. Head and thorax fuscous, face sometimes whitish ochreous in male. Palpi white, becoming fuscous towards apex. Antennae whitish ochreous. Abdomen fuscous, sides more or less suffused with ochreous-yellow. Legs yellow-whitish, hair-pencil from beneath anterior femora of male black. Fore wings triangular, broader in male, costa in male unevenly protuberant at one-third, sinuate in middle, in female nearly straight anteriorly, moderately arched posteriorly, apex obtuse, hind margin obliquely rounded; vein 11 in male bent towards costal protuberance and widely remote from 10; rather dark fuscous, anteriorly more or less mixed with ochreous-yellowish or whitish; first line indistinct, whitish or yellowish, posteriorly obscurely margined with dark fuscous. from one-fourth of costa to one-third of inner margin, somewhat curved; a small transverse, in male linear, clear white spot in disc beyond first line, laterally margined with dark fuscous; a narrow transverse, in male long inwards-curved, in female sometimes roundish white spot in middle of disc, anteriorly margined with dark fuscous; second line irregular, whitish or yellowish, rather well-defined, anteriorly
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margined with dark fuscous, from costa before three-fourths, in male broadly curved inwards in middle, in female indented, almost touching hind margin above anal angle, widely broken inwards to beneath central white spot, thence continued to inner margin at three-fourths; cilia grey, with a dark grey line, sometimes with a white or yellowish spot above anal angle. Hind wings dark fuscous, towards base mixed with whitish or yellowish; a discal spot outlined with darker at one-third, followed by a clear white spot, more conspicuous in female, and connected with inner margin before anal angle by a straight whitish or yellowish line, anteriorly darker-margined; a twice sinuate whitish or yellowish line from two-thirds of costa to before middle of hind margin, anteriorly darker-margined; cilia grey, between middle of hind margin and anal angle whitish or yellowish, with a dark grey basal line, interrupted on extremity of second line.

The colour varies somewhat locally, the specimens from the Ellice Islands being considerably yellower than others, but certainly not distinct. The form of wing in the sexes is very different; but one male in the collection of Mr. Mathew has exactly the ordinary form of wing of the female, whilst in every other characteristic apparently a true male; this is a very singular abnormality, presumably rare.

New Hebrides, Fiji, Tonga, and Ellice Islands (Mathew); common. According to Wallengren also from Tahiti.

Although Wallengren's species was described from a female, and very briefly, I think there is no reason to doubt its correct identification. Felder's figure is, I feel almost sure, intended to apply to this species, but it is quoted with a query, since the lines are distinctly wrong in form.

EURYTORNA, n. g.

Forehead vertical; ocelli present; tongue well developed. Antennæ two-thirds, in male stout, subdentate, shortly ciliated (1⁄3), abruptly bent in middle, with a very large broad hemispherically excavated tuft of hairs on back of bend, a small tuft above this, and a simiation at three-fourths containing another small tuft, basal joint large, swollen. Labial palpi rather long, arched, ascending, second joint with long projecting scales beneath gradually diminishing to apex, terminal joint moderate, cylindrical, obtuse. Maxillary palpi absent. Abdomen in male with valves moderate, exserted, scaled, enclosing a very dense expansible tuft
of hairs. Posterior tibiae with outer spurs one-third of inner. Fore wings with veins 10 and 11 both rising out of stalk of 8 and 9. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle.


♂, 27 mm. Head, palpi, antennae, thorax, abdomen, and legs dark fuscous; enclosed anal tuft whitish ochreous. Fore wings extremely broad, triangular, costa sinuate, apex obtuse, hind margin rounded, rather oblique, inner margin sinuate; rather dark fuscous, markings obscurely darker, indistinct; a quadrato discal spot before middle, preceded and followed by a small pale suffusion; second line irregular, running from four-fifths of costa to near hind margin at two-thirds, thence rectangularly bent inwards to beneath middle of disc, and again rectangularly bent to inner margin at three-fourths; cilia fuscous. Hind wings and cilia rather dark fuscous.

Fiji (*Lucas*); one specimen.

100. *Zinckenia recurvalis*, F.

Fiji (*Matheu, Lucas*); common; the white markings are in most specimens somewhat larger than usual. Occurs also in New Zealand, Eastern Australia, Malay Archipelago, Southern Asia, Madagascar, South Africa, and South America.

**AUTHÆRETIS, n. g.**

Forehead tolerably rounded, vertical; ocelli present; tongue well developed. Antennæ three-fourths, in male rather stout, filiform, with a thickened sinuation towards base, supra-basal joint much enlarged, flatly compressed, dilated with scales in front, basal joint large, broadly compressed, with a scaly erect tooth above on inner side. Labial palpi long, arched, ascending, second joint with long projecting scales beneath rather diminishing towards apex, forming a broad rectangular tuft, terminal joint in male clothed with a long recurved tuft of dense hairs as long as second joint, and forming an angulated projection in middle of posterior side, in female moderate, cylindrical, tolerably pointed. Maxillary palpi erect, in male terminating in a pencil of long hairs, in female filiform. Thorax in male anteriorly with very dense hair-scales.
tending to form tufts. Abdomen stout, in male with tuft of short hairs above apex, valves strong, exerted, scaled. Posterior tibiae with outer spurs about one-third of inner. Fore wings with vein 10 closely approximated to 9, 11 very oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 closely approximated at base, 7 out of 6 near origin, anastomosing with 8 to one-third; lower median, 1a, 1b, and 1c all with strong pectinations; under surface in male with a dense downwards-curved cushion of hairs covering veins 7 and 8 from near base to middle, and a cushion of short erect hairs along basal half of 1c.

101. Autiaretis eridora, n. s.

♂, ♀, 36 mm. Head and antennæ fuscous. Palpi fuscous, apex darker, basal joint white. Thorax fuscous, purplish-tinged, dense anterior hairs suffused with reddish ochreous. Abdomen fuscous. Legs white, anterior pair with apical half of tibiae and two terminal joints of tarsi blackish. Fore wings rather elongate-triangular, costa posteriorly gently arched, apex obtuse, hind margin oblique, somewhat bowed; fuscous, with purple reflections; first line hardly darker, from one-fifth of costa to one-fourth of inner margin; two white violet-shining dark-margined spots transversely placed in disc before middle, upper small, transverse-oval lower larger, quadrate; second line hardly darker, rather irregular, from costa at two-thirds, bent at right angles below middle and continued to touch posterior margin of lower discal spot, thence again rectangularly bent and running to inner margin at three-fifths, latter portion curved outwards; this line margined posteriorly on upper third by three small roundish confluent purplish white spots not touching costa, on median third by three separate white dots, on lower third by a faint whitish streak; cilia light fuscous, with a darker line, extreme base whitish. Hind wings with ground colour and cilia as in fore wings; an irregular white interrupted line from costa at three-fifths, dilated towards costa, widely dislocated inwards in middle, ending on inner margin before anal angle.

Fiji (Mathew, Lucas); two specimens.

Pelecyntis, Meyr.

102. Pelecyntis abstitalis, Walk.

Port Moresby, New Guinea (Mathew); Fiji (Lucas). Occurs also in Eastern Australia, New Hebrides, Celebes, Ceylon, and India.

Omioides, Gn.

Forehead oblique; ocelli present; tongue well developed. Antennae five-sixths of fore wings, in male moderately ciliated (1 1/2), rough-scaled above. Labial palpi moderate, arched, ascending; with dense rough projecting scales beneath, terminal joint extremely short, obtuse. Maxillary palpi moderate, dilated with loose scales at apex. Thorax in male with patagia elongate, ending in a spreading pencil of long hairs. Abdomen in male elongate, with short anal tuft, valves retracted. Posterior tibiae with outer spurs one-third of inner. Fore wings with vein 10 closely approximated to 9, 11 very oblique. Hind wings as broad as fore wings; veins 4 and 5 closely approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

103. Omioides leucostrepta, n. s.

♂. 23—24 mm. Head ochreous-yellow, with a fuscous stripe down face. Palpi dark fuscous, lower half white, apex yellow. Antennae and thorax rather dark fuscous. Abdomen fuscous, becoming darker posteriorly, with two shining snow-white rings near apex. Legs pale whitish ochreous, anterior femora and tibiae suffused above with dark fuscous. Fore wings elongate-triangular, costa slightly sinuate, posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; rather dark fuscous, ochreous-tinged; basal two-thirds of costa suffused with blackish fuscous; first line blackish fuscous, somewhat curved, from one-fourth of costa to two-fifths of inner margin; a transverse linear blackish fuscous discal spot; second line blackish fuscous, from costa at two-thirds rather obliquely outwards, obtusely angulated above middle, again rectangularly below middle, running to beneath discal spot, where it is again acutely angulated, terminating on inner margin beyond middle; a small light ochreous-yellow spot on costa immediately beyond second line; an interrupted dark fuscous hind-marginal line; cilia fuscous, with a darker line. Hind wings with ground colour, discal spot, hind-marginal line, and cilia as in fore wings; a blackish fuscous perpendicular line from beneath costa at three-fifths, rectangularly bent below middle to beneath discal spot, thence again rectangularly bent to inner margin above anal angle.

♀. Head and antennae ochreous-yellow. Thorax suffused with ochreous-yellow except shoulders. Abdomen yellowish fuscous, with only one silvery white ring before apex. Fore wings with ground colour lighter and somewhat mixed with reddish ochreous;
first line preceded by a pale ochreous-yellow fascia except on costa; discal spot preceded by a small round pale ochreous-yellow blotch; second line followed by a large pale ochreous-yellow blotch on costal third, and a narrow fascia-like spot on dorsal third. Hind wings suffused with pale ochreous-yellowish towards inner margin. Rest as in male.

Tonga (Mathew); Fiji (Lucas); three specimens.

**Macaretæra, n. g.**

Forehead oblique; ocelli present; tongue well developed. Antennæ four-fifths of fore wings (?). Labial palpi moderate, arched, ascending, second joint with dense projecting scales beneath, terminal joint rather short, flattened-conical. Maxillary palpi short, filiform. Fore wings with vein 10 closely approximated to 9, 11 very oblique. Hind wings broader by a fourth than fore wings; vein 3 from angle of cell, 4 and 5 stalked from a point with 8, 7 out of 6 near origin, anastomosing with 8 to near middle; lower median loosely pectinated towards base.

Although the male is unknown, the genus appears sufficiently distinguished from its allies by the neuration of the hind wings.

**104. Macaretæra hesperis, n. s.**

♀, 21 mm. Head white, somewhat mixed with pale ochreous. Palpi and antennæ white. Thorax white, with two anterior yellow-ochreous bands. Abdomen white, suffusedly banded with yellow-ochreous. Anterior legs yellow-ochreous, ringed with white (others broken). Fore wings rather elongate-triangular, costa somewhat sinuate, posteriorly gently arched, apex rectangular, hind margin bowed, rather oblique; white, with yellow-ochreous markings; a spot on base of costa; a broad oblique irregular fascia near base; four transverse streaks from costa between this and three-fourths, reaching half across wing, attenuated and somewhat infuscated at apex; a fifth similar inwardly oblique streak from costa near apex, produced along costa to apex; an irregular fascia almost on hind margin, deeply indented above middle; an oval spot in disc before this indentation, infuscated beneath; two small roundish fuscous spots on inner margin before and beyond middle; between the second of these and the second costal streak are two elongate-oval fuscous spots placed transversely in disc; a fuscous suffusion on inner margin before anal angle; cilia pale ochreous, with a deeper yellow-ochreous basal line. Hind wings
white, with an indistinct roundish fuscous suffusion before hind margin in middle; cilia white, with a yellow-ochreous basal line.

Fiji (Mathew); one specimen.

**Compsophila, n. g.**

Forehead rounded, oblique; ocelli absent; tongue developed. Antennæ two-thirds of fore wings, in male moderately ciliated (1), with angularly projecting scales at joints. Labial palpi moderately long, straight, porrected, second joint clothed with long loosely appressed hairs projecting in front, terminal joint concealed. Maxillary palpi short, clothed with rough projecting scales. Abdomen in male with small anal tuft, valves retracted. Posterior tibiae with outer spurs three-fourths of inner. Fore wings with vein 10 approximated to 9, 11 very oblique. Hind wings as broad as fore wings; veins 4 and 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 from origin to middle.

Of doubtful affinity.

**105. Compsophila iocosma, n. s.**

♂. 24 mm. Head, antennæ, thorax, and legs white; anterior legs banded with light yellow-ochreous. Palpi whitish, mixed with dark fuscous. Abdomen white, on basal half irrorated with dark fuscous, and suffused with crimson towards base. Fore wings elongate-triangular, costa posteriorly gently arched, apex rectangular, hind margin very obliquely rounded; light yellow-ochreous, mixed with crimson, and thinly and irregularly irrorated with dark fuscous; costa suffused with white from one-third to apex; base of wing narrowly white; a moderate straight white fascia from two-fifths of costa to before middle of inner margin, ground colour on each side of it suffused with crimson below middle; a suffused white spot in disc at two-thirds; a moderately broad white hind-marginal band, containing a triangular patch of ground colour on hind margin beneath apex; cilia white. Hind wings light yellowish ochreous, irrorated with crimson and dark fuscous; base narrowly white; a moderately broad straight white fascia from before middle of costa to before anal angle; a moderately broad white hind-marginal band, attenuated to a point near anal angle; cilia white.

Fiji (Lucas); one specimen.
Pycnarmon, Ld.

106. Pycnarmon jaguaralis, Gn.

Spilomela jaguaralis, Gn., 283; Pycnarmon jaguaralis, Ld., pl. xvii., 11.

Port Moresby, New Guinea (Mathew); one specimen. Occurs also in Amboina, Celebes, and India.

Conchylodes, Gn.

107. Conchylodes caberalis, Gn.

Spilomela caberalis, Gn., 284.
Fiji (Mathew, Lucas); several specimens. Also from Celebes and Java.

Physematia, Ld. (?).

Forehead rounded, tolerably vertical; ocelli present; tongue well developed. Antennae three-fourths of fore wings, in male shortly ciliated (¼), with angularly projecting scales at joints. Labial palpi moderate, arched, ascending, second joint with dense short projecting scales beneath, terminal joint rather short, somewhat roughened with scales anteriorly, tolerably pointed. Maxillary palpi absent. Abdomen in male with valves short, exserted, scaled. Posterior tibiae with outer spurs half inner. Fore wings with vein 10 rising out of stalk of 8 and 9, 11 oblique. Hind wings somewhat over 1; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

These characters are drawn from the following species, which is perhaps not truly referable to Physematia, and is certainly allied to Conchylodes; Lederer’s Physematia should have an indentation in the cell of the fore wings, which this species does not show, but the other characters agree, so far as given by Lederer.

108. Physematia epispila, n. s.

♂, 13 mm. Head, thorax, and abdomen white, spotted with dark fuscous. Palpi white, base of terminal joint dark fuscous. Antennae and legs white, apex of tibiae with a dark fuscous spot. Fore wings triangular, costa slightly sinuate, posteriorly gently arched, apex obtuse, hind margin obliquely rounded; white; a small dark fuscous spot on costa near base, and a smaller round dark fuscous spot in disc towards base; a fuscous spot on costa at
one-fifth, a smaller one on inner margin near base, and a third more indistinct in disc before first line; first line slender, dark fuscous, forming spots on costa and inner margin, running from one-third of costa to before middle of inner margin, curved inwards beneath costa and more strongly outwards below middle; a small round dark fuscous spot close beyond first line in upper curve; a narrow transverse dark fuscous spot in disc beyond middle, its upper extremity dilated; an indistinct transverse fuscous suffusion between this and first line, and also between this and second line; second line slender, dark fuscous, irregular, running from a spot on costa at three-fourths to near hind margin at two-thirds, thence rectangularly bent to nearly beneath discal spot, and again rectangularly bent to inner margin at three-fourths; indistinct fuscous suffused spots between this and hind margin on costa, inner margin, and in middle; a row of transversely elongate nearly confluent dark fuscous spots on hind margin, two beneath apex longitudinally elongate; cilia white, with a fuscous line. Hind wings white; a dark fuscous discal spot before middle; all posterior markings and cilia as in fore wings.

Fiji (Lucas); one specimen.

Notarcha, Meyr.


Botys orissalis (orissusalis), Walk., 701; Botys trigalis, Ld., pl. x, 18.

Port Moresby, New Guinea (Mathew); one specimen. Also from Ambonai and Borneo.

110. Notarcha erixantha, n. s.

♂, 18 mm. Head, palpi, antennae, thorax, abdomen, and legs deep orange-yellow; antennal ciliations ½; abdomen with two blackish spots on penultimate segments. Fore wings rather elongate-triangular. Costa sinuate, posteriorly gently arched, apex obtuse, hind margin slightly rounded, rather strongly oblique; deep orange-yellow; markings blackish, well-defined; a curved transverse line almost at base, not reaching inner margin; first line from one-fourth of costa to two-fifths of inner margin, slender in middle, somewhat dilated at both extremities, slightly curved; a transverse linear discal spot in middle; second line slender, somewhat curved, from three-fourths of costa, rather inwards-curved, to near middle of hind margin, bent and continued very near hind margin to above anal angle, thence rectangularly bent inwards,
and again obtusely bent to inner margin at four-fifths; cilia deep yellow, tips yellow-whitish. Hind wings deep orange-yellow; lines waved, blackish, tolerably defined; an indistinct blackish discal dot at one-third; a line from beneath this to inner margin beyond middle; second line from beneath costa at two-thirds to hind margin below middle, somewhat curved outwards; cilia deep yellow, tips yellow-whitish.

New Hebrides (Mathew); one specimen.

111. Notarcha octasema, n. s.

♀, 22 mm. Head, antennæ, thorax, abdomen, and legs very pale whitish ochreous; face dark fuscous; anterior tibiae and tarsi grey above. Palpi whitish mixed with dark fuscous, terminal joint dark fuscous except apex. Fore wings elongate-triangular, rather narrow, costa posteriorly gently arched, apex rounded, hind margin strongly rounded, oblique; very pale whitish ochreous; first line nearly obsolete, oblique, forming a blackish mark on costa at one-fifth; an S-shaped discal spot rather before middle, thickly outlined in dark fuscous, upper and lower margins nearly obsolete; a small black triangular spot on costa at three-fourths, whence proceeds a dotted grey line to inner margin at two-thirds, sinuate in middle, widely dislocated inwards at three-fourths; a row of blackish dots along hind margin; cilia whitish ochreous, tips whitish. Hind wings with ground colour, hind-marginal dots, and cilia as in fore wings; a moderate round black discal spot; a dotted grey line from two-thirds of costa to two-thirds of inner margin, formed as in fore wings.

The male being unknown, the generic position is not assured.

New Hebrides (Mathew); one specimen.

112. Notarcha halurga, n. s.

♂, ♀, 30—33 mm. Head, palpi, antennæ, and thorax fuscous, with purple reflections; basal joint of palpi white; antennal ciliations of male ♀, hairs of basal joint on inner side produced upwards over stalk. Abdomen whitish fuscous. Legs white, apex of femora, apical half of anterior tibiae, and base of middle tibiae, grey (posterior legs broken). Fore wings rather elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin straight above middle, obliquely rounded beneath; fuscous, with purplish reflections; markings rather darker fuscous; first line indistinct, from one-fourth of costa to one-third of inner margin;
Mr. E. Meyrick's descriptions of

a small round paler-centred spot in disc close beyond this; a transverse-oblong discal spot before middle, pale-centred; second line dentate, tolerably distinct, followed by a somewhat paler shade, from two-thirds of costa, hardly sinuate above middle, rectangularly bent inwards at two-thirds to below middle of disc, thence again to inner margin at three-fifths; cilia fuscous, tips paler. Hind wings with ground colour, second line, and cilia as in fore wings; a faint discal spot at one-third.

Fiji (Mathew, Lucas); two specimens.

113. Notarcha butyrina, n. s.

♀, 29—30 mm. Head, palpi, antennae, thorax, abdomen, and legs pale yellowish ochreous; back of thorax mixed with white; segmental margins of abdomen white. Fore wings rather elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin oblique, somewhat bowed; light yellowish ochreous, in disc greyish-tinged between veins, and with prismatic reflections; markings grey, ill-defined; first line from near costa at one-fifth to inner margin at one-third; a small round spot in disc near beyond this; a narrow transverse discal spot before middle; second line subdentate, from near costa at two-thirds, curved inwards on upper third, obtusely angulated in middle, rectangularly bent inwards at three-fourths to below middle of disc, and again to inner margin at three-fifths; an irregular hind-marginal band, interrupted on veins, its anterior edge near and parallel to second line; cilia whitish ochreous, tips whitish. Hind wings with ground colour, second line, hind-marginal band, and cilia as in fore wings, but costa and inner margin more whitish; a transverse discal spot at one-third.

Fiji (Mathew, Lucas); two specimens.

114. Notarcha multilinealis, Gn.

Port Moresby, New Guinea (Mathew); Fiji (Mathew, Lucas); common. Occurs also in Eastern Australia, Celebes, Java, Japan, India, and South Africa.

Epichronistis, n. g.

Forehead rounded, oblique; ocelli present; tongue well-developed. Antennae two-thirds of fore wings, in male moderately ciliated (♀), with projecting scales at joints. Labial palpi moderate, nearly straight, obliquely ascending, second joint with short dense
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projecting scales beneath, tolerably truncate, terminal joint concealed. Maxillary palpi moderate, filiform. Abdomen in male with small anal tuft, valves retracted. Posterior tibiae with outer spurs somewhat more than half inner. Fore wings with vein 10 rising out of stalk of 8 and 9, 11 oblique. Hind wings somewhat broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.


♂, ♀, 18—22 mm. Head and antennae yellow-whitish, face dark fuscous. Palpi dark fuscous, beneath broadly white. Thorax yellow-whitish, in male anterior margin, in female shoulders suffused with dark fuscous. Abdomen yellow-whitish, with two dark fuscous dots near base; in male three apical segments dark fuscous above. Legs white, anterior tibiae dark fuscous. Fore wings triangular, costa hardly sinuate, posteriorly moderately arched, apex obtuse, hind margin nearly straight, oblique, rounded beneath; very pale whitish yellowish, more yellowish in female; a moderately broad greyish fuscous streak along costa from base to apex, somewhat interrupted beyond second line, lighter in female, continued from apex along hind margin in male to middle, finely attenuated beneath, in female to anal angle, irregularly narrower beneath; lines very slender, fuscous; first from one-fifth of costa to one-third of inner margin, slightly curved; second from three-fourths of costa towards anal angle, upper half somewhat inwards-curved, at two-thirds rectangularly bent inwards to beneath middle of disc, thence again rectangularly bent to inner margin about two-thirds; two conspicuous dark fuscous discal spots touching lower margin of costal streak, first very small, round, at one-fourth, second larger, transverse-oval, in middle; cilia yellow-whitish. Hind wings yellow-whitish; a conspicuous dark fuscous discal dot beyond one-third; second line as in fore wings; a roundish rather dark greyish fuscous apical spot; cilia yellow-whitish.

Although this species is widely distributed, and likely to have been described, I have not been able to identify it.

Fiji (*Mathew, Lucas*); several specimens. I have taken it also in Mauritius.

Lygropis, *Ld.* (?)

Forehead oblique; ocelli present; tongue well developed. Antennae three-fourths of fore wings, in male (?). Labial palpi moderately long, second joint obliquely ascending, clothed with
Mr. E. Meyrick's *descriptions of*

dense projecting scales above and beneath, terminal joint horizontal, rather short, cylindrical, obtuse. Maxillary palpi absent. Thorax somewhat hairy beneath. Posterior tibiae in female with outer spurs less than half inner. Fore wings with vein 8 terminating in apex, 10 closely approximated to 9, 11 very oblique. Hind wings rather broader than fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to one-third.

In the absence of the male, it is doubtful whether the generic location is correct.


♀, 42—45 mm. Head, palpi, antennae, thorax, abdomen, and legs ochreous-yellow; shoulders sometimes narrowly ferruginous. Fore wings rather elongate-triangular, costa posteriorly moderately arched, apex obtuse, hind margin somewhat bowed, oblique; bright ochreous-yellow, with ferruginous-brown markings; sometimes an indistinct suffusion along anterior half of costa; first line slightly curved, from one-fourth of costa to two-fifths of inner margin, sometimes interrupted into spots; a round dark fuscous dot midway between this and discal spot; a transverse-oblong discal spot slightly before middle, slightly curved inwards, yellow margined with ferruginous-brown; an inwards-curved streak from beneath discal spot to middle of inner margin, connected with first line by a shade along inner margin; a slender transverse line between veins 5 and 7 before two-thirds; a broad hind-marginal band, darker anteriorly, inner edge extending from two-thirds or three-fourths of costa to two-thirds or three-fourths of inner margin, with a semicircular indentation on middle third; cilia white, barred with grey, and with a dark grey basal line. Hind wings with ground colour and cilia as in fore wings; markings ferruginous-brown; a transverse linear or roundish discal spot, containing a pale central line; a dentate line from beyond middle of costa to near three-fifths of inner margin, obtusely angulated above middle, rectangularly bent inwards below middle, and again downwards below discal spot, sometimes partially interrupted; a moderately broad hind-marginal band, sometimes suffused with yellow beneath, gradually attenuated beneath, margined by a faint ferruginous line.

Fiji (*Mathew, Lucas*); two specimens.
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CONOGETHES, Meyr.

117. Conogethes punctiferalis, Gn.
Port Moresby, New Guinea (Mattheu); Fiji (Lucas); several specimens. Occurs also in Eastern Australia, China, and India.

118. Conogethes infundibulalis, Snell.
Fiji (Lucas); one specimen. Also from Eastern Australia and Sumatra.

ISOPTERYX, Gn. (?)

Forehead rounded, vertical; ocelli present; tongue well developed. Antennæ three-fourths (?), in male filiform, pubescent-ciliated (\(\frac{1}{2}\)), with short projecting scales at joints. Labial palpi moderate, ascending, second joint with dense projecting scales beneath, terminal joint very short, truncate. Maxillary palpi moderate, tolerably filiform, apex loosely scaled. Abdomen in male with small anal tuft, valves retracted, anal segment rather elongate. Posterior tibiae with outer spurs about half inner. Fore wings with vein 10 rising out of stalk of 8 and 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 approximated at base, 7 out of 6 near origin, anastomosing with 8 to near middle.

Whether this genus is identical with Isopteryx, Gn., as defined by Lederer, I cannot be sure.

119. Isopteryx antisema, n. s.
\(\sigma\), 16 mm. Head and antennæ ochreous-whitish. Palpi blackish, beneath broadly white. Thorax whitish, shoulders and apex of patagia dark fuscous. Abdomen dark fuscous, base and segmental margins whitish. Legs white, anterior tibiae with a dark fuscous band. Fore wings triangular, costa posteriorly moderately arched, apex obtuse, hind margin obliquely rounded; whitish, slightly ochreous-tinged; a dark fuscous fascia near base, dilated towards costa into a quadrate spot; first line irregular, dark fuscous, from before one-fourth of costa to beyond one-third of inner margin, dilated on costa and bordering a moderate dark fuscous quadrate spot beneath costa beyond it; a smaller transverse dark fuscous discal spot in middle, its lower edge connected with first line near inner margin by an irregular line; space between this and second line fuscous except towards costa; second line dark fuscous, from three-fourths of costa to four-fifths of inner margin,
middle third bent outwards in an angular projection; an indistinct fuscous suffusion before apex; a fuscous hind-marginal line; cilia ochreous-whitish. Hind wings white; a moderately broad blackish fuscous median band, anterior edge somewhat concave, posterior edge obtusely projecting above middle; a fuscous hind-marginal line; cilia white.

New Hebrides (Mathew); two specimens.

**GODARA, Walk.**

120. *Godara comalis*, Gn.

Port Moresby, New Guinea (Mathew); Norfolk Island (Mathew); several specimens. Occurs also in Java, Eastern Australia, and India.

**BOTYS, Tr.**

121. *Botys phaeopteralis*, Gn.

New Hebrides (Mathew); Fiji (Lucas); Marshall Islands (Mathew); common. Occurs also in Eastern Australia, Java, Formosa, China, Mauritius, Africa, and South America.


Fiji (Mathew, Lucas); several specimens. Also from Eastern Australia, Celebes, Ceylon, India, Mauritius, and Africa.

**MECYNA, Gn.**


*Botys furnacalis*, Gn., 332.

♀, ♂, 24 mm. Head and antennæ light yellow-ochreous, face mixed with ferruginous; antennal ciliations 1. Palpi ferruginous, lower half white. Thorax ochreous-yellow, shoulders suffused with ferruginous. Abdomen elongate, yellow-ochreous, anal tuft whitish ochreous. Legs snow-white, all femora and anterior tibiae except apex fuscous; middle tibiae in male lengthened and greatly dilated, apparently containing tuft of hairs in groove (not dissected); posterior tibiae with outer spurs more than half inner. Fore wings somewhat elongate-triangular, costa hardly sinuate, posteriorly moderately arched, apex rectangular, hind margin oblique, hardly rounded; ochreous-yellow, sprinkled with ferruginous; costa in male suffused with ferruginous except towards apex; lines slender,
dentate, ferruginous, obsolete on costa; first from below one-fourth of costa to two-fifths of inner margin; second from three-fourths of costa, curved outwards on upper two-thirds, thence obtusely bent inwards to beneath middle, and again rectangularly to inner margin at two-thirds; cilia ochreous-yellow, tips paler. Hind wings whitish yellowish, becoming whitish on costa, without markings; cilia whitish yellowish, tips whitish.

This species agrees well enough with Guenée's description, but as that is in some respects incomplete, I have redescribed it to prevent error.

Fiji (Mathew, Lucas); two specimens. Guenée's type is stated to be from Australia, but I think this is probably an error, and may be neglected until confirmed.

**Eurycreon, Ld.**


♀, 16 mm. Head, palpi, antennae, thorax, abdomen, and legs yellow-whitish; anterior legs spotted with dark fuscos. Fore wings triangular, costa almost straight, apex rounded, hind margin obliquely rounded; pale whitish yellow; markings shining pale whitish grey, irregularly margined with fuscos; three narrow transverse nearly straight fasciae, first from costa near base to inner margin at two-fifths, second from two-fifths of costa to middle of inner margin, third slightly curved, from four-fifths of costa to four-fifths of inner margin; a somewhat broader irregular transverse spot from middle of costa, reaching half across wing; a small spot before apex, and two small round spots before middle of inner margin; cilia fuscos-whitish, tips and a median line blackish. Hind wings fuscos-grey, with a darker subterminal line and pale yellowish hind-marginal streak, becoming obsolete beneath; cilia pale ochreous, becoming more fuscos towards tips, with an indistinct blackish line.

Port Moresby, New Guinea (Mathew); one specimen.

125. *Eurycreon prionogramma*, n. s.

♂, 17 mm. Head, palpi, antennae, thorax, abdomen, and legs pale ochreous; antennal ciliations 1; palpi white towards base beneath; maxillary palpi tolerably filiform. Fore wings triangular, costa slightly sinuate, apex rounded, hind margin somewhat rounded, rather oblique; pale ochreous, costa more brownish; markings dark fuscos; first line slender, from one-fourth of costa to two-fifths of inner margin, irregularly dentate; a small roundish
spot in disc at two-fifths, and a rather larger transverse oval spot in middle, both outlined with dark fuscous; second line slender, from three-fourths of costa to three-fifths of inner margin, rather sharply dentate except on middle third, below middle rectangularly bent inwards to beneath median spot; a row of blackish dots on hind margin; cilia grey-whitish, with a grey line. Hind wings pale ochreous; a small dark fuscous discal dot; second line, hind-marginal dots, and cilia as in fore wings.

Port Moresby, New Guinea (Mathew); one specimen.

**Exeristis**, n. g.

Forehead with an obtuse conical projection; ocelli present; tongue rather short. Antennae two-thirds of fore wings, in male filiform, evenly ciliated (1), with projecting scales at joints. Labial palpi moderately long, straight, porrected, with rough projecting scales diminishing to apex, terminal joint tolerably concealed. Maxillary palpi rather long, filiform, truncate, porrected. Abdomen in male with short anal tuft, valves retracted. Posterior tibiae with outer middle-spur absent in both sexes, outer end-spur in male half inner, in female nearly equal. Fore wings with vein 10 tolerably near 9, 11 oblique. Hind wings as broad as fore wings; veins 3, 4, 5 tolerably approximated at base, 7 out of 6 near origin, anastomosing with 8 to middle (*E. xanthota*, male), or 6 and 7 stalked to one-third, 8 anastomosing with 7 from cell to two-thirds (*E. asyphela*, male), lower median naked.

Allied to *Eurycreon*; the examination of the specimens was difficult from their small size and somewhat imperfect condition. The differences in neuration of the hind wings are perhaps sexual and repeated in both species.

126. **Exeristis asyphela**, n. s.

♂, 10 mm. Head, palpi, antennae, and thorax pale greyish ochreous, somewhat mixed with dark fuscous; palpi suffused with dark fuscous except at base. Abdomen whitish mixed with dark fuscous. Legs whitish, banded with dark fuscous. Fore wings elongate-triangular, costa gently arched, apex obtuse, hind margin obliquely rounded; pale greyish ochreous, irregularly sprinkled with blackish; markings cloudy, blackish; a suffusion along costa towards base, and an indistinct curved transverse line near base; first line curved, from one-third of costa to two-fifths of inner margin; a small spot on middle of costa; a quadrate spot outlined in disc, connected with inner margin at four-fifths by an irregular
line; second line somewhat curved, from three-fourths of costa to anal angle, sharply indented below costa and in middle; a row of small spots along hind margin; cilia very pale greyish ochreous, basal half sharply barred with dark fuscous. Hind wings ochreous-whitish, coarsely irrorated with blackish; markings cloudy, blackish; a strong irregular streak from disc to inner margin before anal angle; second line, hind-marginal spots, and cilia as in fore wings.

Tonga (Mathew); one specimen.

127. E. exeristis xanthota, n. s.

♀, 8½ mm. Head, palpi, antennæ, thorax, abdomen, and legs light ochreous-yellow, thorax mixed with dark fuscous; apex of tibæ dark fuscous. Fore wings triangular, costa slightly arched, apex rounded, hind margin obliquely rounded; ochreous-yellow, suffusedly mixed with fuscous in disc; markings blackish; some cloudy marks at base; first line nearly straight, from before one-fourth of costa to beyond two-fifths of inner margin; a small round spot outlined in disc at one-third, and a small spot above it on costa; a transverse-oblong spot outlined in disc beyond middle, touching a small spot on costa; second line well-defined, from five-sixths of costa, indented in middle, widely broken inwards to beneath median spot, terminating on inner margin at two-thirds; a row of small spots along hind margin, and a larger one at anal angle; cilia grey, with a darker line, becoming yellowish at anal angle. Hind wings with ground colour and discal suffusion as in fore wings; a small transverse discal spot; second line, hind-marginal spots, and cilia as in fore wings.

Separated from E. asyphela by the quite differently placed (reversed-oblique) first line, as well as the yellow colouring and minor differences of marking.

SCOPARIADÆ.

Hoploscopa, n. g.

Forehead rounded, tolerably vertical; ocelli present; tongue moderate. Antennæ three-fifths of fore wings, in male (?). Labial palpi long, straight, porrected, second joint shortly and evenly rough-scaled above and beneath, terminal joint moderate, cylindrical, exposed. Maxillary palpi moderate, sharply triangularly dilated with scales, porrected, not resting on labial. Fore wings with veins 4 and 5 short-stalked, 10 rising out of stalk of 8 and 9, 11 oblique. Hind wings broader by one-third than fore wings;
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veins 4 and 5 short-stalked, 7 out of 6 near origin, anastomosing with 8 to near middle, 1a and 1b pectinated towards base.

A curious form, more or less intermediate between Scoparia and Schoenobius.

128. Hoplosecota astrapias, n. s.

♀, 22—29 mm. Head, palpi, antennae, thorax, and legs reddish brown. Abdomen pale ochreous, tinged with reddish brown. Fore wings very elongate, nearly oblong, gradually dilated posteriorly, costa slightly arched, apex obtuse, hind margin straight, hardly oblique, rounded beneath; reddish fuscous, purplish-tinged, and suffusedly mixed with bright crimson along veins; a short white or yellow median streak from base to one-fifth; a short transverse inwardly oblique snow-white streak in disc about two-fifths, above shortly fureate, fork sometimes pale yellow and enclosing a crimson spot; a right-angled snow-white streak in disc beyond middle, angle filled with crimson, its extremities reaching near costa in middle and before three-fourths, angle reaching half across wing; a snow-white sinuate line, sometimes reduced to a row of dots, from costa close before apex to near inner margin at four-fifths, terminated beneath by a short white streak on submedian fold; cilia reddish fuscous. Hind wings whitish ochreous, becoming gradually more tinged with reddish fuscous posteriorly; cilia whitish ochreous.

Fiji (Lucas); two specimens.

CRAMBIDÆ.

Calamotropha, Z.

129. Calamotropha dictota, n. s.

♂ , ♀ , 23—29 mm. Head white or whitish ochreous, sides light ochreous. Palpi light brownish ochreous, above white. Antennæ whitish ochreous. Thorax brownish ochreous. Abdomen and legs whitish, anterior pair suffused with ochreous. Fore wings elongate, somewhat dilated, costa hardly arched, apex rectangular, hind margin straight, not oblique, rounded beneath; very pale whitish brown, towards costa and base somewhat darker, with thinly scattered black and dark fuscous scales; a fuscous suffusion along submedian fold from base to three-fourths; a distinct black dot on submedian fold in middle, and a second in disc considerably beyond middle; a row of small indistinct blackish dots from near costa four-fifths to above anal angle, curved outwards, not reaching
margins; a hind-marginal row of black dots; cilia white (imperfect). Hind wings whitish, with a very faint greyish subterminal line; cilia white.

Mr. Mathew states that he took the species amongst sugar-cane; it probably feeds on that plant, and must therefore be introduced with it, but I have not been able to identify it with the described sugar-cane-feeding species of this and allied genera.

Fiji (Mathew, Lucas); two specimens.

**Crambus, F.**

130. *Crambus hapaliscus*, Z.

Port Moresby, New Guinea (Mathew); Fiji (Lucas); several specimens. Also from Eastern Australia, Ceylon, and South Africa.


Norfolk Island, New Hebrides, and Tonga (Mathew); Fiji (Lucas); common. Occurs also in Eastern Australia, to which I had already predicted that it would be found not to be confined; the range now established proves that Australia possesses no really indigenous species of *Crambus*.

**Autarotis, n. g.**

Forehead rounded; ocelli present; tongue well developed. Antennae two-thirds of fore wings, in male shortly ciliated. Labial palpi very long, straight, porrected, with dense loosely appressed scales, attenuated to apex. Maxillary palpi moderately long, triangularly dilated, resting on labial. Fore wings with veins 2 and 3 stalked, 4 and 5 from a point, 7 rising out of stalk of 8 and 9, 10 closely approximated to 9, 11 bent. Hind wings with veins 4 and 5 from a point, 6 and 7 stalked, 8 anastomosing with stalk of 6 and 7 from beyond cell to beyond 6, lower median pectinated; under surface with a longitudinal furrow beneath anastomosed portions of 6 and 8.

Characterised by the stalked veins 2 and 3 of fore wings, and furrow of hind wings.
132. Autarotis curyala, n. s.

♂, 21 mm. Head and palpi white, on sides light ochreous Antenne and thorax light ochreous. Abdomen whitish. Legs white, anterior pair light ochreous. Fore wings broadly triangular, costa hardly arched, apex round-pointed, hind margin slightly rounded, waved, rather oblique; pale greyish ochreous, with scattered black scales on veins; veins posteriorly suffusedly white; a white suffusion along inner margin from base to beyond middle, above extremity of which is a large blackish dot; three other indistinct blackish dots transversely placed in disc beyond middle; a fine brownish ochreous line, posteriorly slenderly whitish margined, from three-fourths of costa to three-fourths of inner margin, strongly curved outwards, bent above middle; a fine blackish hind-marginal line, forming small black spots on veins 2 and 3; cilia shining grey-whitish, narrowly barred with white. Hind wings and cilia white.

Fiji (Matheiu); one specimen.

HEDNOTA, n. g.

Forehead with a more or less developed cone; ocelli present; tongue well developed. Antenne two-thirds of fore wings, in male ciliated, dentate, or bipectinated. Labial palpi very long, straight, porrected, loosely scaled, gradually attenuated. Maxillary palpi moderately long, porrected, triangularly scaled. Fore wings with veins 4 and 5 separate or rarely stalked, 8 and 9 stalked, 11 sometimes bent. Hind wings with veins 4 and 5 from a point, stalked, or rarely coincident, 6 remote from 7 at origin, anastomosing with 8 more or less, lower median and 1b pectinated; inner margin in male of one species (H. argyrocles) lobed and folded, with tuft of hairs.

I have formed this genus to include all the Australian species (except lutivittalis, Walk.) formerly classed by me under Thinasotia, from which they differ by having veins 6 and 7 of hind wings remote at origin instead of stalked. I find this character important, and a new genus was therefore necessary. There are about twenty Australian species, of which the following is one; the genus has not been identified elsewhere.

133. Hednota bijractella, Walk.

Port Moresby, New Guinea (Matheiu); one specimen. Also from Eastern Australia.
Lepidoptera from the South Pacific.

PHYTICIDÆ.

I adopt provisionally the family name suggested by M. Ragonot.

**Conobathra**, n. g.

Forehead flat, vertical; ocelli present; tongue well developed. Antennae two-thirds of fore wings, in male filiform, shortly ciliated (†), with a thickened situation at base, basal joint produced on inner side above into a large acute-conical horny tooth, suprabasal joint slightly enlarged and angular. Labial palpi moderate, curved, ascending, second joint with dense rather projecting scales, terminal joint as long as second, moderately stout, pointed. Maxillary palpi short, filiform. Posterior tibiae in male with hairs dilated above towards apex, and a long curved pencil of hairs from base above directed forwards. Fore wings with (reckoning normal 12 veins) 4 and 5 stalked, 7 absent, 8 and 9 stalked. Hind wings broader by one-half than fore wings; veins 4 and 5 stalked out of 3, 7 out of 6 near origin, Anastomosing with 8 to middle, lower median pectinated.

134. **Conobathra automorpha**, n. s.

♂, 16 mm. Head and thorax grey mixed with purplish. Palpi dark fuscous, base and apex of joints greyish. Antennae and abdomen grey. Legs dark fuscous, apex of joints grey-whitish. Fore wings elongate, moderately dilated, costa nearly straight, apex tolerably rectangular, hind margin rounded, rather oblique; pale greyish ochreous, irregularly irrorated with dark purple-fuscous, costa suffused with whitish ochreous; first line thick, almost straight, from two-fifths of costa to two-fifths of inner margin, dark purple-fuscous, preceded by a pale line, and followed by a rather more ochreous band; second line pale, preceded and followed by obscure dark fuscous lines, somewhat sinuate, near and parallel to hind margin; two obscure dark fuscous dots transversely placed in middle of disc; a dark fuscous hind-marginal line; cilia purplish fuscous, with rows of whitish points. Hind wings whitish grey, semitransparent, apex and hind margin grey; cilia grey-whitish, with a grey line.

Port Moresby, New Guinea (Mathew); one specimen bred.

**Etiella**, Z.


Port Moresby, New Guinea (Mathew); one specimen. Also from Eastern Australia.
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**HOMEOOSOMA, Curt.**

136. *Homoeosoma cataphœa*, n. s.

♂, 22 mm. Head, palpi, antenna, thorax, and legs fuscous, mixed with dark fuscous. Abdomen whitish ochreous. Fore wings elongate, gradually dilated, costa hardly arched, apex obtuse, hind margin straight, rather oblique, rounded beneath; neuration as in *H. vagella*; fuscous, suffused with dark fuscous; the lighter colour forms two obscure straight transverse streaks, first from one-fifth of costa to one-third of inner margin, second from costa before apex to three-fourths of inner margin; cilia fuscous, towards base suffusedly dark fuscous. Hind wings whitish ochreous; a fuscous hind-marginal line; cilia whitish ochreous.

Fiji (*Lucas*); one specimen.

**EPHESTIA, Gn.**

137. *Ephestia elutella*, Hb.

Fiji (*Lucas*); one specimen.Introduced from Europe, as also into Australia.

**GALLERIADÆ.**

**MELISSOBLAPTES, Z.**

I understand the genus in its restricted sense, as distinct from *Aphomia* and *Heteromicta*.


♀, 30 mm. Head, palpi, antenna, thorax, and legs pale ochreous, somewhat suffused with light reddish fuscous, and thinly irrorated with dark grey. Abdomen ochreous-whitish, irrorated with grey. Fore wings elongate-oblong, somewhat dilated, costa moderately arched, apex obtuse, hind margin rounded, rather oblique; light reddish fuscous, somewhat mixed with grey-whitish, and irrorated with dark grey; lines thick, cloudy, dentate, dark grey; first from one-third of costa to two-fifths of inner margin, irregularly curved outwards; second from two-thirds of costa to three-fourths of inner margin, rather strongly curved outwards from near costa to near inner margin; a small dark grey spot in disc before middle and another in disc beyond middle; cilia grey-whitish, basal half light fuscous-reddish. Hind wings pale grey, becoming grey-whitish towards base; cilia whitish, base reddish-tinged.

Fiji (*Lucas*); one specimen.
Heteromicta, n. g.

Forehead with projecting cone of scales; ocelli present; tongue well developed. Antennæ one-half to two-thirds of fore wings, in male filiform, minutely ciliated, basal joint sometimes with slight tooth of scales in front. Labial palpi in male moderate or short, appressed to frontal cone, in female long, straight, porrected, with loosely appressed scales, attenuated from middle to apex. Maxillary palpi short, filiform. Posterior tibiae with outer spurs about half inner. Fore wings with vein 1 furcate at base, 2 from or before two-thirds of cell, 4 and 5 from a point, 6 from near 7, 8 and 9 stalked out of 7. Hind wings broader by one-third to one-half than fore wings, 2 from near angle, 3 and 4 stalked, 5 absent, transverse vein angulated inwards almost to base, 7 out of 6, anastomosing with 8 very shortly or at a point.

I have formed this genus to include the two following species, together with pachytora, Meyr., tripartitella, Meyr., and latro, Z.; it differs from Aphomia and Melissoblaptes, with which these species have hitherto been included, in having veins 8 and 9 of the fore wings stalked out of 7, instead of veins 7 and 8 stalked out of 9. In H. latro male the disc of fore wings is clothed with appressed hairs, and in H. tripartitella male there is a small brush of hairs on fore wings beneath from below costa before middle, but these characters appear specific only.

139. Heteromicta rufivena, Walk.


Agrees sufficiently with both descriptions, but size only 23 mm.; a linear dark fuscous mark in disc before middle, and an incomplete circular mark in disc beyond middle, connected by a line of a few white scales; a dark grey hind-marginal line; veins sharply defined red on dorsal half, obsolete on costal; hind wings and abdomen light yellow-ochreous.

Port Moresby, New Guinea (Mathew); one female specimen. Also from Celebes and Borneo.

140. Heteromicta trichogramma, n. s.

♀, 31 mm. Head, palpi, antennæ, and thorax pale brownish ochreous. Abdomen and legs pale whitish ochreous. anterior legs
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brownish-tinged. Fore wings elongate-oblong, slightly dilated, costa straight, apex obtuse, hind margin rounded, oblique; pale ochreous-brown, with a few very fine scattered black scales; costal edge very narrowly white; an obscure dark fuscous dot in disc before middle, and another in disc beyond middle; a fine interrupted black hind-marginal line; cilia light brownish ochreous. Hind wings and cilia very pale whitish ochreous.

Fiji (Lucas); one specimen.

PTEROPHORIDÆ.

Trichoptilus, Wlsm.

141. Trichoptilus centetes, Meyr.

Port Moresby, New Guinea (Mathew); several specimens.

Sphenarches, Meyr.

142. Sphenarches synophrys, Meyr.

New Hebrides and Tonga (Mathew); several specimens.

Deuterocopus, Z.

143. Deuterocopus Tengstrœmi, Z.

Port Moresby, New Guinea (Mathew); several specimens. Also from Java.

Aciptilia, IIb.

144. Aciptilia aptalis, Walk.

New Hebrides, Samoa, and Tonga (Mathew); Fiji (Lucas); common. Occurs also in Eastern Australia.

TORTRICINA.

GRAPHIOLITHIDÆ.

Eccorsis, Z.

The following species agrees entirely in structure with North American species of the genus, except that in male the inner angle of hind wings is prominent but not excised; the longitudinal pocket of inner margin is equally developed.
145. *Eccopsis aprobola*, n. s.

♂, 20 mm. Head, palpi, and antennae ochreous-brown. Thorax pale ochreous, spotted with brown, crest dark ochreous-brown. Abdomen dark grey, anal tuft pale ochreous. Legs whitish ochreous, anterior tarsi banded with dark fuscous. Fore wings oblong, gradually dilated, costa gently arched, apex rounded, hind margin not oblique, rounded beneath; ochreous-white, strigulated and mostly suffused with pale ochreous; costa and inner margin shortly strigulated with black; two angulated brownish ochreous lines about one-fourth, first spotted with black on inner margin and second on fold; a narrow nearly straight fuscous central fascia from middle of costa to three-fourths of inner margin, its posterior edge dilated into a large quadrate blotch below costa, and spotted with black towards inner margin; an irregular fuscous spot near before apex, between which and anal angle is a series of four or five short longitudinal linear fuscous marks; some dark fuscous subterminal dots before upper half of hind margin; cilia whitish, with a blackish basal line round apex (imperfect). Hind wings with inner angle prominent but not excised; a plate of thickened scales covering upper margin of cell before transverse vein; dark fuscous, becoming lighter towards base; cilia white, with an indistinct grey line.

♀, 19 mm. Fore wings ochreous, slightly mixed with white; fuscous and brownish ochreous markings mostly replaced by black; interspaces with numerous suffusedly confluent metallic leaden grey lines; cilia pale ochreous, on upper half suffusedly barred with blackish, towards anal angle white; rest as in male. Hind wings as in male, but inner angle not prominent; cilia greyer.

Tonga (*Mathew*); two specimens.

**Carpocapsa, Tr.**

The following species possesses every characteristic of the genus, including the discal groove of the hind wings, except that the thorax has a strong posterior crest; I do not at present consider it necessary to separate it on this account.

146. *Carpocapsa immanis*, n. s.

♂, 27 mm. Head, palpi, and thorax reddish fuscous suffused with dark fuscous and somewhat mixed with whitish ochreous. Antennae and abdomen fuscous. Fore wings moderate, posteriorly moderately dilated, costa moderately arched, apex obtuse, hind
margin faintly sinuate, somewhat oblique; reddish fuscous, mixed with grey; basal two-thirds of wing and a large triangular patch on hind margin beneath apex suffused with dark fuscous; costa marked with pairs of very short whitish ochreous strigulae; cilia fuscous (imperfect). Hind wings and cilia fuscous-grey.

Fiji (Lucas); one specimen.

Crocidoæma, Z.

147. Crocidoæma plebeiana, Z.

Tonga (Mathew); Fiji (Lucas); several specimens. Also in Eastern Australia and Europe; an introduced species.

Tortricidæ.

Adoxophyæ, Meyr.

148. Adoxophyes cyrtosema, n. s.

♂, ♀, 16—21 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish ochreous; head and thorax sometimes ochreous-brown, abdomen sometimes more yellowish. Fore wings moderate, oblong, costa anteriorly strongly arched, posteriorly straight, apex obtuse, hind margin sinuate, not oblique; whitish ochreous; costal fold of male more ochreous; a reddish ochreous oblong spot, somewhat mixed and outlined with dark fuscous, on inner margin about one-third, its upper edge sinuate; an incomplete line of reddish ochreous and dark fuscous scales from near one-sixth of costa to posterior edge of this spot, representing basal patch; central fascia from before middle of costa to before anal angle, reddish ochreous mixed with fuscous and outlined with dark fuscous, sometimes partially obsolete in disc, narrow and irregular, towards lower extremity suddenly dilated posteriorly into a large irregular blotch; a triangular reddish fuscous patch on costa towards apex, mixed with fuscous and irregularly outlined with dark fuscous, posterior edge near and parallel to hind margin, and reaching half across wing; all these markings in female sometimes indistinct and entire wing suffused with ochreous; cilia whitish ochreous. Hind wings whitish ochreous, more ochreous posteriorly, base more whitish; cilia whitish ochreous or yellow ochreous.

Tonga (Mathew); Fiji (Lucas); about eight specimens.
TINEINA.
GELECHIADÆ.

Crocanthes, n. g.

Head smooth; ocelli absent or present; tongue well developed. Antennæ as long as fore wings or longer, in male serrate, simple, basal joint moderate, without pecten. Labial palpi long, smooth, recurved, second joint slender or somewhat thickened, terminal joint as long as second, acute. Maxillary palpi short, appressed to tongue. Abdomen in male with anal valves strong, uncus rather short, slender, curved. Posterior tibiae clothed with rough hairs above. Fore wings with vein 1 furcate at base, lower fork partially obsolete, 2 and 3 stalked from angle, 5 absent, 7 and 8 stalked, 7 to costa, 9 separate, or rarely out of stalk of 7 and 8, 10 absent. Hind wings as broad as fore wings, trapezoidal, apex round-pointed, hind margin somewhat sinuate, cilia one-half to one; 3 and 4 stalked, 5 absent, transverse vein extremely faint or absent, 6 and 7 stalked.

Well characterised by the peculiar neuration and long antennæ; besides the two following species I have three others undescribed from Eastern Australia, all belonging to the first section. Vein 9 of fore wings is separate except in one undescribed species.

Sect. A. Ocelli absent; antennæ conspicuously longer than fore wings.

149. Crocanthes prasinopis, n. s.

♀, 12—15 mm. Head, palpi, antennæ, and thorax whitish yellow; shoulders narrowly brownish ochreous; eyes brilliant green when alive. Abdomen and legs yellow-whitish. Fore wings elongate, rather narrow, costa gently arched, apex round-pointed, hind margin sinuate, rather strongly oblique; light yellow; markings brownish ochreous, sometimes irrorated with fuscous; a suffused streak along costa from base to before middle; a broad fascia beyond middle, nearly parallel to hind margin, anteriorly edged with blackish, posterior edge marked with a small blackish spot in disc, and connected on costa and more indistinctly on inner margin with a rather suffused fascia along hind margin; cilia whitish yellow, basal third light ochreous, bounded by a strong blackish line, towards apex and anal angle wholly whitish ochreous. Hind wings pale whitish ochreous, posteriorly sometimes fuscous-tinged, extreme apex fuscous; a small fuscous or dark fuscous.
spot in middle of disc; cilia whitish ochreous, towards base more yellowish.

Described from a series of Australian specimens; the New Guinea specimen is rather smaller and darker than the average.

Port Moresby, New Guinea (Matheu); one specimen. Also common in Eastern Australia.

Sect. B. Ocelli distinct; antennae about as long as fore wings.

150. Crocanthes heliarcha, n. s.

♂, 13 mm. Head and thorax dark fuscous. Palpi with second joint whitish yellowish, upper edge blackish, terminal joint blackish. Antennae grey, towards apex ochreous-whitish. Abdomen bright orange, with a suffused blackish spot on back of each segment except towards base. Legs ochreous-yellowish, tarsi and anterior tibiae spotted with dark fuscous. Fore wings elongate-oblong, rather narrow, gradually slightly dilated, apex rounded, hind margin obliquely rounded; bright orange, with purplish black markings; a large basal patch, extending on costa to two-thirds and on inner margin to two-fifths, outer edge irregular, tolerably straight, a small transverse spot in middle of disc; a hind-marginal patch, bounded by a sinuate line from four-fifths of costa to anal angle; cilia purplish black, terminal half round apex ochreous-whitish. Hind wings bright orange, with purplish black markings; a short line along costa beyond middle; a crescentic inwards-curved spot in disc beyond middle; a narrow hind-marginal band, somewhat dilated at apex, with a small irregular prominence at three-fourths; cilia black.

Port Moresby, New Guinea (Matheu); several specimens.

Brachyacma, n. g.

Head smooth; no ocelli; tongue well developed. Antennae four-fifths of fore wings, in male filiform, simple, basal joint rather long, slender, without pecten. Labial palpi rather long, nearly straight, obliquely ascending, second joint thickened with appressed scales, somewhat rough beneath towards apex, above with rough projecting hairs towards middle, terminal joint short, about one-third of second, filiform, pointed. Maxillary palpi very short, filiform. Abdomen in male with uncus long, flattened, concave beneath, apex formed into a semicircular black plate concave
beneath, before which are two short oblique lateral spines. Posterior tibiae clothed with long hairs above. Fore wings with vein 1 furcate at base, 2 from lower margin of cell at three-fourths, 3 and 4 from point of angle, 7 and 8 stalked, 7 to costa. Hind wings slightly broader than fore wings, tolerably trapezoidal, apex round-pointed, hind margin twice somewhat sinuate, cilia one; 3 and 4 from a point, 6 and 7 stalked.

151. Brachyacma epiochra, n. s.

♂, 17 mm. Head, palpi, antennae, thorax, abdomen, and legs whitish ochreous; second joint of palpi externally fuscous. Fore wings elongate, narrow, parallel-sided. apex rounded, hind margin obliquely rounded; whitish ochreous; costal edge very slenderly dark fuscous from base to near apex, dilated at base, posteriorly also somewhat dilated, more suffused and reddish-tinged; a dark fuscous dot on submedian fold before middle; cilia whitish ochreous, costal cilia dark fuscous except towards apex. Hind wings and cilia light fuscous-grey.

Fiji (Lucas); one specimen.

Atasthalistis, n. g.

Head smooth; no ocelli; tongue well developed. Antennae three-fourths of fore wings, in male subserrate, moderately ciliated (1), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint considerably exceeding base of antennae, much thickened throughout with dense rough scales above and beneath, terminal joint shorter than or nearly equal to second, acute, thickened with dense rough scales except at apex. Maxillary palpi very short, appressed to tongue. Posterior femora in male swollen, posterior tibiae clothed with long hairs above. Fore wings with vein 1 furcate at base, 2 from near angle of cell, 5 absent, 7 and 8 stalked, 7 to hind margin or apex. Hind wings considerably broader than fore wings, trapezoidal, apex round-pointed, hind margin almost straight, cilia two-fifths; veins 3 and 4 from point of angle, 6 from angle, 7 from before middle of cell, running shortly into 8, or 6 and 7 stalked, 8 free; 1 long strongly pectinated.

The insect figured by Felder as Ethmia gnophrina (Reis. Nov., pl. cxxxix, 38) is probably a third species of this genus.
Sect. A. Fore wings with vein 7 to apex; hind wings with veins 6 and 7 stalked, 8 free.

152. *Atasthalistis pyrocosa*, n. s.

♂, 22 mm. Head, palpi, antennae, and thorax purplish black. Abdomen and legs dark fuscous, posterior tibiae greyish ochreous. Fore wings elongate-oblong, narrow, apex round-pointed, hind margin sinuate, rather oblique; black, slightly purplish-tinged; a rather narrow pale whitish yellow streak close beneath costa from base to four-fifths, leaving costal edge black, attenuated at apex; a minute yellow-whitish costal dot near beyond apex of this; a deep orange hind-marginal fascia from apex to anal angle, moderate on costa, gradually attenuated to a point beneath; an interrupted black hind-marginal line; cilia deep orange, on costa and beneath anal angle black. Hind wings bright orange; a large blackish apical patch, bounded by a slightly curved line from three-fifths of costa to middle of hind margin; hairs of vein 1b dark grey; cilia blackish.

Port Moresby, New Guinea (Mathew); several specimens. Mr. Mathew states that a number of this species came on board ship whilst still at some distance from land; he did not meet with the species on shore. In spite of the difference of neuration it cannot be separated generically from the following.

Sect. B. Fore wings with vein 7 to hind margin; hind wings with vein 7 remote from 6, rising from upper margin of cell, running into 8.


♀, 22 mm. Head, palpi, antennae, and thorax blackish fuscous, outer half of patagia yellowish white. Abdomen orange, beneath dark fuscous. Legs dark fuscous, posterior tibiae pale orange. Fore wings elongate-oblong, narrow, apex round-pointed, hind margin rather oblique, strongly sinuate; blackish fuscous; a broad very pale whitish yellowish streak along costa from base to near apex, leaving costal edge narrowly blackish from one-fourth onwards, lower edge of this streak shortly indented before middle; a pale whitish yellowish line along hind margin from above apex to below anal angle, externally margined with a few black scales; cilia bright orange. Hind wings and cilia bright orange.

Solomon Islands (Mathew); one specimen. Occurs also in Java.
Autosticha, Meyr.

I propose this name for the genus characterised by me in the Ent. Mo. Mag., vol. xx., 34, under the designation of Automola, which latter name is untenable, having been previously employed by Loew for a genus of Diptera.

154. Autosticha demias, n. s.

♀, 18 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish ochreous, thinly sprinkled with fuscous. Fore wings elongate, costa moderately arched, apex rounded, hind margin obliquely rounded; pale ochreous, thinly irrorated with dark fuscous; a blackish dot on inner margin near base; a blackish dot in disc before middle, a second rather obliquely before it on fold, and a third larger in disc beyond middle; an almost marginal row of blackish dots between veins on hind margin and apical fourth of costa; cilia pale ochreous. Hind wings pale whitish grey, slightly ochreous-tinged; cilia ochreous-whitish.

Very similar to the Hawaiian A. pelodes, but second discal dot obliquely before instead of beyond first; also fore wings somewhat more elongate, with an additional blackish dot near base of inner margin, and without basal dot on costa, hind wings somewhat greyer, rather broader than fore wings.

Fiji (Lucas); one specimen.

Cryptolechidæ.

I propose to extend the definition of this family provisionally in such a manner as to include forms in which veins 7 and 8 of the fore wings are separate, and sometimes also 8 stalked with 9, the remaining structure being identical.

Copromorpha, n. g.

Head with dense loosely appressed hairs; no ocelli; no tongue. Antennæ two-thirds of fore wings, in male strongly unpectinated (4), basal joint large, broadly flattened, concave beneath. Labial palpi moderate, curved, ascending, second joint not reaching base of antennæ, greatly thickened with dense somewhat rough scales, terminal joint half second, much thickened with appressed scales, pointed. Maxillary palpi obsolete. Thorax broadly crested behind. Posterior tibiae much thickened with dense long hair scales. Fore wings with tufts of scales on surface; 1 furcate at base, 2 from
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beyond three-fourths of cell, 3, 4, 5 approximated at base, 7 and 8 separate, 7 to hind margin. Hind wings broader by one-fourth than fore wings, irregularly ovate, cilia one-fourth; veins 3 and 4 short-stalked, 5 approximated to 4 at base, 6 and 7 parallel; lower median, 1a, and 1b with very dense pectinations towards base.

Even in the extended sense of the family, this genus can hardly with justice be brought within its limits; but it will not agree better with any other established family, and the creation of a new one, which is probably necessary, may with advantage be deferred until further material is obtained. The nearest ally to it which I possess is an undescribed genus from Eastern Australia, in which veins 8 and 9 of the fore wings are stalked.

155. *Copromorpha gypsota*, n. s.

♂, 26—30 mm. Head white. Palpi white, second joint suffused with dark fuscous externally except at apex. Antennae white, narrowly banded with dark fuscous. Thorax white, slightly mixed with purplish, shoulders narrowly purplish fuscous. Abdomen pale greyish ochreous, mixed with grey. Legs dark fuscous, apex of joints white, posterior pair suffused with whitish. Fore wings moderately broad, gradually dilated throughout, costa somewhat sinuate, posteriorly moderately arched, apex very obtusely rounded, hind margin rounded, not oblique; whole disc with numerous tufts of raised scales; white, obscurely strigulated in disc with pale yellowish ochreous, and towards margins with purplish fuscous; a fuscous-purple blotch along basal fourth of costa, ending in a blackish spot; a large ill-defined inwardly oblique fuscous-purple blotch from middle of costa, reaching half across wing, containing two blackish spots on costa, the posterior smaller; a short black curved longitudinal linear black mark in middle of disc; two small black spots on costa towards apex, and some scattered small black spots towards hind margin; cilia ochreous-whitish, with an ochreous basal line, barred with fuscous-purplish, except at apex. Hind wings light fuscous-grey; neural pectinations pale greyish ochreous; cilia pale greyish ochreous, with an indistinct grey line.

Fiji (*Mathew, Lucas*); two specimens.

**Antæotricha, Z.**

The generic reference of the following species is uncertain, since the specimen is a female, and the characteristic long costal hairs of the hind wings of male
remain to be observed; but the species appears to be congeneric with five or six Australian species which I refer to this genus, and in which these costal hairs are strongly developed. The neuration of Zeller’s South American species is not given; that of these is as follows: fore wings with vein 1 furcate at base, 2 from before three-fourths of cell, 7 and 8 stalked, 7 to costa; hind wings with veins 3 and 4 from a point, 6 and 7 from a point.

156. Antaeotricha hospitata, Feld.


♀, 27 mm. Head, palpi, antennae, and thorax white, mixed with pale grey. Abdomen yellow-ochreous. Legs yellow-ochreous, anterior pair black, middle tarsi dark fuscous. Fore wings elongate-oblong, costa moderately arched. apex rounded, hind margin obliquely rounded; white, mixed with light grey, and a few scattered black scales; a narrow oblique transverse black streak from costa near base, reaching half across wing; a cloudy grey spot in middle of disc; cilia whitish. Hind wings light yellow-ochreous, with a grey apical patch; cilia light yellow-ochreous, round apex grey.

Port Moresby, New Guinea (Mathew); one specimen. According to Felder also from North Australia.

DEPRESSARIADÆ.

Octasphales, n. g.

Head loosely haired, side-tufts rather spreading, hairs projecting over forehead; no ocelli; tongue well developed. Antennæ almost as long as fore wings. filiform, basal joint elongate, without pecten. Labial palpi long, slender, recurved, second joint exceeding base of antennæ, clothed with appressed scales, terminal joint as long as second, acute. Maxillary palpi very short. Abdomen broad, somewhat flattened. Middle and posterior tibiaæ densely clothed with scales. Fore wings with vein 1 furcate at base, 2 and 3 stalked from angle, 7 absent (coincident with 8). Hind wings as broad as fore wings, ovate, cilia one-fourth; veins 3 and 4 from a point, 6 and 7 tolerably parallel, 16 pectinated towards base.

Differs from all other genera of the family by the coincidence of veins 7 and 8 of the fore wings.
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♀, 16 mm. Head, palpi, and thorax grey mixed with white, terminal joint of palpi with a dark fuscous subapical band. Antennae white, annulated with dark fuscous. Abdomen grey. Legs white, anterior tarsi spotted with dark fuscous. Fore wings oblong, moderate, costa strongly arched towards base, bent and dilated with scales about one-third, thence nearly straight to near apex, apex and hind margin evenly rounded, semicircular; whitish, somewhat suffused with pale greyish, and marked with numerous small cloudy dark grey spots, posteriorly coalescing to form an oblique fascia from middle of costa to anal angle, narrow on upper half, dilated posteriorly on lower half into a large blotch extending almost to hind margin, and connected by a bar with costa before apex; costal edge narrowly light rose-pink; a dark grey hind-marginal line; cilia whitish, base rosy-tinged. Hind wings grey, lighter towards base; cilia grey-whitish, with a cloudy grey line.

Port Moresby, New Guinea (Mathew); one specimen.

**OEOPHORIDÆ.**

Two species of this family, *Palparia semijunetella*, Walk., and *Philobota monolitha*, Meyr., were included in the collection of Dr. Lucas as taken in Fiji, each represented by a single specimen only; but I am disposed to believe that there must have been some error as to the locality. Both are characteristic Australian species, and in my opinion very unlikely to occur in Fiji, even by artificial introduction; and considering the possibility of confusion, I think it will be right to await further evidence before including them in the Fijian list.

**GLYPHIPTERYGIDÆ.**

**Thylacopleura**, n. g.

Head with dense loosely appressed hairs; no ocelli; tongue well developed. Antennæ two-thirds of fore wings, in male filiform, moderately ciliated (1), basal joint stout, without pecten. Labial palpi moderate, arched, ascending, second joint not reaching base of antennæ, thickened with dense appressed scales, terminal joint less than half second, thickened with loosely appressed scales, bluntly pointed. Maxillary palpi obsolete. Middle tibiae short, triangular; posterior tibiae clothed with long hairs beneath on basal half. Fore wings with vein 1 long-furcate at base, 2 from close before angle, 7 and 8 stalked, 8 to hind margin. Hind wings
as broad as fore wings, trapezoidal-ovate, hind margin rounded, inner margin in male folded longitudinally into a deep pocket opening beneath, and produced at lower angle into a strong rounded lobe; veins 1a, 1b, and 1c apparently concealed in pocket, 3 and 4 remote, 6 and 7 stalked.

This singular genus is out of place everywhere, and certainly cannot be said to fall under the definition of this family; but as it seems to have most affinity here, it may be allowed to remain for the present. The neuration of the hind wings is such as is only found otherwise in the Gelcchiadce; but the ciliated antennæ, form of the palpi, long furcation of vein 1, and hind-marginal termination of veins 7 and 8 of the fore wings are discordant in that family.

158. Thylacopleura autodoxa, n. s.

♂, 19—21 mm. Head and thorax dark purplish fuscous, mixed with yellowish and whitish. Palpi white, above yellowish, a sub-apical band of second joint, and terminal joint except apex black. Antennæ fuscous. Abdomen dark fuscous, segmental margins broadly ochreous-yellow. Legs white, broadly banded with dark fuscous. Fore wings broad, triangular, costa slightly arched, apex obtusely rounded, hind margin rounded, not oblique; fuscous, somewhat purplish-tinged; a streak (sometimes well-defined) from base of costa to inner margin before middle, and a triangular patch extending on costa from before middle to apex, and connected at its apex with middle of inner margin by a dentate streak, irrorated with white; a purplish black suffusion along inner margin to middle, and along submedian fold to two-thirds; a black dot in disc before middle, a second more obscure slightly beyond it on fold, both sometimes obsolete, and a third larger in disc beyond middle; a cloudy ochreous-yellowish spot on costa at two-thirds, and a second before apex, whence proceeds a cloudy dentate yellowish line to anal angle, preceded in middle by a purplish black suffusion; a hind-marginal row of ochreous-yellowish dots; cilia light fuscous-grey, becoming dark grey at apex and anal angle, with a dark grey basal line. Hind wings ochreous-yellow, with a broad blackish border all round except on costa; cilia ochreous-yellow, round apex blackish.

Fiji (Matthew, Lucas); two specimens.
Hilarographa, Z.

The generic characters are incompletely given by Zeller, and I therefore subjoin them in full:—

Head with loosely appressed hairs; ocelli large, bright; no tongue. Antennæ hardly more than half fore wings, in male strongly ciliated with fascicles (2½), basal joint short, stout, without pecten. Labial palpi short, slender, curved, ascending, with appressed scales, terminal joint shorter than second, tolerably pointed. Maxillary palpi absent. Posterior tibiae loosely rough-scaled above. Fore wings with vein 1 furcate at base, 2 from lower margin of cell before three-fourths, 7 and 8 stalked, 7 to hind margin. Hind wings as broad as fore wings, oblong-ovate; veins 3 and 4 short-stalked, 6 and 7 stalked, 1b pectinated towards base.

This genus offers an exception to the definition of the family, in having veins 6 and 7 of the hind wings stalked; I think the definition may be provisionally widened to include this case.

159. Hilarographa zapyra, n. s.

♂, 15 mm. Head, palpi, antennæ, and legs reddish ochreous, anterior legs banded with dark fuscous. Thorax dark fuscous, purplish-tinged. Abdomen orange, banded with dark fuscous. Fore wings moderate, rather strongly dilated, costa almost straight, apex rounded, hind margin hardly oblique, slightly rounded, rather strongly indented below apex; bright deep orange, marbled with numerous very irregular angulated transverse dark purple-fuscous lines, except on a hind-marginal band attenuated to a point at anal angle; between pairs of these lines are four oblique light metallic-blue streaks from costa, becoming obsolete before disc; a curved whitish dark-margined streak from apex returning to costa at four-fifths; a leaden grey mark above anal angle, terminated above by a black dot; a whitish dot on subapical indentation, triangularly margined with dark fuscous; cilia whitish, with a dark purple-fuscous line, interrupted on indentation. Hind wings bright orange, suffusedly margined with dark fuscous, more broadly along inner margin and at apex; cilia grey-whitish, with a dark fuscous basal line.

Port Moresby, New Guinea (Matthew); one specimen.
Simaethis, Leach.

160. Simaethis chalcotoxa, n. s.

♂, ♀, 13—15 mm. Head and thorax dark bronze, sprinkled with whitish. Palpi black, tips of scales white, second joint with three whorls, third apical, terminal joint with one medial whorl. Antennae dark fuscous, annulated with white, ciliations 3. Abdomen dark grey, mixed with bronze, with slender white rings. Legs blackish, mixed with white, basal joint of posterior tarsi much dilated with scales above. Fore wings broad, triangular, costa strongly arched, apex rounded, hind margin oblique, slightly rounded; ochreous-bronze; basal third with scattered whitish scales; a straight obscure ochreous-whitish line from one-third of costa to two-fifths of inner margin; a similar line from an ochreous-white spot on costa beyond middle very obliquely outwards half across wing, thence sharply angulated inwards and becoming obsolete; an upwards-curved brassy-grey or steel-blue metallic black-margined longitudinal streak in disc above middle from first to second line; a large quadrilateral patch of mixed white and black scales on inner margin beyond middle, margined above and on upper half of anterior edge by a thick black streak, containing a small metallic-blue spot in angle; a strong brassy-grey or violet-blue metallic black-edged line from costa at two-thirds very obliquely outwards to beneath apex, thence bent and continued near hind margin to anal angle; a blackish mark at apex; cilia shining dark grey, with a black basal line, tips irregularly whitish. Hind wings dark fuscous; a central streak from base dilating into a discal blotch, two cloudy streaks between this and inner margin, and a small spot on hind margin dull smoky ochreous, sometimes suffused; cilia whitish, with a black basal line, at apex and anal angle grey.

Tonga (Matheu); Fiji (Lucas); four specimens.

161. Simaethis orthogona, n. s.

♂, 15 mm. Head, thorax, and abdomen dark grey, with a few whitish points. Palpi whitish towards base, second joint with three whorls of scales, two upper dark grey with white tips, terminal joint truncate, dark grey, with a white median ring. Antennae dark fuscous annulated with white, ciliations 4. Legs whitish, banded with black (posterior pair broken). Fore wings broad, triangular, costa rather strongly arched, apex obtuse, hind margin oblique, slightly rounded; yellow-ochreous, suffused with grey and irrorated with dark grey, the ground colour only appearing
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plainly beyond anterior fascia and on hind margin beneath apex; markings white, irrorated with dark grey, and suffusedly margined with dark grey; a transverse suffusion near base; a straight moderate fascia from two-fifths of costa to before middle of inner margin; an oblique oval spot in disc beyond middle; an irregular thick double line from costa at three-fifths obliquely outwards, rather curved inwards, at one-third acutely angulated and continued parallel to hind margin but inwards-curved to two-thirds, thence sharply bent inwards to beneath middle and again rectangularly bent to inner margin beyond middle, this lower portion margined anteriorly with blackish; cilia grey, with a blackish line, towards tips whitish. Hind wings dark fuscous-grey, disc somewhat lighter; an obscure whitish line near and parallel to lower half of hind margin; cilia as in fore wings.

Port Moresby, New Guinea (Matthew); several specimens.

PLUTELLIDÆ.

Trachycentra, n. g.

Head tolerably smooth; no ocelli; tongue extremely short, rudimentary. Antenna two-thirds of fore wings, in male filiform, simple, basal joint moderate, without pecten. Labial palpi long, recurved, second joint with long rough hairs towards apex expanding all round into a tuft, terminal joint as long as second, pointed, laterally strongly compressed, exterior side hollowed into a shallow longitudinal channel. Maxillary palpi moderate, filiform, drooping. Anterior tibiae very short, basal joint of anterior tarsi clothed with long rough hairs; middle and posterior tibiae with short rough hairs; all tarsal joints with rough hairs at apex; all spurs clothed with rough projecting scales beneath. Fore wings with tufts of raised scales: vein 1 fureate. 2 and 3 stalked. 7 to hind margin, 8 and 9 stalked. 11 from before one-third of cell, secondary cell indicated. Hind wings slightly broader than fore wings, elongate-ovate, acutely pointed, cilia one-half; veins 3 and 4 parallel, 6 and 7 approximated at base; forked parting-vein strong; lower median and 1 b with strong pectinations.

162. Trachycentra calamias, n. s.

♂. 27—32 mm. Head, palpi, antenna, thorax, abdomen, and legs pale whitish ochreous; abdomen somewhat infuscated. Fore wings elongate, narrow; costa gently arched posteriorly, apex strongly produced, acute, hind margin concave, oblique; whitish ochreous, slightly brownish-tinged, suffused with ochreous-whitish
Lepidoptera from the South Pacific.

towards costa and hind margin; faint indications of numerous small brownish ochreous spots; two small tufts of raised black-tipped scales on submedian fold before and beyond middle; some blackish scales forming an obscure X-shaped mark in disc beyond middle; cilia ochreous-whitish, somewhat mixed with brownish ochreous (imperfect). Hind wings fuscous-grey, apex whitish; cilia grey, round apex white.

Tonga (Mathew); Fiji (Lucas); two specimens.

HYPONOMEUTIDÆ.

OETA, Grote.

163. Oeta apicalis, Voll.

Oeta apicalis, Voll., Tijd. v. Ent., 1863, 139, pl. ix., 5. Solomon Islands (Mathew); one specimen. Also from Java.

CYATHAULA, n. g.

Head smooth, forehead between antennæ with dense smooth scales, face very oblique inwards; no ocelli; tongue well developed. Antennæ three-fourths of fore wings, in male subciliate, somewhat pubescent. Labial palpi moderately long, curved, ascending, second joint broad, laterally strongly flattened, with appressed scales, terminal joint as long as second, broad, laterally strongly compressed and externally concave so as to form a longitudinal channel, blunt-pointed. Maxillary palpi rudimentary. Abdomen flattened. Posterior tibiae clothed above with long rough strong hairs. Fore wings with vein 1 strongly furcate at base, 3 and 4 stalked, 7 to costa, 11 from near base of cell. Hind wings slightly narrower than fore wings, elongate-ovate, cilia four-fifths; all veins separate; 16 pectinated towards base.

164. Cyathaula maculata, n. s.

♂, ♀, 15—18 mm. Head and thorax white. Palpi white, terminal joint in male mixed with greyish ochreous. Antennæ white, spotted with dark fuscous. Abdomen dark grey. Legs white, anterior and middle pair banded with dark fuscous, posterior pair suffused with grey. Fore wings elongate, costa moderately arched, apex round-pointed, hind margin extremely oblique; white, with about thirty-four small irregularly-scattered ill-defined spots, ochreous in male, grey in female; all the larger spots contain some black scales; one on inner margin beyond middle forms a short oblique blackish streak; cilia white, towards anal angle greyish.
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Hind wings dark grey, with purplish reflections, in male considerably lighter towards base; cilia grey, darker towards base, round apex white.

Tonga and Fiji (Mathew); two specimens.

TINEIDÆ.

ANASTATHMA, n. g.

Head with long rough hairs; tongue short. Antennæ four-fifths of fore wings, in male filiform, simple. Labial palpi moderate, widely divergent, curved, ascending, second joint with long rough projecting hairs beneath, terminal joint shorter than second, with appressed scales, tolerably obtuse. Maxillary palpi absent. Posterior tibiae clothed with very long hairs above. Fore wings with vein 1 furcate at base, 2 widely remote from 3, 6 absent, 7 absent, 8 absent, 11 from about middle of cell. Hind wings rather narrower than fore wings, lanceolate, cilia one and a half; veins 2 and 3 remote, 4 from near 5, 5 and 6 stalked, 6 to costa, 7 from angle of cell.

165. Anastathma callichrysa, n. s.

♂, 14 mm. Head, palpi, and thorax dark purplish fuscous. Antennæ, abdomen, and legs grey, anterior legs dark fuscous. Fore wings elongate, tolerably pointed; shining brassy-yellow; base narrowly dark purplish fuscous; a rather narrow purplish fuscous hind-marginal band, anteriorly somewhat edged with blackish, extending from apex down hind margin to middle of wing, attenuated beneath; a blackish apical dot; cilia purplish fuscous, paler towards anal angle, with three black lines. Hind wings and cilia whitish grey, slightly purplish-tinged.

Fiji (Lucas); one specimen.

ERECHTHIADÆ.

DECADARCHIS, n. g.

Head rough-haired; ocelli present; no tongue. Antennæ three-fourths (?) of fore wings, in male (?). Labial palpi moderate, straight, porrected, second joint with long dense projecting hairs beneath, terminal joint shorter than second, obtuse, with short projecting hairs beneath. Maxillary palpi moderate, drooping. Posterior tibiae densely clothed with long hair-scales. Fore wings with vein 1 simple, 2 from rather near angle, 5 absent, 7 absent, 11 from before middle of cell. Hind wings as broad as fore wings,
broad-lanceolate, cilia two-thirds; veins 3 and 4 remote, 5 and 6 stalked, 6 to costa; 1b strongly pectinated.

The apex of fore wings is bent vertically upwards, as in the other genera of the family.

166. Decadarclis melanastra, n. s.

♀, 20 mm. Head and palpi white. Antennae whitish, annulated with grey. Thorax white, shoulders and a posterior spot dark fuscous. Abdomen and legs dark grey (anterior legs broken). Fore wings elongate, costa moderately arched, apex round-pointed, hind margin extremely obliquely rounded; white; markings fuscous, coarsely irrorated with black; a narrow angulated fascia very near base; a moderately broad transverse spot from costa beyond one-fourth, reaching half across wing, and a wedge-shaped oblique spot from inner margin opposite, almost meeting it; a small triangular spot resting on one angle on inner margin beneath middle of wing, a small irregular spot on costa beyond middle, and a small triangular spot in disc at two-thirds; an irregular inwards-curved streak from costa at four-fifths, terminating in a subapical blotch on hind margin; a black line round apex; cilia white, mixed with light grey beneath apex. Hind wings and cilia whitish grey.

Fiji (Lucas); one specimen.

Phthinocola, n. g.

Head rough-haired; ocelli present; no tongue. Antennae four-fifths of fore wings, in male filiform, simple, basal joint large, much thickened with scales, with strong pecten. Labial palpi moderately long, straight, drooping, second joint, and terminal joint except apex, clothed with long rough projecting hairs beneath. Maxillary palpi rather short, folded. Posterior tibiae with extremely long hairs above and shorter ones beneath. Fore wings with vein 1 simple, 2 from rather near angle, 5 absent, 7 absent, 11 from near base of cell; apex bent vertically upwards. Hind wings narrower than fore wings, lanceolate, cilia one; transverse vein absent, 4 absent, 5 absent, 7 to hind margin.

167. Phthinocola dochmia, n. s.

♂, 9 mm. Head, palpi, antennæ, thorax, abdomen, and legs whitish ochreous; anterior legs dark fuscous. Fore wings lanceolate; whitish ochreous, somewhat mixed with fuscous; five dark fuscous fasciae, sharply angulated outwards in middle; first near base, second from one-fourth of margins, third broad, from middle
of margins, interrupted above angle, fourth linear, fifth terminal, broad on costal half, linear and indistinct on dorsal half, separated from fourth by a linear space; a small black apical spot preceded by a white mark; cilia white, base mixed with fuscous and dark grey, with a grey line before tips, becoming black above apex. Hind wings and cilia dark grey.

Tonga (Mathew); one specimen.

ELACHISTIDÆ.

ECHINOSCElIS, n. g.

Head smooth, side-tufts rough, erect, spreading, forehead very prominent between antennæ, face very oblique inwards; no ocelli; tongue well developed. Antennæ three-fourths of fore wings, serrate, basal joint broadly dilated to form an oblong eye-cap. Labial palpi long, smoothly scaled, recurved, second joint somewhat exceeding base of antennæ, rather compressed, terminal joint longer than second, acute. Maxillary palpi rudimentary. Posterior tibiae and first joint of tarsi clothed with very long rough stiff hairs above. Fore wings narrow, lanceolate; vein 1 apparently furcate, 2 from before two-thirds of cell, 5 and 6 rising out of 7, 7 to costa. Hind wings linear-lanceolate, about half fore wings, cilia four; veins 6 and 7 stalked, 7 to costa; a pencil of scales from angle of costa.

This and the two following genera are all allied to Cosmopteryx; it seems probable that Proterocosma is the original form of a group of which Echinoscelis, Cosmopteryx and Persicoptila are developments.

168. Echinoscelis hemithia, n. s.

♀, 9 mm. Head and palpi ochreous-white, crown and thorax blackish. Antennæ ochreous-white, with three blackish bands on terminal half. Abdomen grey. Legs ochreous-white, banded with blackish. Fore wings light ochreous-yellow; basal half blackish, bounded by a straight slender central ochreous-white fascia, and cut by an indistinct irregular ochreous-whitish fascia near base, and a more distinct one at one-fourth; cilia light ochreous-yellow, becoming grey towards anal angle. Hind wings dark grey; cilia grey.

Tonga (Mathew); one specimen.
Proterocosma, n. g.

Head smooth; no ocelli; tongue moderate. Antennae from four-fifths to as long as fore wings, in male serrate, pubescent or simple, basal joint long, somewhat compressed, with distinct pecten. Labial palpi very long, recurved, smoothly scaled, second joint somewhat exceeding base of antennae, rather compressed, terminal joint longer than second, slender, acute. Maxillary palpi rudimentary. Posterior tibiae clothed with dense hairs above. Fore wings narrow, lanceolate, vein 1 furcate at base, 2 from beyond three-fourths of cell, 5 separate or sometimes out of 7, 6 out of 7 or absent (coincident with it), 7 to costa, 8 out of 7 before 6. Hind wings one-third to one-half of fore wings, linear-lanceolate or linear, cilia three to six; veins 6 and 7 stalked or sometimes coincident, 7 to costa; a pencil of scales from angle of costa.

It is not at present necessary to regard the differences of neuration in this genus as other than specific.

Sect. A. Fore wings and hind wings with vein 6 absent (coincident with 7).

169. Proterocosma triplanctis, n. s.

♂, 12 mm. Head and thorax dark fuscous, face ochreo-whitish. Palpi ochreo-whitish, terminal joint anteriorly blackish. Antennae as long as fore wings, ochreo-whitish, spotted with dark fuscous, with two dark fuscous bands before apex. Abdomen dark grey, sides and apical tuft whitish ochreous. Legs dark fuscous, with ochreo-white rings. Fore wings with vein 5 separate; greyish fuscous, irrorated with dark fuscous, with four small whitish ochreous spots; first triangular, on costa somewhat beyond middle; second dot-like, beyond and below apex of first; third and fourth dot-like, placed opposite one another on costa and inner margin near before apex; cilia grey, lighter towards anal angle, with a dark fuscous line round apex. Hind wings linear-lanceolate, cilia three; grey; cilia pale greyish ochreous.

Tonga (Mathew); one specimen.

Sect. B. Fore wings and hind wings with vein 6 present, stalked with 7.

170. Proterocosma epizona, n. s.

♂, 10 mm. Head and palpi whitish ochreous, terminal joint of palpi with a dark fuscous median ring. Antennae and thorax dark
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t Sussex. (Abdomen broken.) Legs dark fuscos, ringed with whitish ochreous. Fore wings with vein 5 separate; dark fuscos, purplish-tinged; two straight rather oblique whitish ochreous fasciae, mixed with ferruginous in disc, first about one-fourth, moderate, second about two-thirds, considerably broader, not quite reaching inner margin; a small triangular whitish ochreous spot on costa towards apex; a hind-marginal row of minute whitish ochreous dots; cilia grey. Hind wings linear-lanceolate, cilia four; grey; cilia grey.

Fiji (Lucas); one specimen.

171. Proterocosma ochronota, n. s.

♀, 18 mm. Head whitish ochreous, sides reddish ochreous. Palpi whitish ochreous. Antennæ ochreous-white, sharply annulated with dark fuscos. Thorax ochreous-brown, with a broad central whitish ochreous stripe. Abdomen grey. Legs whitish ochreous, anterior pair suffused with dark fuscos. Fore wings with vein 5 rising out of 7; ochreous-brown; an irregular light ochreous-yellowish streak along inner margin from base to beyond anal angle, forming three ill-defined short rounded projections upwards, first at one-third, second at two-thirds, third above anal angle; above this streak the ground colour is suffused with darker fuscos; cilia ochreous-brown, becoming whitish grey towards anal angle. Hind wings linear-lanceolate, cilia four; grey; cilia whitish grey.

Tonga (Mathew); one specimen.

172. Proterocosma chionopsamama, n. s.

♀, 12 mm. Head, palpi, and antennæ white; second joint of palpi ochreous except at apex; antennæ with three fuscos bands towards apex. Thorax deep yellow-ochreous, with a broad central white stripe. Abdomen light grey. Legs pale ochreous, anterior pair suffused with dark grey. Fore wings broader near base and gradually narrowed to acute apex; vein 5 separate; deep bright yellow-ochreous; a snow-white streak along inner margin from near base to beyond middle; a round black dot on anal angle; a pale yellow patch extending along hind margin from anal angle to near apex, margined anteriorly and above by six irregular small white spots, of which the last two are produced to costa; cilia pale yellow, beneath anal angle grey-whitish. Hind wings linear, cilia six; grey; cilia pale whitish grey.

Port Moresby, New Guinea (Mathew); one specimen.
Persicoptila, n. g.

Head smooth; no ocelli; tongue moderate. Antennae as long as fore wings, basal joint long, slender, with distinct pecten. Labial palpi very long, recurved, slender, smooth, terminal joint as long as second, acute. Maxillary palpi short, filiform, drooping. Posterior tibiae with a very large dense flattened dilated tuft of scales on inner side, extending from near base to three-fourths. Fore wings narrow, lanceolate; vein 1 furcate at base, 2 from three-fourths of cell, 6 and 7 stalked out of 8, 7 to costa. Hind wings linear-lanceolate, less than half fore wings, cilia six; veins 5, 6, 7 approximated at base, 7 to costa.

173. Persicoptila erythrota, n. s.

♀, 14 mm. Head, palpi, and antennae yellow, face whitish. Thorax yellow, inner side of patagia and a central line crimson. Abdomen white, two basal segments suffused with ochreous on back, and marked on posterior margins of sides with a short blackish streak. Legs yellow, anterior and middle tibiae, and posterior tuft crimson. Fore wings bright crimson, irregularly mixed with dark fuscous; base, a semicircular blotch on middle of costa reaching half across wing, and an oblong blotch on costa extending from near this to near apex, bright yellow; second blotch margined posteriorly with dark fuscous; cilia whitish ochreous, base yellowish. Hind wings and cilia very pale whitish ochreous.

New Hebrides (Mathew); one specimen.

Gracillariadæ.

Timodora, n. g.

Head roughly tufted on crown, face smooth; no ocelli; tongue moderate. Antennæ longer than fore wings, in male hardly serrate, basal joint moderately long, without pecten. Labial palpi long, curved, with appressed scales, second joint not reaching base of antennæ, terminal joint as long as second, blunt-pointed. Maxillary palpi rather long, slender, porrected. Middle tibiae thickened with long hair-scales beneath; posterior tibiae with rough scales above, tarsi twice as long as tibiae. Fore wings very narrow, parallel-sided, pointed; vein 1 apparently simple, 2 from four-fifths of cell, 7 to costa, 10 from opposite 2, 11 from near base of cell. Hind wings almost linear, about half fore wings, cilia five; vein 1 absent, cell open between 4 and 5, 5 and 6 stalked, 7 from upper margin of cell before middle, running to apex.

♂, 14 mm. Head and thorax ochreous-brown, with purple-blue reflections, face mixed with yellowish. Palpi dark fuscous, internally white. Antennæ white, annulated with fuscous. Abdomen grey, beneath yellowish white. Legs ochreous mixed with black; anterior tibiae with a white median ring, all tarsi white with base of joints ochreous and a black dot at apex of each. Fore wings deep ochreous-yellow, becoming clearer yellow along costa; a light purple-brown suffusion along costa from base to one-fourth, and costal edge on this dotted with black; a conspicuous black dot beneath costa in middle; lower half of wing dotted with fuscous, and with some small black and fuscous spots which tend to form an undulating streak, projecting upwards to disc at one-fourth, one-half, and three-fourths, and touching inner margin between these, thence along hind margin to apex; a black apical dot; all these markings have blue reflections; cilia ochreous-brown, on costa yellow, beneath anal angle grey, with rows of black points. Hind wings dark grey; cilia grey.

Tonga (*Mathew*); one specimen.
IX. On Eucnemis capucina, Ahr., and its larva.
By David Sharp, M.B., F.Z.S.

[Read July 7th, 1886.]

*Eucnemis capucina*, Ahr., is a species of Northern and Central Europe that has not hitherto been found in our own islands, but was detected by my friends Mr. G. C. Champion and the Rev. H. S. Gorham and by myself in an old beech tree near Brockenhurst on the 13th June last. Although it appears somewhat remarkable that the beetle should not have been hitherto captured in this country, living as it does in a locality that has been so much collected on, yet there is no doubt that it is truly indigenous, for we captured a series of examples, and found both the larvæ and pupæ; while the condition of the tree and the numerous fragments of the skeleton of the insect we found in it were sufficient to convince us that this tree has probably been the home of numerous generations of the insect. Until recently *E. capucina* has been the only species of the genus, but Dr. Horn has during the present year described from a single example a North American species that apparently differs from its European congener only by some slight structural details.

Although it has been frequently stated that the *Eucnemidae* differ from the *Elateridae* by the absence of the peculiar leaping faculty that is so well known in the latter family as to have procured for them the popular name of skipjacks, yet such statement is erroneous; *Eucnemis capucina*, when placed on its back, regains its feet by a sudden leap like the *Elateridae*, and does this so well that I have not seen it fail to regain its natural position on the first attempt. Ahrens stated seventy years ago that this insect possessed this faculty.

My attention was attracted by the very peculiar larva that we found in company with this insect, so that I took some specimens home with a view to study them;
and, as the larvae of the *Eucnemidae* are extremely abnormal and very little is known about them, I think it worth while to record the results of my observations.

The larva of *Eucnemis capucina* has been imperfectly described by the late lamented M. Ed. Perris from four examples preserved in alcohol and in a contracted condition; his description will be found in de Bonvoullor’s ‘Monograph of the Euenémides,’ pp. 49—52, and it is also figured pl. 2, ff. 1, 2.

This larva possesses no rudiment of legs, and no ocelli, and Perris was unable to detect any mouth, palpi, or antennæ. The figures given by Perris only offer a very imperfect representation of the larva as seen in life; it is very much more elongate, and has the segments remarkably incised so that its outline is very undulatory. In the Ann. Soc. Ent. Fr., 1856, pl. 15, f. 3j, Coquerel gives a figure of *Fornax madagascariensis*, and this figure gives a much better idea of the natural outline of *Eucnemis capucina* larva than does the figure of Perris, *l. c.* By a curious oversight Coquerel has, however, represented the larva with one segment too few. The head of *Eucnemis capucina* is most peculiar, and is represented, *l. c.*, f. 2, by Perris; this figure is, however, far too short and broad in general proportions, and the central tooth is incorrectly delineated and made to appear as two separate teeth, but its form is correctly described on p. 50, *l. c.*

The larva of this insect lives in decayed, but damp, sappy wood, and exists there in burrows, in which it is tightly packed, so that by a slight alteration of the diameter of one or more of its segments it is enabled to have a fixed point so as to locomote by alteration of the length of other segments. The larvae I brought home with me were most of them placed in a tin with rotten wood and a few larvae of *Elateridae* (these latter probably the larvae of *Melanotus rupipes* and *Elater pomonae*), and, on taking them out of the tin, I found that all the larvae of *Eucnemis* had been killed by being bitten by the Elaterid larvae in the thoracic segments; I had, however, taken the precaution to put one larva in a glass tube by itself, and this one, being still alive, I am able to exhibit it to-night.

The killed larvae being quite fresh, I examined them with the microscope, and then proceeded to make such
dissections and preparations as should enable me to perceive the structures, especially of the head. Between the two median teeth there could be seen three excessively minute processes, similar to those figured by Perris, l. c., f. 2, at the side of the head, and representing certainly the labium composed of a ligula and two palpi, and, having detected them in the dead but quite extended example, both myself and Mr. Gorham were able to see them similarly situated in the living insect. They are, however, excessively minute, only about half the size of the minute lateral organs represented by Perris in fig. 2; and in a preparation of the head mounted in Canada balsam they are entirely withdrawn, and can be only faintly perceived through the upper surface of the head. This preparation of the head in balsam shows a feeble line passing across the space behind and between the median teeth, and it is probable that the part in front of this line may be the labrum. The minute lateral organs represented by Perris in fig. 2 are under these circumstances, I have no doubt, a maxillary lobe and its palpus; this is in accordance with the opinion previously expressed by Osten-Sacken and alluded to by Perris, in reference to the larvæ of *Fornax badius* and *orchoideos*; *Fornax* being a genus closely allied to *Eucnemis*.

I also took off a head of one of the larvæ, and found that it consisted of two plates—an upper and a lower—quite separated from one another behind, but in front so firmly soldered together that I could fracture them but not separate them, and, as the outlines of these two plates are in front exactly similar, they appear there as if they were only one plate, and that there is no buccal cavity; on looking at the edge, however, it can be perceived, as we might confidently anticipate, that there is on each side a small orifice between the two plates at the spot where the maxillæ exist, and a still smaller orifice (more difficult also to detect, owing apparently to one of the two plates that form the upper and lower surfaces of the head projecting rather more than the other) in the middle of the front edge, that is, at the spot where the labium can be detected protruding in the living example.

Perris has said nothing about the mandibles; but Coquerel, in the memoir and plate I have alluded to as representing a larva of the allied *Fornax madagascariensis*,
Mr. David Sharp on

considers apparently that the whole of one side of the head is a fixed mandible; this, however, is clearly erroneous, and I am not quite sure that Coquerel really had this idea, for his plate is unfortunately erroneously lettered, so that the interpretation of the figures can only be inferred.

Perris, however, alludes to and represents on fig. 2, l. c., two dark spaces near the front of the head; these dark objects are very conspicuous, and in the preparations in balsam each is seen to be a narrow oval body, more acuminate in front, situate in the interior of the head, the pointed front end of the body just reaching the anterior margin of the head. I think there can be little doubt that this body is the mandible. No antenna can be pointed out with certainty, but I think it probable that the prominent tooth at the side of the head behind the deepest and most posterior excision is the homologue of the antenna, and it will be noticed, on referring to Coquerel's figure of larva of Fornax madagascariensis, that these projections exist more conspicuously in that species, and have even more strongly the appearance of antennae; indeed, in his figure 3 j, any one would at once select these prominences as representing the organs in question.

In a head broken in two and mounted in balsam a large triangular, or rather tubulo-conical, membrane can be seen extending backwards from the labium, and this is connected behind with a large horny apparatus, and I have very little doubt that we have here an apparatus for suction or imbibition.

These details by no means exhaust the external peculiarities of this larva, for there exist on the dorsal and ventral aspects of the segments peculiar velvety patches, and behind each of these a small stigma-like cavity. The velvety patches, when viewed by a high power, present the appearance of closely-packed papillae, similar to what exist on the tongues of carnivorous mammals; and I have found by dissecting the integuments that the small cavities I have mentioned entirely pierce the thicker outer skin, but do not penetrate the much more delicate internal envelope or membrane. What the functions of these papillary spaces and cuticular cavities may be, I have no idea; Perris considered the former to be locomotive organs, but this,
I think, was certainly erroneous. On the terminal segment there exists a larger cuticular cavity surrounded by some asperities, in the middle of which there is a minute longitudinal depression or orifice, which is probably the anal aperture.

Very few larvae of the *Eucnemidae* are as yet known. Schiodte, whose beautiful works on the larvae of Coleoptera are amongst the most important and fascinating of recent additions to Coleopterological science, was acquainted only with one, *viz.*, that of *Melasis buprestoides*, a species which is one of the least characteristic of the family or subfamily; this larva Schiodte classified amongst the *Elateridae*, all of which he considered to be carnivorous. This generalisation has been, however, disputed by Perris in the case of *Melasis buprestoides* ("Bonv. Eucnemides," pp. 40, 41); while, on the other hand, Osten-Sacken, as quoted by Perris, considers the larvae of *Fornax* to be probably carnivorous. As regards these larvae I have no knowledge whatever; but as regards the larvae of *Eucnemis capucina* I can say with certainty that they are not truly carnivorous. As I have previously remarked, they live in burrows in very damp decayed wood; these burrows are exactly of the diameter of the larvae, and there were no other insects in them for the larvae to feed on. I have little doubt that the larva obtains its nutriment by imbibition of the juices amongst which it lives, and think it highly probable that it imbibes them by means of a suctorial apparatus placed inside the head, and I should not be at all surprised if it should ultimately be discovered that the papillary patches or cuticular cavities are supplementary organs of nutrition.

The larva of *Eucnemis capucina* has certainly the capacity of comminuting the decayed wet wood in which it lives, and I presume that it makes its burrows by a process of this kind, though I have not been able to observe how it does it; it is exceedingly slow in all its movements, and I think it is most probably by twisting and pushing a little with its head that it makes its burrows; the peculiar very hard saw-like teeth with which the whole front margin of the head is armed appear admirably adapted for this purpose.

I only found larvae in the sappy or damp wood in the interior of the tree; the outer wood was dry and

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comparatively hard, and was penetrated in all directions by the burrows of former generations of the larvaæ; and it was in this comparatively hard outer wood that we found the perfect insects.

[Read April 7th, 1886.]

Plate I.

The following descriptions of new genera and species of Languriidae are the result of a study of the species in the following collections:—1st, the collection of Mr. Crotch, kindly lent me for the purpose by the University of Cambridge; 2nd, the collection made by Mr. Lewis in Ceylon, chiefly interesting as being made up almost entirely of the Cladoxenoid forms; 3rd, Mr. Gorham's collection; and 4th, the British Museum collection. I have lately been arranging the collection of the group in the Brussels Museum, at the request of M. Prudhomme de Borre, and have added one or two notes on the species therein contained.

Before, however, proceeding to the descriptive part of the paper there are one or two points on which perhaps it will be well to say a few words. In the first place exception may be taken to the use of the term "Languriidae": as far as I know it has only been used by myself and Mr. Lewis, who published a very valuable paper "On Japanese Languriidae" in the 'Journal of the Linnean Society.' As a matter of fact the group has not yet been formally raised to the rank of a family, and is usually classed with the Erotylidae. In the paper referred to Mr. Lewis alludes at length to the habits of Languria in the larval state, as described by Professor Comstock, and argues from these that the group is connected rather with the Chrysomelidae than with either the Erotylidae or the Endomychidae. Mr. Lewis's own observations in Eastern Asia led him to place them near the latter of these families, but he afterwards says:—"I think we must, after reading Prof. Comstock's paper, look at the Languriidae as a—comparatively speaking—recent type of Coleoptera, nearer to the Chrysomelidae than to the Erotylidae, which has greatly multiplied its
species, but which has as yet, owing to simple and constant habits, been evolved in the direction of growth in the longitudinal axis only." In the genus Crotchia, which I describe below, especially in the smaller and broader forms, there seems to be a more distinct approach to the Chrysomelidous type than has yet been noticed in the group, although the development of growth otherwise than in a longitudinal axis has been noticed by Mr. Lewis himself in the case of L. trifoliata, Har., which will be again alluded to.

In his paper on the Languine (Beiträge zur Kentniss der Languria-Arten, Mittheil d. Münchener Ent. Ver., 1879), Von Harold classes all the species of the group under the single genus Languria; if there were very few species, or if the generic divisions were not obvious, this might be permissible, but in the first place it appears certain that when the species are all described they will amount to some hundreds at least; and in the second place, if we are to class the large Fatua longicornis, with its long, slender, clubless antennæ, in the same genus with, for instance, the minute M. Jansoni, with its short antennæ and abrupt three-jointed club, we might with quite as good reason class the great majority of the Chrysomelidæ and Erotylidæ under one genus. At the same time Crotch, whose work on the group has hitherto been generally accepted, appears to lay far too much stress on the number of joints in the club: this is often a misleading character, and sometimes very difficult to decide; in fact, Crotch himself, in his types, occasionally differs in this point from his descriptions. Owing, however, to his having made this a leading character in some of his genera, I have been obliged in one or two cases to adopt new genera, e. g., Tetralanguroides and Ortholanguroides, the insects belonging to which are closely allied to Tetralanguria and Ortholanguria respectively, but have a distinct five-jointed club to the antennæ instead of a four-jointed one, as in the two latter genera. It should, however, be added that Crotch had himself set aside the species on which I describe Tetralanguroides as a new genus, and that he had placed Ortholanguroides under Ortholanguria; his specimen, however, had no antennæ, and there is one specimen in Mr. Gorham's collection and two in the British Museum collection that possess them.
Species *convexae*, latiores, plus minusve gibbose, rarius angustiores; capite antice producto, oculis fortissime granulatis, antennis brevioribus, elava abrupte triarticulata; articulo palporum maxil- larium penultimo brevissimo, secundo distinete breviori; thorace subquadrate, plus minusve transverso, marginato, angulis antecis leviter prominulis, sepius callosis; elytris convexis apicibus singu- latim rotundatis; metasterno sat longo, processu prosternali lato, truncate, utrinque marginato; pedibus modicis, tarsorum articulo penultimo fortiter bilobo, onychio longissimo ceteris articulis superante; lineae coxales obsoletæ vel nullæ.

Rather variable in shape, but convex and usually more or less gibbous; head produced triangularly in front of the eyes, which are prominent and very coarsely granulated; in front of the eyes there is a pronounced depression reaching across front and marking the clypeal suture; labium small but usually evident, setose in front; maxillary palpi with the last joint long, penultimate very short, distinctly shorter than second; mentum trapezoidal, apparently made up of two pieces, distinctly emarginate, with a tooth in the middle of the emargination; antennæ rather short, with the club abruptly three-jointed; thorax subquadrate, more or less transverse, marginated, with the anterior angles well marked, and slightly reflexed or callose at apex; elytra separately rounded at apex; tarsi with the penultimate joint strongly bilobed, onychium very long, first joints strongly pilose; metasternum usually long, prosternal process broad, truncate, and margined at sides.

This genus bears a somewhat strong relation to *Para- cladoxena*, but is distinguished from it by its different shape (the thorax and elytra not being strangulate at base, as in that genus), the emarginate and denticulate mentum, and the shorter penultimate joint of the maxillary palpi. Motschulsky, in describing *Cladoxena*, refers to a genus *Cladophila*, which is not mentioned at all in the Munich catalogue; at all events this genus appears to be distinct from it, as Von Harold (l. c., p. 63), says that in the genus *Cladophila* "the second joint of the antennæ is longer than the third, whereas in all *Languriæ* the third is the longest of the two"; in the genus now described the third joint is the longest as a rule, but the second and third joints are occasionally subequal in length.
Crotchia vagabunda, n. s.

Tota ânea, nitida, elongata, sat lata, convexa, postice sensim acuminata; capite fortiter punctato, antennis rufis, clava abrupte triarticulata, oculis fortissime granulatis; prothorace subquadrate, longitudine paulo latiori, fortiter marginato, marginibus antice productis et callosis, parcius punctato, ad basin valde depressa, basi bisinnata; scutello sat magno, transverse; elytris fere glabris, ordinibus punctorum leviter seriatim instructis, convexis, ad apicem sensim depressis et acuminatis, apicibus rotundatis; pedibus rufo-seneis vel rufo-piceis. L. 7—8 mm.

Entirely âneous and shining; head rather strongly punctured; antennae abruptly three-jointed; eyes very coarsely granulate; prothorax rather broader than long, but not very strongly transverse, rather sparingly but distinctly punctured, with strong margins, which at the anterior angles are somewhat reflexed and callose; sides not sinuate, almost straight; base bisinnate, much depressed, depression terminated on each side by a very small stria or depression; elytra convex, as broad at base as base of prothorax, widest a little behind shoulders, and gradually contracted to apex, with rows of very fine punctures; apices separately rounded; legs pitchy or pitchy-red; under surface ferruginous, glabrous, very obsoletely punctured.

Constantia; Brazil. In Mr. Crotch’s collection.

Var. punctata. Capite thoraceque fortius punctatis, elytrorum seriibus distinctius impressis.

Rio Janeiro. In Mr. Fry’s collection.

This species appears to vary considerably in sculpture, and to a certain extent in colour, being lighter or darker âneous.

Crotchia metallica, n. s.

Præcedente latior et convexior, capite prothoraceque minus evidenter punctatis, hoc breviori, lateribus antice leviter rotundatis et ante basim sensim late sinuatis; elytris evidenter latioribus, leviter gibbosis, ad basin depressis, ordinibus punctorum obsoletissimis seriatis dispositis, pubescencia creata parciissime instructis; antennis ferrugineis, pedibus âneis vel rufo-âneis. L. 7½ mm.

Resembles the preceding, but is distinctly broader and more convex, with the head and thorax less distinctly punctured, and the sides of thorax distinctly though not
genera and species of Languriidæ.

strongly sinuate; elytra plainly broadest just before middle.

Peru; Chancamayo. In Mr. Gorham’s collection.

Crotchia coptengoides, n. s.

Præcedenti similis sed nigro-ænea, minor, capite prothoraceque densius punctatis, elytris confuse evidentior punctatis, pedibus ferrugineis. L. 6½ mm.

Very like the preceding in shape and structure, but with the head and prothorax more distinctly punctured, and the latter more evidently produced in middle of base; the sculpture of the head and thorax by itself is of very little weight in species of the Languriidæ, but the sculpture of the elytra is usually reliable, and the elytra in this species are thickly and confusedly punctured, whereas in C. metallicæ the punctures, though fine, are arranged in evident rows with broad and smooth interstices between each pair; the colour also is darker and less Æneous, and the legs are ferruginous.

Peru; Chancamayo. In Mr. Gorham’s collection.

Crotchia gibbosa, n. s.

Præcedenti similis sed multo minor, prothorace fere glabro, elytris obsoléssimé et confuse punctatis. L. 4—4½ mm.

Much smaller than the preceding species, almost black, with a very slight greenish reflection; head rather strongly and thickly punctured, prothorax almost impunctate, elytra confusedly and very indistinctly punctured. In this and the two preceding species the prothorax is very markedly transverse.

Peru; Chancamayo. In Mr. Gorham’s collection.

Crotchia nitida, n. s.

Præcedentibus similis sed major, nitidior, prothorace magis transverso, marginibus paullo fortioribus, humeris latioribus; elytris ad basim fere glabris, postice obsoléssimis punctatis; pedibus Æneis vel ferrugineis. L. 7—8 mm.

This species belongs to the same group as the three preceding species, but the thorax is more evidently transverse and broader in proportion than the head; it comes
very close to *C. metallica*, but the margins of prothorax are stronger, the sides are more evidently sinuate towards base, and the base is much more strongly and plainly produced into a lobe in the middle; the elytra are more shining and more obsoletely punctured, especially towards base, and the colour is darker aeneous.

In Mr. Crotch’s collection, with the specimens labelled “Constantia,” and evidently taken in the same locality; on the same card as the type is a specimen in which the sides are not sinuate towards base. It is possible that this may be the other sex of the species.

*Crotchia parallela*, n. s.

Elongata, angusta, parallela, sat depressa, tota aenea; capite magno fortius punctato, prothorace subquadrato, diffuse evidentern punctato, lateribus rectis, basi bisinnata; elytris longis, parallelis, ordinibus punctorum distinctis seriatim dispositis, ad apicem sensim angustatis, apicibus rotundatis; antennis brevioribus, clava magna triarticulata; corpore subitus rufo vel rufo-piceo, pedibus brunneo-rufis, genibus infuscatis. *L. 5 mm.*

Narrow, elongate, and parallel; head large, rather strongly punctured; prothorax subquadrate, nearly as long as broad, with sides straight, diffusely but plainly punctured; elytra of the same breadth as prothorax, long, parallel-sided, with rows of rather strong punctures, gradually narrowed from posterior third to apex; apices rounded; legs brownish red, with the knees darker; under side ferruginous.

Amazons; Ega. In Mr. Gorham’s collection.

This species, although evidently belonging to this genus, and strongly related to *C. vagabunda*, is different from any other that I have seen, and approaches more nearly to the typical longitudinal forms of *Languria*.

**Cladoxena, Motschulsky.**


As very little appears to be known about this genus, which is entirely passed over by Crotch (‘Revision of the Erotylide,’ Cist. Ent., i., 396) with the mere mention of the references, and was evidently unknown to him, it may be of use to those who are studying the group to give a short revision of the genus, as far as can be done
provisionally in the present state of our knowledge. I am enabled to do this through the kindness of Mr. G. Lewis, who has handed over to me for the purpose his collection of Languriidae from Ceylon, nearly the whole of which consists of examples of this genus.

Motschulsky's description of the genus is as follows:

"Tetramère de forme intermediaire entre Lissomus et Languria. Corselet convexe antérieurement, un peu rétréci en arrière, angles postérieurs droits; elytres allongées, rétrécies a la base et atténuees vers l'extremité, striées par des points imprimés; écusson quadrangulaire et acuminée postérieurement; antennes surpassant en longeur la base du corselet, un peu moniliformes, a massue des trois articles. Dernier article des palpes acuminée; tarses assez larges, le troisième bilobé."

As a matter of fact the posterior angles of the thorax are rather acute and produced, more so in the female than the male; in all probability Motschulsky formed his description from the latter sex.

Cladoxena maculata, Mots.

Motschulsky's description of this species enables it easily to be identified:—"Elongata, sublinearis, thoracis elytrorumque basi subangustatis, convexa, nitida, cupreo-aenea, elytrorum maculis utrinque in medio tribus alteraque oblonga postice pedibusque rufo-testaceis, elytris distincte punctato stratis. L. 1½ lin." It is, however, incomplete, and is made from a small specimen: the head and prothorax are strongly punctured, aeneous or metallic-blue, the latter being either unicolorous or with more or less testaceous margins; in the female it is convex, rather strongly rounded in front and sinuate behind, with acutely projecting angles; in the male subquadrate and less convex, with posterior angles less acute; the elytra are broader at base than base of prothorax, with shoulders well marked and callose, with rather strong rows of punctures; sides gradually narrowed to apex; apices rounded and callose; aeneous, with margins and often apex, two spots on each elytron, and two oblong patches near suture, yellow; these spots are somewhat variable; antennæ red, with abruptly three-jointed club, which is often darker; legs long, testaceous; tarsi, and sometimes femora partly, fuscous; under side reddish or reddish aeneous. L. 3½—5 mm.

Ceylon. Taken commonly by Mr. Lewis.
Cladoxena pura, n. s.

Præcedenti similis, sed concolor, elytris ante basim latioribus, magis convexis.

This species closely resembles the preceding, but is concolorous aeneous, with the head and thorax occasionally metallic-blue, as in the preceding species; this peculiarity is sometimes found in other aeneous species, as Heniocerus exsulcatus; the prothorax, as a rule, is a little wider and more convex, and the elytra are distinctly more convex, and widest at their anterior third: this is more obvious in some specimens than in others.

Ceylon; Dikoya (3800—4200 ft.), and Bogawantalawa (4900—5200 ft.).

I at first referred this species to C. rufipes, Mots., but, taking into consideration the dimensions of that insect and one or two other points of the description, I have come to the conclusion that it must be referred to the succeeding genus as a variety of C. trifoliata, Har. (picipes, Mots.?).

Paracladoxena, n. g.

Genus Cladoxena affine sed forma latiori et convexiori, thoracisque elytrorumque basi evidentem substrangulatam, humerisque minus callosam, distinguendum.

This genus comes very near the preceding, but in form and general appearance it entirely differs from it, being broader and more convex, and with punctuation much more obsolete; the base of thorax and elytra are contracted so that they appear strangulate, and the shoulders of the latter are not so callose as in the preceding genus, in which the callosity is strongly marked; the metasternum is shorter, and there is a slight difference also in the relative length of the joints of the maxillary palpi. The size of individuals of the same species is extremely variable, and is not due to sex, as in Mr. Lewis’s collection there are two of the smallest specimens taken in cop. I can observe very little sexual difference, but the male appears to have the sides of the prothorax somewhat less sinuate.
**Paracladoxena trifoliata**, Har.

*Cladoxena ruhipes*, Mots. (? var.); *C. picipes*, Mots. (verisim).

Bright bronze or brownish bronze, very variable in size; shining; head rather plainly punctured; antennae moderately long, reddish, with club sometimes darker; prothorax broader than long, but somewhat variable in length, convex, with sides rounded in front and contracted behind; posterior angles not so produced as in the preceding species, absolutely punctured; epipleura strongly punctured; elytra strongly widened in front of middle, contracted to base, and rather strongly also to apex; apices rounded, callose, often dehiscent; rows of punctures very fine; legs testaceous, often more or less clouded with fuscous; under side reddish or reddish brown. L. 2½—5 mm.

This is the most numerous species in Mr. Lewis’s Ceylon collection. Von Harold has confirmed the species for me, and, as it is certainly his *L. trifoliata*, I have retained his name, but it may possibly have to be dropped and *picipes*, Mots., substituted, as Motschulsky’s description in many points agrees with it, and the species is variable as regards colour of legs, &c. I believe Motschulsky’s *ruhipes* to be a rather more strongly punctured variety of this species.

Mr. Lewis, in his paper before alluded to (l. c., p. 348), speaks of this species as belonging to a section the individuals of which, while usually clinging to foliage, are, when disturbed, instant in flight; the separately rounded and more or less dehiscent apices of elytra would prove this, even if the habits of the insect had not been observed, and it is possible that the callosities at the apex are connected with their habits, and aid them in rapidly opening or closing the elytra.

**Paracladoxena bipustulata**, n. s.

Præcedenti similis, sed prothorace latitudine longiori, elytris pro magnitudine brevioribus, utroque macula flava pone medium prope suturam instructo. L. 3—5 mm.

Resembles the preceding in general form, but is very distinct; the prothorax is very evidently longer, being distinctly longer than broad, so that the elytra appear shorter in proportion than in *P. trifoliata*; on each
Elytron there is a distinct yellow spot or patch behind middle near suture, which at once distinguishes the species; as a rule the punctuation of prothorax and elytra is very fine and obsolete, but in one small specimen before me it is much stronger than in others, the prothorax being almost as strongly punctured as in C. maculata. Under side, legs, and antennæ as in the preceding species.

Ceylon. In Mr. Lewis's collection; five specimens from Nuwara Eliya (6234—8000 ft.), and one from Bogawantalawa (4900—5200 ft.).

MICROCLADOXENA, n. g.

If the rules of nomenclature will allow it, I propose, with Mr. Lewis's permission, to adopt this generic name for the insect named by Crotch (L. ?) Jansoni (Ent. Mo. Mag., ix., 1885), which he says "forms the type of a distinct genus, with coarsely granulated eyes, elongate antennæ, a three-jointed club, and short tarsi." This species was afterwards named Microlanguria Jansoni by Mr. G. Lewis; it evidently, however, by its structure, comes very near to Cladoxena, and Mr. Lewis tells me that it resembles Cladoxena in its habit of resting on the higher branches of brushwood, and in this differs from Languria, which lives on the herbage; the change of name therefore seems much to be desired. The species is very small (2½—3½ mm.), entirely of a light castaneous or rufo-ferruginous colour; the much shorter tarsi, more parallel form, and more cylindrical elytra, as well as the more coarsely granulated eyes, will distinguish it from the two preceding genera, with which, however, it is clearly connected by the structure of the antennæ and tarsi. In some points it forms a transition between Crotchia and Cladoxena, in others between Cladoxena and Languria. The species is common both in Japan and in parts of Ceylon.

Besides the species above mentioned Mr. Lewis's collection contains five or six of the ordinary forms of Languria with red thorax and cyaneous elytra; four of these apparently belong to L. ceylonica, Har.; the dark legs and red coxae are characteristic of the species: a fifth is apparently L. fuliceps, Mots., while another appears to agree with the description of L. nigricentris, Mots.
dealing with the Ceylon _Langurice_ the great difficulty lies in Motschulsky's descriptions, which are very incomplete, and in some cases will have probably to be ignored.

The following species, also from Ceylon, I discovered in the British Museum, with the MS. name, _L. decrescens_, Walker, attached; it has not, however, been described, and, as the name _decrescens_ is rather a misleading one, as the elytra are not as strongly narrowed to apex as in many other species, I have adopted another.

_Languria Walkeri, n. s._

Piecus, capite sat magno evidentem punctatam, antennis robustis, clava distincte 4-articulata; prothorace subquadrate, lateribus antice rotundatis, postice contractis, fortiti et diffusius punctatis, basi ad medium depressa et utrinque striola sat longa impressa; elytris obscurioribus, leviter punctato striatis, apicibus obliquis truncatis; pedibus piecis, crassioribus, tarsi dilatatis; corpore subtus piceo. L. 10½ mm.

Entirely pitchy, shining; head rather large, plainly punctured; antennae rather stout, with plain four-jointed club; prothorax subquadrate, with sides rounded in front and contracted behind, rather strongly and diffusely punctured, with a well-marked depression in the middle of the base, and a plain and rather long stria on each side: elytra gradually narrowed to apex; apices obliquely truncate; legs pitchy, rather stout; tarsi much dilated; under side pitchy.

Ceylon; taken by Dr. Thwaites. A very distinct species. In the British Museum collection.

_Languria oblonga, n. s._

Nigra, oblonga, sat parallela; capite sat magno, triangulare, fortiter punctato, antennis crassis, brevioribus, clava minus distincta, 4-articulata; prothorace subquadrate, latitudine longiori, lateribus antice rotundatis ad basim leviter sinuatis, evidenter marginato, diffusius et fortissimis punctatis, ad medium late longitudinaliter impresso, basi depressa utrinque obliqua striola longissima instructa; scutello sat magno; elytris oblongis, parallelis, ad apicem vix angustatis, ordinibus punctorum fortissimis dispositis, apicibus truncatis; corpore subtus cum pedibus nigro, prosterno fortissimo transversim rugoso. L. 16 mm.

Elongate-oblong, entirely black on both upper and under surface;
head rather large, strongly punctured; antennæ stout and comparatively short; 6th joint a little broader than 5th, 7th slightly dilated, 8—11 forming a not very distinct club; prothorax subquadrate, longer than broad, rounded in front, somewhat sinuate before posterior angles, diffusely and distinctly punctured, plainly margined, broadly impressed longitudinally in middle, the depression forming a wide channel, base depressed, with a very long stria on each side extending for about a quarter the length of thorax, and directed outwards; elytra oblong, very little narrowed to apex, with rather strong rows of punctures; apices truncate; legs black; prosternum strongly wrinkled longitudinally.

India (Mr. J. C. Bowring). In the British Museum collection: a very large and distinct species.

**Languria refulgens, n. s.**

Angusta, parallela, nitida, capite prothoraceque rufis, illo lato, triangulari, ante oculos producto, oculis prominulis; antennis sat longis, nigris, clava 5-articulata; prothorace latitudine sesqui longiori, lateribus vix rotundatis, cum capite obsoletius punctato, ad basim depresso; elytris nitidis, virescentibus, ordinibus punctorum sat magnorum seriatim dispositis, apicibus oblique truncatis, denticulatis, exterius callosis; corpore subitus nigro-virescenti, fere glabro, capite infra prosternoque rufis; pedibus metallicis, coxis rufis. L. 8½ mm.

A narrow, parallel, and shining species; head and prothorax red; elytra light metallic-green; head large and triangular, with prominent finely granulated eyes; antennæ black, with five-jointed club; prothorax plainly longer than broad, with sides very slightly rounded, rather obsolesce but evidently punctured, depressed at base; elytra with rather strong rows of punctures; apices obliquely truncate and denticulate, externally callose; legs metallic-green; coxae red. L. 8½ mm.

Elopura, North British Borneo; a very distinct and brightly-coloured species. In Mr. Gorham’s collection.

I believe this species to be a Langurites, but, as there seems a little doubt on the matter, I have for the present included it provisionally under Languria.

**Compsolanguria, n. g.**

Elongata, fusiformis; capite sat magno, oculis prominulis; antennis paullo ante oculos insertis, teretioribus, articulis 7o et 8o triangulariter dilatatis, 9o et 10o latioribus, emarginatis, 11o
genera and species of Languriidae.

rotundato; prothorace lateribus fere parallelis pone medium leviter latiori; elytris apud humeros prothorace latioribus ad apicem sensim acuminatis, apicibus divaricatis, denticulatis; pedibus elongatis, tarsis longis sat dilatatis, onychio longo teretiori; lineae coxales obsolete.

Elongate, fusiform; head rather large; eyes prominent and finely granulated; antennae inserted at some little distance in front of eyes, rather long and slender, with the 7th and 8th joints tri- angularly dilated, and joints 9—11 wider, 11th joint rounded, almost as broad as 10th; prothorax elongate, with sides almost parallel, slightly broadest behind middle; elytra at shoulders broader than base of prothorax, gradually narrowed to apex; apices divaricate and denticulate.

This genus appears to bear some relation to Gonio-languria, but is at once separated by its antennae, which point to a relation with Doubledayia.

Compsolanguria concinna, n. s.

Capite prothoraceque rufis, fere lœvibus, elytris cyaneis ad basim late rufis, corpore subitus rufo, apice abdominis cyaneo, antennis fere nigris basi rufis, pedibus rufo-piceis, genibus obscurioribus; prothorace latitudine evidenter longiori ad basim depresso, basi striola utrinque brevi distincta impressa; elytris seriebus punctorum apicem versus obsolete nibus evidenter instructis, apicibus divaricatis, denticulatis; corpore subitus fere lœvi. L. 12 mm.

Head, prothorax, and under side, except apex of abdomen, red; elytra cyaneous, broadly red towards base; antennae as above described; last joint of maxillary palpi slightly securiform; prothorax plainly longer than broad, narrower than elytra at shoulders; elytra gradually narrowed from shoulders to apex, with distinct rows of punctures, becoming obsolete towards apex; under side almost smooth.

Amazons; in the collections of the British Museum and the Leyden Museum. One of the handsomest and most distinct of the Languriidae.

Compsolanguria teres, n. s.

Præcedenti affinis sed minor et angustior, elytris totis cyaneis facile distinguendus. L. 10 mm.

This species appears closely to resemble the preceding, but it is smaller and considerably narrower, and the
elytra are entirely cyaneous; the prothorax also is more parallel-sided, and the under side is more broadly cyaneous.

New Granada; in Mr. Crotch's collection as the type of a new genus. It evidently belongs to the same genus as the preceding.

Ortholanguroides, n. g.

Very closely related to Ortholanguoria, Crotch (Rev. Erot. Cist. Ent., i., 395), but with the club of antennae five-jointed and larger eyes: the species that I have seen are much smaller and narrower. Crotch's description of his genus is as follows:—"Cylindrical, parallel; head destitute of stridulating organ; antennae with a four-jointed club; thorax elongate, base margined; elytra with the apex truncate, denticulate, sutural angle acute." Both the genera are at once distinguished by their very peculiar parallel and cylindrical shape, the elytra and thorax being of the same breadth, with sides continued almost in a straight line, and the former being parallel to apex.

Ortholanguroides cylindrica, n. s.

Cylindrica, parallela; capite nigro, magno, triangulari, oculis magnis, rotundatis, leviter granulatis, antennis brevioribus, nigris, clava longa ovali distincte 5-articulata; prothorace rufo, latitudine longiori, obsolete punctato, basi utrinque striola impressa; elytris longis, nigris vel nigro-violaceis, ordinibus punctorum seriātim fortiter dispositis, apicibus denticulatis; corpore subtus nigro, pro- sterno rufo; pedibus nigris. L. 9 mm.

Elongate, parallel, cylindrical; head black, with very large eyes, which are round, prominent, and finely granulated; antennae rather short, with large oval five-jointed club; prothorax red, longer than broad, obsoletely punctured, posterior angles rather prominent, base with a stria on each side; elytra black with a violet tinge, as broad as prothorax, elongate, with strong rows of punctures, apices denticulate; legs black; under side black; pro- sternum red.

South America; Guiana. In Mr. Gorham's collection.

Ortholanguroides Egensis, n. s.

Præcedenti simillima sed capite rufo, prothorace fere lævi, ely- trorumque seriebus minus fortiter impressis facile distinguendus. L. 9 mm.
genera and species of Languriidæ.

Very like the preceding, but with the head as well as the prothorax red, and eyes not so large; the elytra are more cyanous; the prothorax is almost impunctate, and the rows of punctures on the elytra are less strongly impressed; the under side is dark, cyanous, but in Mr. Crotch's collection there is a specimen with the under side red; this, however, appears to be immature. The specimen is without antennae, and is placed by Mr. Crotch under Ortholanguria.

Ega; Amazons. In the British Museum collection.

Ortholanguroides virescens, n. s.

Præcedenti similis sed tota lete virescens; capite thoraceque obsoletius punctatis, antennis clava 5-articulata, articulis 7o et 11o minoribus; elytris ordinibus punctorum distincte impressis, inter-striis lævissime rugosis, apicibus ut in præcedentibus denticulatis. L. 9 mm.

In form and general structure very closely resembling the preceding, but of an entirely shining green metallic colour. It appears to bear the same relation to the two preceding species that Ortholanguria concolor bears to O. Batesi.

Santarem; in the British Museum collection.

Goniolanguria, Crotch.

In his remarks on this genus (l. c., p. 395), Mr. Crotch says that a closer examination of his series of G. latipes would probably eliminate several very closely allied species; this species, however, is so variable that I think it would be a difficult matter to separate them satisfactorily under the several names that Mr. Crotch appends to the examples in his series. The following species, however, appears quite distinct, and it is separated from all the others by Mr. Crotch.

Goniolanguria flavipes, n. s.

Elongata, angustata, tota aenea, nitida; capite prothoraceque fere lævibus, hoc latitudine multo longiori, lateribus fere parallelois, marginatis, angulis posticis acutis, productis, basi bisinuata, in medio fortiter producta, striola minutissima utrinque impressa; elytris ad basim prothorace evidenter latioribus, apicem versus sensim angustatis, ordinibus punctorum postice obsolscantibus.
seriatim dispositis, apicibus divaricatis, denticulatis; antennis clava 5-articulata; corpore subitus aeneo, glabro, segmento ultimo abdominis fortiter punctato; pedibus flavis, genibus fuscis. L. 11½ mm.

Narrow and elongate, shining aeneous; head and prothorax almost smooth, the latter much longer than broad, almost parallel-sided, plainly margined, posterior angles acute, base strongly produced in middle, with a distinct impressed line above produced part, and a very small stria on each side; elytra at base broader than thorax, gradually contracted to apex; apices divaricate and denticulate; rows of punctures distinct, fainter towards apex; under side aeneous, smooth; apical segment of abdomen strongly punctured; antennae with five-jointed club; legs yellow, knees fuscous.

Brazil. In Mr. Crotch's collection.

**Tetralanguroides, n. g.**

The genus *Tetralanguria*, formed by Crotch to include several species of Fabricius, Wiedemann, and Motschulsky from the Indo-Malayan region, is distinguished by its subquadrate thorax, which has the anterior angles always well marked and not rounded, and by its abrupt four-jointed club. Crotch enumerates six described species (l.c., p. 378), and four are set aside in his collection as types of new species; as, however, he remarks himself, the species are very hard to separate satisfactorily: he says, "Probably most of those here given will ultimately prove to be varieties of one species," and, after having seen a large number of specimens, I have not been able to refer any of them to a distinctly separate species. Although the extreme forms appear at first sight widely different, yet they are connected by every gradation; the size varies from about 12 to 18 mm., and some specimens are broader, with the elytra more parallel-sided than others. The colour variations, however, are most remarkable; the commonest form in some districts appears to be metallic-blue or green, with red head and thorax (*T. elongata*, Fab.). The thorax, however, is often more or less green, the colour forming a spot in the centre, or a band, or covering the whole surface; this appears to be *T. pyramidata*, Wied. Specimens also occur which are entirely aeneous or bright metallic-blue.

In Mr. Crotch's collection, however, there is a specimen set aside by him as the type of a new genus, which,
while having the shape of the prothorax as in *Tetralanguria*, is abundantly distinct by reason of its very different antennae; as, however, it in many points resembles *Tetralanguria*, I have adopted for it the name of *Tetralanguroides*, for the same reason that I have adopted other names formed on the same principle. The genus may be thus characterised:

Forma elongata, parallela, sat lata; prothorace subquadrato, angulis anticis distinctis, evidenter marginato, basi leviter bisinuata, elytris parallelis, apicibus truncatis; antennis erassoribus, clava 5-articulata, articulo 6o jam dilatato.

*Tetralanguroides Fryi*, n. s.

Capite sat magno, triangulari, leviter virescenti, fortissime punctato; antennis robustis, clava 5-articulata; prothorace rufo, obsolete punctato, macula disceoidali, alteraque utrinque laterali, nigris, basi depressa, marginata, utrinque striola impressa, angulis posticis productis, acetuminatis; elytris nigro-cyaneis, apicem versus leviter angustatis, apicibus truncatis, rugosis, ordinibus punctorum seriatim dispositis, interstriis latis, distincte punctatis; corpore subtus cuna pedibus nigro, prosterno rufo; lineae coxales modice. L. 12—12½ mm.

Head large, triangular, very strongly punctured, black, with a greenish metallic tinge; antennae short, with the 1st joint transverse; joints 2—5 about as long as broad, 6th joint a little broader than 5th, 7—11 dilated, forming a not very distinct club; prothorax red, obsoletely punctured, with a discoidal black spot, and two others close to margins in a line with the central spot; elytra cyanous-black, with rather strong rows of punctures, interstices plainly punctured, parallel almost to apex, then narrowed and narrowly truncate; under side and legs black: prosternum red; last segment of abdomen very strongly punctured; coxal lines distinct, but not strong.

China; in Mr. Crotch's collection. Also in the British Museum collection.

Among the species in the collection of the Royal Museum, Brussels, is a specimen of a *Pachylanguria* which I have named *Pachylanguria Borrei*; the club of the antennæ, however, is more elongate than is usual in the type-species of the genus (*P. Paivæ*, Woll., and *P. metasternalis*, Crotch) and differently shaped, and the species differs also in one or two other points, and may
form the type of a distinct genus. As, however, *P. collaris*, Crotch, is closely connected with it, it seems the best course to leave these two species, for the present at all events, under *Pachylanguria*. Among other new species in the Brussels Museum collection there is a small *Callilanguria*, distinguished by its yellowish abdomen; a species of *Languria* near *L. formosa*, Crotch; and a species with dark elytra and red thorax, which is remarkable for its very long and slender legs. Descriptions of these species have been lately published in the ‘Comptes Rendus de la Société Ent. de Belgique’ (May 1st, 1886).

With the Ceylon species Mr. Lewis handed to me a few other specimens of the group. Among these is a small *Languria* with red head and thorax, cyaneous elytra, and five-jointed club, which is very interesting as having occurred in Egypt; a species has occurred in Siberia, but no species has hitherto been recorded so near to Europe as the one now referred to. It appeared most probable that the Egyptian species would prove a new one, but, on examining the under side, I at once saw that it was *L. melanosterna*, which was described by Von Harold in his paper above referred to from Luzon, Philippine Islands, and of which I have a number of specimens before me in the Brussels collection from the same locality. The species is easily distinguished by having the under side of the head, the prosternum, and abdomen clear testaceous or red, while the meso- and metasternum are black, and by the first joint of the posterior tarsi being as long as the two following together; the occurrence of this insect in such widely-separated localities is very interesting, but is somewhat paralleled by the distribution of *M. Jansonii* above referred to.

The following species remains to be described from Mr. Crotch’s collection.

*Languria affinis*, *n. s.*

*Nitida, capite prothoraceque nigris, illo sat magno obsoletius punctato, hoc convexo lateribus modice rotundatis, ante basim subsinuatis, fortiter marginato, evidenter parcius punctato, basi depressa, striola brevi utrinque impressa; elytris laevo cyaneis vel violaceis, humerus elevatis, ad apicem sensim contractis, apicibus truncatis; corpore subtus cum pedibus nigro vel nigro-cyaneo;
genera and species of Languriidae.

antennis nigris, clava haud distincta 5-articulata; lineae coxaes elongatae, fortissimae. L. 8 mm.

Head and prothorax black, the former obsoletely punctured, the latter convex, with sides moderately rounded and slightly sinuate before base, plainly but diffusely punctured; margins strong, somewhat reflexed, base depressed, and with a short stria on each side; elytra cyanous or slightly violaceous, with shoulders well marked, gradually narrowed to apex; apices truncate; rows of punctures moderately strong; under side and legs black or dark cyanous; antennae with rather indistinct five-jointed club; coxal lines very strong; male with prothorax rather wider in front than female.

From L. Giloloæ, Crotch, L. rufigpes, Crotch, and L. atrocyanea, Har., this species appears to be well distinguished by its punctured prothorax and five-jointed club of antennae. It seems, however, most probable that the three species here mentioned are all varieties of one species which is variable in size. Crotch (l. c., p. 386) speaks of L. rufigpes as very near to, and probably a variety of, L. Giloloæ, and Von Harold seems somewhat doubtful regarding L. atrocyanea. L. nigrocyanea, Crotch, belongs to the same group, and differs very slightly from the species belonging to it.

L. Lewisii, Crotch, appears to be another variable species as regards size, colour of legs, &c. I believe that L. geniculata, Har., and very probably L. nauræ, Lewis, are merely varieties of this species, and that some of the allied unicolorousæææ species stand in need of further revision.

In studying the Languriæ it is impossible to help being struck by the fact that certain of the groups of species are extremely variable in points that in more highly organised Coleoptera are always constant, so much so that it is in many cases almost impossible to draw the line between species and species; this is more particularly the case with regard to sculpture. The sexual differences, which in some genera (e. g., Doubledaya) are very remarkable, also give rise to considerable confusion, and in describing new species must be carefully taken into account.

Mr. Lewis, as quoted at the beginning of this paper, regards the Languriidae as a, comparatively speaking,
New genera and species of Languriidae. Recent type of Coleoptera. I am inclined to think that this cannot be regarded as in any way settled, and that the simplest forms are often the most archaic; the question appears to be one of environment entirely, and if the environment is constant, and no special circumstances arise to call for any special alteration, no alteration takes place. In the predaceous Coleoptera there must always be a great development going on from the very nature of their habits both in the larval and the perfect state, which tend to bring about the survival of those individuals that possess certain organs in their fullest development. In phytophagous Coleoptera, however, like the *Languriidae*, which as a rule live on low herbage, and appear to undergo their metamorphoses inside the stems of plants (as observed by Professor Comstock, quoted by Mr. Lewis), there seems every reason why they should continue without change for a very long period. It is of course possible, as Mr. Lewis (l.c., p. 351) seems inclined to think, that they have developed the elongate from the rotundate form, and then retained it. I am inclined, however, to believe that the elongate form is the prior form, and that the least divergency from their usual habits of keeping to low herbage is at once attended by an alteration of form, as is shown by the *Crotchia* and *Cladoxena* groups, which are found resting on the higher branches of shrubs and brushwood. The question, however, is a very difficult one, and can only be touched upon in passing in a descriptive paper.

Explanation of Plate III.*

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*Not Plate I., as printed in error at p. 303.*
XI. Notes on the occurrence in Britain of some undescribed Aphides. By G. B. Buckton, F.R.S.

[Read August 4th, 1886.]

Plates IV., V., VI., & VII.

Much interest will always attach to any possible tracing back of a specific form to its natural and more simple groupings, and also to the enquiry what modifications of structure and habit have formerly been the factors in a development from the simple to the complex. For this reason alone, an undue multiplication of described species is to be deplored, for it must tend to complicate a problem which is already sufficiently difficult and obscure.

In forming a judgment as to the existence of a new species, much must be left to the intuition of the biologist, for, as a sailor may be able correctly to read the sky, and yet be unable satisfactorily to tell you why he comes to an opinion, so it may not be always easy for a man of science positively to state why he decides for or against a form as specific.

Since the publication of the fourth volume of the 'Monograph of British Aphides' friends have kindly sent to me what appear to be several new species, and I venture here to describe certain of them, although they might perhaps better appear in a short supplement to that work.

Aphis crithmi, Buckton.

Apterous viviparous female.—Size of body, 0.060 x 0.030 inch. Small, oval, brown, and slightly mealy to the naked eye. Neck-ring, cornicles, and two or more broad irregular patches on each side of the abdomen, dark olive-green or brown. Abdomen pilose and pitted near the carina. Eyes black. Antennæ greenish, and about two-fifths the length of the insect. Young individuals are often bright yellow or greenish, with numerous minute spots dotted over the surface. The pupa is of a drab-yellow colour, with black head, eyes, nectaries, knee, and tarsal joints. Wing-coverts yellow, tipped with black or brown.

Trans. Ent. Soc. Lond. 1886.—Part III. (Oct.)
Mr. Buckton's notes on the occurrence in

Winged viviparous female. — Expanse, 0·220 inch; body, 0·080 × 0·030 inch. General colour lemon-yellow. Head and antennae black, eyes red, rostrum reaching to the third coxae, thorax with a broad interrupted discoidal brown or black spot. A similar square spot occurs on the dorsum, between the cornicles, with two or more luteous dashes. There are also four carinal spots. Knees and tarsi dark brown. Cauda absent. Wings hyaline, with the usual twice-forked cubital vein. Insertions yellow, as also is the stigma.

Found on the stalks of the samphire, Crithmum maritimun, growing on the rocks at Kingsbridge, situated at the head of the Salcombe Estuary, Devonshire. Specimens were kindly forwarded to me in July by G. C. Bignell, Esq.

The aphis which most nearly agrees with this insect perhaps is Aphis Angelice of Koch. But, though his figure fairly answers to my drawing, the different food and the peculiar habitat on the sea-shore, amongst other considerations, preclude the identity of these two insects.

Lachnus pini, Linn.

I was unable, from the want of examples, to describe and figure the winged viviparous female of this species in the 'Monograph of British Aphides.' The apterus female is there noticed on page 50, vol. iii., and a drawing occurs on plate 97 of the same volume. Through the kindness of Mr. Bignell I can now describe the winged form, which is relatively much smaller than the apterus. The insects were taken on the spruce fir late in September, and near Stonehouse, Devon.

Winged viviparous female.—Expanse, 0·400 inch; size of body, 0·100 × 0·040 inch. General colour ochreous-yellow. Head black, neck-ring ochreous. Thoracic lobes dark brown. Abdomen corrugated and marked with a double row of dark dorsal spots. Cornicles papilliform and brown. Legs yellow, with brown femoral, tibial, and tarsal joints. Antennae black. Wings with a yellowish membrane, ochreous insertions, and a broad brown stigma. Venation very fine, but the first cubital vein is coarser than the rest. The body is covered with a fine yellow coat of hair. The pupae are also small, yellow, finely spotted, and furnished with dark brown wing-cases.
Thelaxes betulina.

I think Mr. Darwin remarks that some suspicion attaches to a genus which is represented by a single species. Unless the characters differentiated rise to a high significance in classification, hesitation must be involved in the creation of such a genus; due regard being paid to the difficult and obscure subject of variation.

The genus Thelaxes was constructed by Prof. Westwood in 1840, but some continental authors have ignored it in favour of the genus Vacuna, which has been thought to have priority. Vacuna was established by Van Heyden in his paper entitled, "Entomologische Beitrage," published in 1837 in the second volume of the 'Museum-Senkkenbergianum,' pp. 289—291, and there describes Vacuna coccinea, which is a true Phylloxera; as appears evident from a drawing of the wing, kindly made for me by Prof. Westwood; and taken from one of the type-specimens sent to him by Van Heyden himself. No notice seems to be published as to the character of the lower wing. Westwood says "the very minute species Vacuna coccinea, Heyd., has its wings very similar to those of Phylloxera of Fonseolombe, in which the cubital vein is unforked; whilst in Thelaxes of Westwood the cubital vein has a distinct furcation." Prof. Westwood moreover thinks that his T. quercicola, which has never been described, may possibly be identical, or at least congenerical, with Aphis dryophylla, Schr.; and he writes, "In this particular it agrees with Thelaxes dryophylla of the 'Mon. British Aphides.'" He quotes his former diagnosis:—"Wings flat on the back whilst at rest, anterior with three oblique discoidal nervures, the anterior bifid; antennae short."—See 'Introd. Mod. Class. of Insects,' vol. ii., p. 441. From the foregoing it would appear that the natural position of Thelaxes is between Glyphina and Pemphigus.

I am indebted to the courtesy and observation of the Rev. E. N. Bloomfield for the opportunity of describing another species of Thelaxes. At first, the discoverer of this insect thought that it had some affinity with Glyphina. The insect inhabits the birches round Guestling, near Hastings, and it congregates in clusters, not so much on or under the leaves, as near the ends of the shoots. Towards the middle of June he found both the
apterus and winged female forms, and I received from him a consignment of about thirty individuals, some five or six of which had wings.

By the first week in July the winged viviparous females had almost disappeared, and considerable difficulty was found in obtaining an additional specimen on the 21st of that month, though the apterous insects were still fairly plentiful. They certainly also live to the middle of August.

I append a diagnosis of this new species:—

*Thelaxes betulina*, Buckton.

*Apterous viviparous female.*—Size of body, 0.050 × 0.035 inch. Variable both in colour and in size. The earlier broods have a general pale or olive-green colour, and are furnished with a delicate brown hairy coat. Head small; eyes pale; antennae green, tipped with black, five-jointed, ending with a "nail," as in *Thelaxes dryophylla*. Legs short. Upper side sometimes of a lively green, whilst other examples show an olive tint, with four or more disjoiined transverse bands, which, being interrupted down the dorsum, mark out a green stripe with adjacent white or green side-patches. Six or seven obscure pores occur down each side, just as we see in *T. dryophylla*. The nectaries are mamilliform. The young are wholly of a bright and delicate green. The later molts occur larger, more globose, and the green parts become dark to almost black. Pupa bright yellow, with brown head, wing-cases, and tarsi. The thorax and abdomen are sparsely dotted with brown.

*Winged viviparous female.*—Expanse, 0.240 inch; size of body, 0.060 × 0.040 inch. General colour dusky green, with dark brown patches on the thorax. Head, eyes, and antennae dark brown or black. Cauda, nectaries, and several broad square spots down the dorsum accompanied by smaller lateral spots, of the same colour. Antennae five-jointed, ending in a nail-like process; the third joint the longest and green. Abdomen slightly tuberculate. Rostrum reaches to the third coxae. Wings delicate in texture, folded horizontally when at rest. Costa greenish, with a brown stigma. Venation distinct and dark brown. Cubital vein, which does not quite touch the cubitus, once forked. Hind wings with a single oblique vein rising from the cubital.

Wing-venation amongst the Aphides is a highly important character. Mr. F. Walker, in his Cat. Homop., has, on p. 1052, vol. iv., a mere notice without descrip-
tion of a _Thelaxes betulae_, but he makes this insect synonymous with _Vacuna betulae_, Heyd. From what I have said before, the venation of this insect must differ from my _T. betulina_, and I do not adopt it as a synonym. Kaltenbach has _Vacuna betulae_, and his description in many points agrees with the insect here shown to be at any rate new to Great Britain. But his insect has ringed antennae, and, like others, he says his _Vacuna_ is the _Vacuna_ of Heyden.

**Chermes taxi.**

The genus _Chermes_ is at present restricted to a very few described species, and of these two, viz., _Chermes abietis_ and _C. strobilobius_, Kalt., have been observed to construct gall-like swellings on their food-plants. The last-named insect Kaltenbach describes as forming excrescences on the shoots of _Pinus abies_ about the size of a hazel nut.

Prof. Rupert Jones has been good enough to send me some galls made on the Irish yew, _Taxus baccata_, the work of a _Chermes_, which certainly is not _C. strobilobius_, and this insect I propose to name—

**Chermes taxi,** Buckton.

_Apterous viviparous female._—Size, 0·050 × 0·030 inch. Figure irregular, oval. Colour dark shining brown or black. Very small. Head much hidden in the thorax, black. Abdomen deeply ringed. Dorsal and lateral portions roughened by numerous squarish tubercles. Legs black, and not appearing beyond the carapace. The anal ring is expanded into a pale semilunar termination, from which is exserted a quantity of white flocculent filaments.

The galls occur on the terminal shoots, and are composed of from eight to sixteen pea-formed cells, united into brown bunches. When cut into they are found to be full of sap, and the walls to be constituted of alternate layers of bright green and pink woody matter. I could find no openings to these excrescences, but as they were gathered in the month of March it is very probable that the openings would not occur until later in the year, when the inhabitants were ready to assume wings, as we know to be the case in _Chermes abietis_.

I have not been able to capture any winged forms;
indeed, they are always in this genus less plentiful than the apterous females, if we except the gall-making *Chermes* of the spruce-fir.

In the consignment made to me from a garden at Ealing, Middlesex, the insects were congregated on the stems below the attachments of the galls; and several were surrounded by their shining honey-coloured eggs. The produce of these eggs probably are the gall-makers, and these females become prolific within the juicy distortions they make on this conifer.

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**Explanation of Plates IV., V., VI., & VII.**

**Plate IV.**—*Aphis crithmi.*

Fig. 1. The apterous female.
2. Pupa of the same.
3. The winged imago.
4. Antenna of the same.
5. Sheath and three setæ of the rostrum.
6. Tarsus and claws.

**Plate V.**—*Lachnus pini.*

1. Apterous viviparous female, with exserted proboscis.
2. The pupa.
3. Winged viviparous female.

**Plate VI.**—*Thelaxes betulina.*

1. Apterous viviparous female.
2. The same, but of a later brood.
3. The pupa.
4. The imago.
5. Part of the head, showing the eye with its supplemental lenses, and the antenna.
6. Tarsal joint.

**Plate VII.**—*Chermes taxi.*

1. *Coccus*-like larva, showing the anal end, from which the flocculent substance is extruded.
2. Another specimen, with her eggs, a cast skin, and the silky attachment.
3. A sprig of yew, with five bunches of cells or pseudo-galls, fabricated by the above insects.

[Read August 4th, 1886.]

PLATE VIII.

Amongst the various secretions emitted by different species of insects, such as wax, silk, gums, the oily matter of the Melloé and ladybird, &c., none has attracted more general attention than the white frothy material observed upon almost all kinds of plants in the spring and early summer, known by the common name of "cuckoo-spit," each patch of which is caused by, and forms the residence of, the immature states of a small homopterous insect, Aphrophora spumaria. From the very careful observations and experiments of DeGeer (Mem., iii., p. 168, et seq.), it is clear that the true nature of this secretion was first made known by Poupart in the Memoires of the Academy of Paris in 1705, and that it is no other than the fluid excrement of the larva of this insect, consisting of the juices of the plant on which it subsisted, and which, being discharged, with very little alteration in its nature, drop by drop from the anus of the insect, forms an accumulated moistened mass which keeps the body of the insect in a moist condition until it is ready to assume the perfect state. Other instances of the employment of the excrement as a covering of the body of the larve occur in the Hispidae amongst beetles, whilst the fluid emitted by the bombardier-beetles is so volatile that immediately on coming into contact with the air it explodes. I have now to describe another curious secretion emitted by an insect closely allied to Aphrophora, serving the same purpose as the cuckoo-spit.

In the course of the autumn of 1885 I received by parcel-post from Ceylon (forwarded by my excellent correspondent, Staniforth Green, Esq., of Colombo) a
small box containing specimens of a small homopterous insect allied to the genus *Aphrophora*, the economy of which is remarkable. "The larva," my correspondent remarks, "resides in a tube, which is fixed on a twig or leaf-stalk of the Suriya tulip tree (*Adansonia digitata*, L.), on the end of the branches. The perfect insect, no doubt, deposits its eggs in the same way that *Aphrophora spumaria* lays hers, but I have not yet noticed the growth of the tube. I had one under observation for about a week, and could, with the aid of a lens, see the movements of the larva inside. Its position in the tube was head downwards, and it seemed to be continually working its anus against and round about the inside of the tube near its orifice. At intervals a clear water-like fluid was discharged from its anus, which would escape from the tube drop by drop. I allowed some of this to fall upon a clear slip of glass, but it did not seem to congeal. It gradually dried on the glass, leaving but a slight mark on its surface. I see in your 'Modern Classification of Insects,' ii., p. 433, that a species of *Aphrophora* is found upon trees in Madagascar, the larva of which emits a considerable quantity of clear water, especially in the middle of the day, when the heat is the greatest. Can this be the same insect? [No.] Here in Ceylon the water seems to drop from the tube day and night, for I have seen it dropping before sunrise. Our insect has a life of some weeks in the larval state, and never shows itself outside of its tube until it is ready to assume its perfect state. The change occurs early in the morning, generally between six and seven o’clock, shortly after sunrise. First of all a quantity of little bubbles appear in the form of a knob at the mouth of the tube. Then the pupa comes out tail first, and takes up a position on the top of the tube [transversely, like the letter T], and in the middle of the bubbles. In about ten minutes it completely extricates itself from its old skin, and the curved horn on its thorax seems to uncurl. Some of the specimens I have sent you show this. Please see if there are any males among them. If not, it is possible that they may not reside in tubes. I noticed a few the other morning resting on a twig, the female above and the male below; the latter was considerably smaller, and of darker colour. On being slightly disturbed they leaped away. They appear to be very scarce, seldom
showing themselves. I have been resident here for more than thirty years, and, until I noticed these tubes lately, I had only met with two specimens."

"PS., 19th August.—Yesterday morning I discovered some newly-hatched larvae of the Aphrophora on the tip of a small tulip tree. They could not have been long out of the egg, little tiny creatures of an orange colour, and in the midst of a spot of froth. I could see them moving about in it. I find that the tube is beginning to be formed. I am now convinced that it is commenced and finished by the little creature itself while in the larval state; the walls of the tube were commencing to rise, enclosing a space of sufficient size to contain the larva in a perpendicular position, but it must be a close fit by the time they are ready to assume the perfect state. At present they are in a horizontal position, and must by working about form the foundation of their cells as the froth becomes congealed. There are five or six of these young larvae close together on the tip of a twig which is sending out leaves. One tiny larva is moving about with no froth about it, and with quite a dry skin. You will notice that the cases have a ringed appearance; this is probably caused by the semicircular motion of the anus of the larvae, which is crushed against the interior of the tube sometimes above and sometimes below. I do not believe that the insect does any injury to the tree, or even to the branch it feeds on."

The full-sized larva-tubes are about half an inch long and about a line in diameter. They are about the thickness of writing-paper, of a dirty whitish colour, with the surface finely transversely wrinkled. The basal portion is dilated and curved so as partially to clasp the twig on which it is fixed, as shown in the accompanying sketches. In this manner the bottom of the tube is closed, and, as the insect resides in it with the head downwards, I do not understand how it can obtain nourishment from the plant through its delicate rostrum, unless it occasionally emerges from its abode, which, of course, is stationary. During the past spring I have noticed that our common English cuckoo-spit insect remains stationary on a plant for several weeks.

The immature insect differs from the imago in the usual manner, having the wings only visible in a rudimental
condition in the pupa state, in which, as will be seen in figure, the only appearance of the large curved dorsal horn is seen in a very small dorsal protuberance in the middle of the hind part of the thorax.

The perfect insect proves to be a species of Burmeister's curious genus *Machærotia* (Handb. d. Ent., 2 Bd. pp. 127, 128), intermediate between the *Cercopides* and the *Centroti* and *Membracides*.

Of Burmeister's type of *M. ensifera*, brought by Chammisso from the Island of Luzon, the chief of the Philippines, I fortunately made a sketch in the Berlin Museum more than fifty years ago, and was thereby enabled to identify the species also brought from the Philippine Islands by the late Mr. H. Cuming (Proc. Zool. Soc., Nov. 14th, 1837, p. 130).

The Ceylon insect agrees with the type in size and general appearance, but the head is more pointed in front and is concolorous, whereas it is black in *M. ensifera*, which latter is destitute of the very minute dark dots with which the Ceylon species is marked both on the body and also on the fore wings. The specimens of the latter (preserved, however, in spirits) are uniformly pale luteous-coloured, whilst in the Philippine insect the prothorax is marked with five slender brown longitudinal vittæ, and the sides of the middle segments of the abdomen are black.

The following specific characters will serve to distinguish the Ceylonese species:—


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**Explanation of Plate VIII.**

Figs. 1, 2, 3.—The tube of the larva of *Machærotia guttigera*, seen in different positions; magnified.

", 4, 5.—Basal portion of the tube, showing the manner in which it is made to clasp the twig on which it is affixed.
**Fig. 6.—** The pupa, taken out of the tube.

**7.—** The perfect insect (natural size).

**8.—** Front of head of imago, showing the rudimental ocelli in two impressed spaces of the hind part of the vertex.

**9.—** Side view of the head, showing the antennæ inserted close to the anterior margin of the eyes.

**10.—** One of the antennæ.

**11.—** The dorsal thoracic horn.

**12.—** Fore wing or tegmen.

**13.—** Hind wing.

**14.—** Hind leg.

**15.—** Under side of the abdomen of the male imago.

**PS.—** Whilst this memoir was in preparation there appeared in an American entomological periodical the following notice of a very similar discovery, in New Holland, of a case-making species:—"At the meeting of the Linnean Society of New South Wales on the 26th November, 1884, a paper was read by F. Ratte, M.E., on the larvæ and larva-cases of some Australian *Aphrophoridae*, in which the larval state of some small species of *Rhynogota*, closely allied to the genus *Aphrophora*, and probably belonging to the genus *Ptyelus*, is described. The description of the larva-cases and of some of the larvæ discloses a feature probably new to the science of Entomology. These cases, unlike those of insects generally, are true shells, containing at least three-fourths of carbonate of lime, and resembling in shape some fossil and recent Serpulaæ, some being conical, others serpuliform or helicoidal. The conical shells are fixed on the branches of some species of *Eucalyptus*, the mouth turned upwards, the larva being placed in it with the head downwards. It introduces its suctorial apparatus into the bark of the stems, sucking the sap of the tree, and emits from time to time, by its anus, drops of clear water. This property of emitting clear water is possessed by all the family."—'Psyche,' vol. iv., p. 288, June, 1885.

[Read July 7th, 1886.]

Since the appearance of my last list of additions I have examined a very large number of British Ichneumonidae, and, as might be expected from the very little attention which has been bestowed on this division of Entomology in this country, I have detected many species which have not hitherto been recorded as British; while some have been met with which appear to me to be undescribed. Professor C. G. Thomson has very kindly examined many insects for me, principally *Cryptides* and the genus *Mesochorus*, and the result of his examination I have in many instances recorded in this paper. I am very deeply indebted to Mr. W. H. B. Fletcher for the trouble he has taken in saving for me the parasites he has bred, which last year amounted to more than 1000, and, as in most instances the name of the host was added, much valuable information has been obtained. My thanks are also due to Messrs. Atmore, Bignell, Billups, Cross, Griffiths, Harwood, Porritt, and many others for insects kindly sent me.

*Ichneumon bimaculatorius*, Panz.

I took a female of this handsome little ichneumon at Brundall, near Norwich, on September 17th, 1884.

*Trogus exaltatorius*, Panz.

I have a fine female of this *Trogus*, given to me by Mr. G. C. Bignell in 1882. It is very like *lutorius*, but is larger, has the cloud at the apex of the wings more distinct, and different sculpture at the back part of the metathorax.
Mr. Bridgman's additions to T. A. Marshall's

_Ichneumon magus_, Wesm.


Mr. W. H. B. Fletcher bred the female of this species from _Padiaca solandria._ These Scotch specimens differ slightly from Wesmael's and Holmgren's descriptions: they both give the hind femora as nigro-piceous; in my specimens the hind femora are dark red, one of them is fuscous in the middle, the abdomen of one has the apex of the 1st segment and all the rest of the abdomen palish chestnut; the other two have the same coloured abdomen, but the segments have a more or less distinct fuscous band in the middle. All three vary in this respect, so that perhaps the described coloration may occur in this country. The above were taken at Rannoch.

_Apelcticus inclytus_, Wesm.


Mr. Thouless took a specimen at Lakenham, near Norwich, in 1885.

_Phæogenes modestus_, Wesm., ♂, ♀.

Wesm., Tent., 1884, 193, ♀; Mant., 1848, 86, ♀.

Head behind the eyes somewhat swollen; supero-medial area about as broad as long or longer than broad, and sometimes broader than long, and varies from hexagonal to almost pentagonal with a blunt apex; in the female the metathorax is rugosely punctate, in the male shining and somewhat coarsely rugose, much finer in some specimens than in others; the post-petiole in the male is sub-globose, longer than wide, and narrower than the female; in both aciculate, distinctly but rather irregular in the male, almost obsolete in the female, especially in the middle; remaining segments finely granular, with indications of rather coarse somewhat scattered punctures; punctures a little finer in the female than in the male; 2nd segment longer than wide, remainder transverse; mesopleura smooth and shining, with coarse not very close punctures.

♂. In coloration agrees with the female, except that the hind knees, apex of tibia, and tarsi of hind legs are fuscous, and the abdomen varies in colour from deep brown; incisions of anterior segments reddish, to 2nd and 3rd segments almost entirely dull
red; this latter variety appears to be scarce, and the former to be
the normal coloration. In the female the white on the middle
joints of the antennae is sometimes almost obsolete.

These were bred by Mr. W. H. B. Fletcher, from
Euchromia flammea from Rannoch, in June.

Phaeogenes nitidus, n. s.

Niger, pedibus rufis, coxis et trochanteribus nigris, femoribus
posticus nigris, basi rufa, facie flavo-picta.

Head transverse, somewhat oblique, and rather swollen behind
the eyes; face and forehead smooth and shining, with a few fine
scattered punctures; clypeus separated from the face by a shallow
depression; apex truncate; labrum slightly projecting; antennae
not quite so long as the body. Thorax: mesonotum somewhat
smooth and shining, with very fine rather scattered punctures;
scutellum almost free from sculpture of any sort; metathorax
smooth and shining, with faint traces of ruge; supero-medial area
transverse, rounded in front, slightly concave behind, somewhat
kidney-shaped; lateral areas distinctly subdivided; mesopleurc
smooth and shining, with scattered punctures (these denser behind
than in front). Post-petiole of abdomen is about as wide or a little
wider than long, sides parallel, and has a depression in the middle,
slightly tridivided, smooth and shining, with a few scattered punc-
tures; 2nd segment longer than wide, remainder transverse; 2nd,
3rd, and 4th segments finely and rather closely punctate; interstices
almost smooth and shining; apex and sides of abdomen pubescent;
2nd segment with a faint transverse depression before the base;
thryidi distinct and reddish. Legs moderate.

Black; mouth, clypeus, middle of mandibles, facial orbits more
or less, and two spots below the antennae, yellow; scape of
antennae beneath red; flagellum beneath reddish; incisions of 1st
and 2nd segments reddish. Legs red; coxae and trochanters black;
apex of the latter reddish; apex of hind tibae and hind tarsi
fuscous; hind femora in one specimen black, extreme base reddish;
in the other the basal half red. Stigma and tegulae nigro-fuscous.
Male. Length, 6:5 mm.

Two males bred by Mr. W. H. B. Fletcher in 1885; host unknown.

Phygadeuon rusticellae, n. s.

This insect is a Phygadeuon, according to Thomson’s
division of Cryptida, and comes next to P. vagans, Gr.
(Thoms., Opusc. Ent., p. 951, 25), but differs from it
Mr. Bridgman's additions to T. A. Marshall's

in having the coxae red, sometimes the hind pair dark at the base above, or very rarely almost entirely dark; the scape of the antennae beneath in the male is pale yellow, and red in the female. It also comes very near to P. austriacus, Gr. Taschenburg, in his table (Die Schlupf. Cryptides), gives No. 23, "Hüften roth, wie die Spitzen der Hinterschienen, austriacus"; this is evidently a mistake, as both he and Gravenhorst give "legs red, coxae and trochanters black." If Taschenburg had added after Spitzen, "und Wurzel," he would have accurately described this species.

Pedibus, abdomenque rufis, segmento primo negro.

The antenna, like those of P. vagans, are slender, rather more like a Cryptus than a Phygadeuon; head behind the eyes scarcely narrow; forehead smooth and shining; thorax shining; mesonotum finely punctated; area of metathorax distinct, superomedial area transverse; 1st segment of abdomen rather long and somewhat slender; post-petiole about three times as wide as the petiole; the entire abdomen smooth and shining, elongate-ovate; apex of 2nd segment the widest; aculeus fully half the length of the abdomen; legs moderate; the posterior inferior angle of discoidal cell of front wings acute; transverse anal nervure antefurcal; legs moderate.

♂. Black; legs red, front ones paler than the hind ones; base and apex of hind tibia and hind tarsi brownish black; base of hind coxae above sometimes more or less brown; scape of antennae brownish red, dark above; flagellum brownish beneath; abdomen red; 1st segment black; stigma black.

The male differs in having the scape of the antennæ pale yellow beneath; front and middle coxae are paler, and the hind pair darker at the base; the abdomen has only the 2nd, 3rd, and 4th segments red, and these often stained with brown.

Male and female. Length, 4—5 mm.

These were bred by Mr. W. H. B. Fletcher from old birds' nests from Bognor, and from the same host were bred two females and one male of an Hemitheles, which I believe to be floricolator. The two females differ very much from one another in colour; one has the abdomen almost black, only the two first segments reddish at the apex.
Phygadeuon sodalis, Tasch.

This is added on the strength of a specimen received from Mr. J. E. Fletcher.

Phygadeuon brachyurus, Thoms.

Prof. C. G. Thomson returned a small female Cryptid which I received from Dr. Capron, taken in the neighbourhood of Shiere, and a male which I took at Eaton, near Norwich, as the above species.

The insect which I named Hemiteles ruficaudatus, Trans. Ent. Soc. Lond., 1883, 149, Prof. Thomson says belongs to his genus Stylocryptus.

Hemiteles mixtus, m., Trans. Ent. Soc. Lond., 1883, 148, he also says is a Phygadeuon. It might easily be put into either genus, but the absence of the outer nervure of the areolet induced me to include it in Hemiteles; this latter is far from being a good genus, as many insects are found that would easily go into either one or the other. The extremes of either are very decided, but the intermediate forms are far from being so.

Phygadeuon brevitarsis, Thoms.

This insect I thought was a var. of P. nitidus, but Prof. Thomson returned it with the above name.

Hemiteles cynipinus, Thoms.

This and the following were kindly named for me by Prof. Thomson.

Taken in the neighbourhood of Norwich.

Hemiteles Gyrini, Parfitt.

Thomson thinks this is most probably Hemiteles argentatus, Gr.
Mr. Bridgman's additions to T. A. Marshall's

*Hemiteles gracilis*, Thoms.
Thoms., Opusc. Ent., 989, 60, ♂, ♀.
This species I had considered *H. micator*, Gr.

*Hemiteles validicornis*, Thoms.
This species I considered *H. melanopygus*, Gr., and do not see in what respect it differs from Gravenhorst's description of that insect.

*Hemiteles balteatus*, Thoms.
This I took at Heigham, near Norwich. Female.

*Hemiteles capreolus*, Thoms.
Thoms., Opusc. Ent., 970, 8, ♂, ♀.
The female was taken in the neighbourhood of Shiere by Dr. Capron; the male I took myself near Norwich.

*Hemiteles scabriculus*, Thoms.
Thoms., Opusc. Ent., 969, 6, ♂, ♀.
Taken in the neighbourhood of Norwich. Female.

*Hemiteles minutus*, n.s.
Nitidus; niger; pedibus antecis ex parte piceis.
Very smooth and shining; head subquadrate, not quite so wide as the thorax; face quadrate, rather protuberant; space between the eyes and mandibles about equal to the space between the base of the two mandibles; clypeus scarcely divided from the face; antennae a little shorter than the body; scape rather longer than wide, notched outside; flagellum somewhat filiform, thinner at the base than the apex, slightly attenuated at the apex; 1st joint about four times as long as wide, remainder gradually decreasing in length. Parapsides of thorax somewhat distinct in front; mesonotum covered with very fine pubescence, and almost obsolete punctures; thorax longer than high; metathorax with two distinct transverse ridges; supero-medial area defined by two longitudinal converging lines, wider in front than behind, and a little wider than long, very finely punctate or with very fine rugae, either only just
perceptible; posterior surface divided into three areas; metathorax transverse. Abdomen ovate, about as long as the head and thorax, and a little wider than the latter; 1st segment slender; post-petiole very little wider than the petiole; spiracles hardly projecting, placed just behind the middle; remaining segments transverse; apex of 2nd the widest; aculeus about as long as the 1st segment, or between one-fourth and one-third the length of the abdomen. Legs very slender. Wings without areolet; outer nervure absent; posterior inferior angle of discoidal cell subacute; transverse anal nervure not divided.

The male scarcely differs from the female; the antennæ are more filiform, and the abdomen rather more cylindrical.

Black; part of front femora, tibiae, and tarsi, piceous; sometimes hind tibiae show faint indications of darker marks at the apex and before the base, and the 2nd segment of the abdomen is sometimes rather piceous. Tegulae more or less piceous. Stigma fuscous, more or less diluted.

Male and female; length, about 2.5 mm.

Bred by Mr. W. H. B. Fletcher from spiders’ nests taken at Worthing, which swarm on the coast.

This species appears to me to come in Phalanx 2, ll. mm. n. of Thomson’s divisions in ‘Opuscula Entomologica,’ p. 989.

Pezomachus hortensis, Gr.; P. agilis, Thoms.; P. spinula, Thoms.; P. mandibularis, Thoms.; P. formicarius, Gr.

These Pezomachi were taken in the neighbourhood of Norwich, and were named for me by Prof. Thomson, who says the one I thought was a variety of P. analis is P. faunus, the P. intermedius and P. furax are the same species, and that P. juvenilis is a small variety of P. rufulus; he also says Foerster has made several species of P. rufulus. I sent to him the species which Mr. Marshall named for Mr. J. E. Fletcher as Hemi-machus trux; this he returned to me named P. insolens, thus confirming my opinion. P. trux must, I think, be removed from our list.

Pezomachus costatus, n. s.

Rufus, capite, apice antennarum, abdominisque apice, nigris.

Head large, slightly oblique behind the eyes; antennæ about three-fourths the length of the body; 2nd joint of flagellum a little
Mr. Bridgman’s additions to T. A. Marshall’s

longer than the 1st (this latter about twice as long as wide); 5th rather longer than wide; metanotum scarcely higher than the mesonotum, and nearly as long; the transverse ridge of the metanotum about half-way down the slanting part, very distinct, and in form resembles a V, at others runs almost straight across. First segment of abdomen without projecting spiracles; sides of post-petiole rather rounded and gradually increasing in width, sub-pyriiform; abdomen densely pubescent, pubescence rather more scattered on the apical segments; aculeus about as long or a little longer than the 1st segment.

Black; basal half of the antennae, thorax, three first segments of the abdomen, and legs red. Female.

Var. Like the above, but inner orbits broadly obscure red. Female; length, 5 mm.

This species comes between 33 and 34 of Forster’s table of Pezomachus.

This species has been sent to me by Dr. Capron, who took it in the neighbourhood of Shiere. Another specimen was sent to me by Mr. Fitch; this he received from Mr. J. E. Fletcher, and I have taken it myself; and the variety I took at Mousehold, near Norwich, in 1882.

Pezomachus vulnerans, Fst.

Mon. d. Gat. Pez., 157, 102, ♀.

Mr. T. R. Billups has taken four females of this species at Headley and Reigate.

Pezomachus immaturus, Fst.

Mon. d. Gat. Pez. 193, 150, ♀.

I have seen a female which agrees exactly with the description of the above insect, taken by Mr. Billups at Headley.

Pezomachus vagantiformis, n. s.

This insect comes next to P. vulnerans in Förster’s table, and might be added as “thorax bicoloured” before “thorax red.” In general appearance it reminds one of P. vagans, and most probably would have been included by Gravenhorst in that species.

Niger, pro- et mesothorace, segmento primo pedibusque rufis.

Head somewhat narrow behind the eyes; 1st joint of flagellum scarcely longer than the 2nd, about four times as long as wide;
5th about one and a half times longer than wide. Thorax somewhat elongated, the metathorax longer than the mesothorax, no trace of scutellum; a transverse line separates the superior from the posterior face of metathorax; both meso- and metanotum somewhat rounded, the latter higher than the former; thorax about twice as long as high. Abdomen rather narrow, subcylindrical, not wider than the head, pubescence dense, scarcely more scattered at the apex; the hair-pits are more strongly developed than usual; 1st segment rather narrow, about two and a half times as wide at the apex as at the base; spiracles not very distinct (from these to the apex sides straight and gradually widening); between the spiracles about twice the width of the base; remaining segments transverse; aculeus rather longer than the 1st segment.

Head black; antennae brown, apex darker; 2nd and base of 3rd joints reddish; pro- and mesothorax brownish red; metathorax reddish brown, paler on middle of back; abdomen brown-black; 1st segment and all the margins of the 2nd red; legs red; apex of hind femora, apex and before the base of hind tibiae, slightly tinged with brown. Female. Length, 3 mm.

Taken by Dr. Capron in the neighbourhood of Shiere, 1884.

Pezomachus Foersteri, n. s.

This very distinct species comes next to P. spurius in Förster's table (iv. 2, * a. b b. c.).

Niger, pedibus rufis.

Head behind the eyes rather narrow; antennae reaching about to the apex of the 1st segment of the abdomen; 1st joint of flagellum slightly longer than the 2nd, about two and a half times longer than wide; 5th rather longer than wide; thorax rather stout, scarcely longer than high, the meso- and metathorax of about equal length; the transverse ridge of metanotum terminates laterally in a rather short acute spine; 1st segment of abdomen with spiracles scarcely projecting, about three times as wide at the apex as at the base, and about twice as long as the width of the apex; abdomen ovate; apex of the 3rd segment the widest; aculeus almost longer than the 1st segment; abdomen covered with scattered pubescence. The abdomen is the same shape as in P. instabilis, but the insect differs from that species in the shorter antennae and thorax.

Black; 2nd and base of 3rd joints of antennae and legs red; apex of hind femora, apex and before the base of middle and hind tibiae, and apical joints of tarsi very faintly browned. Female. Length, 2·75 mm.
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Taken by Dr. Capron in the neighbourhood of Shiere in 1884.

Exochilum (Anomalon) capitatum, Desvig.

Mus. Cat., 104, 5.

"Head buccated; forehead not cornuted; face slightly narrowed below; clypeus at the apex widely emarginate; antennae shorter than the body. Metathorax with a shallow depressed line down the middle, and with rather deep longitudinal sulcations. Abdomen compressed; 1st segment nearly straight. Legs slender; femora slightly thickened; hind legs much longer and thicker than the others; first two joints of hind tarsi much thickened; 1st joint about one-fourth longer than the 2nd; the last three small, together about as long as the 2nd joint. Wings: recurrent discoidal nervure joining the 1st cubital cell in the middle; transverse anal nervure of lower wing post-furcal, and divided above the middle."

This fine species of Anomalon, so far as I know, has not been taken since Mr. Desvignes described it. When at the Museum two or three years ago I saw plainly that it belonged either to one of Wesmael's subgenera or to a new genus; Mr. W. F. Kirby has very kindly examined them for me, and from his description, which I give above, it is very evident that it agrees exactly with none of Wesmael's genera, but still it comes very near to Exochilum, and I think it will be far better to stretch that genus than to make a fresh one for it. The principal differences are that the forehead is not cornuted, the apex of the clypeus widely emarginate instead of truncate, and 2nd joint of hind tarsus is proportionately longer.

Campoplex rugulosus, Foerst.


I have a specimen of this species bred by Mr. F. Norgate from Trachea piniperda.

Campoplex unicinctus, Holm.


I have seen two specimens of this species from Mr. E. A. Fitch; and I have one given to me by Mr. G. T. Porritt, which he took at Doncaster in May, 1884.
Campoplex trisculptus, Holm.

L. c., 39, 18, ♂, ♀.

Mr. Porritt sent me this species, taken at the same locality and time as the former species.

? Campoplex tenuis, Foerst.


Mr. Fitch sent me three specimens of Campoplex which I believe to be this species, and I have two in my own collection.

Campoplex punctatus, n. s.

Abdominis medio rufo; pedibus maxima ex parte nigris. ♂.

Mesopleura smooth between the punctures; vertical ridge behind front coxae indistinct; 3rd segment of abdomen convex below and without a lateral black streak. Face dull, pubescent, and finely punctate; mandibles in the middle widely yellow; palpì black; forehead finely granular, without keel; head behind the eyes oblique. Thorax: mesonotum rather coarsely but not deeply punctate; interstices reticulate; scutellum keeled laterally beyond the middle, with rather large and somewhat scattered punctures; interstices reticulate; metanotum shining, rugose, forming a network, somewhat obliterated above; supero-medial area distinctly defined within; costa long; mesopleura rather coarsely and somewhat closely punctate; interstices almost free from any markings; disc aciculate; the vertical ridge behind front coxae scarcely perceptible; sides of metathorax finely rugose.

Abdomen: 1st segment slender, gradually tapering from base to apex, widest just before the apex, spiracles slightly projecting, segment reticulate; 3rd segment about two-thirds the length of the 2nd, convex below; abdomen dull and pubescent; apex of 2nd segment obscurely castaneous; 3rd red, fuscous at base above, and without the lateral black streak; 4th red, with a vertical black bar in the middle, running from the lower margin almost to the centre of the back; sometimes the apical half of 4th segment is entirely black, sometimes the whole segment is red, and sometimes the apical half of the 2nd segment is red, and the 3rd entirely so. Legs black, front one partly palish red; middle tibiae pale brownish
Mr. Bridgman's *additions to T. A. Marshall's* red; middle tarsi brown. Wings: base, squamula, stigma, and nervures brown; areolet petiolated; recurrent nervure received before the middle; transverse anal subgeniculated about one-third from the bottom; no emitting nervure. Male. Length, 9.5 mm.

Taken by Mr. Harwood.

*Campoplex costulatus*, n. s.

Abdominis medio rufo; pedibus maxima ex parte flavis; fronte costata. ♀.

Third segment of abdomen not concave beneath, with a lateral black streak; interstices of mesopleura reticulate; vertical ridge behind front coxae very fine. Face dull, rough, not distinctly punctate, pubescent; mandibles yellow; palpi pale red; forehead dull and granular, with a prominent central keel, and radiating from the base of the antennae five or six prominent costae extending about half the distance to the anterior ocellus; sides of head behind the eyes oblique. Thorax: mesonotum finely punctate, interstices reticulate; scutellum margined to the apex, punctate, punctures rather large and scattered, interstices almost smooth; metanotum somewhat shining, upper part with faintly impressed punctures, lower part transversely rugose; sculpture not prominent; supero-external area distinctly defined within, area dentipara scarcely defined below, depression in the middle moderate; sides of metathorax punctate; mesopleura moderately punctate, interstices reticulate; disc longitudinally aciculate; behind the front coxae a fine vertical line.

Abdomen: 1st segment slender, tapering from the middle to the apex, widest part just before the apex; spiracles not prominent; 2nd and 3rd segments of equal length; 3rd segment slightly convex below; abdomen somewhat finely pubescent and punctate; 2nd segment clear red, apex above and lateral streak black; 3rd clear red, with a lateral streak just below the level of the spiracle; 4th red, apex black; ventral segments the same colour. Legs yellow; base of front and middle coxae brownish red; front and middle femora inclining to red; hind coxae, trochanters, femora, black; base and apex of hind tibiae and hind tarsi brownish. Wings: base and squamulae reddish yellow; stigma brownish red; nervures brown; areolet very shortly petiolated; recurrent nervure received before the middle; transverse anal almost straight, obscurely divided not far below the middle; emitting nervure almost indistinct. Male. Length, 11 mm.

One specimen taken by Mr. Harwood.
Campoplex femorator, n. s.

Abdominis medio rufo, pedibus rufo nigroque variis, femoribus posticis apice rufis. ♂, ♀.

Mesopleura with the interstices between the punctures faintly reticulate, with a distinct vertical costa behind the front coxae; the lower margins of the 3rd abdominal straight. Forehead with a vertical ridge; face punctate, pubescent; forehead reticulate, dull, obscurely punctate, behind the eyes somewhat oblique; mandibles yellow in the middle; palpi of male yellow, female brown. Thorax: mesonotum finely punctate, interstices reticulate; scutellum margined at the base only, punctate, interstices reticulate; metanotum shining, irregularly rugose, not coarsely so, much smoother above than below; supero-external area not closed below; area dentipara clearly defined, except above depression, in the middle not deep; mesopleura moderately punctate, interstices very finely reticulate, almost shining; a distinct vertical ridge behind the front coxae.

Abdomen: 3rd segment almost straight beneath; in the female the 2nd segment a little longer than the 3rd, in the male the 2nd one-third longer than the 3rd; female: apex of 2nd and the 3rd segments darkish chestnut, the latter obscure at the apex and base of lower margin; 4th obscurely chestnut laterally at the base; male: apical half of the 2nd, all the 3rd, and basal half of 4th segments red, the latter black above; 2nd and 3rd segments with a lateral black streak; the coloured segments of both sexes the same colour beneath, the abdomen smooth and shining, post-petiole with rounded sides; aculeus of female rather more than one-third the length of the 1st segment. Legs, female: front pair red, coxae and trochanters black; middle pair red; coxae, trochanters, and basal half of femora black; hind pair black; knees and middle of tibia deep chestnut. Male: front and middle pair yellow; base of coxae black, and greater part of femora red; hind pair, coxae, trochanters, and basal half of femora black; apex of femora red; tibiae yellow, extreme base, apex, and tarsi chestnut. Wings: areolet rhomboidal, petiolated, petiole about the length of one-third the distance from the radial nervure to the recurrent discoidal nervure, which joins the areolet just before the middle; transverse ordinary nervure not interstitial; transverse anal divided below the middle at one-third from the lower nervure, which runs beyond the transverse anal nervure; squamulae of male yellow, female black; stigma red, nervures dark. Male and female. Length, 19 mm.

I have seen several specimens from Mr. Harwood, of
Mr. Bridgman's additions to T. A. Marshall's

Colchester, who could not give the host they were bred from or the locality; also a female from Mr. Bignell, taken in Devonshire.

Thymaris fasciatus, n. s.

Thymaris is one of Foerster's subgenera of Campoplegoidae; it is a subdivision of Cymodusa: wings without an areolet, and post-petiole with a transverse depression. Foerster has described no species of the genus, and the only described species I know of is one by Brischke, which has pale legs.

Niger, abdomen rufo fasciato.

Head subbuccated; eyes finely pubescent; behind the eyes not oblique; space between the eyes and the base of the mandibles about equal to the width of the mandibles; apex of clypeus rotundate; teeth of mandibles of equal length; face moderately pubescent. Supero-medial area of metathorax pentagonal, rather wider than long; lateral areas imperfectly divided, the lower half with fine transverse rugae; supero-medial area not completely closed behind; postero-medial area transversely rugose, very slightly depressed in the middle; mesopleura opaque, finely punctate, towards the front finely rugose; disc smooth and shining. First segment of abdomen slender; petiole about half the width of the post-petiole, which is nearly twice as long as wide; sides parallel; just behind the middle is a distinct transverse depression; the 2nd segment twice as long as wide; 3rd rather longer than wide; the remainder transverse; abdomen finely pubescent. Legs slender. Wings without an areolet; transverse anal nervure not divided.

Black; middle of mandibles red; front legs pale red; coxae, base of trochanters, and base of femora black; middle legs the same colour, but the black a little more extensive, and apex of tibiae and apex of tarsi brownish; hind legs black; apex of trochanters, middle of tibiae, calcaria, and extreme base of tarsi, palish red. Abdomen with a red band at the apex of the 2nd segment, and a band below the middle of the 3rd segment, not extending to the apex, and obscure indication of a similar band on the 4th segment. Base of wings pale; squamulae black; stigma pale brown. Male. Length, 7 mm.

A single specimen was taken by Mr. Thouless in Norfolk in 1884.
Sagaritis punctata, n. s.

Niger; pedibus rufis coxis et trochanteribus posticis nigris, tibiis posticis albo-annulatis.

Subopaque; head transverse, somewhat oblique behind the eyes; face slightly pubescent; antennae filiform, slightly attenuated at the abdomen, as long as the head, thorax, and first two segments of the abdomen; teeth of mandibles of equal length; a slight groove between the clypeus and the face; apex of clypeus strongly pointed. Mesonotum opaque; metanotum rather short, rounded, areae more or less distinct; supero-medial area wider than long, obtuse at the apex, opaque, reticulate, with almost obsolete transverse striations; mesopleura somewhat shining, finely reticulate; disc smooth and shining. Abdomen elongate-ovate, almost cylindrical in the male; petiole of 1st segment about the same length as the post-petiole and about one-fourth the width of it, the latter subquadrate or a little longer than wide, sides almost parallel, more slender in the male; 2nd segment of female about one-third longer than wide, 3rd quadrate; 2nd of male nearly twice as long as wide, 3rd longer than wide, apical segments somewhat compressed; aculeus a little longer than the 1st segment, and slightly curved. Legs slender. Areolet of wings regular, as broad as long, petiolated; recurrent nervure in or a little before the middle; external radial nervure slightly curved; transverse anal nervure divided below the middle.

Black; palpi red; mandibles in the middle yellow or piceous; legs red, coxae and base of hind trochanters black; apex of anterior coxae sometimes red; hind tibiae white, base and apex black; an oval red mark at the extreme base above; hind tarsi black, basal half and calcaria white. Tegulae yellow. Stigma fuscous. Male and female. Length, 5.5 mm.

The cocoon is opaque, pearly white, with a faint band before each end.

Bred by Mr. W. Cross, of Ely, from Plausia orichalcea, April 19th, 1885.

Sagaritis laticollis, Holm.


One specimen of this insect was bred by Mr. Bignell, he believes from the larva of M. typica, obtained by Mr. Peter Inchbald from the People's Park, Hull, May, 1884.
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Sagaritis postica, n. s.

Nigra, pedibus rufis, basibus nigris. ♀.

Head subbuccated; face quadrate; mandibular teeth of equal length; a subdistinct ridge running from just in front of the base of the mandibles upwards and outwards towards the eyes, but not quite up to them; apex of clypeus produced into a distinct spine. Mesonotum obsoletely trilobed; supero-medial area of metathorax hexagonal, longer than wide, not distinctly closed behind; lateral area divided; mesopleura opaque; disc smooth and shining; the remainder partially aciculate, most distinctly so in front of the disc; a deep strongly defined depression running from anterior margin of mesopleura half across the surface, rises from just below the level of base of front coxae. Post-petiole of 1st segment of abdomen quite three times as wide as the petiole, longer than wide, sides subparallel, the widest part between the spiracles; 2nd segment one-third longer than wide; 3rd longer than wide; aculeus as long as the 1st segment. Wings: areolet petiolated; recurrent nervure received before the middle; transverse anal nervure geniculated, one-third from the bottom; emitting nervure all but absent.

Black; mandibles and palpi yellow; base of wings yellow, squamulate white; stigma pale brown; legs red, coxae black; trochanters yellow; greater part of 1st joint black; base of 2nd joint of hind ones, as well as extreme base of hind femora, slightly fuscous; middle of hind tibiae yellow, before the base within a faint brownish stain; last joint of all the tarsi darker than the rest; belly yellow, with a lateral fuscous spot increasing in size from before backwards. Female. Length, 7 mm.

One female taken by Mr. Harwood in the neighbourhood of Colchester. The colour of the legs easily distinguishes it from any species I am acquainted with.

Limneria pedella, Holm.


Both sexes of this insect have been taken by Mr. G. C. Bignell in Devonshire.

Limneria coxalis, Brischke.


Both sexes of this very distinct species have been met with by Mr. Harwood, of Colchester; and the male has
been bred by Mr. E. A. Atmore from larvae taken in the neighbourhood of Lynn; host uncertain.

*Limncria ramidula*, Brischke.


Both sexes of this *Limncria* were bred from *Retinia pinivorana*, taken near King's Lynn by Mr. E. A. Atmore in June, 1885.

*Limncria tripunctata*, n. s.

Niger, pedibus rufis, coxis et trochanteribus nigris; aculeo segmento primo paulo longiore, post-petiolo subgloboso scrobiculis tribus dorsalibus.

Head transverse, rather oblique behind the eyes; face transverse, with fine white pubescence; teeth of mandibles subequal; antennae a little more than half the length of the body. Thorax subopaque; lateral area of metathorax obsoletely divided; supromedial area as long as wide, sides parallel, not closed behind, posterior surface not depressed; mesopleura subopaque, with very fine transverse striations. Abdomen as wide as the thorax and a little longer than the head and thorax; aculeus about one-third the length of the abdomen; 1st segment moderate; petiole about as long as the post-petiolo, and about one-third the width; post-petiolo with rounded sides and three distinct pits at its base; 2nd segment as long as wide; remainder transverse, pubescent at the sides; apex of the 4th segment the widest. Areolet of wings petiolated; external radial nervure slightly curved outwards; transverse anal not divided. Legs rather slender.

Black; palpi and mandibles pale reddish yellow, base and apex of latter dark. Legs red; coxae and trochanters black, extreme apex of latter reddish; extreme apex of hind tibiae nigro-fuscous, base of latter reddish; apex of middle tarsi fuscous. Tegula yellowish white; stigma stramineous. Female. Length, 5 mm.

Taken at Peckham by Mr. T. R. Billups in May.

The three pits in the post-petiolo readily distinguish this from any other *Limncria* I am acquainted with, although the same character is found in two other insects belonging to the allied genera of *Casinaria* and *Suguritis*, viz., *C. scnicula*, Gr., and *S. incisa*, m.
Limneria variabilis, n. s.

Nigra, pedibus rufis, coxis et trochanteribus nigris, tarsi et tibiis posticis apice et ante basin fuscis, femoribus sape plus minusve fuscis apud nigris, aculeo dimidii abdominis longitudine.

Somewhat shining; head transverse, rather wider than the thorax, slightly oblique behind the eyes; face not wider than long, wider above than below; margin of eyes scarcely indented opposite the antennae; margin of elytral widely rotundate, with a lateral depression; face punctate, clothed with white pubescence; antennae of male about five-sixths the length of the body, rather shorter in the female. Thorax about one-third longer than high; mesonotum reticulate, with fine scattered punctures; metathorax shining, finely reticulate; lateral area subdivided; supero-medial area pentagonal, longer than wide, sides somewhat parallel, not closed behind; mesopleura opaque, finely reticulate, interspersed with fine somewhat scattered punctures; disc smooth and shining. Abdomen of male subcylindrical, female fusiform; 3rd segment the widest, somewhat shining, finely reticulate; apical margin of segments smooth and shining, covered rather closely with fine white pubescence; 1st segment about as long as hind coxae and trochanters; petiole rather stout, a little longer than the post-petiole, which is about twice as wide as the petiole or a little more, sides generally somewhat rounded; 2nd segment of female a little longer than wide, male about one-third longer than wide; gastrocoeli distinct; 3rd segment of female transverse, of male subquadrately aculeatus rather less than half the length of the abdomen. Areolet of wings wide, subsessile or petiolated; recurrent nervure received beyond the middle; transverse anal nervure subgeniculated, but with no emitting nervure. Legs moderate; base of claws of tarsi finely pectinated.

Black; middle of mandibles obscurely yellow or piceous; tegulae pale piceous or yellow. Stigma fuscous, varies in depth of colour. Legs vary much in colour from red; coxae, middle and hind trochanters, black; hind tarsi fuscous; coxae and trochanters black; base of middle femora and hind femora almost entirely nigro-fuscous; middle and hind tibia, apex and before the base, and apical half of joints of hind tarsi, dark brown. Male and female. Length about 4 mm.

Bred by Mr. W. H. B. Fletcher from Gelechia notatella, Wicken, June, 1886.

This comes very near to L. combinata, Holm., but has the stigma of a different colour.
Mesochorus pictus, Brischke.
This handsome insect has been taken by Mr. Harwood in the neighbourhood of Colchester; its proper place in Holmgren’s table is C. b. It has the pro-, mesothorax, and scutellum red; face pale yellow; sides of thorax partly pale yellow and partly red; the third and following segments of the abdomen widely yellow at the apex; legs pale, a black streak on the hind coxae above; apex of hind tibiae and tarsi dark. Length, 6 mm.

Mesochorus dorsalis, Holm.
Holm., Mon. Oph. Succ., 120, 6, ♂, ♀.
This fine species has been taken by Mr. Bignell in the neighbourhood of Plymouth.

Mesochorus stigmaticus, Thoms.
This was given to me by Mr. W. Cross, of Ely, and probably came from that neighbourhood; and was bred by Mr. F. Norgate from Orgyia antiqua.

Mesochorus plagiatus, Thoms.
Bred by Mr. Bignell from Odontopera bidentata in 1882.

Mesochorus tachypus, Holm.
Bred by Mr. W. Cross from E. Knautiata. I have also two which Professor Thomson returned as doubtful M. tachypus.

Mesochorus laticeps, Thoms.
Bred by Mr. W. H. B. Fletcher from Gelechia notatella from Wicken Fen, June, 1885.

Mesochorus crassicrus, Thoms.
Bred by Mr. W. H. B. Fletcher from the same host as M. laticeps.

Mesochorus incidens, Thoms.
Taken by Mr. J. E. Fletcher. Female.
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Mesochorus graniger, Thoms.
This species I considered *M. festinus*, Holm.; it was bred by Mr. Bignell from *Abraxas grossulariata*, hyper-parasitic on *Exorista vulgaris*, F.

Mesochorus tenuicornis, Thoms.
Taken in the neighbourhood of Norwich.

Mesochorus temporalis, Thoms.
Bred from *Z. filipendulae* by Mr. Bignell in 1878.

Mesochorus convexicollis, Thoms.
I had considered this species *M. complanatus*, Hal.; it seemed to me to agree exactly with Holmgren's description of that species, and from Thomson's description I fail to see the difference; he gives the length of his species as 4 mm. The two females I have taken are 3 mm. long.

Mesochorus fuscicornis, Brischke.
This Thomson considers to be *M. pectoralis*, H.; but in my bred specimens the hind coxae are generally more or less piceous, a point not mentioned by Holmgren, Thomson gives the length as 5 to 6 mm.; mine do not exceed 4 mm.

I sent all my specimens of *Mesochorus* to Professor Thomson, at his request, and these new species were named by him. He has written a monograph of the genus, which has just appeared in the 'Annales de la Société Entomologique de France,' 1886, 327.

Thersilochus marginatus, n. s.
Niger, segmento secundo rufo marginato, aculeo segmento primo breviore.
Head behind the eyes slanting backwards at the sides; head and thorax subopaque, finely punctate; clypeus distinctly separated from the face; apex widely rotundate. Antennæ rather long; flagellum 26 joints, 1st joint rather more than twice as long as
wide, no joint quite quadrate. Thorax but little longer than high; metathorax slightly coarser than the rest of the thorax; supero-medial area about twice as long as wide: postero-medial area divided into three spaces; lower half of mesopleura finely rugose, upper half smooth, with rather scattered punctures. First segment of abdomen slightly curved; post-petiole nearly twice as long as wide, sides somewhat convex; the 2nd segment about as long as wide; the abdomen moderately compressed. Aculeus about two-thirds the length of the 1st segment. Legs moderate; hind tarsi longer than the tibiae. Radial nervure almost straight, but decidedly incurved towards the base; transverse anal not divided.

Black; scape and mouth reddish; legs red, hinder coxae black. Abdomen: apical margin of 2nd and side of remaining segments castaneous; stigma and nervures dark. Female. Length nearly 5 mm.

Three females, taken by Mr. Bignell in the neighbourhood of Plymouth, 1884.

**Dicolus insectator**, Foerst.


Mr. E. D. Marquand has taken at Penzance, in 1883, what I believe to be this species. Foerster’s descriptions are far too short (consisting of only a line or two) to remove all uncertainty.

**Proclitus grandis**, Foerst. ?.


At the end of September I took, in the neighbourhood of Norwich, a female *Plectiscus* which agrees with Foerster’s description of *P. grandis*. These descriptions are contained only in a short table. It also agrees with Brischke’s description of his *Proclitus grandis*, Foerst. ?.

**Mesoleptus gracilis**, Holm.

Holm., Mon. Tryph. Suec., 108, 8; Suppl., 375, ♂, ♀.

I have taken a *Mesoleptus* at Horning Ferry, Norfolk, which I believe to be this species. Mr. G. T. Porritt has also sent me the same insect; they are females, and
have the hinder coxae greater part dark brown. Holmgren makes no mention of this, but says the male often has the hind coxae black above, and the face is not entirely yellow, but has the clypeus that colour, and a broadish band is continued upwards on either side of the face by the eyes.

Mesoleptus scutellatus, n. s.

This insect belongs to Holmgren's division B. **, but differs from any I can find described in having the scutellum and post-scutellum yellow.

Niger, abdominis medio, pedibusque rufis, coxis intermediiis et posticis nigris, scutello post-scutelloque flavo.

Head transverse, sides oblique, slightly rounded; clypeus widely rotundate; face finely punctate, as is the forehead; vertex almost smooth, with only rather scattered hair-pits; antennae longer than the body. Parapsides distinct; central lobe with fine rather scattered punctures; lateral lobes almost smooth; metathorax smooth and shining, with no trace of area. Spiracles of 1st segment of abdomen situated in the middle, about as long or a little longer than the hind coxae and trochanters; 2nd and 3rd segments longer than wide; 5th the widest; abdomen subclavate, about three times as long as the width of the apex. Legs thicker than usual, more like a Tryphon; last joint of hind tarsi twice as long as the 4th. Transverse anal nervure of wings, post-furcal, divided above the middle; the external radial slightly incurved; areolet petiolated; recurrent nervure received almost at the apex.

Black; mouth, clypeus, and face yellow, the latter with a triangular black central mark on the upper part; antennae red; scape below yellow, fuscous above; tegulae and tubercles whitish; scutellum and post-scutellum yellow; 2nd, 3rd, and 4th segments of abdomen red; legs red; trochanters yellow; coxae black, the front ones yellow at the apex; base of wings yellow; stigma dilute fuscous. Female. Length, 8.5 mm.

I took this insect at Horning Ferry, Norfolk, on June 29th, 1882. By the stoutness of the legs it might pass for a Tryphon, but the 1st segment of the abdomen is too slender.

Mesoleptus marginatus, n. s.

Niger, facie macula flava, pedibus rufo flavis, coxis et femoribus posticis nigris. ♂.

Head transverse, sides slightly sloping backwards behind the
eyes; face and forehead punctate; apex of clypeus rounded, sides slightly incurved. Antennæ rather shorter than the body, filiform. Thorax shining, finely punctate; scutellum, seen sideways, appears keeled to the apex; metathorax smooth and shining, without area. Abdomen not quite so wide as the thorax; 1st segment rather slender, longer than the hind coxae and trochanters; spiracles in the middle, nearly four times as long as the width of the apex; 2nd and 3rd longer than wide; 4th quadrate. Last joint of hind tarsi a little longer than the 4th, and but slightly curved. Head and sides and metathorax covered with white pubescence. Areolet of wings petiolated; recurrent nervure received almost at the apex; external radial but very slightly incurved; transverse anal opposite, divided just below the middle.

Black; mouth yellow; apex of mandibles red; spot on each side of clypeus, an oblong blotch on each side of the face, and scape beneath yellow. Legs: coxae black; trochanters yellow, marked with black, especially the hind pair; front and middle femora, tibiae, and tarsi, yellowish red; middle femora fuscous behind, hind femora black; hind tibiae yellowish; apex fuscous-red; hind tarsi pale fuscous. Abdomen black; extreme apex of 2nd segment red; lower margin of 3rd faintly red; extreme margin of 5th, 6th, and 7th pale; abdomen pale beneath. Male. Length, 8 mm.

I captured this at Brundall, near Norwich, May 9th, 1881.

Euryproctus sinister, Brischke.


I took a female of this species near Norwich middle of September, 1879. I have also seen one taken by Mr. Bignell in Devonshire. Mr. J. E. Fletcher has bred both sexes from Eriocampa varipes. The male agrees exactly with the female, except that it has the mouth and face yellow, and the abdomen has the apex of the 1st segment narrower. Mr. Fletcher says one of his has the areolet of the right wing imperfect; Brischke says his has the left wing with an imperfect areolet. Probably specimens may be found without an areolet at all.

Euryproctus varicornis, Gr.

Gr., ii., 325, 211, ♂; Thoms., Opusc. Ent., 927, 5, ♂, ♀.

I took a male at Wimbledon, in Surrey, July, 1881. This species is very like defecticus, but differs in having
the head less oblique behind the eyes, the 1st segment of the abdomen wider, and base of hind femora red.

**Euryproctus minutus, n. s.**

Niger, abdominis medio rufo, pedibus antieis rufis, postieis nigris, tibiis rufis apiee nigro, facie, coxis et trochanteribus antieis, flavis maculatis.

Head transverse, a little wider than the thorax, behind the eyes sides parallel; antennae as long as the body. Thorax punctate; parapsides distinct, extending to beyond the middle of the meso-notum; metanotum finely rugose; superior area of metathorax, 5 distinct; supero-medial area converging in front, not closed behind, continuous with the postero-medial. Abdomen a little longer than the head and thorax, thinly pubescent; the 1st segment petiolated; spiracles distinct, placed a little before the middle; petiole cylindrical, two and a half times as long as wide; post-petiole tapering, three times as wide at apex as at the base, nearly twice as long as the apex, not canaliculate; 2nd segment rather wider than long. Legs moderate. Wings without an areolet; external radial nervure scarcely incurved; transverse anal divided in or a little below the middle.

Black; mouth, clypeus, cheeks, face except a central black line, front coxae, front trochanters greater part, tegula, a spot before, a line beneath the wings, and marks on sutures of mesopileae, yellow. Abdomen red; 1st segment black; a dorsal mark on the middle of the 2nd segment, 4th more or less, and remaining segments fuscous; apex paler. Front and middle legs red; middle femora fuscous behind; hind legs black; hind tibiae red, apex fuscous-black. Stigma fuscous.

**Var.** Face with two spots by the side of the orbits, on each side of the clypeus, and two spots on the cheeks yellow, the yellow coxae black at the base, the yellow marks on the thorax less distinct, those on the mesopileae absent.

**Male.** Length about 5 mm.

Two males taken at Brundall, near Norwich, May, 1882.

**Grypocentrus bipunctatus, n. s.**

Niger, capite rufo maculato, pedibus postieis ex parte fuscis.

Face transverse; clypeus distinctly separated by an impressed line from the face; apex subtruncate, margin depressed; middle of face produced; lower tooth of mandibles rather longer than the upper one; base of mandibles almost touching the eyes; sides of head
behind the eyes somewhat oblique; antennæ as long as the body; head subopaque, very finely punctate. Thorax longer than high, subopaque, very finely punctate; mesonotum rather distinctly trilobed; scutellum triangular and elevated; metathorax opaque, finely punctate; 5 superior areæ indistinctly defined; supero-medial area pentagonal, longer than wide; mesopleura shining, almost absolutely punctate. Abdomen ovate, shining, quite as wide as the thorax; apex of 3rd segment the widest, about as long as the head and thorax; 1st segment petiolated; spiracles just beyond the middle; post-petiole gradually tapering from base to apex, the latter wide, nearly four times as wide as the middle of the petiole; a small oval depression in the middle; remaining segments transverse, with rather scattered white pubescence; aculeus slightly projecting, turned upwards. Legs moderate. Areolet of wings sessile; external radial nervure slightly curved; transverse anal nervure divided a little below the middle.

Black; mouth, mandibles, greater part of elytrous, a short line on each side of the face just above the antennæ, and a round spot behind the eyes above, and base of antennæ beneath, fulvous-red; antennæ fuscous; abdomen obscurely piceous, margins not pale. Legs fulvous; coxae black, apex of front pair pale; hind femora piceous; apex of hind tibiae and tarsi black, base of latter red; apex of front and middle tarsi fuscous. Tegulae pale; stigma dilute fuscous. Female. Length, 3.5 mm.

One female taken at Wimbledon, Surrey, July, 1880.

*Rheustus lativentris*, Holm.


A female taken in the neighbourhood of Norwich the end of May, 1882.

These two species belong to *Grypocentrus*, Ruthe, which genus Thomson has divided into three genera, this and the next two.

*Grypocentrus incisulus*, Ruthe.

Holm., Mon. Try. Suec., 184, ♂, ♀.

A small *Tryphon*, which I took to be this species (Trans. Ent. Soc. Lond., 1882, 158), Prof. Thomson says is the closely-allied *G. albipes*, Ruthe, or a new species.
Lathrolestus angularis, Thoms.

Thoms., Opuse. Ent., 918.

This species I thought was Grypocentrus clypeatus, Zett. Prof. Thomson says it is the above species.

Prionopoda glaber, n. s.

Niger, abdominis medio rufo, pedibus anticus rufis, coxis trochanteribus et pedibus posticus maxima ex parte nigris, facie feminis flava.

Smooth, shining, impunctate, with only hair-pits, except the face, which has shallow somewhat scattered punctures; pubescent; apex of clypeus subrotund; lower tooth of mandibles longer than the upper; head somewhat tumid, not so much so as in P. stictica; sides of head scarcely oblique; antennae as long as the body; 2nd joint of flagellum twice as long as the 1st in the female, more than twice as long in the male. Thorax: parapsides scarcely indicated; scutellum hardly elevated; mesopleura punctate; disc smooth; metanotum with three distinct superior areas; supero-medial area elongate, somewhat bulging in the middle, most frequently closed behind; postero-medial generally with a central longitudinal keel. Abdomen of female elongate-ovate, apex of 3rd and 4th segments the widest; the male subcylindrical, 2nd, 3rd, and 4th of equal width, about one-half longer than the head and thorax; female about as wide as the thorax, male narrower; 1st segment of both sexes the same length, subpyriform; spiracles not projecting, the apex about three times as wide as the base; petiole gradually tapering; in the male the segment is about two and a half times as long as the width of the apex, in the female four times; the segment is more slender in the female than in the male, very slightly curved; 2nd and 3rd longer than wide; 4th transverse. Legs somewhat slender; claws with short not close pectinations. Wings with a petiolated somewhat oblique areolet; external radial nervure curves first slightly outwards and then inwards; transverse anal nervure divided below the middle about one-third from the bottom.

♀. Black; mouth and face yellow; flagellum pale beneath; abdomen red; 1st segment black, apical segments dusky. Legs: coxae and trochanters black; front and middle femora red, paler at the apex, dusky at the base; front and middle tibiae and tarsi yellow; last joint of middle tarsi dusky; hind legs black; apex of trochanters, extreme base of femora, and basal half of tibia and
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1st joint of tarsi, yellowish red. Wings smoky; stigma fuscous; tegula yellowish, piceous at the base.

The male differs from the female in having the face and antennae black, hind legs entirely black, and tegulae piceous. Abdomen: 2nd, 3rd, and 4th segments red; 2nd sometimes with a dusky spot on the back.

Male and female. Length about 9 mm.

Norwich, end of July, 1879.

I believe these are the two sexes of the same insect, although the colour of the face is the reverse of what is generally the case; usually the male has the yellow face, and the female black.

Phrudus, n. g.


This insect is very peculiar. I can find nothing described like it. In general appearance it is not unlike a small Phygaedon, but the pectinated claws and the antennæ clearly take it from this genus; the pectination of the claws is like that of the genus Paniscus, whilst the antennæ are like those of Thersilochus, and, viewed sideways, it resembles this latter, but the shape of the head, form of the areolet of the wings, as well as the arrangement of the costa on the metathorax, will prevent its being placed in this genus.

Thomson thinks its proper place is in the Tryphonidae, and should come under his Ctenopelmidae; I am indebted to him for the suggested names.

Phrudus monilicornis, n. s.

Niger, pedibus rufis, coxis nigris.

Head shining and smooth, seen from above subquadrate; antennæ not longer than the head and thorax; joints of flagellum moniliform, joints scarcely quadrate, the last one conical, twice as
long as wide, 16 in number. Thorax smooth and shining, no parapsides, rather longer than high; metathorax short; area 5 complete; supero-medial are equilateral triangle in female, hexagonal in the male, closed behind; postero-medial hexagonal; wing large in comparison to insect. First segment of abdomen linear, but little broader at the apex than at the base, nearly four times as long as wide, with a central furrow; spiracles not projecting; remaining segments transverse, 3rd the widest in the female, 3rd and 4th of equal width in the male; base and apex of equal width, as wide or a little wider than the thorax in the female, the same width as the thorax in the male; aculeus about one-third the length of the 1st segment. Legs rather stout; claws strongly pectinated. Areolet of wings pentagonal or subpentagonal; recurrent nervure received almost in the middle; transverse anal not divided.

Black; legs palish red, coxae black; scape of antennae brownish red; tegulae and stigmas brown. Male and female. Length, 3·5 mm.

Taken by Dr. Capron at Shiere, who has kindly given me the female.

*Perilissus triangulatus*, n. s.

Abdominis medio rufo, pedibus posticis maxima ex parte nigris, facie flavo maculato.

Subopaque; head transverse, rather wide behind the eyes, side of head behind the eyes parallel in the female, wider behind than in front in the male; antennae as long as the body; 1st joint of flagellum one-third longer than the 2nd; clypeus not separated from the face, apex widely rotundate, slightly elevated; lower tooth of mandibles rather longer than the upper; mandibles somewhat thickened, face transverse, eyes not touching the mandibles by the width of the base of the latter, face closely and distinctly punctate as in *P. filicornis*. Mesonotum finely and closely punctate, slightly trilobed in front; scutellum scarcely elevated, margined at the base only; mesopleura finely punctate, with glistening white pubescence; a distinct perpendicular costa behind the front coxae; metathorax finely rugose; supero-medial area subdistinct, elongate, or entirely absent. Abdomen subclavate, scarcely petiolate; spiracles placed before the middle, one-third from the base; petiole about as broad as long, slightly narrowed at the base; post-petiole longer than wide, a little wider at the apex than at the base, more the shape of *Mesoleius* than *Perilissus*, scabrous, apex smooth; a distinct canal runs almost to the apex.
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without prominent keels; remaining segments transverse; the 2nd of the male subtransverse; acenlux just projecting. Legs somewhat slender; calcaria of hind tibiae one-third the length of the 1st tarsal joint. Areolet of wings small, suborbicular, petiolated; outer nervure sometimes incomplete, external radial straight, incurved at the extreme apex; transverse anal almost opposite, divided below the middle, one-third or one-fourth from the bottom.

Black; mouth, mandibles, clypeus, and a triangular mark on each side of the face below the antennae and scape beneath, reddish yellow in the male, and reddish in the female; base of flagellum reddish (female), beneath in the male. Abdomen dull red; female apex of 5th, 6th, and 7th entirely black, male 2nd, 3rd, and 4th paler red; remainder black. Front and middle legs red; coxae and trochanters black, apex of latter pale; hind legs black; hind tibia fuscous-red, base and apex female, apex male, black. Stigma fusco-stramineous, base paler, squamulae whitish. Male and female. Length, 9 mm.

Taken by Mr. Billups at Peckham and Dulwich, May 30th, 1885

Mesoleius caninae, n. s.

Niger, pedibus rufis, tibiis et tarsi posterioribus nigris.

Head finely reticulate, transverse, slightly oblique behind the eyes; clypeus separated from the face, apex truncate, depressed in the middle. Antennse as long as the body. Thorax rather short and stout, parapsides distinct; mesonotum somewhat shining, finely and rather closely punctate; meseopleura smooth and shining, without sculpture; upper part of metathorax rather short; supero-medial area distinct, the superior surface separated from the posterior surface by a prominent transverse ridge; postero-medial area large, well-defined, shining, and finely reticulate. Abdomen short and broad, as wide as the thorax, and scarcely more than three times the length of the width of the apex of the 2nd segment, which is the widest part; 1st segment gradually widening from base to apex, sides slightly curved outwards, about one-third longer than the width of the apex; basal fovea not closed at the apex, but continued in two well-developed keels to beyond the centre of the post-petiole; remaining segments transverse; the 2nd and 3rd about twice as wide as long; abdomen subopaque, reticulate; apical segments rather smooth and shining. Legs rather stout. Wings without an areolet; transverse anal nervure, ante-furcal, i.e., the upper termination, nearer the thorax than the lower, divided below the middle.
Mr. Bridgman's additions to T. A. Marshall's

Clypeus, mandibles, scutellum, and post-scutellum reddish yellow; legs red, hind tibiae and hind tarsi black; abdomen of female has the last segments with a thin pale apical margin; the male has the apex of 1st and 2nd segments obscurely pale. Male and female. Length, 5—5'5 mm.

I bred a single male and female from the larvae of the pear-tree sawfly, *Eriocampa canina*, taken from a garden in Norwich, which has since unfortunately been built upon. In general appearance the insect, as to size and shape, is not unlike *Erromenus frenator*; legs rather more slender.

*Erromenus (Trichocalymma, Foerst.) plebejum*, Wolds.


Taken by Mr. T. R. Billups at Dulwich, June 11th, 1885.

*Acrotomus xanthopus*, Holm.


Mr. J. E. Fletcher took this near Worcester in 1873, at the end of October.

*Bassus bizonarius*, Gr.

Gr., I. E., iii., 350, 23, ♂.

A specimen of this *Bassus* was taken by Mr. Billups at Peckham, May, 1885.

*Bassus scutellaris*, n. s.

Abdominis medio rufo, dorso nigro-maculato; scutello flavo, pedibus flavis, areola nulla.

Forehead smooth and shining; antennae slender, about the length of head and thorax; apex of clypeus truncate; the middle of the clypeus has three longitudinal depressions, which occupy nearly the whole area of it; the centre one is narrow like a furrow, the lateral ones are about as broad as long; a distinct triangular elevation runs down the face from the base of the antennae to the clypeus, as wide as the antennae above, terminating in a depression above the clypeus. Thorax smooth and shining, with indications of scattered punctures; supero-medial area of metathorax complete, longer than wide. First segment of abdomen long and slender; petiole quadrate, rather wider than the post-petiole, and about
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one-third longer than it; sides of post-petiole almost parallel, apex rounded, margins keeled, and an oblong pit in the centre, shining, with somewhat coarse irregular aciculations; remainder of the abdomen smooth and shining; base of 2nd segment between the distinct thyridii coarsely aciculate, extending one-third the length of the segment (this is nearly twice as long as wide), the 3rd sub-square, the remaining ones transverse. Legs slender. Wings without an areolet; transverse anal nervure divided in the middle.

Mouth, apex of clypeus, elevation of face, greater part of base of antennæ beneath, squamulæ, tubercles, base of wings, scutellum, yellow. Legs, coxae, and trochanters yellow; base of posterior joint of hind trochanters fuscous; rest of legs yellowish red; apex of hind tibiae and apical joints of hind and middle tarsi slightly fuscous. Stigma dilute fuscous. Abdomen: apex of 2nd segment, the 3rd, 4th, 5th, and 6th chestnut-red, with a large dorsal black mark at the base, occupying almost all the back of the segment. Male. Length, 5 mm.

Taken by Mr. Bignell in the neighbourhood of Plymouth in 1884.

Bassus abdominator, n. s.

Niger, macula parva media faciei, et scutello apice, flavo; pedibus rufis, tibiis posticis maxima ex parte tarsisque posticis nigris, meta-thorace, segmentis primo et secundo abdominis rufo maculato.

Head opaque, finely punctated; apex of clypeus rotundate, slightly immarginate in the middle, distinctly separated from the face. Antennæ about two-thirds the length of the body. Metathorax without a trace of supero-medial area; the lateral angles of the metathorax terminate behind more prominently than usual, giving the upper part a square appearance, but transverse. Abdomen longer than the head and thorax. First segment of abdomen about one and a half times longer than wide, slightly tapering from behind the projecting spiracles to the apex of the segment; remaining segments transverse, compressed towards the apex; 1st segment opaque, scabrous, with indications of longitudinal aciculations; 2nd segment transverse, scabrous, at the base with a deep transverse depression on each side, and between them a shallower longitudinal groove, distinctly aciculated; remaining segments subopaque. Wings without an areolet; transverse anal nervure divided below the middle.

Black; mouth and greater part of mandibles yellow; apex of scutellum with a transverse yellow line; base of wings, tubercles, and squamulæ yellow. Metathorax with a large dull red spot on.

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each side. First segment of abdomen dull red, with a black central blotch; 2nd the same, but central blotch larger. Legs red; base of front coxae black, apex of coxae and trochanters yellow, apex of middle trochanters yellow; hind tarsi black; hind tibiae black, extreme base whitish, merging through dull red into the black. Stigma somewhat pale brown, extreme base pale. Female. Length, 6 mm.

One female taken by Mr. G. C. Bignell near Plymouth in 1884.

_Ephialtes strobilorum_, Ratz.


Mr. Bignell bred both sexes from _Coecyx strobilorum_, end of May and beginning of June.

_Pimpla nigriceps_, Tasch.

Tasch., l. c., 260, 24, ♂.

Mr. Thouless took a _Pimpla_ which agrees with this species in general coloration and structure, but is only 5 mm. instead of 11 mm., the size given by Taschenburg; this is not of much consequence, as many of the species of _Pimpla_ vary much in size. In this specimen the metathorax and breast are black; the transverse anal nervure is divided a little below the middle.

Taken at Drayton, 1885.

_Glypta ceratites_, Gr., ? var.

Mr. W. H. B. Fletcher has bred about forty specimens of a _Glypta_ which Prof. C. G. Thomson says is this species. In every specimen the same coloration of the legs exists, viz., legs red, coxae black, sometimes base of trochanters, hind femora at the knees, base and apex of hind tibiae and hind tarsi fuscous, extreme base of joints of latter more or less pale; abdomen varies from incisions reddish to apex of 1st, 2nd, and 3rd segments somewhat widely red. Except for the coloration I am unable to detect any structural difference. The true _ceratites_ has the extreme base of hind tibiae pale or whitish. These were bred from _Euclromia flammeana_.

from Rannoch. I have also received the same species from Mr. A. F. Griffith from Sunderland.

_Glypta parvicornuta_, **n. s.**

Niger, pedibus rufis, tibiis posticis apice et ante basin fuscis, basibus pallidis, fronte subcornuta; aculeo abdominis longitudinie.

Punctate; head oblique behind the eyes; antennae more than half the length of the body; clypeus very thinly pubescent; forehead somewhat coarsely and closely punctate; a minute horn above the antennae. Mesonotum distinctly trilobed in front; areas of metathorax complete; mesopleura punctate; supero-posterior surface smooth and shining; 2nd and 3rd segments of abdomen longer than wide, keels on 1st distinct, extending to the middle; aculeus as long as the abdomen, claws pectinated. Wings without areolet; transverse anal nervure divided about one-fourth from the bottom.

Black; clypeus pale; legs red; base of hind tibiae pale, apex and before the base fuscous; hind tarsi fuscous; base of joints pale; tubercles and tegulae pale; stigma palish brown.

One female bred by Mr. E. A. Atmore; host unknown.

It is very like _ceratites_ and _consimilis_ in general appearance, but differs in having the forehead more coarsely punctate, and in having a much shorter horn than _ceratites._

_Glypta similis_, **n. s.**

Niger, pedibus rufis tibiis posticis basi pallidis, apice et ante basin fuscis, aculeo abdominis longitudinie.

Punctate; head wider than long; pubescence on clypeus long and dense; forehead coarsely punctate; antennae of male not quite so long as the body, of female about two-thirds the length of body; head behind the eyes oblique, sides somewhat rounded; areas of metathorax distinct and complete, shining; lateral areas with somewhat scattered punctures; medial area almost without any punctures; keels of abdomen somewhat distinct, indications of them extending two-thirds the length of the segment; 2nd and 3rd rather wider than long; aculeus about as long or a little longer than the abdomen, claws pectinated. Wings without an areolet; transverse anal nervure divided about one-fourth from the bottom.

Black; clypeus yellow; flagellum fuscous above, rufous beneath; abdomen black, incisions reddish; legs red; base of hind tibiae whitish, apex and before the base fuscous; hind tarsi fuscous; base
of joints pale; squamulae pale yellow; tubercles pale piceous; stigma pale testaceous. Male and female. Length, 9.5 mm.

Bred by Mr. W. H. B. Fletcher from *Ephippiphora scutellana*, Worthing.

Very like *G. consimilis*, but the head is wider, forehead coarsely punctate, clypeus densely pubescent, and stigma paler.

*Glypta trochanterata*, n. s.

*Glypta trochanterata*, n. s.

Niger, pedibus rufis, trochanteribus posticis nigris, tibis posticis basi pallidis, apice et ante basin fuscis, abdomine rufe cingulato, aculeo abdomenis longitudine.

Punctate; head behind the eyes oblique; antennæ of male as long as the body, of the female one-fourth less than the length of the body; forehead not cornuted, with rather scattered punctures; metathorax without or with faint indications of areae. Second and 3rd segments of abdomen transverse; keels on the 1st segment distinct only at the base; aculeus about as long as the abdomen. Wings without an areolet; transverse anal nervure divided below the middle about one-fourth from the bottom; claws with a few coarse pectinations.

Black; apex of clypeus piceous; abdomen with a distinct red band at the apex of 1st, 2nd, and 3rd segments; legs red; hind trochanters entirely, front and middle ones sometimes more or less, black; base of hind tibiae whitish, apex and before the base dark; hind tarsi dark; base of joints pale; squamulae pale yellow; stigma dilute fuscous. Male and female. Length about 6.5 mm.

Norwich, middle of June; swept off Ling.

Size and shape of *G. lineata*, Des., but has the thorax and hind trochanters entirely black, areae of metathorax less distinct, and transverse anal nervure divided further below the middle; the clypeus of *lineata* is densely pubescent also, as in this species. This is the insect I thought at first was a black var. of *G. lineata*, Trans. Ent. Soc. Lond., 1884, 433; but I have taken several of both sexes this year, and find the above differences persistent, and I believe it to be a good species.

*Lissonota leptogaster*, Holm., ♂♀.

Mon. Pimp. Suec., 55, 18, ♂.

I have taken near Norwich a *Lissonota* male which agrees exactly with the description of the above. Last
autumn I again met with several males, and with them a female, which is exactly like the male, except that the yellow marks on the face and thorax are absent; the aculeus is very short, about the length of the 1st segment of the abdomen, in this respect similar to Holmgren’s short description of the female of *L. caligata*. I do not feel at all certain that they are not one and the same species; Gravenhorst only described the male, and Holmgren was the first who found the female for it, and it is not impossible that he may be mistaken, and that his female *caligata* is really the female of *leptogaster*.

**Lissonota brachycentra** Gr.

Gr., I. E., iii., 56, 30, ?.

Head and thorax punctate, interstices finely reticulate; superior surface of metanotum not separated by a transverse ridge; abdomen very finely transversely aciculate, with indistinct indications of punctures; 2nd and 3rd segments rather longer than wide; transverse anal nervure divided below the middle, but this varies; it may be about one-third from the bottom or rather nearer to the middle. Aculeus about as long as the 1st segment of the abdomen.

Black; inner orbits with a narrow yellow line, this shorter in the female than in the male; clypeus, mandibles, and palpi reddish yellow, more red and less in extent in the female; mesonotum of male with two small yellow spots in front against the parapsides; base of wings, squamae, and tubercles yellow; stigma pale testaceous; abdomen reddish brown, incision of 2nd segment and sometimes back of base of 3rd paler; legs red; greater part of hind tibiae and hind tarsi slightly fuscous. Male and female. Length about 7 mm.

This insect is very much like the previous one (*L. leptogaster*), but differs in the following particulars: the abdomen is decidedly brown, not black, and the transverse ridge on the metathorax is absent; in *leptogaster* the squamae are red and the stigma brown, and the transverse anal nervure is divided almost at the bottom; the face of the only female I have taken has not the yellow line. I know of the description of only two species of *Lissonota* with aculeus as long as the 1st segment; the one is Holmgren’s *L. caligata*, and Thomson’s *L. genalis*, which is much like the former, but has a yellow mark on the cheeks, and hind knees blackish. Several specimens of
both sexes were bred by Mr. Harwood, of Colchester; host and locality uncertain. Mr. Bignell has also bred a female from Anticlea badiata.

Lissonota rufomedia, n. s.

Niger, pedibus rufis, trochanteribus posticis nigris, tibiis posticis fuscis; capite thorace scutelloque flavo ♂, rufo ♀, notato; aculeo abdominis longitudinal.

Finely reticulate; head punctate; face transverse, rather wider than the forehead; head transverse, oblique behind the eyes; antennae of female as long as the body, male a little longer. Mesonotum punctate; mesopleura punctate, with a few punctures on the upper part of the disc, which is subopaque; metathorax longer than wide, subrugosely punctate, the punctures larger and less close than on the mesonotum, with a slight longitudinal depression. Abdomen: 1st segment more than twice as long as wide, more slender in the male than in the female, and proportionally longer, longitudinally depressed in the female, not so in the male; the whole abdomen of the female with very fine somewhat transverse striations; apical segments shining and almost free from sculpture; 2nd and 3rd segments distinctly longer than wide. Male: 1st segment at the base transversely striated; apical two-thirds with rather coarse somewhat scattered punctures; remaining segments subopaque, punctate; apex of abdomen pubescent; 2nd and 3rd segments distinctly longer than wide; 4th quadrate; aculeus as long as the abdomen. Legs slender. Wings with an areolet, which varies from subpentagonal to a petiolated triangle; outer nervure sometimes very faint; transverse anal nervure divided below the middle one-third or one-fourth from the bottom.

♀. Black; palpi, part of mandibles, and clypeus reddish; an obscure pale spot on each side of the vertex, an obscure reddish line on the side of the prothorax, and a spot in front of the wings; middle of the scutellum with a transverse red blotch, often absent; apex of first three segments thinly red. Legs red; hind trochanters blackish, front and middle ones more or less so; hind tibiae fuscous, slightly reddish in the middle; hind tarsi fuscous. Tegulae piceous; stigma fuscous.

♂. Differs from the female in having the mouth, clypeus, facial orbits, and a spot on each side of the vertex, marks on anterior sutures of pleuræ, a mark on shoulders, a line beneath the wings and lateral marks on the scutellum, greater part of front and middle coxae (these sometimes blackish at the base), front and middle
trochanters (these sometimes black marked), and squamulæ, yellow bind coxae and trochanters black, sometimes yellow at the apex.

Male and female. Length about 7 mm.

Bred by Mr. W. H. B. Fletcher from Eudora murana, Rannoch; Crambus contaminellus, Worthing; and Eudora mercurella, Worthing.

The scutellum of the female is often entirely black, and all the yellow marks are sometimes all but absent in the male; one male has the yellow spots replaced by red ones. I sent this species to Prof. C. G. Thomson, and he returned it as L. biguttata, Holm., or what he considered that species. I think it cannot be Holmgren's species, because he says that the segments after the 1st are somewhat wider than long, whereas in this species the 2nd and 3rd are decidedly longer than wide; and besides, Holmgren makes no mention of the black hinder trochanters. These two points are present in over forty specimens of both sexes which have been bred by Mr. Fletcher.

Lissonota nitida, n. s.

Abdominis medio, pedibusque rufis, trochanteribus posticis nigris, aculeo abdominis longitudine.

Somewhat shining; face and forehead finely punctate, interstices reticulate, between the antennæ smooth and just above finely rugose; head transverse, behind the eyes oblique; antennæ about as long or a little longer than the body, filiform, not attenuate at the apex; apex of clypeus rounded. Mesonotum not trilobed, finely punctate, interstices almost obsolutely reticulate; mesopleura the same, reticulations more distinct; a few punctures on disc; metathorax somewhat finely rugoso-punctate, slightly depressed in the middle. First segment of abdomen about two and a half times as long as the width of the apex, with fine transverse aciculations; 2nd rather longer than wide; 3rd rather wider than long, almost free from sculpture (with strong magnifying the same sculpture may be seen as on the 1st); aculeus about as long or a little longer than the abdomen. Areolet of wings triangular, narrow, and subsessile; transverse anal nervure opposite, divided one-fourth from the bottom.

Black; apex of clypeus pale yellowish. Apical one-fourth of 1st segment of abdomen, 2nd, 3rd, 4th entirely, bright red. Legs red; hind trochanters black, anterior ones fuscous; apex of hind tibiae and tarsi slightly dusky. Cocoon thin, white, and semi-transparent. Female. Length about 6.5 mm.
One female bred from *Botys asinalis*.

Like *L. bellator* and *commixa*, but stouter and more glabrous, especially the abdomen, which is differently sculptured.

**Lissonota subaciculata**, n. s.

Abdominis medio, pedibusque rufis, coxis fusco-nigris, segmento primo apice aciculato, aculeo corporis longitundine.

Head and thorax punctate, interstices finely aciculate; apex of clypeus rotundate; head transverse, sides behind the eyes oblique; antennæ shorter than the body, filiform. Mesonotum not trilobed; mesopleura shining, finely and rather closely punctate; disc shining, with very few scattered punctures; metathorax transversely rugose in the middle, punctate at the sides, slightly depressed in the middle; apical costa distinct. Abdomen shining; 1st segment longer than hind coxae, transversely depressed before the apex, towards the apex aciculate; 2nd and 3rd segments longer than wide, absolutely reticulate, not punctate; aculeus as long as the body. Areolæ of wings petiolated, about as long as wide; transverse anal nervure divided one-third from the bottom. Legs moderate; base of claws of hind tarsi slightly pectinated.

Black; apex of clypeus yellow; also base of wings and tegulae; apex of 1st segment of abdomen and all of 2nd., 3rd, and 4th red, the latter with a narrow black band before the apex. Legs red; coxae black, red at the apex; hinder pair dull red, black at the base; trochanters black; hind tibiae duller than the femora; middle and hind tarsi reddish brown. Stigma fuscous, slightly paler at the base. Female. Length, 7 mm.

One female sent to me by Mr. W. H. B. Fletcher.

It comes nearest to *L. Fletcheri*, m., but differs in the length of the aculeus, and in the 2nd and 3rd segments of the abdomen, which are shining and not opaque; the hind coxae partly red.

**Lissonota lineata**, Gr.

Gr., I. E., iii., 82, ♂.

Gravenhorst described four male species of *Lissonota*, which are very much alike in coloration, all having pale dorsal lines on the mesonotum, black coxae varied with yellow, and a fifth species with red coxae varied with yellow, *L. parallela*; of these four species, Taschenburg says *perspicillator* is a var. of *parallela*, and *argiola* and *lineata* are varieties of *bellator*; Gravenhorst says *insignita*
is perhaps the male of *verberans*. Mr. W. H. B. Fletcher and Mr. G. T. Porritt have bred six females and four males from *Crambus contaminellus*; the males agree exactly with *L. lineata*, Gr., and the females are exactly coloured as the males, except that all have black coxae, not varied with yellow, and one male also has no yellow on the coxae, but the other three are variegated with yellow: the yellow marks on the female are less distinct than in the male, and none of the former have any yellow marks on the abdomen; the whole ten have the sides and apex of the scutellum and a line on the post-scutellum yellow; this species is the only one of four in which Gravenhorst gives the post-scutellum yellow-marked. The 2nd and 3rd segments of the abdomen are a little longer than wide; in a male which I take to be *insignita* the 2nd and 3rd segments are much longer than wide (about one-third). Not one of the ten exhibit any trace of red on the thorax, as in *parallela*, of which this was considered a variety, and also the coxae are differently coloured. The aculeus is as long as the body. The description of *lineata* is very like that of *perspicillator*, and whether they are only varieties I am unable to say.

*Lissonota carbonaria*, Holm.

Holm., Mon. Pimp. Suec., 54, 15, ?.  
Mr. W. H. B. Fletcher has bred a female *Lissonota*, which I believe is this species, from a *Tortrix* pupa found at Abbott's Wood, Sussex.

*Schizopyga circulator*, Panz.

*Ichneumon circulator*, Panz., Faun. Fase., 79, tab. 12;  
*Schizopyga tricingulata*, var. 2, 3, Gr., I. E., iii., 129, 69, ♂; *S. analis*, Gr., l. c., 130, 70, ♀;  
*Ichneumon circulator*, Gr., l. c., 10, 59.

The Rev. T. A. Marshall sent me the male and female of the above insect, and referred me to Gravenhorst's copy of Panzer's description, from which there is no doubt but that Panzer's *I. circulator* is the same insect that Gravenhorst described as *S. analis*, nor is there any doubt but *S. tricingulata*, vars. 2 and 3, is its male: so *S. circulator*, Panz., must supersede *S. analis*, Gr.

[Read August 4th, 1886.]

In the 'Entomologist's Monthly Magazine' for October, 1885, I published a short account of certain experiments made with beans infested by Bruchus rufimanus, Boh. These experiments, however, were carried out upon so small a scale that I did not feel justified in drawing any definite conclusions as to the true extent of the injury caused by the beetle. In the spring of the present year, therefore, I instituted an investigation upon a larger scale, and now beg to lay before the Society the results which I have obtained.

In the first place, I may perhaps be permitted to give a brief résumé of my last year's experiments. These were conducted with seed of a variety of broad bean recently introduced by Messrs. Carter & Co., of High Holborn, and entitled by them the "Leviathan," in consequence of the great size often attained by the pods. The packet which I received being only a small one, I sowed but twenty seeds, three of which had each been perforated by three weevils, five by two, and twelve by one only. In about a fortnight the young plants appeared, seemingly in no way injured by the damage wrought to the seed. The growth for a time was strong and vigorous, no sign of weakness or disease could be detected, and the condition of the plants, until the time for flowering arrived, was all that could be desired. With the reproductive impulse, however, came a change. Notwithstanding the apparent health of the plants, the blossoms were few and small, the foliage rapidly withered, and in several cases the plants died without producing a single pod.

The first three plants, grown from seed perforated by three weevils, were very unproductive, one being altogether barren, while the remaining two bore but three pods between them, none of which attained to maturity. The next five, raised from seed tenanted in each case by...
two weevils, bore in all six pods, of which five came to perfection; two of these plants, however, were barren. The remaining twelve, the seed of which had sustained but one perforation, produced twenty-three pods, of which not more than ten arrived at their full size. Only one of these latter plants, however, was altogether unfruitful. The twenty plants thus bore among them thirty-two pods (six to a plant being with this variety considered the normal number), and even of these barely one-half attained to their full development. That the seed itself was not in any way deficient, apart from the injury caused by the beetles, was sufficiently proved by the fact that the plants raised from the remainder, which were free from the weevil, yielded an average crop. I therefore concluded that the presence of the Bruchus in the seed, although only in exceptional cases affecting the germinating powers, was yet highly prejudicial to the reproductive capabilities of the adult plant. I also found that, with one exception, the plants raised from weevilled seed were altogether passed over by Aphis rumicis, which attacked almost every other bean-plant in the garden, and destroyed at least one-third of the entire crop before it was fit for gathering. From this I inferred that the sap of the weakened plants was of too deteriorated a character to be suitable for Aphis nourishment. I have since found reason to modify the former of these conclusions in some cases, and in some degree.

Before proceeding to discuss results, however, I will specify the conditions under which the second series of experiments were carried on. I procured in all five varieties of infested beans, two of which, the "Leviathan," already mentioned, and the "Seville Longpod," were kindly supplied by Messrs. Carter, who inform me that they have devoted much attention to the possibility of eliminating the damaged from the sound seed. The remaining three varieties consisted of the well-known "Early Mazagan," and of two more belonging to the longpod section.

From the packets supplied to me I selected the damaged beans, and sorted them out in accordance with the number of perforations sustained by each. Towards the end of March I planted them in well-dug and thoroughly-manured ground, under the most favourable conditions for their subsequent development. Of the
Bruchus-infested Beans.

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whole number of seeds sown not more than three or four failed to germinate. Three, however, gave rise to plants entirely devoid of colouring-matter, which grew to the height of five or six inches only, produced a few yellowish-white leaves, and then withered away. The plants proceeding from the remainder, however, were to all appearance strong and healthy, rapidly increased in size, and showed no sign whatever of weakness or disease. But, just as in the first instance, the show of blossoms, when in due course they appeared, told a different tale, and it became evident that in most cases the reproductive powers were seriously diminished by the presence of the weevil in the seed. Several plants were altogether barren; others boasted of no more than one or two small flowers; while scarcely five per cent. of the whole number could be credited with the average yield.

Contrary to my expectations, however, I could not find that the produce of the individual plants was proportionate to the number of perforations sustained by the seed. One plant, for instance, the seed of which was tenanted by no less than six weevils, nevertheless bore nine pods, of which seven arrived at maturity. On the other hand, several raised from seed attacked by one beetle only were barren. So little rule was there in this respect, indeed, that I was compelled to relinquish my original intention of classifying the plants according to the number of perforations sustained by the seed, and to content myself with ascertaining the whole number of pods produced by each variety, and striking an average therefrom by dividing the result by the number of plants.

The distribution of the pods was briefly as follows:—

The plants of No. 1 variety (Carter's "Leviathan") were 86 in number, four of the 90 seeds originally planted having failed to germinate. These 86 plants produced 480 pods, of which 201 shrivelled away almost immediately. Six pods, as before stated, form the normal yield in this variety. In the diseased plants, however, taking only the developed pods into the account, the average number was rather less than three and a half. At the same time, as if to falsify all deductions, one plant, the seed of which had been tenanted by three weevils, bore no less than ten mature and two immature pods; just double the ordinary number.

Of variety No. 2 (Carter's "Seville Longpod"), I sowed
67 seeds. The plants which resulted produced among them 270 pods, of which no less than 127, or nearly one-half, shrivelled away while quite small and immature. The yield per plant, therefore, barely exceeded two pods, as against a normal average of six or seven.

Of variety No. 3 (Longpod) 51 seeds were sown. Of these three failed to germinate; the remainder bore in all 218 pods. Exactly fifty of these 218, however, failed to develop, and thus the average yield of mature pods was slightly more than four to each plant, the normal average again being seven.

Of variety No. 4 (Longpod) 45 seeds were sown. The plants raised from these bore 204 mature and 55 immature pods, an approximate average of four and a half to each. The normal average in this variety is again seven.

Of variety No. 5 ("Early Mazagan"), 44 seeds were sown, none of which were perforated by more than two weevils. The plants resulting from these seeds, all of which germinated in due course, produced 359 pods, of which only nineteen failed to arrive at maturity. The average yield to each plant, therefore, was as nearly as possible eight pods; the normal number.

Judging, therefore, by the criterion of the average number of pods produced, this latter variety was the only one which remained practically unaffected by the damage caused to the seed; being by far the most robust, this fact is less striking than it at first sight appears. Of the remainder, the two longpod varieties (Nos. 3 and 4), which are tolerably hardy in constitution, were each deprived of nearly one-half their reproductive capabilities, the "Leviathan" (No. 1) of almost exactly one-half, and the "Seville Longpod" (No. 2), perhaps the most delicate of all, of rather more than two-thirds.

Another and a still more striking fact, however, has yet to be recorded, namely, that with the exception of those borne by the "Early Mazagan" plants, more than one-fourth of the pods, although large and healthy in appearance, proved upon examination to contain nothing more than the withered germs of the beans which they should have enclosed. In as many more, one or at the most two, perfect beans were found, while in scarcely fifty pods altogether were the contents fully developed in both size and number. Several pods, again, were
aborted in a very curious manner, but this may possibly have been due to other causes. The appearance of these unproductive pods may be seen by the coloured sketches which I now exhibit, and which were most carefully drawn to scale from accurate measurements.

The total produce, therefore, of four out of the five varieties experimented upon was so greatly diminished as to leave no possible ground for doubt that the presence of the weevil in the seed is highly detrimental, affecting to a very considerable degree the reproductive powers of the future plant. At the same time, we have the curious fact that the number of weevils present, whether one, two, three, four, five, or even six, appears to influence but slightly the health of the plant and its produce, the mischief being apparently caused by the mere presence of the weevil, almost irrespective of its numbers in any individual case. It is also remarkable that certain of the diseased plants—if diseased we may justly term them—bore even more than the normal number of pods. This latter fact would seem to point to the conclusion that the amount of damage sustained by infested seed depends in some measure upon the position of the burrow. If the germ itself be penetrated the seed must necessarily be rendered sterile; and it is not impossible that the nearer the burrow is situated with regard to the germ the greater is the consequent injury. This point I hope to clear up in the course of future experiments.

It would also be both interesting and instructive to sow uninfested seed produced by diseased plants in order to ascertain whether the injury is transmitted in any degree to the second generation. This experiment I should myself have attempted, but that I was informed by Messrs. Carter that seed-beans of the more delicate varieties will not ripen in the English climate, but are principally imported from Southern Spain. And, as these varieties are those which suffer most severely from the presence of the beetle, I judged it useless to attempt the experiment with the more robust varieties only.

With regard to the aversion manifested by *Aphis rumicis* for the sap of the weakened plants, the almost total absence of the insect in this neighbourhood during the present season afforded me no opportunity of making further observations upon the subject. I found specimens,
however, upon three or four plants of the "Leviathan" variety which had resulted from seed perforated by from four to six weevils; but these, although they certainly bred, did so in but small colonies, and did not spread to the neighbouring plants.

[Read June 2nd, 1886.]

The species described in the present paper were sent to the Museum for identification, with many other previously named species received at the Godeffroy Museum from collectors in Australia, Fiji, &c. Many of the species, as might have been anticipated, form the types of new genera, but at the same time the appearance of the greater part of them is by no means striking, their colouring being, as a rule, sombre,—of various shades of brown or grey.

All the species here described have been seen by Mr. Meyrick since I wrote the descriptions.

**AGARISTIDÆ.**

**Ægocera, Latr.**

1. *Ægocera cornigera, n. s.*

Allied to *Æ. diversa* (*Agarista diversa*, Walk.), the pattern of the primaries being very similar to that species and to *A. ephyra* (Herr.-Sch., Aussl. Schm., fig. 27), but of a cupreous-brown colour; base white, divided by the veins, two subcostal spots near the base; an oblique abbreviated fascia immediately below the second subcostal spot, and below it again an elongated spot on internal border; a large quadrate spot crosses the discoidal cell towards its extremity, and below it is an oblique irregular interno-median streak; between the latter and the internal spot previously noted is a small internal dot; beyond the cell is a broad almost 3-shaped fascia, and near the external angle a cuneiform spot; at about apical fourth is a subcostal dot; an abbreviated series of seven dots crosses the disc almost parallel to the outer edge of the 3-shaped fascia, and is followed by a regular submarginal series alternating with a series of quadrate spots on the fringe; all these markings are milk-white; secondaries nearly as in *Æ. bicolor*, ochreous, with a dark or cupreous-brown spot across the end of the cell, and
an irregularly sinuated external border of the same colour; fringe white, ochreous at base and spotted with brown, in the male only towards apex, in the female throughout; head and thorax white, the antennæ, a spot on the head, the front of collar, shoulders, two longitudinal stripes on the thorax, and an oblique stripe on the tegulae brown, a short horny process, flattened and truncated in front projecting from the frons; wings below much as above, but the primaries pale ochreous at the base so as to cover the subbasal spots of the upper surface, the white dots across the disc wanting, palpi white with an oblique lateral black dash and black terminal joint; body below pale ochreous, legs partly brown above, the tarsi barred with white; venter barred with brown. Expanse of wings: male, 29 mm.; female, 37 mm.

Male, Gayndah; female, Peak Downs.

The singular frontal process possessed by this species occurs in a much less highly developed condition in *A. diversa*, and therefore I do not think it sufficient of itself to constitute a character of generic value.

**LITHOSIIDÆ.**

**MILTOCHRISTA, Hüb.**

2. *Miltachrista similans*, n. s.

Size and aspect of *Nepita conferta* (male), excepting in the absence of any dark border to the secondaries; allied to *Miltachrista (Barsine) placens* from Timor and Ceram; primaries above grey, crossed by five series of ochreous markings, the first across the base semicircular, the second forming an interrupted angulated band across basal third and consisting of four somewhat oval spots in pairs, the third consisting of three nearly equidistant spots in an angular series across the middle of the wing; the fourth begins with an oval costal spot, below which is a sinuous series of seven small spots only divided by the nervures; the last consists of three unequal angulated spots on outer margin; fringe ochreous; a series of black marginal dots partly impinging upon the fringe; secondaries pale ochreous, slightly deeper towards external border; body ochreous; thorax reddish, spotted with slaty black; under surface more salmon-tinted than above, markings on the primaries obliterated excepting on the borders; legs barred with dull greyish black. Expanse of wings, 32 mm.

Rockhampton.

To any one who neglected to examine the neuration in new species this would appear to be a *Nepita*
(Liparidae); that *Nepita* really belongs to the latter family has been proved to me by Mr. F. Moore.

**Cyptasia, Walk.**

The following species belongs to a genus which has been referred to the *Lithosiidae*; its structure appears to indicate some affinity to the Micro-Lepidoptera; nevertheless, for the present it may stand where it has been placed.

3. *Cyptasia cristata*, n. s.

Somewhat nearly allied to *C. egregiella*, but smaller; primaries bronze-brown, flecked with cream-colour and with seven unequal but nearly equidistant spots round the borders of the wing; three costal, the third being a mere narrow oblique dash, one external and three internal; fringe yellow opposite to the white spots; secondaries bright salmon-orange, with a few greyish scales at apex; head sulphur-yellow, crested; antennæ pale bronze-brown, with white basal joint; thorax dark brown, white-spotted behind; abdomen salmon-coloured; under surface salmon-coloured, the primaries greyish, especially towards apex; fringe alternately brown and sulphur-yellow as above. Expanse of wings, 20 mm.

Gayndah.

Until such genera as *Themiscyra*, *Cyptasia*, &c., have been carefully reared, and their actual affinities satisfactorily ascertained, their great resemblance to typical genera of *Lithosiidae* will always tend to raise a doubt as to their actual distinctness from that family; characters offered by the imago alone are, as already shown in the case of the various genera formerly associated under *Acronycta*, not always reliable; and for this reason (if for no other) all families erected upon the structure of the imago alone should be regarded with disfavour by lepidopterists: there cannot be a question that the Micro-Lepidoptera ought to be distributed among the larger moths, and that the sole reason for which the fathers of Entomology associated them was their usually small size; yet it has been difficult in some cases for the most careful students to decide to their own satisfaction whether they had before them a *Deltoid* or a *Tortrix*, a *Noctua* or a *Tinea* (these names are applied in their wide signification, of course); even the most confident workers have, after describing a species as a
Mr. Butler's descriptions of Lepidoptera-Micro-Lepidopteron, come to the conclusion that it should have been placed amongst the Noctuites.

Xanthodule, n. g.

Form of Setina (S. ramosa); general aspect of Eubaphe, neuration most like Eudule, but that of the primaries quite distinct; costal vein terminating at third fourth of the margin, subcostal five-branched, the first three branches emitted before the end of the cell, fourth and fifth branches emitted from the anterior angle of the cell, forking from a long footstalk; disco-cellulars inangled; upper radial emitted from the anterior angle of the cell immediately below the last subcostal branch; lower radial emitted close to the third median, having the appearance of a fourth median branch; second and third median branches emitted near together but at some distance beyond the first, the latter running obliquely almost to the external angle, almost joining the submedian vein at its extremity; discoidal cell of secondaries extending to second-third of wing, the costal margin slightly concave, costal vein running almost to apex, subcostal forked at some distance beyond the cell; disco-cellulars unequally inangled; radial emitted nearer to the median than to the subcostal vein so as to appear like a fourth median branch, it and the second and third median branches being about equidistant; first median branch a little further apart; body slender, the thorax rounded, the abdomen extending slightly beyond the anal angle of secondaries; antennae thick at base, tapering, serrate-pectinated; palpi wanting.

4. Xanthodule semiochrea, n. s.

Primaries pale greyish brown, with an ill-defined paler oblique sinuous transverse central band; secondaries ochreous, with the apex and an ill-defined streak from it along the outer margin dark brown; head white, collar tinted with ochreous, thorax greyish white, abdomen whitish; primaries below smoky brown, with a narrow tapering whitish apical border; secondaries below as above; legs (probably the palpi) and venter ochreous. Expanse of wings, 18 mm.

Peak Downs.

LIPARIDÆ.

Chionophasma, n. g.

Aspect of Porthesia, but with more thinly scaled wings, comparatively smaller secondaries, and very different neuration; primaries elongate-ovate, the costal margin only slightly convex,
apex rounded, outer margin slightly convex, very oblique, continuous with the inner margin, which is also slightly convex; the neuration of all the wings utterly unlike that of any of the white-coloured genera of Liparidae; costal vein of primaries terminating at about the third fourth of costa; subcostal five-branched, the first branch emitted before the end of the cell, and the four others form a long footstalk; of these four short branches the first and fourth start almost from the same point, but from opposite sides of the vein, the first running to costa, the last to outer margin, and the intermediate pair form a short fork to apex; upper radial emitted from the anterior angle of the cell, lower radial from the posterior angle, where it appears as a fourth median branch; discocellular veinlet inangled; median branches nearly equidistant; secondaries short, subpyriform; costal vein running to apex; discoidal cell short, not reaching the middle of the wing; subcostal vein forked from a long footstalk at one-third the distance between the cell and outer margin; discocellular extremely slender, inangled; no radial vein; second and third median branches emitted from a short footstalk; head and thorax clothed with woolly hair; palpi depressed; antennae short, pectinated; abdomen with a large anal tuft; legs tolerably robust, clothed somewhat sparsely with long silky hairs.

In the branching of the subcostal nervure of the primaries, the forking of the subcostal and median veins of secondaries, and the total absence of a radial vein in these wings, this genus is most abnormal.

5. Chionophasma paradoxa, n. s.

♀. Wings semitransparent snow-white, with a faint silky gloss; two very slender greyish lines on the fringe; body white, sparsely scaled; abdomen with golden ochraceous anal tuft; under surface coloured as above. Expanse of wings, 32 mm.

Rockhampton.

This species was sent as the female of the succeeding Porthesia, to which, in common with many other Liparidae, it bears considerable resemblance; an examination of the structure would, however, convince the most sceptical that there is no relationship between them.
Porthesia, Steph.
6. Porthesia alicua, n. s.

Primaries sericeous snow-white; costal margin towards the base golden brown; secondaries white, the veins broadly suffused with pale testaceous, giving the wings a creamy tint; thorax white, antennæ with pale brown pectinations; abdomen, excepting at base, yellowish barred with black; anal tuft ochreous; wings below white, slightly yellowish at the borders; basal half of costal border of primaries dark brown; pectus white; palpi and front of anterior legs ochreous, legs otherwise cream-coloured; venter ochreous. Expanse of wings, 30 mm.

Peak Downs.
Allied to P. similis of Europe.

Leptocneria, n. g.

Most nearly allied to Ocneria of Europe (O. rubra), but differing as follows:—Primaries comparatively longer, with more oblique and less regularly convex outer margin; costal vein extending to about the second-third of costa; subcostal with five branches, the first branch emitted considerably before the end of the cell and almost uniting with the second branch at some distance beyond the cell; second branch emitted from the anterior angle of the cell, extending to the apex and throwing off the fourth and fifth branches from its inferior edge; the fifth branch is emitted at some distance beyond the cell and opposite to the point where the first and second branches almost unite; the fourth branch is emitted much nearer to outer margin; the radials are emitted from opposite angles of the cell, the lower radial (as in Ocneria) forming a fourth median branch; disco-cellular concave; median branches almost as in Ocneria; secondaries with the costal margin convex and the subcostal branches emitted from a footstalk; otherwise as in Ocneria; woolly frontal tuft longer; palpi much longer and less hairy; tibial spines of hind legs nearer together; antennæ more strongly pectinated.

7. Leptocneria binotata, n. s.

Whitish grey; primaries with a dusky-marginated white spot just beyond the middle of the cell, and a second reniform spot at the end of the cell; these spots are enclosed between the two usual stripes, which are grey, a little darker than the ground colour; inner stripe slightly irregular, dentated, outer stripe denteate-sinuate,
inarched towards costa, otherwise parallel to outer margin; an ill-defined submarginal macular stripe; fringe dusky spotted with sordid white; secondaries with pale fringe; thorax in front slightly brownish, antennae with ferruginous pectinations; under surface of wings pearl-grey, the borders tinted with golden brown; no markings; pectus whitish; legs and venter pale brown. Expanse of wings, 41 mm.

Peak Downs.

LASIOCAMPIDÆ.

Cosmotriche, Hüb. n. s.

8. Cosmotriche indistincta, n. s.

2. Allied to C. exposita of Lewin,* but paler; wings of a semitransparent smoky grey tint; primaries a little darker than secondaries, with an abbreviated indistinct dusky oblique stripe across the middle of the interno-median area, and traces of a submarginal series of dusky spots upon the veins; head and front of collar blackish, centre of thorax dusky, abdomen brown; antennæ with testaceous pectinations; body below smoky-brown; wings more uniform in tint than above, wholly destitute of markings. Expanse of wings, 32 mm.

Peak Downs.

Pinara, Walk.

This was described as a genus of Arctiidae; the typical species, P. cana, consisted of the females of three species of Walker's genus Entometa, placed by him in the Psychidae; the female of a fourth species was, however, referred to its proper family, and placed in the genus Opsirhina.

9. Pinara rufescens, n. s.

3. Intermediate in character between P. divisa and P. sesioides, but with the secondaries of a uniform rufous-brown tint; primaries with the basal two-fifths to submedian vein and the costal area to lower radial vein reddish chocolate; remainder of the wing pale rufous-brown, sparsely irrorated with cream-coloured scales; a straight transverse creamy yellowish stripe across the basal fifth from costa to submedian vein; a white transverse spot across the end of the cell; a whitish stripe across the middle of the disc, incurved towards costa, lunulated and interrupted by the

* This species was redescribed by Walker under the names of Poecillogaster hebes and P. brevis; Boisduval's Bombyx myceria may be the same moth.
Mr. Butler's descriptions of Lepidoptera-

veins below the lower radial; four small orange spots, externally dotted with black just beyond the discal stripe on the median and interno-median interspaces; external border greyish; body pale rufous-brown, head and collar darker, antennæ blackish; anal tufts tipped with bright reddish chocolate; wings below paler than above, primaries with no stripe across the basal fifth; the disco-cellular spot pure white; the discal stripe abbreviated, not extending below the third median branch, pure white; pectus smoky brown, venter bronze-brown. Expanse of wings, 36 mm.

Rockhampton.

LIMACODIDÆ.

DORATIFERA, Westw.

10. Doratifera ordinata, n. s.

Ochreous; primaries pale, irrorated with the usual shining scales; a pale rust-red subbasal spot; an oblique interrupted series of ill-defined rust-red spots across the middle, and a discal arched series of ten well-defined ferruginous spots parallel to outer margin; tegulae whitish spotted with reddish ochreous; centre of thorax reddish ochreous; under surface pale sericeous-ochreous, costal borders darker; legs ochreous barred with whitish. Expanse of wings, 33 mm.

Peak Downs.

Not near to any species known to me.

NYCTEOLIDÆ.

EARIAS, Herr.-Sch.

11. Earias smaragdina, n. s.

Closely allied to E. chlorana, but the costal margin of primaries shorter and the outer margin consequently less oblique, the primaries of a clearer emerald-green tint, costal border pale pea-green instead of white; no orange margin towards the base of the costa; external border darker green instead of yellowish; secondaries of a less pearly white tint, more or less sordid, especially towards outer margin; head and collar of a yellower tint; under surface of primaries grey excepting at the margins, costal border cream-coloured, external margin greenish; fringe white; secondaries and body below white. Expanse of wings, 11 mm.

Peak Downs.
Heterocera from the Australian Region. 389

COSSIDÆ.

ACRITOCERA, n. g.

Nearest to the S. American genus Langsdoria, but with somewhat the aspect of a Notodout; primaries with the costa nearly straight, apex rounded; outer margin oblique, very slightly convex, rounded off at external angle; inner margin incurved at base, otherwise nearly straight; all the veins separate; costal vein extending to a little beyond the middle of the margin, subcostal five-branched, emitting its first branch at about half-way between the base and apex; a little beyond this the vein runs obliquely downwards and emits its other four branches near together, and at about equal distances apart; upper radial emitted near to the fifth subcostal branch from the end of the cell, having the appearance of a sixth branch; the lower radial also bears a similar relation to the third median branch, the second and third median branches and the lower radial being equidistant; disco-cellular veinlet zigzag, emitting two short recurrent veins; submedian vein slightly curved outwards towards the base; secondaries with long and very slightly curved frenum; costal margin rather deeply sinuated towards the base and convex in the middle; apex rounded; outer margin slightly convex; abdominal margin short, rounded off at anal angle; costal vein nearly straight, very slightly arched, very thick towards the base; subcostal vein slender, slightly arched to end of cell and then straight to apex, simple, its second branch having passed round to the end of the cell and thus become an upper radial; lower or true radial emitted near to the third median branch, thus having the aspect of a fourth branch; disco-cellulars unequally zigzag, emitting one short recurrent vein; third median emitted from the inferior angle of the cell, second branch running close to the main vein for a considerable distance towards the base, first branch emitted near to the base, sinuous towards its origin; submedian and internal veins widely separated; body very robust; head broader than long, with a keeled frontal crest; eyes large and prominent; palpi broad, with closely appressed scales, apical joint deflexed; antennæ reaching to about the middle of costa, broadly plumose in front, disordered, basal joint tufted, thorax broad, less convex than in most Cossidæ above; legs very thick, middle tibæ terminating in a long spur, posterior tibæ with two subterminal and two terminal spurs; abdomen broad, tapering and somewhat flattened, especially towards the anal extremity; anal tuft very small.
12. *Acritocera negligens*, n. s.

Primaries brown, the veins slenderly blackish, the whole of the internervular areoles longitudinally streaked with blackish and dark brown; an oblique pale testaceous stripe beyond the middle; secondaries pale brown; body brown, head and antennae whitish, palpi with blackish terminal joint; wings below pale brown, irregularly mottled with patches of dark brown scales. Expanse of wings, 41 mm.

Viti Islands.

The character of the antennae in this species is so peculiar that it at once arrests the attention; in some respects it resembles that of *Ereuxa (Amphidasiiidae)*, and still more nearly that of *Ptilophora (Notodontidae)*, but the feathering in *Acritocera* is much less orderly, and is confined to one side of the shaft.

LEUCANIIDÆ.

**Leucania, Ochs.**


Pale creamy stone-colour; primaries above with a brown <-shaped marking at base, its upper fork resting upon the median vein, irrorated with black scales, and forming the commencement of a slender dusky median streak, which extends beyond the cell almost to the middle of the disc, but is interrupted at the inferior angle of the cell by a black and white dot; a slender blackish streak along the internal margin, but not extending to the base; fringe slightly greyish, preceded by a marginal series of black points; secondaries semitransparent sericeous-white, with ill-defined greyish apical external border and fringe, tapering towards the first median branch, where it ceases; a white line at the base of the fringe; a short blackish streak on the inner fringe of the tegula; primaries below with marginal black dots and greyish fringe, otherwise without markings; secondaries with six internervular marginal black dots; antennae below ochraceous. Expanse of wings, 29 mm.

Peak Downs.


♂. Primaries above whitish brown, irrorated with black scales; a broad brown longitudinal median streak, divided by a slender white stripe, which runs along the median vein and its third
branch; a creamy whitish longitudinal streak immediately above the median streak; a marginal series of black dots; apex dusky; secondaries silvery white; thorax whitish stone-colour, abdomen white; primaries below and costal border of secondaries creamy whitish, remainder of secondaries pure white, all the wings with marginal black dots; body below white, antennae below dark brown. Expanse of wings, 28 mm.

Gayndah.

15. Leucania scottii, n. s.

Primaries above cream-colour; veins whitish margined on both sides, from the middle of the wing, with ferruginous, internervular folds also indicated by longitudinal ferruginous lines; a broad longitudinal ferruginous streak, enclosing an ill-defined grey stripe, commencing below the median vein, which interrupts it at the end of the cell, where it passes into the upper radial interspace; two black discoidal dots just above the median vein, the second within the inferior angle of the cell; a marginal series of black dots; fringe greyish, paler at the extremities of the veins; secondaries sericeous-white, with greyish external border, especially towards apex, where there are also indications of blackish marginal dots; body white; antennae greyish; primaries below flesh-coloured, with the base and internal area white, secondaries white with flesh-coloured apex; body white, tarsi blackish; venter with lateral black dots. Expanse of wings, 27 mm.

Rockhampton.

16. Leucania cruegeri, n. s.

Vaguely resembles the genus Epimecia; primaries above cream-coloured, the veins from the middle of the wing silvery white, slenderly edged on both sides with greyish brown; the internervular folds also indicated by slender greyish brown longitudinal lines; a broad silvery white longitudinal discoidal stripe edged below with brown; above and beyond this is a cream-coloured stripe, tinted with ochraceous, and running obliquely upwards from the end of the cell to the apex; fringe with two unequal brown stripes; secondaries semitransparent, white, tinted with greyish towards outer margin; fringe white, with a brownish stripe towards the base; thorax white, antennae and abdomen cream-coloured; primaries below shining cream-coloured; secondaries shining white; body below white, anal tuft slightly yellowish. Expanse of wings, 31 mm.

Gayndah.
17. *Leucania alarioides*, n. s.

Primaries above rose-pink, divided in the middle by two broad longitudinal creamy white bands, the upper one passing from outer margin through the upper radial interspace into the cell, where it tapers to a point near the base, sometimes bounded on each side by a dusky streak; lower band filling the median interspaces and continued below the median vein to the base, where it is somewhat abruptly pointed, being bounded by the upcurved submedian vein; fringe white, traversed by two rose-coloured stripes; secondaries sericeous-white, with rose-pink veins; fringe slightly pink at apex; head dull vinous, collar greyish, thorax white, tegulae rose-tinted on the shoulders; abdomen white; wings below shining creamy white; primaries with the veins pink; median area clouded with fuliginous-brown; fringe rosy lilacine; secondaries with rosy costal margin; fringe pure white; pectus silvery white, legs dull rose-colour varied with silvery white, abdomen silvery white, becoming sordid towards anal angle and banded with rosy lilacine. Expanse of wings, 29 mm.

Peak Downs and Gayndah.

This is one of the most delicately-coloured species in the genus, agreeing in tint with some species of *Alaria*.

**Eurypsyche**, n. g.

Allied to *Leucania*, with which it agrees in neuration, excepting that the veins are wider apart owing to the greater width of the wings; antennæ finely ciliated; body more slender than in *Leucania*.


♂. wings above silvery greyish white; primaries pale vinous-brown towards apex of costal border; basal half of costal border, interno-median area, and internal border irrorated with scattered black scales; a central longitudinal brown streak commencing with a blackish line below the median vein (which is white), then passing, as a narrow dark brown streak, immediately above the median vein to the base of the lower radial interspace, where it is interrupted, continued again as a blackish line in the upper radial interspace; an ill-defined flesh-tinted streak in the cell, bounding the upper edge of the central longitudinal streak; a marginal series of black points; secondaries slightly darker towards outer margin; a marginal series of elongated dusky dots; fringe whitish, traversed
by a grey stripe; body white, antennæ pale bronzy brown; primaries below and costal and external borders of secondaries shining pale brown; a marginal series of black dots; remainder of secondaries silvery white; pectus pale brown; venter white. Expanse of wings, 30 mm.

Gayndah.

In general tint and pattern this species much resembles *Leucania lewini*, but the differences of structure will at once separate it.

**CARADRINIDÆ.**

**Caradrina, Ochs.**


Primaries above dull copper-brown, costal border dull whitish brown, bounded below by a diffused blackish streak, which passes through the cell and then obliquely upwards to apex; a zigzag black line across the basal fourth; reniform spot small, outlined in black, and immediately followed by a transverse irregularly undulated black discal line from subcostal vein to inner margin; a series of unequal longitudinal discal black dashes upon the veins, and a marginal series of black dots commencing at outer third of costal margin; fringe grey, spotted with yellowish at the base and flecked with white; secondaries creamy white, with a slender dusky marginal line towards apex, and two greyish spots traversed by a darker line on the fringe; head and front of collar dull whitish; thorax fuliginous-brown; abdomen whitish; primaries below pale shining bronze-brown, the disc in some lights changing to ash-grey; internal area whitish; fringe blackish, with pale basal dots; secondaries pearly white, with a broad costal brown border not extending quite to the base; pectus white; legs and venter pale greyish brown. Expanse of wings, 25 mm.

Viti Islands.

Belongs to the same group with *C. cubicularis*, of Europe.

**Radinogoes, n. g.**

Allied to *Caradrina*, but differing in its narrower primaries and in neuration, which is that of *Hydrilla (H. palustris)*, the subcostal branches and the second and third median branches of the secondaries being emitted from footstalks; the palpi sufficiently distinguish this genus from *Hydrilla*, as they are gently curved upwards and not fringed.
20. **Radinogoes tenuis**, n. s.

General aspect of *Caradrina cubicularis*, but much smaller; primaries cupreous-brown; discoidal area dusky, excepting for a central longitudinal line, on which are two small black spots, indicating the orbicular and reniform spots; a deeply zigzag black line across the basal third, and a very ill-defined curved denticulated line bounded externally by a pale cupreous-brown stripe across the disc just beyond the cell; a marginal series of alternate black and pale cupreous dots; fringe dark grey; secondaries pearly white; veins and a slender marginal line cupreous-brown; apex suffused with pearl-grey; head and thorax cupreous-brown; abdomen white; primaries below silvery whitish; costa and fringe grey-speckled; secondaries pearly white; costa grey-speckled; body whitish brown. Expanse of wings, 21—24 mm.

Peak Downs; Rockhampton.

**COSMIIDÆ.**

**Leucocosmia**, n. g.

General aspect of *Orthosia*, but much paler; allied to *Enargia* (*E. ahluta*), but the primaries narrower, and the antennæ, with the exception of the basal joint, very slender, filiform, tapering.

21. **Leucocosmia ceres**, n. s.

♀. Primaries above pale sericeous sandy brown, almost golden, crossed towards base by three irregularly zigzag stripes formed by somewhat contorted double lines of brown, duller and darker than the ground colour; a transverse brown stripe, dentate-sinuate externally, crosses the wing just beyond the middle; between this and the basal stripes is a black discoidal dot indicating the orbicular spot, and at the end of the cell (bounded internally by the post-median stripe) is a small unciform whitish spot representing the reniform spot; external two-sevenths dusky, darker than the ground colour, bounded internally by a cream-coloured slightly sinuous stripe, beyond which are two parallel darker brown lines; a submarginal trisinuate whitish stripe; a marginal series of minute black dots; fringe creamy white, with dusky brown external edge; secondaries pearly hyaline whitish, the veins and broad diffused external and abdominal borders pale sericeous gold-brown; body pale brown, slightly greyer than the primaries, below whitish brown with golden reflections, markings of the upper surface
almost obsolete; secondaries with an oblique discal series of blackish dashes on the veins; otherwise as above; body below whitish. Expanse of wings, 31 mm.

Viti Islands.

Dysbatus, n. g.

Allied to Cosmia, but with more nearly the coloration of the Homopteridae; primaries triangular; costal vein extending to about third fourth of costal margin; subcostal vein five-branched, emitting its first branch before the end of the cell, its second to fourth at a considerable distance beyond, the third and fourth forming a rather short fork to apex, the fifth emitted from the posterior margin of the main vein a little before the emission of second branch from the anterior margin; the upper radial emitted from the anterior angle of the cell, and the lower radial from about the middle of the disco-cellulars, which form a concave line; median vein swollen and sinuous towards the base; second and third median branches emitted from the same point at the posterior angle of the cell; secondaries subpyriform, the costal and abdominal margins nearly straight, and the outer margin rounded and sinuated; costal vein running close to the subcostal to about the middle of the cell, and thence diverging to apex; subcostal forking from the anterior angle of the cell; radial obsolete, replaced by a slender longitudinal fold from base to outer margin; disco-cellular veinlet inarched; second and third median branches forking from the posterior angle of the cell; thorax broad, rounded; head broad, palpi short, compressed, with sharply defined quadrate fringe at the base, porrect; proboscis long and thick; antennae slender, tapering, internally pectinated; legs long, femora flattened, posterior tibiae broad and flat, abdomen slender, laterally tufted.

22. Dysbatus singularis, n. s.

Primaries above cinereous, tinted with pale brownish towards base and external area; crossed by six black lines, the first subbasal, oblique, the second at basal third curved, the third just before the middle angulated upon the median vein and inarched below it, the fourth crossing the disc like the third, but less strongly angulated, the fifth very irregular, thick, undulated and dentated, limiting the external area, the sixth submarginal, ill-defined, excepting at apex, where it commences with an oblique black dash costal border, excepting at apex, and a spot at the end of the cell, dusky; an interrupted black marginal line; fringe whitish spotted with grey; secondaries greyish white, slightly sericeous, with a
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broad dusky external border tapering to anal angle; fringe greyish white; thorax and base of abdomen cinereous; remainder of abdomen fuliginous-grey, with narrow white segmental bands; under surface sericeous-white, the wings irroration with black-brown scales, especially towards the costal margins; a broad blackish external border, fading to grey towards the externo-anal margins, and with a whitish apical spot; fringes grey, white at base; legs grey-speckled, the tibiae and tarsi almost entirely dark grey.

Expanse of wings, 28 mm.

Peak Downs.

This species bears but little external resemblance to its allies.

PLUSIIDÆ.

Westermannia, Hüb. 

23. Westermannia argentata, n. s.

Primaries above silvery white; secondaries pearly subhyaline, the costal area with brassy reflections; veins smoky grey; external border smoky grey, diffused, fringe dark grey; thorax pure pearl-white, collar bright orange in front; abdomen white, barred with smoky grey; primaries below dark smoky grey with golden reflections; costal border cream-coloured; secondaries pearl-white, with a slender blackish marginal line; fringe brownish at base; body below pearl-white; tibiae cream-coloured; anal segment of venter whitish brown. Expanse of wings, 33 mm.

Peak Downs.

This species has the general aspect, but not the structure, of Metoponia.

24. Westermannia concha, n. s.

Allied to W. superba, much smaller; primaries silvery white washed with bronze towards costa; a narrower internal border, a large rounded spot at centre of interno-median area, and a broad external border gradually narrowing to apex leaden grey, partly edged and flecked with bronze-brown; an indistinct narrow white looped line, commencing on the costa before the middle, crossing the cell, bounding the interno-median spot and part of the external border as far as the upper radial, where it leaves it and returns to costa at apical fourth; secondaries white, semitransparent, pearly except towards costa, where there are brassy reflections; veins and a well-defined external border tapering to a point at submedian vein smoky brown; fringe white; body pearl-whitish, collar
buff-coloured; primaries below shining leaden grey; the internal area and a narrow line at base of fringe white; secondaries nearly as above, but the border leaden grey and the veins silvery; body below pure pearl-white; anterior femora grey in front, anterior tarsi broadly barred with grey. Expanse of wings, 26 mm.

Peak Downs.

**XYLINIDÆ.**

**Crambodes, Guén.**

25. *Crambodes minor*, n. s.

Considerably smaller than *C. talidiformis*, with pale costal area to primaries and brownish secondaries; primaries above silvery grey, darker and with bronze-brown reflections in an oblique line from the inferior angle of the cell to the apex, so as to form an ill-defined diffused streak, crossed by a black-edged tapering longitudinal cream-coloured streak from the reniform spot; discoidal cell and reniform spot also cream-coloured; a slightly curved longitudinal white litura in the cell just above the median vein; reniform spot white-edged, and enclosing a small brown spot below the median vein; a discal series of short black dashes upon the internervular folds towards outer margin; fringe blackish, interrupted by slender white lines in continuation of the veins; internal border cream-coloured towards base, two or three irregularly placed black or blackish subbasal longitudinal lines; secondaries shining pale brownish grey, slightly darker towards outer margin; fringe white, with a pale brownish subbasal line; thorax grey, abdomen whitish brown; primaries below grey; secondaries cream-coloured, with a slender abbreviated black marginal line and white fringe; body below greyish white. Expanse of wings, 21 mm.

Peak Downs.

**Crioa, Walker.**


Aspect of the genus *Pharetra* (*Acronycta*, part. auct.); primaries whitish cinereous, black-speckled; about six short oblique black abbreviated costal stria followed by the discal line, which is very irregular, commencing at the subcostal vein, running obliquely outwards almost to the upper radial vein, where it bends down at a sharp angle and runs transversely to the second median branch, where it again turns abruptly inwards and forms a deep sinus (through the centre of which the first median branch passes), then inwards again to meet the inner line, which is 3-shaped and continuous with the third costal stria; three subapical longitudinal
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black striae, the two upper ones crossed by a zigzag white line; a
diffused white subapical dash below the black striae; median inter-
spaces fuliginous-brown, enclosing longitudinal black striae, and
crossed by white lunate markings; a deeply dentate-sinuate slender
black marginal line; fringe white spotted with fuliginous-brown;
secondaries pale testaceous or whitish brown with golden cupreous
reflections, the veins, a discal line, and a broad external border
greyish brown; fringe white; thorax brown, white-speckled and
streaked with black; abdomen mouse-grey; under surface whitish,
with faint cupreous reflections; disco-cellular spots lunate, two
somewhat diffused discal arched stripes, the veins, and a slender
marginal line greyish chocolate; tibiae hairy, chocolate-tinted;
tarsi black-barred. Expanse of wings, 34 mm.

Peak Downs.

The genus *Crioa* appears to me to be allied to the
European genus *Lithocampa*.

**ACONTIIDÆ.**

**Aporocosmus, n. g.**

Allied to *Agrophila*; with similar pattern; the thorax, however,
smoother; the palpi longer, porrected, the veining of the wings
somewhat different; costal vein of primaries extending to about
the middle of the costal margin; subcostal four-branched, the fifth
branch being emitted as a third radial from the anterior angle of
the cell; first subcostal branch emitted before the end of the cell,
second running from the end of the cell to costa, third and fourth
forming a short fork, the fourth running to apex; upper (in this
case the second) radial emitted from the same point with the fifth
subcostal branch (or first radial); lower or third radial emitted as
a fourth median branch from the inferior angle of the cell; first
and second median branches wide apart; secondaries with the
costal vein much swollen at the base, coalescing with the subcostal
to beyond the cell, where it separates and runs obliquely to apex;
the first branch of the subcostal vein thus appears to be merely a
furea from the costal, and its second branch is emitted freely as a
radial; the true radial is emitted as a fourth median branch at the
same point with the third median and close to the origin of the
second; disco-cellulars very oblique and angulated; first and
second median branches tolerably wide apart; legs rather long
and compressed.
27. *Aporocosmus bracteatus*, n. s.

Primaries above cream-coloured; markings red-brown, spangled with silver as follows: an interrupted oblique band and a spot at base, an oblique irregular band crossing the wing before the middle, a broader transverse irregular abbreviated band from costa to median vein across the end of the cell, a slightly sinuous discal band subparallel to outer margin, two short arched bands almost uniting at centre of outer margin, the inferior one interrupted, an interrupted marginal line, and a similar line on the fringe, which is white; secondaries pale golden brown or "dead golden," with the costal area, excepting at apex, cream-coloured; a dark brown external border shot with gold, and therefore only visible in certain lights; the extreme margin irregularly pale yellow; fringe very long, cream-coloured, traversed by a slender interrupted brown line; body coloured in accordance with the wings, the thorax cream-coloured and spotted, the abdomen golden opaline; under surface pale stramineous, the primaries with indications of the markings of the upper surface in pale smoky brown; secondaries with a discal line of brown parallel to outer margin; pectus pearly whitish. Expanse of wings, 16 mm.

Peak Downs.

**Acontia, Ochs.**

28. *Acontia amorpha*, n. s.

Allied to *A. signifera* of India, from which it chiefly differs in its slightly superior size and paler golden brown banding of the primaries; it also differs in showing traces of stripes across the basal area, in having two spots, the lower one black, in place of the black crescent in the reniform spot, and the secondaries decidedly darker. Expanse of wings, 18 mm.

Gayndah.

Specimens of this species from Moreton Bay stand in the collection under a MS. name of Walker's.

29. *Acontia viticinus*, n. s.

Also allied to *A. signifera*; primaries above pearl-white, crossed in the middle by a broad cupreous-brown band with dentate sinuate edges, the inner edge bounded by a black line; reniform spot indicated by a cupreous-brown 3-shaped marking beyond the cell, and a corresponding black linear marking just beyond it at the edge of the external border; the latter broad, cupreous-brown, dotted with white on costal margin, flecked with black and white
towards the outer margin, along which is a reddish cupreous stripe; fringe white; secondaries sericeous creamy whitish, with diffused cupreous-brown external border and an ill-defined stripe of the same colour on the fringe; thorax white flecked with cupreous-brown, abdomen brown in type (sometimes cream-coloured flecked with brown); primaries below greyish with pink reflections; secondaries sericeous creamy whitish, suffused with pink towards costal and external margins; pectus pearl-white, legs pale flesh-brown, anterior legs greyish above; venter whitish. Expanse of wings, 21 mm.

Viti Islands.

Also in the Museum from Moreton Bay; it is nearly related to the "Erastria" ritsemae of Snellen.

30. Acontia tripartita, n. s.

Allied to the preceding species; primaries pure white, divided by two transverse equidistant undulated chocolate-brown bands into three nearly equal parts, the inner band of about half the width of the outer, the latter expanded into an oblong spot upon the costa; a blackish costal spot near the base; an irregular submarginal brown line and a slender black-brown marginal line; fringe flecked with brown; secondaries sericeous, cream-coloured, broadly suffused with grey towards outer margin; an interrupted slender dark brown marginal line; thorax cream-coloured; abdomen greyish, especially in the middle; primaries below smoky grey; apical third of costal border black spotted with ochreous; secondaries pale creamy ochreous, changing in certain lights to silvery greyish; costal area irrorated with blackish; a black spot at the end of the cell, and an angulated discal stripe beyond it from costa to submedian vein; all the wings with a very slender black marginal line; body below ochreous. Expanse of wings, 15 mm.

Rockhampton.

31. Acontia niripicta, n. s.

Allied to A. maculosa of China and A. letragona of St. Domingo. Primaries above deep olivaceous, shading into cupreous-tinted chocolate-brown towards outer margin; interno-median area glossed with lilac and crossed by four interrupted oblique bands of the ground colour; a large quadrangular snow-white patch at base, and upon it, close to the base, four unequal dark olivaceous spots; three black dots along the infero-exterior margin of the basal
patch; two snow-white costal patches, the first larger than the second, its margin denticulated and bounded on each side by the discoidal spots, which are black and annular; three black spots bounded externally by a rectangular red-brown marking beyond the cell; an irregular line of white scales crossing the disc towards outer margin, partly enclosing two black dots towards costa, confluent, and forming an oblique dentated line towards external angle; a submarginal series of black spots with white internal borders; a large white spot on the fringe below the middle and a narrow whitish dash crossing it longitudinally at apical third; the remainder of the fringe is divided by a central blackish line, beyond which it is glossed with grey; secondaries straw-yellow, with a broad external brown border; basal half of fringe occupied by a brown stripe, separated from the external border by an ochreous line; outer half of fringe white; thorax white, the collar slightly sordid; abdomen ochreous banded with brown, the base and anus white; wings below stramineous; primaries clouded with grey, indicating the pattern of the upper surface; secondaries with three dark grey costal spots, shot with rosy cupreous, the third at apex, almost confluent with a dark spot on the fringe; body below white. Expanse of wings, 22 mm.

Peak Downs.

32. Acontia detrita, n. s.

Allied to the preceding species; primaries above with the basal patch reduced to a basal spot on the costa, the two other costal spots smaller than in A. nivipicta; all three spots slightly yellowish; indications of an oblique yellowish stripe connecting the central spot with the inner margin; black markings on the wings less sharply defined; the discal line of white scales not terminating in a dentated line as in A. nivipicta, but uniform throughout; no large white spot on the fringe, the latter cream-coloured, marked with three dusky spots, one at apex, one above the middle, and one at external dusky spots. secondaries bronze-brown, greyish towards the base; body whity brown; primaries below smoky grey, with a golden gloss; costal border white at base, otherwise ochreous, interrupted beyond the cell; internal border cream-coloured; secondaries pale golden stramineous; a spot at end of cell, an angular discal stripe, and a tapering marginal stripe dusky; fringe greyish; body below white. Expanse of wings, 19 mm.

Gayndah.
33. Acontia clarissa, n. s.

General pattern of A. Komaga, but smaller and with yellow instead of white basal area and costal spot; primaries with the basal half pale creamy yellow, irregularly variegated with chrome-yellow; the inner border and two or three longitudinal costal dashes leaden grey; external half purplish brown internally, pale reddish brown externally, the division between the two halves of the wing oblique and biangulated; reniform spot indistinct, yellowish, followed by a blackish >-shaped character; a small yellowish white costal spot at apical fourth; a very indistinct submarginal zigzag whitish line; fringe white, flecked with black towards apex, and with a brown patch at external angle; secondaries bronze-brown, with the basal half pale; fringe tipped with white; thorax yellow in front, greyish behind; abdomen whitish brown, with a dusky dorsal stripe; under surface as in the preceding species. Expanse of wings, 24 mm.

Peak Downs.

34. Acontia conchidia, n. s.

Primaries above chalky white; costal margin to the end of the cell divided into three equal parts by small black dots; edge of costal margin black; an abbreviated black-speckled brown band, with undulated internal and dentate-sinuate external margin from the inner margin to the base of the third median branch, a small spot similarly coloured just above the median vein, from which a straight line of black runs across the cell to the subcostal vein; a large irregular French-blue patch, with black external border immediately beyond the cell; a subsigmoidal discal bronze-brown stripe varied with plumbageous across the disc; external border narrow, of the same colours, excepting that the brown is of a more orange tint; a marginal series of small black spots; fringe white, traversed by central and external greyish stripes, and spotted at the extremities of the veins with sandy brown; secondaries cream-coloured, with diffused golden brown external border and white fringe spotted towards apex with golden brown; thorax white, abdomen testaceous; wings below creamy white with brassy reflections, primaries with a brown spot on the inner margin near external angle; secondaries with a brown apical spot; body below pearl-white; venter with lateral blackish dots and pale stramineous anal tuft. Expanse of wings, 28 mm.

Peak Downs.
Erastridæ.
Erastria, Ochs.

35. Erastria fasciolata, n. s.

Primaries above dark fuliginous-grey, traversed by numerous subparallel black undulated lines; a number of interrupted undulated ash-grey stripes between the black lines; an irregular white band tapering to costal margin across the basal third, a white costal spot at apical third, two white costal dots between the latter and the apex, a widely interrupted submarginal series of white dots and an oblique squamose white spot at the external angle; a slender black marginal line formed by the confluence of subconical black spots; fringe white at apex, otherwise brown dotted with white; secondaries fuliginous-grey, with bronze reflections; a black marginal line; fringe cream-coloured, traversed by a grey stripe; thorax dark fuliginous-grey, with lateral white dots on the collar; abdomen cream-coloured at the sides, a broad dark grey dorsal band traversed by slender whitish segmental lines; primaries below sericeous-grey; basal two-fifths of costal area cream-coloured, with scattered black scales on the costal margin; a quadrate white spot at about the apical third of costa, and indications of a pale stripe in continuation of it across the disc; a submarginal series of white dots and a marginal series of indistinct cream-coloured dots alternating with the confluent conical black spots; fringe dark grey, with the apex, external angle, and a basal line cream-coloured; secondaries with the basi-abdominal area silver-grey, two large white discoidal spots; remainder of wing dark fuliginous-grey, crossed beyond the middle by an irregular white band; a submarginal irregular interrupted white line; fringe silver-grey, with a white basal line; body below cream-coloured. Expanse of wings, 15 mm.

Peak Downs.

Anthophilidæ.

Metachrostis, Hübner.*

36. Metachrostis panurograpta, n. s.

General size and coloration of M. mendaculalis, but without the undulated ash-grey lines on the secondaries; the primaries with all the transverse lines blacker, making the ground colour appear to be lighter; these lines are also less oblique and more irregular;

* This is the Leptosia of Gueneé, a name preoccupied in the Butterflies. Scudder argues, upon what I think are unsatisfactory grounds, that Leptosia is a synonym of Leptidia.
under surface also very similar to *M. mendaculalis*, but the internal border of the primaries greyish white; the secondaries decidedly whiter, with the two abbreviated dusky stripes from the costa rather better defined; palpi with longer terminal joint, the distal half black, crossed by a whitish line between the joints. Expanse of wings, 18 mm.

Rockhampton.

**Thalpochares, Lederer.**

37. *Thalpochares leonata*, n. s.

Allied to *T. partita* of Java; stramineous; primaries with the external half brownish testaceous, crossed along its inner edge by an externally waved darker and somewhat lilacine band, and margined internally by a white and black line; a submarginal series of black dots; external border narrowly greyish, tapering at the extremities, bounded internally by a white line; fringe broad, flesh-pink, irrorated, excepting along the outer edge, with red-brown; costa slightly redder than the ground colour; secondaries with a diffused externo-discal ferruginous stripe, only well-defined towards the abdominal margin; slender marginal and submarginal ferruginous lines; fringe whitish, traversed by a slender pale brownish line, and margined with the same colour; wings below ochreous, irrorated with ferruginous towards the apices; internal borders whitish; costal margin of primaries from beyond the middle to the apex blackish spotted with white; legs whitish. Expanse of wings, 15 mm.

Rockhampton.

38. *Thalpochares pusilla*, n. s.

Somewhat allied to *T. parva*, though altogether more brightly coloured; primaries with the ground colour whitish brown, crossed before the middle by an internally diffused oblique castaneous band, its outer edge sharply defined, followed almost immediately by an internally diffused greyish band, its outer edge bounded by a darker sinuous discal line; a broad patch of castaneous below the apex, and a second at external angle, with a slender arched connecting line of the same colour; four submarginal white dots, the three upper ones crossing the subapical patch, and the fourth upon the inferior patch; a marginal series of blackish dots followed by a white line at the base of the fringe; fringe pale grey with reddish reflections, white externally with a brown edge; secondaries whitish, becoming greyish brown towards outer margin; fringe
white; body white; primaries below grey, with white fringe; secondaries and body white. Expanse of wings, 14 mm.

Peak Downs.

39. Thalpochara immaculata, n. s.

Wings above satiny whitish, with faint golden reflections; primaries with the costal border snow-white towards the base; edge of costal and outer margins golden ochraceous; head and collar ochraceous; thorax glistening snow-white; abdomen pearl-whitish; under surface creamy whitish; primaries with the discoidal area slightly greyish, the costal and external borders slightly yellowish; pectus snow-white, legs and anus yellowish. Expanse of wings, 22 mm.

Peak Downs.

Nearest to a Venezuelan species, T. debilis.

Anthophila.

40. Anthophila vestalis, n. s.

♂. Snow-white; costal margin of primaries slenderly golden brown, four nearly equidistant brown-tipped oblique costal dashes beyond the middle, the third extended as a brown line to below the upper radial vein, where it is abruptly angulated, and runs inwards obliquely almost to the second median branch, below the angle, however, it is indistinct; the fourth costal dash is united to a fifth, but reversed, dash immediately beyond it; a subapical grey and golden spot crossed by the line from the third costal dash, and marked externally with two connected black dots; an undulated narrow grey external border with dusky inner edge, in certain lights slightly shot with golden; fringe golden; outer margin of secondaries tinted with golden; head and collar ochreous; wings below satiny white, slightly tinted with golden ochraceous, especially towards costal and external margins; primaries with two black costal dots beyond the middle; body pearl-white, legs more or less ochraceous. Expanse of wings, 18 mm.

Peak Downs.

Heliothidæ.

Heliothis, Guenée.

41. Heliothis aberrans, n. s.

Not very near to any known species; primaries whitish brown, with faint greyish indications of bands formed somewhat as in H. armigera; blackish indications of a subbasal acutely zigzag
Mr. Butler's descriptions of Lepidoptera-

line; two dusky spots placed obliquely at the end of the cell (indicating the reniform spot); an angulated series of short longitudinal black dashes across the disc, and a marginal series of black dots; secondaries greyish white, with a broad external grey border, upon which is the usual oval whitish spot; fringe cream-coloured, spotted with grey at apex; body greyish white; primaries below whitish brown, with two spots in the cell and an arched band beyond it grey; secondaries and body below cream-coloured. Expanse of wings, 28 mm.

Peak Downs.

**Canthylidia, n. g.**

Probably nearest to *Heliocheilus*, but with more nearly the general aspect of *Heliothis* or *Leucania*, especially in the form of the wings; the primaries, however, have a swelling upon the costal margin beyond the middle, and the body is as slender as in the genus *Micardia* (*Leucanidae*); primaries with the discoidal cell extending to beyond the middle of the wing; costal vein terminating in the costal swelling; subcostal emitting its first branch at some distance beyond the end of the cell, and the four others beyond it, the second and fifth from opposite sides of the vein, and the third and fourth as an apical furca; radials emitted from extremity of cell, not from the angles, lower radial emitting a recurrent vein through the cell to the base, the second and third median branches and lower radial about equally distant from one another at origin; secondaries with slightly sinuous costal vein extending to apex; discoidal cell reaching to about the middle of the wing; subcostals emitted from one point at the anterior angle of the cell, and the second and third medians from the posterior angle; discoidal forming a regular concave arc, from the centre of which the radial is emitted; first median branch emitted near the end of the cell; body rather slender; palpi slender, porrected.

42. *Canthylidia pallida*, n. s.

Satiny whity brown, slightly darker towards the external borders of the wings, especially of the secondaries, which also show a faint indication of a disco-cellular spot; under surface cream-coloured; primaries with the disc slightly greyish. Expanse of wings, 26 mm.

Gayndah.

The absence of the post-discoidal cell in the primaries proves this to belong to the *Heliothidae*, and not the *Leucanidae*. 
Heterocera from the Australian Region. 407

**Plusiodonta, Guenee.**

43. *Plusiodonta arctipennis*, n. s.

♂. General coloration of *P. thomae*, Guenee, from Haiti, but the metallic markings more golden, as in *P. chalcitooides*, from Java, with which it also agrees in having metallic markings near external angle of primaries; it differs from all the described species in its narrower wings; primaries reddish-brown, more olivaceous upon the central area, tinted with lilac at base, centre of costa upon the reniform spot, and along the internal border of the discal line; ordinary lines blackish, the external line double; pattern nearly as in *P. chalcitooides*, the subbasal metallic patch brassy mottled with ferruginous; that at external angle sharply defined, quadrate, brassy, with the central ferruginous mottling flecked with gold; subapical biangulated fascia golden mottled with ferruginous; secondaries fuliginous-brown, getting whitish towards base; fringe tipped with sordid white; thorax chocolate-brown; head blackish; abdomen fuliginous, whitish at base and sides; under surface pale shining fuliginous greyish with bronze-brown reflections. Expanse of wings, 32 mm.

Sydney.

**Gonopteridæ.**

**Gonitis, Guenee.**

44. *Gonitis samoana*, n. s.

Nearest to *G. involuta* of Ceylon; primaries golden or cupreous-brown, glossed with pale lilacine-pink, especially upon the median vein and its branches and on the costal area at apex; ordinary lines dark brown, less irregular than usual; outer or discal line externally edged with whitish, straight from inner margin to cell; external margin dark brown; orbicular spot represented by a white dot; reniform spot by two whitish-edged black dots placed obliquely at end of cell; secondaries pale dove-brown, whitish at base of costa; fringe white-tipped; thorax foxy brown; abdomen dove-brown, slightly reddish at base; primaries below grey, with a rosy cupreous gloss; costal border sparsely whitish-speckled to beyond the cell, where the white speckling suddenly becomes dense, and forms a cuneiform apical patch separated by an oblique line from the remainder of the border; internal border creamy white; disc slightly and indistinctly striated with ashy-grey; fringe whitish-tipped, black-dotted below the angle; secondaries with the costal half and external border almost to anal angle grey, with a rosy cupreous gloss; interno-median area creamy white; fringe whitish, traversed by a bronze-brown stripe; apical area indistinctly striated
with pale yellowish scales, making the apical third abruptly paler than the remainder of the dark portion of the wing; pectus whitish, tinted with foxy red; venter greyish chocolate. Expanse of wings, 35 mm.

Samoa Islands.

. 45. *Gonitis vitiensis*, n. s.

♀. Primaries above reddish chocolate or coffee-brown, transversely mottled with darker brown and black; inner line more or less abbreviated, only visible below the cell; outer line biangulated, forming a simple rectangular zigzag; both lines dark brown; a diffused discal whitish-cinereous belt bounding the outer line externally; a subapical subsigmoidal line immediately beyond the whitish band; external margin blackish; discoidal spots barely visible, the orbicular spot indicated by a white point, and the reniform by two black dots; secondaries fuliginous-grey, gradually paler towards base; fringe of the outer margin with a slender white basal line, of abdominal margin wholly white; thorax red-brown, abdomen fuliginous-grey; under surface nearly as in the preceding species, but without the whitish apical costal patch. Expanse of wings, 36 mm.

Viti Islands.

Var. ♀. Darker than the type, and without any whitish band across the primaries. Expanse of wings, 36 mm.

Viti Islands.

46. *Gonitis vulpina*, n. s.

Primaries above bright foxy red, decidedly brighter than the allied *G. revocans* of Australia, the lines across the wings similar in form, excepting that the central line is abruptly elbowed outwards from submedian vein, and that all the lines are a little better defined; orbicular spot prominent, small, rounded, creamy white; reniform spot represented by two small rounded grey spots; secondaries creamy whitish, with the veins and a broad external border dull rose-red or pale vinous; thorax bright foxy red, almost orange; abdomen whitish, banded with pale fuscous, slightly tinted with vinous at anal extremity; primaries below silvery whitish, washed with flesh-tint excepting along internal area, a diffused patch of dull rose-red covering the discoidal area; a white-edged oblique vinous line crossing the disc; apical border golden brown, fringe darker brown; secondaries sericeous-white, with the costal area broadly irrorated with dull rose-colour; a darker
Heterocera from the Australian Region. 409

bisinuated subapical line; pectus white, palpi and legs varied with foxy orange and dark vinous; tarsi brown banded with white; venter white at base, but with lateral dull rose-coloured tufts; remainder of venter pale flesh-brown, washed in front with ochreous. Expanse of wings, 49 mm.

Viti Islands.

47. Gonitis xanthochroa, n. s.

Allied to G. privata from Shanghai; primaries ochreous, crossed by four irregularly dentate-sinuate more or less diffused red-brown stripes of the usual character; an abbreviated dentate-sinuate blackish line from costa between the third and fourth stripe; orbicular spot small, white, with red-brown border; reniform spot red-brown, bounded externally by the third stripe; costal and external borders diffused, paler olivaceous; secondaries rosy ferruginous, paler towards the base; fringe whitish; thorax ochraceous; abdomen pale flesh-brown; primaries below dull rose-pink, with the external border creamy yellowish, broadly suffused from apex to below the marginal angle with testaceous; fringe brown; an internally diffused subapical costal triangular brown spot, bounded externally by an oblique abbreviated darker brown zigzag line; an abbreviated arched line from costa beyond the cell; inner border cream-coloured; secondaries cream-coloured, with rose-tinted costal third, crossed beyond the cell by an arched brown line; body below creamy ochraceous, with the front of pectus, legs, and venter ochreous; under surface of legs white. Expanse of wings, 50 mm.

Vanua Levu.

POLYDESMIDÆ.

Eurythmus, n. g.

Allied to Diatenes, but reminding one rather of Bryophila; costal vein of primaries extending to about the apical fourth of costa; subcostal five-branched; first branch emitted at a considerable distance before the end of the cell, second branch emitted at a short distance before the end, united by an oblique cross-vein to the third branch, which is emitted from the anterior angle of the cell, giving off the fifth branch from its inferior margin at the junction of the cross-vein and forking towards apex; upper radial emitted near to anterior angle of the cell, the lower radial near to the posterior angle, and equidistant with the second and third median branches; lower disco-cellular veinlet inarched; costal vein of secondaries terminating before the apex; subcostal
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branchesforkingfromanteriorangleofthecell,aslenerven-likelongitudinalfoldpassingthroughthecellioutermargin;disco-cellularstransverse,nearlystraight;radialandsecondandthirdmedianbranchesemittedclosetogetherattheposteriorangleofthecell;bodyveryrobust;paltiplong,slender,curvingupwards
toabovelevelofthehead;posteriorfemoraflattenedandlongitudinallygrooved;tibaebroad,flattened,thicklysealed,
bearingtwopairsofunequaldivergentspurs.


Primariesabovepalesandybrownish,irroratedwithfuliginous-
brown,andwithlongitudinalpalesiennastreaksalongtheveins;
markingsnotunlikethoseontheprimariesof*Diateses gerula*,
darkbrownandblack;adenicate-sinuateblackishsubmarginal
line;fringegreyish,withaseriesofblackishspotsopposite
tothesimmationsofthesubmarginalline;secondariescream-coloured,
becomingpearl-whitecosta;externalborderpalebronze-brown,
diffused,apalermarginaldashnearanalangle;amarginalsub-
confusseriesseriesofduskylunules;fringecreamywhite;bodyabove
whitish,frontofthoraxondcollairroratedwithdarkbrown
scales;undersurfacepearl-white;wingssericeousgreyishtowards
externalborders;amarginalseriesofgrey-edgedwhitetriangular
spots;primarieswiththecostalmarginblack-spottedtowards
apex. Expanse of wings, 28 mm.

Peak Downs.

**Girpa, Walker.**

Nearly allied to *Polydesma*, and thereforeincorrectly
referredtothe*Remigiidae*.

49. *Girpa maxima*, n. s.

Testaceous;wingssomewhatsericeous;twobrowndots,one
abovetheothernearthebase,athirdwithinthecellbeyondthese,
aseriesacrossthebasalfourth,thelowestofthemblackish;
reniformspotindicatedbypalereddish-browndots;anill-defined
greyishstripeacrossthemiddle,followedbyanill-definedzigzag
dentatedline;adiscaltrisinatedsubconfluentseriesofmoreor
lesstriangularpale-centredferruginousspots,towardsapexpassing
intoacuneiformapicalred-brownpatch,crossedbyaseriesof
whitesscales;externalmarginandfringesuffusedwithred-
brown;amarginalseriesofblackishdots;secondariessimilarin
patterntotheprimaries;headandcollairrotintedwithreddish
brown;primariesbelowgreyish,exceptingtowardsoutermargin,
with a few traces of the markings of the upper surface; secondaries stramineous grey-speckled, crossed by three discal greyish stripes, the outermost macular and with pale outer edge; blackish marginal dots as above; body below pale testaceous. Expanse of wings, 56 mm.

Vavao, Friendly Islands.

50. *Girpa carne*, n. s.

Allied to the preceding species, glossy clay-coloured, with a pink tint; a faintly indicated irregular grey line across the basal fourth of the primaries; a black dot upon the line just below the submedian vein; two white dots at the end of the cell; an irregularly trisimuated greyish line across the middle of the primaries, continued across the basal third of the secondaries; two parallel dentate-sinuate grey lines crossing both wings beyond the middle, and followed by a confluent discal series of externally white-edged orange spots; a submarginal series of black dots; under surface nearly as in the preceding species. Expanse of wings, 55 mm.

Vavao.

The differences both in ground colour and in the details of marking are so great between this and the preceding species that they can hardly be conspecific.

**HOMOPTERIDÆ.**

**Homoptera, Boisid.**

51. *Homoptera cruegeri*, n. s.

Primaries above purplish brown, crossed by numerous blackish-edged wavy oblique paler lines; external fourth whity brown, crossed near its inner edge by a clay-brown undulated stripe, washed with ochreous internally; a darker nebula in the centre of this area; base whity brown, traversed by a bisimuated dark brown line, and with a costal spot of the same colour; veins on the darker area of the wing slaty grey in certain lights; two dentate-sinuate stripes immediately succeeding the ordinary discal line also shot with slaty grey; the two ordinary lines widely separated, irregularly dentated, very slender, black; a slender undulated black submarginal line; external margin and fringe wood-brown or brownish testaceous, with darker central stripe bounded by two slender sinusons whitish lines, the outer one indistinct; secondaries whity brown; five or six parallel internally diffused dentated dusky stripes with whitish external edges, followed by two slightly sinuous
convergent black lines enclosing a purplish brown stripe; external area purplish brown, with a nebulous blackish spot on the second median interspace, external margin and fringe as in primaries; body of different brown shades corresponding with those of the primaries; abdomen with three dorsal and two lateral subbasal tufts; under surface greyish stone-colour, with faint brassy reflections, especially on internal area of primaries; numerous sub-parallel slender brown lines, excepting across the basal area; three of these lines, across the disc of secondaries, more strongly defined than the others; a submarginal series of black dots; fringes tipped with reddish brown; tarsi black, banded with whitish. Expanse of wings, 48 mm.

Gayndah.

HYPOGRAMMIDÆ.

GADIRTHA, Walker.

52. Gadirtha pulchra, n. s.

Primaries above sericeous silver-grey, transversely striated with dark grey and black scales; basal area whitish, bounded by two transverse black lines, slightly divergent at costa; three grey costal dashes, the second broad and oblique; orbicular spot pale sandy brownish; reniform spot large, outlined in black, enclosing, in its posterior half, a triangular grey-brown spot; two transverse black lines from first median branch to inner margin, the inner line throwing off a slender curved line at right angles to join the post-median line, the outer line shorter, but also rectangular at its upper extremity; post-median line black, crossing the wing obliquely from costa to outer margin near external angle; a reversed oblique black dash from costa almost to the post-median line, incised at its extremity, and continued across the disc by a regular zigzag white line, the uppermost \( \geq \)-shaped division of which is edged with greyish; a marginal series of subconfluent black crescents; fringe white, spotted with greyish at the base; secondaries subhyaline pearl-white, with the veins and a broad decreasing external border greyish brown with golden reflections, fringe pure white; thorax ash-grey, the collar crossed in front by a slightly arched slender black line; antennæ testaceous; abdomen silver-grey banded with white; primaries below greyish, becoming white on interno-basal area and faintly glossed with gold; costa creamy white from the end of the cell almost to the apex, with four elongate black spots on its anterior edge; a marginal series of small triangular black spots; fringe white, with a double series of greyish spots; secondaries pearl-white; a large cuneiform diffused costal spot or streak, and the external border greyish with golden reflections; body below
white, tibía (excepting of the posterior pair of legs) crossed above by slender curved black lines, tarsi above black. Expanse of wings, 42 mm.

Rockhampton.

This is the most distinctly marked species in the genus, in colour and marking not at all unlike Walker's genus Calathusa, though different in structure.

**OPHIUSIDÆ.**

**PSEUDOPHIA, Guenée.**


General coloration and size of *P. illunaris* of Europe, the prevailing tint on the upper surface being pale greyish with a creamy whitish subtint; costal border of primaries faintly shot with lilac; all the markings ill-defined, darkest on costa; ordinary lines diffused internally, bounded externally by a creamy whitish stripe, the inner line at basal fourth, oblique, regular; outer line just beyond external fourth, slightly sinuous, undulated, olivaceous; traces of a submarginal undulated line, olivaceous in the middle; ordinary spots obsolete; traces of a very irregular whitish-edged dusky line across the external third; fringe white, traversed by two broad greyish stripes; secondaries whitish, sordid towards the base; a curved grey litura at end of cell; a slightly oblique dark grey central stripe; external area dark grey, diffused internally, crossed from anal angle nearly to apex by a whitish stripe; a second abbreviated marginal whitish stripe at extremity of radial interspaces; a slender black marginal line; a nebulous dusky spot just below the middle of the external border, and extending into the fringe, which is otherwise creamy white; thorax grey in front, whitish behind; abdomen whitish, crossed by broad pale greyish bands; under surface creamy yellowish; markings similar in all the wings, the costal areas grey-speckled; disco-cellular spots narrow, blackish; a dark grey undulated arched post-median stripe, not reaching the inner margins, followed by a slightly irregular internally diffused, externally undulated, grey discal stripe; a large diffused apical greyish brown spot, and a second similar spot (almost black on the secondaries) just below the middle of external border; a slender undulated blackish marginal line; anterior and middle femora and tibiae grey above. Expanse of wings, 38 mm.

Peak Downs.

*TRANS. ENT. SOC. LOND. 1886. PART IV. (DEC.)* 2 F
Although this species agrees in its structural details with *P. illunaris*, the dark nebulous spot on the external border of the secondaries gives it somewhat the aspect of *Cerocula*.

**Hypetra, Guenée.**

54. *Hypetra sordida*, n. s.

Primaries pale greyish brown, slightly suffused with lilacine, speckled and transversely striated with blackish grey; inner and central striæ indicated by ill-defined wavy blackish squamose stripes; discoidal spots obsolete; a clavate black spot below the submedian vein at basal third; a cream-coloured nearly straight line crossing the disc at external fourth; from this line tapering ferruginous streaks run outwards along the veins, but they are only strongly defined towards apex; immediately beyond the discal line is an interrupted and slightly irregular series of blackish spots; a marginal series of black dots; fringe whitish brown.

Secondaries whitish brown towards base; crossed beyond the middle by a slightly curved internally diffused greyish band; external border broad, of the same colour, and separated from the postmedian band by a whitish-brown band a little paler than the basal area; a marginal series of blackish dots; fringe sandy whitish; thorax pale fuliginous-grey; head and collar darker grey, the latter with dark brown borders; abdomen whitish brown; under surface whitish brown, costal areas slightly tinted with pale flesh-brown; central area of primaries, a disco-cellular spot, and two arched diffused bands on the secondaries, slightly greyish; palpi whitish brown internally, dark brown externally. Expanse of wings, 45 mm.

**Viti Islands.**

Somewhat resembles "*Toxocampa orthosioides*" of Walker from N. Australia; the latter is, however, synonymous with *Pantydia recondita* of Walker.

*Hypetra diffundens*, Wlk., is *Remigia virbia*, Cram.

55. *Opheusa vitiensis*, n. s.

Allied to *O. stuposa*, Fabr., but differing as follows:—Primaries above suffused with lilac, the band before the middle much less white and decidedly narrower; the irregular dark olivaceous belt beyond it considerably broader, the second angulation of its outer edge much farther from the upper one; two dark olivaceous spots in the sinus between these two angles; the oblique apical patch not externally incised; the white band across the secondaries only
indicated by a diffused greyish streak; a slender abbreviated oblique whitish anal stripe, well separated from the greyish patch on external border; the latter suffused with lilacine. Expanse of wings, 46 mm.

Viti Islands.

**REMIGHIDÆ.**

**Remigia, Gueneé.**

56. *Remigia discrepans*, n. s.

♀. Closely allied to *R. archesia* and *R. mayeri*; differing in the ochraceous clay-colour of the primaries, the costal border and basal area alone being slightly suffused with lilacine-grey; in the absence of markings across the centre of these wings, and in the inner line being replaced by a slightly inarched abbreviated black-brown transverse stripe with whitish internal edge; secondaries almost exactly as in *R. archesia*; on the under surface it differs from the latter in its sandy yellow instead of reddish ochreous colour, in the reduction of the markings on the primaries, and the almost total obliteration of those on the secondaries. Expanse of wings, 42 mm.

Viti Islands.

But for the well-defined blackish bar at the basal third of the primaries I should have thought it possible that this might be the female of *R. mayeri*.

**THERMESIIDÆ.**

**Erosia, Gueneé.**

57. *Erosia stolida*, n. s.

Allied to *E. theclata* of Africa and Ceylon (female of *Dirades binotata*); differs from both sexes of that species in its superior size, considerably paler, silvery greyish coloration; the markings white-edged, but not enclosed by an outer brown line; the outer margin of the primaries in the female more irregular than in *E. theclata*. Expanse of wings, 22—23 mm.

Rockhampton.

The genus *Erosia* has hitherto been placed among the *Geometrides*, but it has been shown that its true position is amongst the Pseudo-Deltoids; the genus *Dirades* has hitherto been regarded as distinct, but it is now evident that it is founded upon the males of certain species of *Erosia*, the sexes of which differ in outline of wings.
HERMINIIDÆ.

Bocana, Walk.

58. Bocana sypnoides, n. s.

♂. Aspect of many species of *Sypna*; primaries purplish brown, almost black; an ill-defined dentated black line across the basal fourth; reniform spot angular, golden testaceous, enclosing a black litura; two parallel widely sinuated and dentated externally pale-edged black discal lines, the external dentations dotted with whitish at their apices; a black marginal line dotted with pale ochreous; fringe blackish, varied along its outer edge with whitish; secondaries smoky brown; two internally diffused blackish stripes from abdominal margin, not reaching the costa, dentated and partly edged with whitish externally; a marginal series of pale ochreous dots; fringe spotted at the base with blackish; thorax dark purplish brown, the head and collar blackish; abdomen dark smoky brown, slightly paler at the sides and base; wings below smoky brown, crossed by two darker diffused discal stripes, the outer one with pale external border; a sprinkling of whitish scales on the costal areas; a slender blackish marginal line, interrupted at the extremities of the veins by testaceous dots; secondaries with a blackish disco-cellular litura; palpi dark brown, the scales on the inner surface tipped with ochreous; body below smoky brown, the legs dark brown, with ochreous spots at the extremities of the joints. Expanse of wings, 42 mm.

Viti Islands.

Allied to *B. manifestalis*, which ranges from Ceylon to Fiji.

Lophocoleus, n. g.

Form and neuration almost exactly as in *Edessa*, from which genus it is, however, at once distinguished by the long tapering broadly pectinated antennae, in which character it agrees with *Bocana*; from the latter it differs in form of wing, and from both genera in the broad flattened and coarsely scaled palpi and the structure of the front legs, the femora being armed at their distal extremity by a strong curved process thicker than the tibia, and extending almost to the extremity of the tarsus, its lower surface clothed with long silky hairs; thus, at first sight, the leg appears to be double from the knee-joint.

59. Lophocoleus mirabilis, n. s.

♂. Primaries above dark smoky brown; the two ordinary lines indistinct, that at basal third represented by an unequally
trisinuated dusky line from subcostal vein to inner margin; that at external third by a transverse series of greyish lunules with dusky inner edges (this series is inangulated or elbows at the first median branch); a small whitish spot at the end of the cell, and a series of squamose whitish dots parallel to the outer margin; a series of minute whitish marginal points; outer margin rather acute and subfalcate at apex, and subangulated at the extremity of the second median branch; secondaries paler than the primaries, especially towards costa; fringe with an interrupted whitish basal line; thorax dark smoky brown, black-speckled; abdomen a little paler than the thorax; under surface greyish brown; primaries with grey internal border; secondaries with a dusky disco-cellular lunule and a diffused sinuous discal stripe; anterior legs armed with a strong curved process, clothed below with long silky stramineous hair. Expanse of wings, 47 mm.

Viti Islands.

60. Lophocoleus ? astrifer, n. s.

♀. Much like Bocana manifestalis in colour and pattern, but with the form of the preceding species; upper surface dark purplish brown, primaries with the two ordinary dentate-sinuate black lines; a sinuous discal series of black-edged cream-coloured dots, terminating in a spot of this colour at inner margin; fringe with a whitish basal line; secondaries crossed in the middle by a single black line; a discal series of black-edged cream-coloured dots, confluent towards the abdominal margin; fringe with a whitish basal line; head and thorax dark chocolate-brown, abdomen paler, purplish brown; wings below pale brownish, densely irrorated with blackish scales; costal areas washed with lilacine; all the wings with two black discoidal spots; a black irregularly dentated line beyond the middle; an imperfect dark brown discal band enclosing a series of pale spots; a slender wavy cream-coloured line at the base of the fringe; primaries with a subapical greenish grey patch; secondaries with an apical patch of the same colour; body below greyish, legs purplish brown. Expanse of wings, 38 mm.

Viti Islands.

From the form of the wings this species appears to be a Lophocoleus, but unfortunately the palpi and anterior legs of the type are missing.
Matœomera, n. g.

Somewhat allied to Rivula; primaries with the costal margin nearly straight, slightly incurved in the middle; outer margin straight to lower radial vein, then gradually arched to external angle; inner margin nearly straight, excepting at base, where it curves inwards; secondaries rather small, subpyriform, the costal margin nearly straight; costal vein of primaries extending to about the apical third of costa, subcostal five-branched, emitting its first branch before the end of the cell, second at some distance beyond the cell, third and fourth branches forking to apex, fifth emitted from the anterior angle of the cell; radials emitted from the disco-cellulars near the anterior and posterior angles of the cell, second and third median branches and lower radial about equidistant at their origins; a small flattened tuft of hair from behind the base of the median vein directed forward over the base of the cell; subcostal of secondaries forking from the anterior angle of the cell; upper disco-cellular long, arched; lower disco-cellular very short and transverse, the radial and the second and third median branches being emitted near together and at equal distances apart; body very robust, palpi of male moderately long, triangular, compressed, coarsely scaled, rather obtuse at apex; palpi of female considerably longer and decidedly more acuminate; antennae of male delicately ciliated to the tip, of the female somewhat flattened, submoniliform, and simple; legs with the femora grooved, the tibiae flattened, fringed with long hair-scales in the male.

61. Mateomera dubia, n. s.

Primaries pale reddish brown; central belt represented by two arched white lines; the costa speckled with slaty grey up to the second line; a white-dotted black spot at the end of the cell, followed by slaty grey scales (in continuation of the costal irroration) as far as the second white line; costal margin from the central belt almost to the apex ochreous, the subcostal area whitish; a submarginal series of black spots white-bordered internally and confluent towards apex; an apical white point; fringe cupreous-red towards apex; secondaries whity brown, becoming bronze-brown towards anal angle; thorax ash-grey, white in front; head and abdomen whity brown; antennæ yellowish; under surface sericeous-white, costal areas of the wings speckled with pale brown; fringe of primaries red-brown towards apex; legs pearl-white. Expanse of wings, 18 mm.

Peak Downs and Gayndah.
Eulochastra, n. g.

Nearest to Locastra, of the same general form, though with the aspect of the Lithostid genus Eulane; primaries with the costal vein extending nearly to apex; subcostal with five branches, the first branch emitted before the end of the cell, the second emitted beyond the cell, united to the third by a short cross vein so as to form a narrow post-discoidal cell, the third and fourth forming a short fork to apex, the fifth emitted from the inferior margin of the third at the extremity of the post-discoidal cell; upper radial emitted near to the anterior angle of the cell, lower radial forming a fourth median branch (the lower disco-cellular being absent) emitted from the posterior angle of the cell and equidistant with the second and third median branches; base of the wings below clothed with long hair-scales; secondaries with the costal and subcostal veins coalescing towards the base, the two subcostal branches emitted at about the middle of the wing; discoidal cell open, the upper disco-cellular veiulet being absent; radial emitted rather near to the posterior angle of the cell; second and third median branches emitted from one point at the posterior angle; body rather robust, the thorax rounded, the head twice as broad as long; antennæ cylindrical, tapering, with very short fine ciliations; palpi long, thick, subcylindrical, slightly compressed, upcurved; legs rather long and thick, the middle tibiae fringed with rather long hair-scales.

62. Eulochastra fasciata, n. s.

♂. Primaries above shining silvery white; the base, an irregular transverse band just before the middle, a second from costa near apex to external angle, a spot just above the middle of external border, and a second at external angle, black with bronze-brown reflections; secondaries sericeous-stramineous, with a brownish apical spot; thorax bronze-brown, collar cupreous; tegula clothed with metallic cupreous and blue scales; head and abdomen pale stramineous; under surface pale shining golden stramineous, primaries with the discoedral area, a discal band as above, but enclosing three subcostal dots of the ground colour and a few scales on the fringe blackish; secondaries with an abbreviated squamose dash from the centre of costal margin to the end of cell and a slightly longer tapering subapical dash blackish; legs barred with black. Expanse of wings, 20 mm.

Sydney.

Although this species in general appearance, and in
the supplementary cell in the neuration of its primaries, corresponds with the Lithosiidae, it differs entirely in its very characteristic palpi: a comparison of its structure with that of Locastra shows it to be evidently allied to that genus.

**SICULIDÆ.**

**Microsca, Butler.**

63. *Microsca plagifera, n. s.*

Fiery cupreous, indistinctly speckled and striated with earthy greyish; primaries with an unequally subquadrate silver patch, through the centre of which runs a golden reticulated bar; wings below paler than above, sericeous-red, reticulated with dark grey; primaries with the basi-costal area and the centre of disc earthy greyish; patch of upper surface pearly, corrugated, the reticulated band dark ochraceous; body below testaceous; anterior legs brownish, with testaceous bands. Expanse of wings, 25 mm.

Tonga Island.

Somewhat resembles Felder's *Thermesia fenestrina*, which probably is not a *Thermesia*.

**Pharambara, Walk.**

64. *Pharambara reticulata, n. s.*

♀. Not unlike the female of *P. micacealis*; golden testaceous, slightly rosy towards outer margins; with numerous darker reticulations which tend to form lines in some instances, only one of these lines, however, is at all pronounced, forming a slightly sinuous submarginal line across the primaries; a slender marginal black line along the costa, interrupted by seven or eight minute black-edged yellowish spots; a series of extremely minute black points near outer margin, the third from costa continued obliquely downwards as a slender abbreviated zigzag line; fringes tipped with whitish; under surface pale shining testaceous, with the body and internal areas of the wings almost cream-coloured, but the apical areas washed with reddish golden; reticulations more strongly defined than above, golden cupreous, some of them expanded into angulated stripes enclosing black dots and striae; three of these stripes cross the primaries, the central one united to a patch of the same colour, dotted with black and silver at the end of the cell; the base of the cell, costal vein, and median vein are also defined by metallic silvery and opaline scales; an oblique subapical black line; legs clay-coloured or reddish ochraceous;
posterior tarsi banded with silvery whitish. Expanse of wings, 20 mm.

Peak Downs.

**ENNYCHIIDÆ.**

**GRAPHICOPODA, n. g.**

Seems to come nearest to *Ennychia*, the wings of the same form; costal vein of primaries terminating at about second third of the margin; subcostal five-branched, the first branch emitted before the end of the cell, the second, third, and fourth form a long foot-stalk, the second and third running to costa near apex and the fourth to apex, the fifth emitted from the inferior margin of the same footstalk just beyond the cell; radials emitted from opposite angles of the cell, the disco-cellular being obsolete; secondaries with the costal vein thickened towards the base; forked at some distance beyond the cell, the subcostal simple, free, tapering to a fine point below the costal vein but not passing into it, met by an arched line of colour, which probably indicates the former existence of a disco-cellular (or transverse) vein, now obsolete; radial forming a fourth median branch; body tolerably slender, extending only a short distance beyond the secondaries; antennæ with large and somewhat cuneiform basal joint, otherwise thick, especially towards the middle, sparsely and delicately pilose; palpi straight, thick, rather long, porrect, coarsely scaled, the terminal joint rather short and acute; legs rather long, compressed, the femora longitudinally deeply grooved, anterior femora with a thick tuft of hair towards the distal extremity, which curls forwards over the knees and projects from the inner surface; anterior tibia short, bearing a pencil of hairs, which is emitted below the knee and lies flat below the joint; tarsi long; second pair of tibiae bearing a terminal spur, as long as the first tarsal joint, and a long smooth pencil of gradually expanded hair-scales, which almost conceals the spur when viewed from the side; the distal extremity of the tibial joint is also oblique and fringed; tibie of last pair of legs bearing the usual two pairs of unequal spurs.

**G 55.** **Graphicopoda hecate, n. s.**

Wings above pitchy black-brown; the primaries with two ill-defined basal spots and a third spot below the origin of the first median branch of grey, changing in certain lights to opaline-lilac; secondaries with the basi-costal area whitish; body above greyish brown; wings below blackish picaceous, with the basal third whitly brown, showing two blackish lunate spots towards the extremities
Mr. Butler's *descriptions of Lepidoptera*—

of the discoidal areas; interno-basal area of primaries greenish opaline in certain lights; body below and legs sordid whitish or pale whitish brown. Expanse of wings, 21 mm.

Tonga Island (Friendly Islands).

**HYDROCAMPIDÆ.**

**Pseudephyra, n. g.**

Apparently nearest to *Homophysa*, though the palpi differ considerably; wings broad, having the general aspect of the *Gomctrid* genus *Ephyra*, especially of *E. splendens*: very like *Homophysa* in neuration; body very robust, not extending beyond the secondaries; palpi porrected, large, compressed, expanded in front by a long fringe along the anterior surface, the terminal joint small and directed slightly downwards so that the anterior, or more strictly speaking, inferior, margin of the palpus is elongate sigmoidal; antennæ filiform, extending to beyond the middle of the wing; legs moderately long, stout, and somewhat compressed.

**66. Pseudephyra straminea, n. s.**

Bright straw-yellow; primaries with a subbasal reddish ochreous band, bounded by a metallic leaden line and sprinkled with metallic scales; reniform spot indicated by two plumbageous dots connected by short ochreous lines; an angulated black-bordered reddish ochreous discal band, bounded internally by a plumbageous line of scales; external margin irregularly bordered with reddish ochreous; secondaries with a dot at the end of the cell, and the external two-fifths reddish ochreous, the latter crossed by a discal band similar to that on the primaries; a line of plumbageous scales close to outer margin; abdomen reddish ochreous crossed by slender black lines; under surface pale stramineous; the wings crossed by arched discal blackish bands, which do not reach the margins. Expanse of wings, 19 mm.

Var. The reddish ochreous spots and bands replaced by black spots and broader greyish brown bands mottled with black; the plumbageous scales remaining. Expanse of wings, 18 mm.

Peak Downs.

**Niphadaza, n. g.**

Apparently nearest to *Oligostigma*; wings narrow, elongated, acute at apex; primaries with the outer margin very oblique; costal margin nearly straight, costal vein extending to about the apical third of costa; subcostal five-branched, emitting its first two branches before the end of the cell, its third just before the
apex, its fourth running to the apex, fifth branch emitted from near the base of the long footstalk, which bears the third and fourth branches, just beyond the cell; upper radial vein emitted from the anterior angle, and lower radial from the posterior angle of the cell; disco-cellular veinlet angulated; the three median branches well separated from each other at their origins; secondaries with the costal margin nearly straight, outer margin slightly arched, abdominal margin short and nearly straight; costal and subcostal veins contiguous to basal fourth, where they caelesee, but separate again just before the middle of the wing, the costal vein forming a long furca to apex and the subcostal continuing straight on to the outer margin; disco-cellular veinlet absent, the cell consequently open, and the radial emitted as a fourth median branch; palpi moderately long, directed forwards so as to show almost their entire length in front of the head; antennae short, slender, moniliform, finely penicillated; thorax robust, projecting well in front of the wings; tegulae large, extending to beyond the mesothorax; legs thick (both legs and abdomen broken short off in the type).

67. Niphadaza bicolor, n. s.

Primaries above rust-red; the base, an externally angulated band across the basal third, a small spot near the base of the lower radial interspace, a large apical costal spot, separated by a curved stripe of the ground colour from an internally somewhat conical external border (the centre of which is divided again by a forked line of the ground colour) snow-white; secondaries snow-white, with a large subbasal interno-median spot, a broad discal band with arched outer edge and a small oblique spot near the middle of the outer margin, rust-red; antennae dark ferruginous banded with white; body snow-white, collar with a ferruginous spot on each side, thorax with darker red-brown scales at the sides; primaries below pale golden, with white markings almost as above; secondaries white, with a narrow diffused golden discal streak; body white. Expanse of wings, 24 mm.

Viti Islands.

Oligostigma, Guériné.

68. Oligostigma pallida, n. s.

Chalky white; primaries sparsely irrorated with dark brown scales to external third, crossed at basal two-sevenths by an elbowed pale ochraceous band; a second widely bisinuated ochraceous band crossing the wing obliquely beyond the middle; a third band, twice interrupted and with dusky zigzag external edge near to outer
Mr. Butler's descriptions of Lepidoptera.

margin; a submarginal series of short black dashes followed by a narrow testaceous stripe, and a marginal series of black dots; fringe slightly testaceous; an oblique blackish dash upon the first ochreous band just below the median vein, and an imperfect annular blackish spot at the end of the cell; secondaries crossed near the base by an oblique blackish-speckled pale ochreous line; a second line crossing the middle of the wing from abdominal margin to costa, emitting a branch inwards from the end of the cell to the costa nearer the base; a dusky-edged pale ochreous band crossing the disc, attenuated and elbowed towards the costa; an undulated submarginal blackish line followed by a testaceous line and a marginal series of black dots; fringe tinted with testaceous; markings below, excepting along the outer margins, very indistinct. Expanse of wings, 23 mm.

Rockhampton.

ASOPIIDÆ.

RINECERA, Butler.

69. Rinecera nigrescens, n. s.

Allied to R. mirabilis; purplish black; primaries crossed at basal fourth by an irregularly angulated whitish line; a second very indistinct and very irregular zigzag line from costa to first median branch, along which it runs inwards for some distance, and then turns abruptly at a right angle and passes with two alternate angles to inner margin; discoidal spots represented by two little white dashes; secondaries crossed by two whitish lines, the first interrupted by a white dot at the end of the cell, the second running from about the middle of the outer margin to the costa; both lines ill-defined in the male; wings below nearly as above, but the internal borders sericeous-whitish; body below sordid white. Expanse of wings: male, 23 mm.; female, 20 mm.

Viti Islands.

The species is larger and darker than R. mirabilis, and differs in many details of colouring; both evidently differ structurally from Ceratoclasis barbingonis, Feld.

HORMATHOLEPIS, n. g.

Allied to Rinecera; wings elongated; primaries with the costa deeply grooved below to a little before the middle, where the costal vein bends somewhat inwards before its termination; subcostal vein apparently five-branched; remaining veins as in Niphadaza;

* Owing to the folding over of the costal border in the type these branches are difficult to follow, but they appear to be similar
Heterocera from the Australian Region.

a thick tuft of projecting hair emitted from the middle of the internal border on the under surface of the primaries; body much elongated, antennae much elongated, extending to about the fourth fifth of costa of primaries, the basal joint large, cylindrical; following joints short, somewhat flattened, tapering, knotted above the middle, and emitting a tuft of long clubbed scales, which project forwards and slightly upwards to the distal fourth; palpi long, curved, corrected; second joint bearing a long pencil of hairs above and a shorter one below the terminal joint (giving the appearance of three pairs of palpi from one base; legs long and rather slender, femora grooved; anterior and middle tibiae short, with an appressed terminally fringed spur emitted from its inferior margin and running forwards to the extremity of the joint; posterior tibiae with three long slender spurs, the first projecting from near the middle, and the two others from the distal extremity of the joint.

70. Hormatholepis erebina, n. s.

Dark smoky grey, with slight purplish and bronze reflections, the primaries almost crossed by two irregular blackish bands, the first across the basal third, and the second just beyond the middle; both of these bands have zigzag external edges; wings below darker than above. Expanse of wings, 28 mm.

Viti Islands.

Asopia, Guenée.

71. Asopia leonina, n. s.

 Primaries above bright straw-yellow, with purple-glossed black markings, almost exactly as in Dichocrocis frenatalis of Lederer, as follows: an arched line across the base; a bisinuated line, angulated upon the median vein before the middle; an oblique reniform spot, enclosing two whitish dots, at the end of the cell; a sinuous line across the disc, bending inwards so as to touch the posterior extremity of the reniform spot, and a marginal line, emitting a streak above its centre to join the discal line, and broken up into spots towards external angle; fringe whitish, spotted with grey; secondaries distinctly paler, cream-coloured shot with strawineous, the disc crossed by an abbreviated and slightly tapering grey stripe; an external grey border confined to apex and a continuous black marginal line; fringe spotted with blackish; front of thorax and centre of abdomen bright straw-yellow; the latter with dorsal blackish dots; remainder of body above shining to those of Niphadaza (Hydrocampidae): the wings are delicate, and will not bear much damping with benzine.
Mr. Butler's descriptions of Lepidoptera.

cream-colour; anal segment tipped and spotted with grey; wings below cream-coloured, sericeous, with stramineous reflections; markings on primaries less strongly defined than above; fringe whitish, spotted with grey; body below sericeous, cream-coloured. Expanse of wings, 17 mm.

Peak Downs.

Leucophotis, n. g.

Allied to Agathodes (A. ostentalis); with similar neuration; style of coloration of Leucinodes; body very robust, palpi erect, one-third of their length being visible above the top of the head, compressed, but not so broad as in Agathodes, and with prominent terminal joint; antennæ extending to about second third of primaries, serrated and finely penicillated along their inner or anterior surface; tegulae large, expanded, almost entirely covering the thorax, abdomen extending about half its length beyond the secondaries, dorsally keeled and tufted, and with five tufts on each side; wings broad, as in Margarodes.

72. Leucophotis pulchra, n. s.

Wings semitransparent, yellowish; basi-internal area of primaries above clay-coloured, crossed by two subbasal dull blackish bars, shot with steel-blue; a third oblique interrupted blackish bar running from the middle of the inner margin to the end of the cell; discoidal spots near together, annular, ferruginous, with yellowish centres; an irregular subapical blue-black patch, edged internally by a slender white line, but externally bounded by a diffused ferruginous border; an indistinct undulated ferruginous and ochreous submarginal line curving inwards towards costa; secondaries with a rather broad abbreviated oblique band of blue-black, with ferruginous edges, from the middle of the radial interspace across the end of the cell to the submedian vein, up which it runs almost to the base. a subbasal brown spot; an angular subapical blue-glossed blackish patch bordered externally with reddish ochreous, and partly confluent with an irregularly situated ochreous submarginal line; head above yellow, banded with ferruginous; antennae ferruginous; collar reddish testaceous; tegulae pale greyish brown, opaline in certain lights; abdomen greyish brown, reddish at the base; lateral tufts with a plumageous gloss; under surface sericeous cream-colour; the discs of the wings semitransparent; an abbreviated transverse black bar from the cell almost to the inner margin in all the wings, and the subapical angulated black patches of the upper surface; front pair of legs
blackish above; venter with a central longitudinal clay-coloured line. Expanse of wings, 49 mm.

Viti Islands.

This is one of the largest, and at the same time strikingly coloured, of the Pyrales.

**Endotricha, Zell.**

73. *Endotricha annuligera*, n. s.

General appearance of *Locastra* (*L. amica* and allies); primaries greyish brown, with the central third creamy, subhyaline, bounded by the usual lines, which are black; the outer line broken up into spots and of the usual angulated form; four black annular costal markings upon the central area; a small cuneiform costal cream-coloured spot beyond the outer line, in continuation of the central belt; reniform spot represented by a curved clavate brownish outline; fringe micaceous-grey, with a basal black-spotted cream-coloured line; secondaries cream-coloured, with the external third irregularly grey-brown; fringe as in the primaries; head and front of thorax brown, mottled with whitish and pale testaceous; back of thorax white; abdomen white, with a large slightly greyish scutiform central patch, partly margined and dotted with black-brown; primaries with markings as above, but the black lines on the primaries replaced by grey, and the basal area cream-coloured; body below creamy white. Expanse of wings, 17 mm.

Peak Downs.

Though much unlike the known species of *Endotricha* in coloration, this species appears to belong to that genus.

74. *Endotricha obscura*, n. s.

♀. Nearest to *E. docilisalis*; considerably smaller, with differently coloured fringes and differently formed lines across the secondaries on the under surface; upper surface shining dark lilacine-grey, costa of primaries golden brown, with a very slender black edge dotted with yellow; a faintly indicated arched line across the basal third; a slender slaty grey submarginal line, internally white-edged at costa; fringe bright golden chrome-yellow tipped with silvery white, replaced by shining cupreous tipped with lilacine at apex, in the middle and at external angle, the two latter patches of deeper colour being moreover connected by a partly confluent series of plum-coloured dots near the base of the fringe; secondaries with pearl-white costal area; faint indications
of two grey-edged pale lines across the wings; fringe silvery white, golden cupreous, spotted with plum-coloured lunules at the base; head, collar, and tegulae golden brown; thorax and abdomen lilacine greyish; primaries below smoky grey, shot with lilacine; internal area white; costal margin black, spotted with yellowish; costal area golden towards apex; a biangulated white line towards outer margin, its costal third black-edged externally; a black marginal line; fringe nearly as above; secondaries rosy lilacine, whitish on the basi-abdominal area; an augulated grey-brown stripe at basal third, and a lunule of the same colour at the end of the cell; a broad tapering brown stripe enclosing a pink undulated line from costa to anal angle; a partly confluent marginal series of black dashes; fringe almost as above; body below dull rose-coloured, legs partly white, tarsi more or less broadly banded with grey-brown; anal segments golden ochreous in the centre. Expanse of wings, 21 mm.

Rockhampton.

The allied *E. docilisalis* has been declared to be synonymous with *E. stilbealis*, a species differing from it in size, coloration, and pattern; the two have also been pronounced to be females of *Messatis sabirusalis = Paconia albifimbrialis = Tricomia auroralis = Rhodaria robina*; if it be a fact that either *E. docilisalis* or *E. stilbealis* is the female of Walker’s *M. sabirusalis* (which has much the aspect of *Rhodaria sanguinalis* on a larger scale), the species can no longer remain in *Endotricha*, a genus in which the sexes agree in both size, form, and pattern.

*E. obscura*, in pattern, nearly resembles *E. sondaicalis* of Snellen from the Celebes.

**Rhimphalea, Led.**

75. *Rhimphalea anone*, n. s.

Pearly semitransparent white, wings with a broad internally dentated bronze-brown border with purplish reflections, enclosing three acute closely approximated spots above the median branches; veins black; wings crossed beyond the middle by a very irregular purplish brown line parallel to the inner edge of the external border; primaries with the costal border creamy white; two or three blackish subbasal spots; two irregular lines crossing the wing, the first near the base, the second (partly formed by a large purplish black reniform spot) across the middle; orbicular spot
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somewhat elongated, angulated in front; a longitudinal black streak almost uniting the two lines below the cell; fringes of all the wings plumbageous-grey, with a whitish basal and a black subbasal line; head and front of collar pale ochreous; back of collar pale sericeous-grey; a large black spot on each tegula; abdomen pearly white; wings below as above; body pearl-white, front legs greyish. Expanse of wings, 25 mm.

Rockhampton.

Pterygisus, n. g.; Isopteryx, Gueneé.*

76. Pterygisus ochreipennis, n. s.

Primaries black, changing in certain lights to dark chocolate; an ochreous spot at base of inner margin; a paler ochreous band from the median vein to the inner margin at basal fourth; a minute spot of the same colour obliquely above the latter within the cell; two white spots placed transversely in the middle of the wing; a small pale ochreous spot obliquely below the latter close to inner margin; a quadrate white spot immediately beyond the cell; an ochreous subapical costal spot; three small ochreous discal spots on the median interspaces, forming a transverse tapering line; fringe alternately black and white; secondaries deep ochreous; the centre of the costal border, a tapering abbreviated, shaped streak just before the middle, an angulated discal line and the outer border (sinuated in the middle), black; thorax brown; abdomen grey, pale testaceous at the base. Expanse of wings, 18 mm.

Peak Downs.

Gonocausta, Led.

77. Gonocausta? asuridia, n. s.

Like the small genus Asura (Lithosiidae) in coloration; primaries above with two ochreous spots towards the base of the costa, an oblique cream-coloured streak from the second of these spots almost to the inner margin; and two broad cream-coloured bands, central and discal, connected near the centre so as to form the letter Ω, thus; fringe whitish, with the middle, the apex, and the external angle, black; secondaries ochreous, streaked with black at the base; the outer half of the costal border, a broad apical patch, a smaller anal patch, and a narrow external border uniting all together, black; fringe alternately black and white; body dark chocolate-brown; the head and back of tegulae pale ochraceous;


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abdomen crossed by slender white segmental lines: under surface nearly as above; palpi ochreous, legs and venter banded with ochreous. Expanse of wings, 20 mm.

Peak Downs.

**MARGARONIIDÆ.**

78. *Margaronia limbata*, n. s.

Allied to *M. transvisalis*; primaries silvery white; costal border golden ochraceous; veins towards outer margin greyish, in certain lights cupreous; fringe, excepting at apex, grey with bronze reflections and whitish brown basal line; secondaries pearly white, with diffused grey external border and slender dusky marginal line; fringe white, the apical half tipped with grey; body silvery white; antennæ pale bronze-brown; primaries below white to the end of the cell, with the veins and costa greyish; remainder of the wing sericeous-greyish; secondaries sericeous snow-white, with greyish external border; body below silvery white; an ochreous lateral stripe running from the tip of the palpus to the shoulder. Expanse of wings, 27 mm.

Rockhampton.

The greyish border to the secondaries in this species is sufficient to distinguish it at a glance from *M. transvisalis*, apart from other characters.

**BOTYDIDÆ.**

Botys, Latr.

79. *Botys horatius*, n. s.

Nearly resembles *B. hecataialis* of St. Domingo, excepting in its inferior size; bright golden ochreous; primaries with the central area slightly opaline; an oblique purplish black dash at base of costa; a subangulated purplish black line across the basal fourth; a short transverse line at the end of the cell and a line across the external fourth arched from costal margin to first median branch, and thence biangulated or zigzag to inner margin; secondaries pale towards the costa; a slightly irregular purplish brown line from the end of the cell to the anal angle; markings below less strongly defined than above. Expanse of wings, 20 mm.

Viti Islands.

This species is also probably allied to *Astura d. clytusalis*, Walk. (*Botys clytialis*, Led.).
80. *Botys argyrogaaster*, n. s.

Pale golden testaceous; wings becoming gradually pearl-white towards the base; orbicular spot represented by a golden brown dot; reniform spot by a little transverse spot of the same colour; a faint indication of a golden brown wavy discal line; back of thorax pearl-white, abdomen golden testaceous, becoming darker towards the posterior margins of the segments, which are pearl-white, sides and anal segment pearl-white; wings below slightly paler than above, pectus white, legs cream-coloured; venter silvery white. Expanse of wings, 25 mm.

Viti Islands.

Belongs to the long-winged group of this too elastic genus.

**Emprepes, Led.**

81. *Emprepes insignis*, n. s.

Primaries above rather pale chrome-yellow, with broad internally bisinuated shining bronze-brown outer border; a small spot of yellow, with a faint submarginal streak of the same colour above it, near external angle; costal margin to just beyond the end of the cell, a subbasal transverse stripe and a quadrate spot at the end of the cell (uniting the costa to the angle between the situations of the external border) black-brown; secondaries shining bronze-brown; costal area white, excepting at apex; fringe greyish; head above cream-colour; collar dark brown, with a cream-coloured spot on each side; thorax ochreous, with a dark brown band across the front; abdomen pale bronze-brown, with whitish hind margins to the posterior segments; under surface with the brown areas more golden; otherwise much as above. Expanse of wings, 17—18 mm.

Male, Gayndah; female, Peak Downs.

**Scopula, Schr.**

82. *Scopula auritincta*, n. s.

Golden ochraceous, primaries paler towards the inner margin; base of the wing crossed by a broad imperfect greyish brown S-shaped figure, not reaching the margins; a quadrate spot closing the cell, and a second large oblique S-shaped figure (open at its extremities) crossing the disc; this figure is formed by an angulated discal stripe united just about its central angle to a 3-shaped submarginal stripe; neither of these stripes extend to the costal or
inner margins; secondaries considerably paler than the primaries, excepting along the outer margin; an indistinct greyish apical border; wings below uniform pale golden stramineous, the primaries showing traces of the markings of the upper surface; pectus silvery white, legs partly ochraceous; venter cream-coloured, with glistening white hind margins to the segments. Expanse of wings, 25 mm.

Peak Downs.

**Nymphula, Schr.**

83. *Nymphula sordida*, n. s.

Whity brown, with faint golden reflections; primaries with a small dusky spot at the base; a dark brown dot just below the middle of the discoidal cell; orbicular spot also represented by a similar dot; reuiform spot well-defined, smoky brown; a diffused smoky brown apical spot and a streak of scattered scales of the same colour near outer margin; a marginal series of blackish dots; fringe shining whitish, traversed by a dusky line; secondaries slightly greyish, with darker diffused external border; fringes as in primaries; thorax greyish; wings below whity brown, slightly pearly; markings obsolete; body below pearly white. Expanse of wings, 24 mm.

Rockhampton.

**Boarmidæ.**

**Boarmia, Treit.**

84. *Boarmia tongaica*, n. s.

Yellowish (or bone-) whitish; external borders of the wings blotched with sepia-brown, crossed by a submarginal dentate-sinuate white line; an angular undulated sepia-brown discal band, traversed along its inner edge by a line of the ground colour; a conspicuous black spot enclosing a line of silvery grey scales at the extremity of each discoidal cell, below and beyond which spot is a dusky nebulous patch, widest on the secondaries; an irregular oblique dark brown line commencing with an elbow at the middle of the costal margin of the primaries, passing in front of the cell in these wings and behind the discoidal spot on the secondaries, terminating at about the middle of the abdominal margin; base mottled with blackish brown; primaries with an elbowed black-edged brown band across the basal fourth; costal margin irregularly spotted with black; thorax greyish brown; tegulae and abdomen spotted with black; under surface of the wings with the disc clouded with greyish brown; a spot of the ground colour at the apices of the wings, a second at the extremity of the second
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median interspaces, and a diffused discal streak from the inner margins near the posterior angles; the anal border of secondaries also whitish; discoidal spots well-defined, black in the centre; markings towards the base ill-defined; body below bone-whitish. Expanse of wings, 42 mm.

Tonga Island.

Not very nearly allied to any known species.

85. Boarmia samoana, n. s.

Pale vinous-brown, irrorated with sepia-brown; wings crossed by blurred imperfect sepia-brown lines and spots, as in B. abietaria of Europe; an undulated yellowish testaceous undulated discal stripe, interrupted by the dark brown spots, which succeed the outer line of the central band, the primaries also with two longitudinal divergent stripes of the same yellowish colour below the cell, and one or two indistinct yellowish spots towards base of costal border; abdomen with the usual dorsal series of black dots in pairs; under surface with the markings almost obliterated, the annular discoidal markings represented by a large grey spot on the primaries and a smaller one on the secondaries; a greyish diffused submarginal band widening into a broad patch towards costa of primaries; the costal border of these wings also spotted with blackish. Expanse of wings, 36 mm.

Samoan Islands.

Nearest to B. procursaria from India.

86. Boarmia godefiroyi, n. s.

Apparently most nearly allied to B. secundaria of Europe; whitish brown; most of the lines across the wings externally ill-defined, only indicated here and there by a few dark brown scales; spots at the extremities of the discoidal cells large, blackish, enclosing a white crescent; the post-median blackish line and the undulated brown stripe beyond it distinct, excepting on the median interspaces of the primaries and the costal area of the secondaries; the costal area of the primaries clouded with greyish towards apex; a marginal series of black dots; secondaries with the central belt rufous-brown from the disco-cellular spot to the abdominal margin; abdomen with the usual black dots; wings below whiter than above, with the disc purplish grey, forming a broad belt across the wings, with its centre rather paler than its borders, that on the primaries extending to the outer margin, excepting at apex and
extremity of second median interspace, that of the secondaries zigzag and partly touching the outer margin towards apex; disco-cellular spots represented by large black spots. Expanse of wings, 35 mm.

Rockhampton.

The coloration of this species is decidedly peculiar, especially on the under surface, which is like that of Ophthalmodes.

Ægitrichus, n. g.

Allied to Boarmia; neuration very similar, especially in the primaries; the subcostal branches of the secondaries and the second and third median branches emitted at a short distance from each other instead of from the same point; the disco-cellular veinlet also much more deeply inarched than in Boarmia; on the under surface of the secondaries are two thick masses of woolly hair, the first projecting from the outer half of the median vein and the base of its first branch over the interno-median area, the second spreading outwards from the basal half of the abdominal margin; body robust, palpi rather longer than in Boarmia, porrected, with deflexed short fusiform terminal joint; antennae wanting in the type.

87. Ægitrichus lunaris, n. s.

Nearly resembles Boarmia consortaria, but the ground colour of the wings is whiter, the disco-cellular spots are well-defined, crescent-shaped, white, that of the primaries with a grey border; the lines across the wings are also better-defined, blacker; the submarginal dark-bordered zigzag white stripe is farther from the outer margin, the lines of the central belt converge more towards the inner margin of the primaries, the outer line in all the wings is less regular, and the black dots along the outer margin are better-defined; on the under surface the differences are considerably more marked, the ground colour both of wings and body being of a pale sericeous vinous-grey instead of clear cream-colour, and the markings consist of ill-defined greyish disco-cellular spots, an arched discal streak and a submarginal band, barely distinguishable on the primaries; the hairy masses are tipped with grey. Expanse of wings, 47 mm.

Viti Islands.
Lycauges, Butler.

88. Lycauges proxima, n. s.

Very near L. lactea of Japan, of nearly the same size and general tints; white brown, almost white; wings with a black disco-cellar dot, an oblique greyish stripe beyond the cell, its upper extremity touching a slender black dotted grey discal zigzag line, elbowed towards costa; two undulated grey submarginal stripes, ill-defined on the primaries, and a marginal series of extremely minute black points; costal margin of primaries yellowish in certain lights; the submedian area of these wings on the under surface greyish; basal half of secondaries below sprinkled with grey scales; all the black dots of the upper surface present, but the grey stripes and lines ill-defined. Expanse of wings, 19 mm.

Rockhampton.

This species should be placed between L. defamataria and L. lactea.

Geometridæ.

Chlorochroma, Dup.

89. Chlorochroma neptunus, n. s.

Dull sea-green; primaries crossed by two widely-separated slender undulated white lines; costal margin very narrowly edged with creamy whitish; a small dark green disco-cellar lunule; fringe whitish, with a central green stripe; secondaries crossed beyond the middle by a single slender subangulated undulated white line; a dark green disco-cellar dot; fringe as in primaries; vertex of head and upper surface of antennæ snow-white, under surface of antennæ cream-coloured; wings below, especially the secondaries, suffused with pearly white; costal margin of primaries cream-coloured; markings obsolete; body below white; legs yellowish. Expanse of wings, 26 mm.

Gayndah.

Nearest to C. carenaria, which appears to have been described from worn examples of Geometra submissaria of Walker.

Idœidæ.

Idæa, Hüb.n.

90. Idæa lydia, n. s.

Whitish brown, irrorationed with grey-brown; a slightly irregular smoky brown band crossing the primaries obliquely beyond the
middle and the secondaries at the middle; a paler and more diffused band beyond the latter; its outer edge zigzag; secondaries also with a submarginal stripe of the same colour; an almost marginal series of black points alternately placed with a series of small brown spots at the base of the fringe; markings below less strongly defined. Expanse of wings, 23 mm.

Peak Downs.

Allied to I. attributa.

91. *Idaea jessica*, n. s.

Nearly allied to the preceding species, smaller, the primaries more acute; the band beyond the middle much nearer to the outer margin, narrower, paler, and less irregular; the discal band following it better-defined upon the primaries, and with undulated (not zigzag) external edge; a submarginal series of grey-brown spots on all the wings; dots at outer margin extremely minute; secondaries with a black dot at the end of the cell. Expanse of wings, 17 mm.

Peak Downs.

92. *Idaea nivipennis*, n. s.

Snow-white; wings crossed beyond the middle by two parallel slender grey dentated lines and two subconfluent squamose stripes near the outer margin; a marginal series of very minute blackish points; primaries with a very slenderly ochraceous costal margin; a minute black point at the inferior angle of the cell; face brown, darkest towards the vertex of the head, the latter white; front of collar orange; antennæ brown, becoming white at the base; under surface snow-white; the costal margin of the primaries ochreous anterior coxae yellowish; anterior tibiae and tarsi brownish above. Expanse of wings, 26 mm.

Viti Islands.

93. *Idaea innocens*, n. s.

Belongs to the *I. ornata* group; small; chalky white, with small but conspicuous black disco-cellular spots; a very irregularly sinuous olive brownish line crossing the primaries in front of the disco-cellular spot, curving inwards below it and then downwards with a slight curve inwards to inner margin, crossing the secondaries obliquely behind the disco-cellular spot at about the basal third; a faint indication of a brownish discal line, followed
by an internally diffused widely undulated brownish band towards outer margin; an imperfect submarginal brownish stripe, a marginal series of linear black markings almost forming a perfect marginal line; wings below only showing the black markings, the primaries also with an indication of the undulated brownish band; these wings are suffused with pale brown, excepting towards inner margin; legs brownish. Expanse of wings, 18 mm.

Rockhampton.

94. *Idea agnes*, n. s.

Pure white; primaries with a brown and secondaries with a black disco-cellular dot, from which to the inner margins is a faint linear stain of brown (only visible with a lens); a very slender crenulated brownish discal line, dotted with black, and externally edged with ochreous upon the radial interspaces of the primaries; two barely visible parallel brownish stripes; a marginal brown line dotted with black, and interrupted at the extremities of the veins on the secondaries; face dark brown; antennæ bronze-brownish; back of head pale ochreous; pectus silvery white; anterior and middle legs silvery brownish in front; abdomen chalky white; primaries below sericeous, sordid white, pure white towards inner margin; secondaries pure white; black dots as above; other markings obsolete. Expanse of wings, 22 mm.

Rockhampton.

Allied to *I. deliciosaria*, and belongs to the group with angulated secondaries, flattened posterior tibiae, and short posterior tarsi.

**FIDONIIDÆ.**

**Panagra, Gueneé.**

95. *Panagra rupicolor*, n. s.

Dove-grey, sparsely irrorated with dark grey; a black spot at the extremity of each discoidal cell, and an abbreviated black-brown stripe from just beyond the middle of each inner margin, that on the primaries strongly marked, with pale inner edge, oblique, extending to the lower radial vein; a small spot at about the basal third of the submedian vein; the stripe on the secondaries slender, disappearing at the base of the second median branch; fringes pale brown; under surface paler, the primaries very pale bronzy brownish, indistinctly and transversely striated with grey; costal border and veins pale straw-yellow; a blackish disco-cellular spot; secondaries white speckled with dark grey, with three sub-apical spots and a subanal dash of the same colour; veins yellow;
fringe yellowish at the base; a black disco-cellular spot; body whity brown. Expanse of wings, 33 mm.

Peak Downs.

**Casbia, Walk.**

96. *Casbia irrorata*, n. s.

2. Pale pinky brown with golden reflections, densely irrorated with grey; wings with very minute marginal black dots; primaries with the costal border slightly whitish; head dark brown; under surface white, grey-speckled, with a faint bronze-brown tint in certain lights; external borders pinky brown, mottled with grey; a small blackish disco-cellular spot on each wing; legs cream-coloured. Expanse of wings, 26 mm.

Rockhampton.

Allied to *C. rectaria*, Walk., but without the bands and spots characteristic of that species; it seems improbable that it can be a variety.

**Aspilates.**

97. *Aspilates clarissa*, n. s.

General aspect of very pale examples of *Osteodes turbulentata*, Guen. (= *Aspilates exumbrata* and *semispurcata*, Walk.), serious pinky whitish, indistinctly irrorated with grey-brown scales; under surface of a more creamy tint, with the costal border of the primaries slightly ochraceous; the female decidedly whiter than the male on both surfaces. Expanse of wings, 31 mm.

Male, Moreton Bay; female, Peak Downs.

**Larentiidae.**

**Cidaria, Treits.**

98. *Cidaria decipiens*, n. s.

Closely allied to *C. emilia* of Chili, from which it chiefly differs in the absence of the yellow streaks on the veins; primaries pale leaden grey, with darker basal patch and subangulated central belt, with zigzag black margins and white borders; a narrow grey-speckled testaceous band bounding the inner edge of the central belt; an ill-defined black reniform spot; a submarginal series of more or less confluent squamose blackish spots, largest towards apex, indistinctly edged externally by a white line; secondaries grey; a faint indication of an angular whitish diffused stripe across the middle and an oblique whitish line from anal
angle; thorax dark grey; abdomen paler grey, with darker lateral spots; under surface sericeous pale grey; wings with small black disco-cellular spots and a whitish angular discal stripe. Expanse of wings, 20 mm.

Sydney.

Coremia, Guenée.

99. Coremia picta, n. s.

Primaries sericeous golden buff; crossed at the base by two black-edged zigzag silvery grey bands, in the middle by an irregular pale shining chocolate-brown band, widest on costa, biangulated internally and bisinuated externally, edged with black and bordered with white and silvery grey; a rather broad pale shining chocolate-brown external border, interrupted at apex by a large oval silvery white spot, and bounded internally by a series of silvery margined black spots; secondaries pale sericeous smoky grey; head and thorax dark grey, spotted with pale yellow; abdomen whitish brown; under surface dark shining grey, irrorated with white; a submarginal series of white spots, bordered internally with dark grey. Expanse of wings, 19 mm.

Viti Islands.

Phycitidæ.

Salebria, Zell.

There can be little doubt that the following species belongs to this genus; the secondaries, however, have distinctly nine veins; they appear to have twelve, as there is a strongly defined fold between the abdominal margin and the internal vein, and there are two similar (but reversed) folds between the internal and the submedian veins; in Meyrick's description, and in his structural diagnosis of the family, he appears to have overlooked the internal vein altogether. It is very improbable that any of the Phycitidæ can have so few as seven veins in the secondaries.

100. Salebria squamicornis, n. s.

Primaries pale shining stramineous; a pure white longitudinal subcostal stripe tapering at each end, passing through the cell almost to outer margin; secondaries sericeous brownish white, with yellowish reflections, semitransparent, slightly darker along the external border; fringe white, traversed near the base by a dusky line; head, collar, and tegulae dull stramineous; remainder of body yellowish white, pearly; primaries below pale stramineous;
secondaries whitish, tinted with stramineous towards the outer margin; body below whitish, palpi and legs dull stramineous. Expanse of wings, 24 mm.

Peak Downs.

**Mella, Walk.** *(EtieLLa, Zell. nom. spec.)*

In this genus also there appear to be nine veins (not eight) in the hind wings, the internal vein having been passed over.

101. *Mella arenosa, n. s.*

Primaries above pale sandy testaceous, the fringe slightly greyish with a pale basal stripe; secondaries semitransparent pearly greyish white, with faint golden reflections; fringe whitish, with a dusky subbasal stripe; body pale testaceous, the head and thorax slightly olivaceous; wings below sericeous, pearly; the primaries, the costa of the secondaries, and the base of the fringes in all the wings pale golden stramineous; fringe with a greyish subbasal stripe; body below whitish, legs and palpi sordid. Expanse of wings, 26 mm.

Peak Downs.

**Anerastia, Hübn.**

102. *Anerastia nitens, n. s.*

Shining whity brown; primaries sparsely irrorated with black, with an oblique line of black scales from outer fourth of dorsal margin to lower radial vein; external border somewhat more densely irrorated with black than the remainder of the wing, the atoms tending to produce a marginal series of spots and indicating a line through the centre of the fringe; thorax and abdomen somewhat ochraceous; under surface shining whity brown, without markings. Expanse of wings, 21 mm.

Peak Downs.

**Crambidae.**

**Diptycophora, Zell.**

103. *Diptycophora inornata, n. s.*

Pale stone-greyish, sericeous; primaries in the female greyer than the secondaries; reniform spot large, more or less ochraceous, and sometimes outlined in black and subquadrate; costal margin slenderly blackish, interrupted (so as to form three short dashes) towards apex; a diffused white band from centre of inner margin to costa at apex, interrupted by a slender oblique elbowed line of
the ground color, the angle just beyond the end of the cell; a diffused black-speckled grey streak partly bounding the white band externally; an ill-defined wavy submarginal dusky line (not visible in the male), followed by a series of elongated spots forming an interrupted stripe; external area white towards the posterior angle; outer margin slenderly dusky, undulated fringe grey, white at the base; secondaries with the fringe grey, excepting a very slender basal line; palpi greyish; under surface whitish brown, without markings. Expanse of wings, 17—18 mm.

Gayndah and Peak Downs.

Explan.tion of Plates IX. & X.

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**Plate IX.**

Fig. 1. *Xantholule semiochrea.*

2. *Chionophasma paradoxa.*

3. *Leptocuris binotata.*

4. *Acrityocera negligens; a, antenna.*

5. *Dyschatassingularis.*


7. *Aporocosmus bracteatus.*


9. *Canthylida pallida.*

10. *Leucocosmia ceres.*

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**Plate X.**

Fig. 1. *Lopholeuce mirabilis; a, tibia and tarsus, with the apex of the femur.*

2. *Malacoma rubricula.*

3. *Leucopholis palchra.*

4. *Aegirichus lanariis.*

5. *Gonocauda asuridia.*


7. *Hormatholpis erubina.*

8. *Niphadaza bicolor.*


10. *Pseudephyra straminea.*

TRANS. ENT. SOC. LOND. 1886.—PART IV.
XVI. Descriptions of uncharacterised species of Diabrotica.

By J. S. Baly, M.R.C.S., F.L.S.

[Read June 2nd, 1886.]

In working out the Colombian species of Diabrotica I had to examine a large series of others from other countries. Some of these, which I believe to be undescribed, are characterised in the following paper:—

**Diabrotica viridana.**

Oblongo-ovata, convexa, prasina, nitida, tibiis tarsisque nigris, scutello antennisque piceo-nigris, his basi pallide piecis, articulo penultimo prasino; thorace lavi, bifoveolato; elyris subopacis, crebre subrugoso-punctatis, disco leviter sed distincte elevato-vittatis; vittis latis duabus, una marginali alteraque suturali, postice abbreviatis flavo-albidis, sutura anguste pica. Long. 2½ lin.

**Hab.** Chili.

Head trigonate; antennæ slender, filiform, the second joint short, the third one-half longer, the fourth longer than the preceding two united: the three lower joints pale piceous, the penultimate one pale green. Thorax about one-third broader than long; sides parallel and sinuate from the base to beyond the middle, thence rounded to the apex; disk smooth and shining, rather deeply bifoveolate; elytra oblong, closely subrugose-punctate, the disk of each with five slightly elevated but distinct longitudinal costae; each elytron with two broad ill-defined yellowish white vittæ, one marginal, the other sutural (these vittæ, which commence at the base, terminate some distance before reaching the apex); humeral callus with a narrow longitudinal piceous line.

**Diabrotica graminea.**

Ovata, convexa, flavo-fulva, nitida, capite, scutello, pectore, tibiis, tarsisque nigris, femoribus antennisque prasiniis, harum articulis intermedias ultimique nigris, penultimis duobus albidis; thorace lavi, dorso non impresso; elyris viridibus, convexis, prope

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medium leviter transversim depressis, tenuissime punctatis. Long. 3 lin.

Hab. Porto Rico.

Head trigonate, shining black; antennae filiform, pale green, the fifth to the eighth joints, together with the eleventh, black, the ninth and tenth white; the second and third very short, equal. Thorax rather broader than long; sides slightly diverging and sinuate from the base to beyond the middle, thence rounded and converging towards the apex; disk shining, impunctate. Elytra oblong-ovate, convex, transversely depressed across the middle, dark grass-green.

*Diabrotica latevittata.*

Oblongo-ovata, convexa, sordide prasina, nitida, pedibus pallide viridi-piceis; antennis pallide piceis, articulis penultimis duobus sordide albidis; thorace lævi, dorso non impresso; elytris oblongis, crebre punctatis; utrisque vitta lata castanea, a basi fere ad apicum extensa ornatis. Long. 3 lin.

Hab. Amazons; a single specimen.

Head much longer than broad, wedge-shaped; antennae slender, filiform, the third joint short, about one-half longer than the second; the ninth and tenth yellowish white; the eleventh in the single specimen before me broken off. Thorax rather broader than long; sides straight and nearly parallel from the base to beyond the middle; disk smooth, convex. Elytra oblong, finely but closely punctured; on each elytron, running downwards from the humeral callus, is a raised longitudinal line, the space on the inner side of which is longitudinally sulcate.

*Diabrotica apicalis.*

Auguste oblongo-ovata, convexa; flava nitida, capite, elytris apice, post-pectore, tibiis tarsisque nigris; antennarum articulis basibus tribus flavis, dorso piceo tinctis, duobus penultimis albidis; thorace convexo, lævi, dorso non impresso; elytris oblongis, tenuniter sat crebre punctatis. Long. 3½ lin.

Hab. Guatemala.

Head triangular, not longer than broad; antennae filiform, three-fourths the length of the body, the three lower joints fulvous, more or less stained with piceous; the ante-penultimate and penultimate ones, together with the extreme base of the apical, white; the third joint short, rather longer than the second, the fourth equal in length to the preceding two united. Thorax slightly broader
Diabrotica Grayella.

Subelongata, convexa, pallide flava, nitida, scutello capiteque piceis, pectore, oculis antennisque nigris, his basi et apice flavis; thorace lavi, dorso obsolete bifoveolato; elytris distincte, sat crebre punctatis; utrisque maculis quatuor, duabus baseos duabusque ante apicem, his oblique positis, nigris. Long. 2 2/3 lin.

Hab. Brazil, Petropolis, Constantia (Gray).

Head piceous or fulvo-piceous; antennae filiform, black, the four or five lower joints, together with the apical two, fulvous or flavous; the second and third joints short, nearly equal in length, the fourth longer than the preceding two united. Thorax rather broader than long; sides nearly straight and parallel, slightly converging at the apex; disk smooth, obsolete but bifoveolated. Elytra oblong, dilated posteriorly, rather closely punctured; on each elytron below the humeral callus is a faintly raised longitudinal ridge, and on the inner disk before the middle are several very faint longitudinal sulcations, only visible when viewed obliquely.

Diabrotica interrupta.

Subelongata, postice paullo ampliata, flava, nitida, pectore, abdominis segmento anali, tibiis, tarsis, scutello capiteque nigris, antennis basi fulvis, articulis penultiimis duobus albidis; thorace lavi, obsolete biimpresso; elytris tenuiter sat crebre punctatis, linea suturali vittaque submarginali ante apicem interrupta, nigris. Long. 3 lin.

Hab. Amazons, Para (Bates).

Antennae slender, filiform, the second and third joints very short, equal. Thorax about one-third broader than long; sides sinuate posteriorly, slightly converging at the apex; disk convex, smooth, obsolete impressed on either side. Elytra narrowly oblong; upper surface finely punctured; a narrow sutural line and a submarginal vitta, which extends from base to apex, but is interrupted just before reaching the suture, black.

Diabrotica Duivicieri.

Anguste ovata, postice ampliata, nigra. nitida, thorace inferiori pectoreque rufo-piceis, abdomen, coxis, femoribus antennisque basi

* In some specimens these foveæ are entirely absent.

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et ante apicem pallide flavis; thorace laevi, disco postico trifoveolato; elytris tenuissime punctatis; utrisque fascia prope medium utrinque abbreviata, maculique subrotundatis duabus, una infra basin, altera ante apicem, flavo-albidis. Long. 2½ lin.

Hab. Mexico, Teapa (Sallé); a single specimen from Deyrolle's collection.

Antennae filiform, the three lower joints, together with the ninth, tenth, and the basal half of the eleventh, yellowish white; third joint scarcely one-half longer than the second. Thorax about one-third broader than long, sides nearly parallel and slightly sinuate from the base to beyond the middle, thence converging towards the apex; hinder disk impressed triangularly with three shallow foveae, the middle one less distinct than the other two. Elytra very minutely punctured.

Diabrotica ampicornis.

Anguste oblonga, postice paullo ampliata, piceo-nigra, nitida, capite piceo-fulvo, antennis verticisque plagis duabus nigris; thorace transverso, disco late transversim excavato, margine basali, lateribus vittaque discoidali, basi ampliata, sordide fulvis; scutello piceo; elytris oblongis, postice vix ampliatis, sat crebre et foritier punctatis; linea suturali, margine laterali, vittaque discoidali, a basi fere ad apicem extensa, flavo-albidis. Long. 2½ lin.

Hab. Brazil; Parana; Spirito Sancto.

Antennae three-fourths the length of the body, the third joint about one-half longer than the second, three upper joints enlarged, the apical one acute. Thorax about one-half broader than long; sides slightly diverging and sinuate from the base to beyond the middle, thence slightly converging towards the apex; disk broadly and deeply transversely excavated. Elytra oblong, dilated posteriorly, coarsely subrugose-punctate.

The three specimens from which the above description was drawn are all evidently males; the other sex is unknown to me.

Diabrotica flavo-vittata.

Elongata, picea, nitida, antennis extorsum nigro-piceis, basi sordide fulvis, femoribus tibisique quatuor posticos, apice exceptis, thoraceque flavis; hoc laevi, profunde bifoveolato; elytris regulariter elevato-vittatis, interspatiis seriato-punctatis, utrisque limbo externo vittisque duabus discoidalibus, basi et apice conjunctis, flavis. Long. 2½ lin.

Hab. Yucatan.
Antennæ filiform, the third joint twice the length of the second. Thorax about one-half broader than long: sides parallel and slightly sinuate from the base to beyond the middle, slightly converging near the apex; disk smooth, deeply bifoveolate. Elytra narrowly oblong, regularly elevate-vittate, the third and fifth costæ from the suture rather broader than the others, spaces between the vittæ seriate-punctate; each elytron with the outer margin and two discoidal vittæ, one covering the third, the other the fifth costa, but united at base and apex, flavous.

**Diabrotica Fairmairei.**

Elongata, postice paullo ampliata, flava, nitida, pectore abdo-
mineque piceo-violaceis, femoribus apice, tibis, tarsis capiteque
rufo-castaneis, violaceo tinctis; thorace laevi, profunde
bifoveolate; elytris regulariter elevato-vittatis, vitta tertia a
sutura latior, interspatisiis biseriato-punctatis; violaceis ant fusco-violaceis, metallicco
nitentibus; utrisque limbo externo vittaque discoidali, apice ad
marginem connexa, flavis. Long. 3½—4 lin.

**Hab.** Mexico.

Antennæ filiform, the third joint nearly three times the length of the second. Thorax rather broader than long: sides nearly parallel, slightly sinuate posteriorly, slightly converging towards the apex; disk shining, impressed with two large foveæ. Elytra narrowly oblong, subparallel; each elytron with eight regular raised costæ, the third from the suture broader than the others; rufo- or fusco-violaceous with a metallic tint, each with the outer margin, together with a discoidal vitta, which covers entirely the third costa and is confluent at its apex with the outer margin, flavous.

Nearly allied in size, general coloration, and sculpture to *D. innuba* and *corusca*. Separated from both by the pale head, and by the third vitta on the elytron alone being broader than the rest; in the above-named species the second and third costæ are both broad and of equal width.

**Diabrotica consimilis.**

Subelongata, postice paullo ampliata, nitida, nigro-picea, capite,
scutello, pedibusque nigris, femoribus, apice exceptis, thorace-
que flavis; hoc laevi, profunde bifoveolato; elytris oblongo-ovatis,
regulariter elevato-vittatis, vitta tertia a sutura quam caeteris vix
latrior; interspatisiis biseriato-punctatis; piceis, subnitidis, limbo
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externo vittaque angusta discoidali, a basi ad apicem extensa, flavis. Long. 3½ lin.

**Hab.** Ecuador, Peru.

Antennæ filiform, the third joint more than twice the length of the second, the three lower ones piceous, the rest black. Thorax nearly one-half broader than long; sides nearly parallel and sinuate from the base to beyond the middle, thence slightly converging towards the apex; upper surface smooth, deeply impressed with two large foveae. Elytra oblong-ovate, slightly dilated posteriorly; upper surface sculptured as in *D. Fairmairei*, but the third costa from the suture is narrower and scarcely broader than the others; piceous, subopaque, each elytron with the outer limb and a narrow vitta covering this third costa, flavous.

From *D. Fairmairei*, the only insect with which the above species can be confounded, it is separated by the black head, and by the narrower third costa on the elytron.

**Diabrotica cornuta.**

Subelongata, nigra, nitida, pedibus capiteque fulvis, antennarum articulis intermediis ultimoque nigris; thorace lateribus angulatis, disco distincte punctato, profunde bifoveolato; elytris anguste oblongis, regulariter elevato-vittatis, vitta tertia a sutura latiori, interspatis biseriato-punctatis; utrisque basi, limbo externo vittaque discoidali, a basi ad apicem extensa, flavis. Long. 2½—3 lin.

Mas. — Clypei margine antico in cornu obtuso utrinque producto labro ampliato.

Fem. — Clypeo non producto, facie inferiori nigra.

**Hab.** Peru, Guatemala, Mexico, Vera Cruz.

Antennæ filiform, the third joint twice the length of the second, the intermediate joints, together with the apical one, black. Thorax broader than long; sides distinctly angulate; disk shining, finely but not closely punctured, medial disk impressed with two large foveae, the space between them depressed. Elytra sculptured as in *D. Fairmairei*.

Any difference in the form and sculpture of the lower face in the two sexes is rare in the vittate section of the genus; the above is the only instance known to me of its occurrence.
Diabrotica Curtisii.

Oblongo-ovata, postice paullo ampliata, convexa, flava, nitida, scutello capiteque nigris, antennis basi et apice flavis; thorace transverso, levi, profunde bifoveolato; elytris oblongis, postice paullo ampliatis, metallico-viridibus ant cyaneis, rude et fortiter rugoso-punctatis, elevato-vittatis, punctis inter vittas subseriatim dispositis.

Mas.—Antennis extrorsum distincte incrassatis, fere totis flavis, elyro utroque ante apicem prope suturam callo valido, intus emarginato, flavo instructo. Long. 3 lin.

Hab. Mexico.

Antennae filiform in the female, distinctly thickened towards the apex in the male, the third joint twice the length of the second in both sexes. Thorax nearly twice as broad as long; sides nearly parallel, deeply sinuate posteriorly; upper surface smooth, deeply and broadly bifoveolate, the space between the foveæ depressed; in some specimens there is a small third fovea on the hinder disk. Elytra oblong, slightly dilated posteriorly, coarsely and deeply punctured; each elytron with five or six elevated vittæ, the punctures between the vittæ irregularly arranged in striae. Near the suture just before the apex in the male is a large strongly raised flavous callus, the inner side of which is broadly excavated and bounded by a deep excavation, the surface of which is clothed by a few fulvous hairs.

Diabrotica cinctipennis.

Oblongo-ovata, postice ampliata, flava, nitida, femoribus et tibiis dorso, vertice antennisque nigris, harum articulis basaliuis quattuor subitus flavis (articulae ultimae quatuor fractae sunt); thorace transverso, late transversim excavato, crebre punctato, nigro maculato; elytris oblongis, postice paullo ampliatis, dorso sub-depressis, profunde et crebre punctatis, metallico-viridibus, limbo externo flavo. Long. 3 lin.

Hab. Peru.

Antennæ filiform, the third joint twice the length of the second. Thorax nearly twice as broad as long; sides diverging and sinuate from the base to the middle, then obtusely angulate; upper surface coarsely punctured, hinder disk impressed with a broad deep lunate sulcation, which is more deeply foveolate at either end; an irregular patch on either side and a small spot on the hinder disk black. Elytra closely covered with large deep round punctures.
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Similarly coloured to *D. viridipennis*, Jac.; at once separated by the absence of the longitudinal costæ on the elytra.

**Diabrotica gibbosa.**

Late ovata, postice ampliata, valde convexa, nigra, nitida, thorace elytrisque sordide flavis; thorace transverso, disco leviter transversim depreso, utrinque obsolete foveolato; elytris gibbosis, crebre rugoso-punctatis. Long. 4 lin.

**Hab.** Eastern Ecuador (Buckley).

Head longer than broad, trigonate; antennæ filiform, the third joint twice the length of the second, nearly equal to the fourth. Thorax nearly twice as broad as long; sides straight and parallel from the base nearly to the apex, the anterior angle subacute; disk transversely and slightly depressed, minutely but not closely punctured, obsolete foveolate on either side. Elytra gradually increasing in height from the base to beyond the middle, then obliquely deflexed to the apex; surface closely rugose-punctate.

**Diabrotica rugulosa.**

Ovata, postice ampliata, valde convexa, nigra, nitida. femoribus, antennis, thoracis lateribus elytrorumque limbo laterali, pallide prasinis, mesopleuris pube aurea dense vestitis; thorace lateribus fere rectis, pone medium leviter sinuatis; disco bifoveolato, subcrebre punctato; elytris olivaceo-tinctis, rude rugoso-punctatis, vittis nonnullis irregularibus instructis. Long. 4 lin.

**Hab.** Eastern Ecuador (Buckley).

Antennæ slender, filiform, the third joint twice the length of the second; three or four upper joints stained with fuscous. Thorax broader than long; sides nearly straight and parallel, slightly sinuate behind the middle, narrowly edged with pale grassy green; disk nitidous, impressed on either side with a large round smooth fovea, rest of the surface distinctly but not very closely punctured. Elytra strongly convex, coarsely rugose-punctate; disk of each with four or five irregular raised vitæ, which are connected with each other by irregular ridges, and form a network on the surface; lateral margin narrowly edged with pale grassy green.

This and the preceding species are very similar in form to *D. Hebe*. 
Diabrotica dimidiaticornis.

Late ovata, postice ampliata, convexa, nigra, nitida, antennarum articulis externis quatuor elytrisque flavis; his crëbre punctatis, utrisque plagis subrotundatis magnis, duabus, una ante, altera pone, medium positis, nigris; thorace transverso, bifoveolato. Long. 2½ lin.

Hab. Eastern Ecuador (Buckley).

Head rather longer than broad, wedge-shaped; antennae filiform, the four outer joints fulvous; third joint twice the length of the second. Thorax transverse: sides straight and diverging from the base nearly to the apex, thence obliquely converging to the anterior angle, the latter with an obtuse tubercle; upper surface punctured along the base, flattened on the hinder disk and rather deeply impressed on either side with a large fovea. Elytra closely punctured.

Closely allied to D. lugubris, mihi. Separated by the pale apices of the antennae, and by the more deeply impressed foveæ of the thorax.

Diabrotica lata.

Late ovata, convexa, dorso subdepressa, nigra, subtus subnitida, supra nitida, antennis extrorsum pallide piceis; thorace flavo, quam longo plus duplo latoi, disco pone medium utrinque oblique foveolato; elytris subcrebre punctatis, limbo externo late flavo. Long. 3 lin.

Hab. Peru.

Antennae slender, filiform, the third joint more than twice the length of the second; black, the four upper joints pale piceous. Thorax twice as broad as long; sides straight and very slightly diverging from the base to beyond the middle, thence slightly converging towards the apex, the anterior angle produced into a subacute tooth; disk minutely punctured, impressed on either side behind the middle with an oblique fovea. Elytra subquadrate-ovate, slightly dilated posteriorly, broadly rounded conjointly at the apex, slightly flattened along the suture, distinctly punctured; the outer limb broadly edged with flavous.

Diabrotica nigrocincta.

Subelongata, postice paullo ampliata, nigra, nitida, thorace bifoveolato elytrisque flavo-albidis, his late nigro limbatis anten-
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narum articulo nono albo (articulis ultimis duobus fractis). Long. 2 1/4 lin.

_Hab._ Teapa; collected by M. Pilate. A single specimen.

Vertex smooth, front impressed just above the encarpae with a distinct fovea; encarpae thickened, transversely trigonate; antennae filiform, the last two joints broken off; the second joint more than half the length of the third. Thorax about one-fourth broader than long; sides straight and diverging from the base to beyond the middle, thence slightly rounded and converging to the apex; disk smooth, impressed on either side with a large deep fovea. Elytra oblong, dilated from the base to the apex, the latter broadly rounded; upper surface shining, slightly irregular, finely but distinctly punctured. Entire disk of each elytron broadly edged with black.

_Diabrotica Oberthuri._

Anguste oblonga, postice ampliata, convexa, flava, nitida, capite, scutello, pectore, tibiis tarsiisque nigris; horum articulis ultimis duobus antennisque apice castaneis, his basi flavis; thorace transverso, laevi, transversim excavato, utrinque foveolato; elytris sat crebre punctatis, basi extrema, linea suturali, apice abbreviata, vittisque dupibus, una submarginali, una ad apicem extensa, altra discoidalis, utrinque abbreviata, nigris. Long. 3 lin.

_Hab._ Guatemala.

Antennae slender, filiform, the third joint twice the length of the second; the three lower joints flavo-fulvous, the three upper ones castaneous. Thorax about one-half broader than long; sides parallel and sinuate from the base to beyond the middle; disk smooth and shining, transversely excavated across the middle, more distinctly foveolate on either side. Elytra oblong, finely but distinctly punctured, the punctures on the disk subcrenate.

_Diabrotica Paraensis._

Elongato-ovata, postice paullo ampliata, flava, nitida, capite scutelloque nigris, pectore nigro-piceo; antennarum articulis quatuor basaliibus fulvis, tertio et quarto plus minusve piceo tinctis, articulis quinto nec non octavo et sequentibus tribus nigris, sexto septimoque albidis; thorace laevi, convexo, flavo-fulvo; elytris oblongis, sat crebre punctatis, nigris, utrisque limbo laterali, fascia prope medium, utrinque abbreviata, maculisque dupibus, prima infra basin, altera apicali, ad marginem adfixa, flavis. Long. 3 lin.

_Hab._ Amazons; Para.
Head not longer than broad, trigonate; antennae three-fourths the length of the body, robust, attenuated towards the apex, the third joint more than twice as long as the second, rather shorter than the fourth. Thorax one-half broader than long; sides parallel, obtusely rounded, the anterior and posterior angles thickened, obtuse; upper surface moderately convex, faintly excavated on the middle of the hinder disk. Elytra oblong, slightly dilated posteriorly, distinctly and rather closely punctured, punctures sub-seriate on the middle disk.

**Diabrotica albosignata.**

Anguste ovata, postice paullo ampliata, flava, nitida, capite, pectore, tibiis tarsisque nigris, antennarum articulis penultimis duobus ulturnique basi albidis; thorace lavi, utrunque leviter foveolato; elytris tenuiter punctatis, nigris, utrisque limbo externo, macula infra basin. fascisisque duabus, una prope medium, altera ante apicem, albidis. Long. 3 lin.

**Hab.** Guatemala (Dr. Scherzer).

Antennae slender, filiform, the third joint scarcely more than one-half longer than the second, the fourth equal in length to the preceding two united. Thorax about one-third broader than long; sides nearly parallel and simuate behind the middle, thence converging towards the apex; disk smooth, impressed on either side with a shallow fovea, the space between obsequtely excavated. Elytra oblong, slightly dilated posteriorly, convex, very minutely punctured.

**Diabrotica piceicollis.**

Anguste ovata, postice paullo ampliata, nigra, nitida, thorace antennisque piecis, his basi et apice piceo-flavis, cyypeo pedibusque flavis, tibiis ad apicem nigro tinetis, tarsis piecis; elytris crebre tenuiter punctatis, flavis; utrisque maeculis duabus saturalibus, prima elongata, postice attenuata, a basi fere ad medium extensa, altera subapicali, parva, plagisque duabus magnis, una a basi ad vix ultra medium extensa, subeuneiformi, intus angulatim emarginata, altera transversa, inter medium et apicem oblique posita, nigris. Long. 3 lin.

**Hab.** Amazons.

Antennae filiform, the third joint twice as long as the second, equal in length to the fourth, the three lower, together with the three or four apical joints, piceo-flavous. Thorax about one-fourth broader than long; sides simuate and slightly diverging from the base to beyond the middle, thence converging towards the apex,
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anterior angle with an obtuse tubercle; upper surface convex, finely punctured.

**Diabrotica setosa.**

Elongata, postice paullo ampliata, albido-flava, nitida, capite nigro, antennis flavis, articulis basalibus tribus piceis (*articulis 10*mo *9*fractis); thorace levii, disco bifoveolato; scutello elytrisque nigris, his sparse setiferis, elevato-vittatis, interspateüs fortiter punctatis; utrisque limbo exteriori, apice lato maculae magna dicsmoidali, pallide flavis; pectore, femoribus dorso ad apicem, tibiiis tarsisque piceo-nigris. Long. 2 lin.

**Hab.** Teapa? Collected by M. Pilate.

Vertex smooth; front impressed above the encarpæ with a deep fovea; encarpæ subtrigonate, thickened; antennæ filiform, the third joint twice the length of the second. Thorax one-half as broad again as long; sides straight, very slightly converging at the apex; disk smooth, minutely punctured. Elytra narrowly oblong, slightly but regularly dilated towards the apex, the latter conjointly and regularly rounded; surface sparingly clothed with stiff suberect yellow hairs, each elytron with six moderately raised vittæ, their interspaces strongly punctured, elevate-reticulate, the reticulations anastomosing with the vittæ and rendering the latter less distinct.

**Diabrotica vittatipennis.**

Elongata, nigra, nitida, pedibus, antennis (articulis 6, 7, 8—11 exceptis) elytrisque flavis; thorace quam longo vix latiori, disco trifoveolato; elytris anguste oblongis, tenniter seriato-punctatis, utrisque tricostatis, costis duabus externis basi coeuntibus; tarsis apice nigro-piceis. Long. 2 lin.

**Hab.** Eastern Ecuador (Buckley).

Antennæ slender, filiform, the third joint nearly twice the length of the second. Thorax scarcely broader than long; sides parallel, sinuate posteriorly; disk shining, impunctate, convex on the sides, trifoveolate, one large fovea being placed on either side scarcely below the middle and a third smaller on the basal margin just in front of the scutellum. Elytra narrowly oblong, convex, very finely seriate-punctate; each elytron with three elevated vittæ, the first on the inner disk extending from the base nearly to the apex; the two others, which commence conjointly at the lower end of the humeral callus, being shorter and less distinct.
Diabrotica melanocephala.

Anguste oblonga, substus subnitida, nigra, pedibus flavis; supra nitida, flava; capite nigro, scutello antennisque pallide piceis, his basi et ante apicem flavis; thorace quam longo latiori, lævi, disco trifoveolato; elytris oblongis, postice vix ampliatis, distincte subseriato-punctatis, elevato-costatis. Long. 2½ lin.

Hab. Eastern Ecuador (Buckley).

Antennæ slender, filiform, the third joint more than twice the length of the second, the fifth to the eighth, together with the tenth and eleventh, pale piceous, the rest flavous. Thorax about one-third broader than long; sides straight and parallel, slightly converging near the apex; disk smooth, trifoveolate, the foveae arranged as in D. viitaitipennis. Elytra oblong, slightly dilated posteriorly, rather coarsely subseriate-punctate; each elytron with about four elevated vitæ, those towards the outer margin less distinct than the inner ones.
XVII. Some observations on the tea-bugs (Helopeltis) of India and Java. By Charles O. Waterhouse.

[Read October 6th, 1886.]

Plate XI.

Some short time since Mr. H. B. Brady presented to the British Museum a series of specimens of Helopeltis, named Helopeltis Antonii, Sign., which had been doing much mischief in the Cinchona plantations in Java, and had been the subject of a paper in the 'Pharmaceutical Journal' (December, 1885). The species was supposed to be the Ceylonese tea-bug, and to have been imported into Java. I noticed, however, at the time that the specimens did not quite agree with the figure of H. Antonii given in the 'Annales de la Soc. Ent. de France' (1858, pl. 12, f. 2), but I was not able to decide as to the identity of the species, never having seen specimens from Ceylon. I am glad to say that Dr. Trimen, who is at present on a visit to England, brought with him a number of specimens of the Ceylonese tea-bug, and, having presented some examples to the British Museum, I am able to say that they are distinct from those received from Java. Mr. F. Moore has kindly lent me a specimen of a third species, the Assamese tea-bug, to which he gave the name Helopeltis theivora. The description of this species does not appear ever to have been published.

In the 'Gardeners' Chronicle' for April, 1874, p. 475, there is an article by Prof. Westwood, describing the tea-bug of Java; it is called Helopeltis Antonii, and is supposed to have been introduced from Ceylon.

Whether the specimens from the tea-plants in Java are the same species as those which attack the Cinchona I am not at present able to say; but, from a note which I have received from Prof. Westwood, they appear to be distinct.

The following descriptions will, I hope, serve to distinguish the three species:—

TRANS. ENT. SOC. LOND. 1886.—PART IV. (DEC.)
Mr. C. O. Waterhouse's observations on the

*Helopeltis Antonii.* (Pl. XI., fig. 4).

Black. Thorax red, with a blackish line in the anterior constriction. Scutellum blackish, inclined to red at the sides; the horn perpendicular, straight, yellowish. Antennae brown; the extreme base testaceous. Legs dirty yellow, speckled with brown.

All the specimens I have seen are the same colour, and are therefore probably all females. The males would probably have the thorax black.

*Helopeltis Bradyi,* n. s. (Pl. XI., figs. 1 & 2).

♀. Black. Thorax deep red, with the anterior margin black. Scutellum reddish yellow, with the base of the horn black; the horn perpendicular and straight, yellowish. Antennæ black, with the extreme base testaceous. Legs black, with a ring of pale yellow at the base of the femora; tibiae brownish. The sides of the basal segments of the abdomen are clear yellow, as in *H. Antonii.* Length, about 5½ mm.

The male has the thorax and scutellum black, and the horn of the latter is blackish, with a little brown at the base. The abdomen has less yellow at the sides.

This species appears to average a trifle larger than *H. Antonii,* and the females are a little broader.

*Helopeltis theivora.* (Pl. XI., fig. 3).

♀. Black. Thorax orange-yellow, with a black line near the front margin, the base margined with black. Scutellum brown, black at the base, the horn long, much curved; black, brown at the apex. Antennæ dark brown; the basal joint paler, yellow at the base. Femora dark brown, mottled with light brown, with a light yellow ring at the base. Tibiae light brown, speckled with dark brown.

This species is at once distinguished from the two preceding species by the longer and curved horn on the scutellum.

Mr. Peal, in his paper on "The tea-bug of Assam" ('Journ. Agri. Hort. Society of India,' iv. (1872), p. 131), states that when full grown "the colour deepens," and "it turns black on the head and thorax." This remark probably refers to the male.

Two other species of this genus are known to me: *Helopeltis niger,* Walker, from Waigiou,* and *H. braconi-

* Not "Wagrin," as printed in the 'Gardeners' Chronicle.'
formis, Walker, from Dorey, New Guinea (Cat. Hemipt. Het. in B. M., vi., 1873, p. 165). This latter Mr. Walker also described under the name *Dulichius clarifer* (l. c., iv., 1871, p. 170).

*Helopeltis niger*, Walker. (Pl. XI., fig. 6).

The type appears to be a male. It is black, with the antennae dark brown, the basal joint yellowish brown. The legs are pale brown, with a few darker spots on the femora. The scutellar horn is long, very slightly curved; light brown, with the extreme base and apex black.

*Helopeltis braconiformis*, Walker. (Pl. XI., fig. 5).

♂. Black, or nearly so. Antennae brown, with the basal joint pale brown. Scutellar horn long, very slightly curved, very pale brown, with the extreme base and apex dark brown. Legs pale brownish yellow, with a few dusky spots on the femora.

♀. Antennae dark brown. Thorax light red, inclined to yellow in front, with the anterior margin black. Scutellum pale red; the horn very pale brown. Legs dark brown, some spots on the femora and the tibiae paler, but not so pale as in the male.

**General Remarks.**

*H. Antonii* and *H. Bradyi* will easily be distinguished from the three other species by the form of the scutellar horn, which is small, very slender, and erect.

*H. theicora, niger*, and *braconiformis* have the scutellar horn longer and stouter. *H. theicora* has the horn much more curved than in either *H. ater* or *braconiformis*.

*H. ater* and *H. braconiformis* only differ in the colour of the legs and antennae, except that the single specimen of *ater* has the thorax jet-black, whilst both the males of *braconiformis* have the base of the thorax smoky brown. The scutellar horn is somewhat different.

Prof. Westwood, in the note which I received from him, above referred to, states that the specimens he had from the tea-plants in Java, and which he considered to be *Helopeltis Antonii*, "have the front of the pronotum nearly whitish buff, antennae and head black, scutellar spine dirty buff-brown, legs buff varied with black." This description does not correspond with any specimens I have yet seen.
Explanation of Plate XI.

Fig. 1. *Helopeltis Bradyi*, male.
2. *H. Bradyi*, female;  *a*, scutellar spine.
3. *H. theivora*, female;  *a*, scutellar spine.
4. *H. braconiformis*, female; thorax and scutellum;  *a*, scutellar spine;  *b*, spine of male.
5. *H. Antonii*, female; thorax and scutellum;  *a*, scutellar spine.
XVIII. Notes on insects apparently of the genus Margarodes, Lausld.-Gnilding, stated to occur abundantly in the nests of White Ants, and also of true Ants, in certain Western Districts of the Cape Colony. By Roland Trimen, F.R.S., F.L.S.

[Read October 6th, 1886.]

Early in the current year I received, from Mr. G. G. Rainier, the Civil Commissioner of the Tulbagh District, a number of small seed-like objects with a partly coppery, partly pearly, surface-lustre, which he wrote were found in great abundance under the base of the mounds roofing the nests of the White Ants (Termites) in the mountainous parts of his district. These objects, he stated, were strung on chains for sale by the residents, their varying shades from yellowish pearly through golden to coppery, making them rather effective ornaments.

At my request—as the specimens first received were all empty and presenting a large hole on one side—Mr. Rainier obtained some fresh examples, which were without holes, and all of the yellowish pearly or very pale golden tint. On opening a few of these there could be no doubt that they were insect-pupae, the interior being full of the cream-like juices so characteristic of newly-formed chrysalids. I set these fresh examples, with the cemented material from the White Ants' nest which accompanied them, and in which many of them were embedded, carefully aside in a separate receptacle, and watched daily for the disclosure of some perfect insect from them; but up to the date (May 26th) of my leaving the Cape no such insect made its appearance. My impression, which was shared by my assistant, Mr. L. Péringuey, was that these insects belonged to some hymenopterous or dipterous parasite, and I suggested to my correspondent that this might be the case.

I brought the later-received examples to England, and after my arrival received from the Rev. G. U. R. Fisk, who had left the Cape soon after myself, theTRANS. ENT. SOC. LOND. 1886.—PART IV. (DEC.) 21
further set of specimens which I now exhibit, viz., the
pearl-like pupae (some free and others embedded in the
material of the ants' nest), specimens of the chains
made by stringing them together, and also some true
Ants, stated by Mr. Fisk's correspondent to have been
found in the same nest.

Quite recently, on visiting the Zoological Department
of the British Museum of Natural History, I was shown,
by Mr. Waterhouse and Mr. Kirby, a chain of these
creatures, which had been sent from the Cape to Sir
J. Lubbock, and forwarded by him to the Museum. I
was also shown specimens of Guilding's *Margarodes*
*formicarum* pupae from the West Indies, with which in
general structure and appearance the Cape examples
presented much agreement, but were obviously much
larger and of brighter tints. The British Museum
collection also contains specimens of a similar species
(even smaller than the West Indian one) from North
Australia.

Thanks to a reference kindly furnished by Mr. Kirby,
I was able to consult Lansdowne-Guilding's original
account of his "ground pearl" (*Margarodes formicarum*),
read to the Linnean Society as long ago as 1827, and
published in vol. xvi. of the 'Transactions,' pp. 115—119.
That well-known naturalist records that in the Bahamas
the insects occurred plentifully, and under the name of
"ant-eggs" were strung into necklaces and ornamental
purses. In Union Island Mr. Guilding collected a box-
full, kept them in the moist marly soil in which they
were found, and soon observed insects issuing from
them. The spots of soil whence he took the specimens
were about stones, under which Ants had established
their nests, and he suggests that the insects were
parasitic on the larva of the Ants. Guilding's figures
of the insect produced from the "pearls" have much of
the appearance of a *Coccus*, except that the fore legs are
shown as very strongly recurved and evidently raptorial.
According to the author's account *Margarodes* has no
mouth, and it occurs to him as not unlikely that it
obtains nutriment by suction through a foramen in each
anterior claw. He hesitates to assign the insect to any
known order, but Burmeister (Handb. der Ent., ii.,
p. 79), and Westwood (Introd. M. Class. Ins., ii., p. 449),
agree in placing it among the *Coccidae*. Burmeister,
indeed, without hesitation places Margarodes in the
genus Porphyrophora, Brendt, with the well-known
forms P. Polonica and P. Armeniaca; but this location
would appear to be of very doubtful propriety, if
Guilding's figures and description of the perfect insect
have any claim to accuracy.

As regards the insects living with either Ants or the
so-called "White Ants," it is quite clear that Guilding
refers to the former, and I have so often noticed the
nests of true Ants about the bases of those of the
Termites that I think it by no means improbable that
the Cape "ground pearls" are actually denizens of the
Ants' nests, although associated with those of the
Termites, and perhaps are parasites of the very Ant sent
by Mr. Fisk's correspondent.

I trust, on my return to the Cape, to be able, either
personally or through a correspondent living in the
locality, to rear the insect of the "ground pearl," and
to ascertain whether or not it presents the characters
noted by Guilding in his account of the West Indian
species.
XIX. *The life-history of Geometra smaragdaria.*

By George Elisha.

[Read October 6th, 1886.]

The eggs of *Geometra smaragdaria* are laid in July, on the stems and leaves of *Artemisia maritima*, generally near the top of the shoots. When first laid they are of a light yellowish colour, changing in about a fortnight to dark greyish, soon after which the young larvae emerge, and immediately cover themselves with minute portions of their food-plant, which they attach to their bodies, with some glutinous secretion, so firmly that it is very difficult to remove them. It seems a matter of great importance to these larvae that they should so cover themselves; for a few eggs laid by a female which I had temporarily placed in a chip-box, being firmly attached to the side of the box, were left there until they hatched, when the young larvae, having no *Artemisia* to operate upon, appropriated the loose splinters and other small particles that were inside the box, and attached them to their bodies, giving themselves a most singular appearance when viewed under a lens, not unlike that of miniature porcupines. On putting them into a glass jar with some *Artemisia* they very soon changed their costume, and, on looking at them a few hours afterwards, I found them covered with fragments of their food-plant, as in their natural state.

The larvae during the whole of their existence keep the body in an arched position, except when feeding when they stretch themselves out a little; but on the slightest alarm they again assume the curved position, with the anal claspers fixed to the plant, and the prolegs drawn up close to their bodies. They feed rather slowly, and for about three weeks after emerging from the egg appear like little balls of white wool, from being covered with the mealy portions of the *Artemisia*. As the larva increases in size it increases the length of the morsels
of the food-plant it attaches to its body, which on some adult larvae are often three-quarters of an inch in length. When the pieces are first attached to the body they are, of course, green and fresh, but they soon become discoloured, and in a few days are withered and brown; then the larvae, in their curved position, so exactly resemble the dead shoots of their food-plant that they are extremely difficult to detect, unless some movement betrays them, or one is familiar with their peculiar appearance. Thus it is evident that the object of the larvae in attaching these pieces to their bodies is for the purpose of protection against their numerous enemies.

The larvae continue feeding till about the end of October, by which time they have attained the length of one-half to three-quarters of an inch, after which they fix themselves to the food-plant, and remain motionless during the winter months. With the first warm days of spring, towards the end of February, they begin moving; and about the first week of March, when the Artemisia is again appearing above the ground, they commence feeding, soon after which they moult and again cover themselves with pieces of the food-plant, which, being now green and fresh, give them a healthy appearance. About the middle of June they are full-grown, when they rest for a day or two, and then spin a loose network cocoon; (this they form by drawing together, with silken threads, the pieces of the Artemisia that are thickly adhering to their bodies, into an oval-shaped covering attached to the stem of the food-plant), and in it they change to a greyish pupa, with the striped wing-cases showing very distinctly.

The larva, when full-fed, is about an inch and a quarter long, of a dirty greyish colour, with darker lines along the body, the skin very rough, and the head and legs brown; but, owing to its being covered so entirely with the dead and brown portions of the food-plant, it is extremely difficult to make out the exact markings. It sometimes feeds at dusk, but more frequently during the morning sunshine, and at times, when the sun is hot, it eats most voraciously, appearing in a very excited state during the whole time the sun is shining upon it. This necessity for sunshine constitutes one of the many difficulties the collector has to contend with in rearing these larvae, for the sun is, of course, a great obstacle to keeping
the food fresh. The only way to keep the food comparatively fresh is to dig up the *Artemisia* with a large clod of earth, so as not to disturb the roots, and even then it rarely keeps longer than a week. To be successful therefore with these larvae a great deal of trouble must be undergone.

The perfect insects appear about the middle of July, generally during the early morning, and remain motionless the whole of the first day; and I believe until daybreak of the next, for I have looked at them as late as twelve o'clock at night, and found them still motionless; but, on again looking at them about seven o'clock on the following morning, some had paired, remaining *in copulâ* during the whole of that day, but parting towards the evening. By the following morning the females had commenced depositing ova, and continued to do so for four or five days, each laying about 150 eggs altogether, and some more.

It seems singular that this insect should have remained such an apparent rarity for so many years past; but no doubt the habits of the perfect insect are the cause. It seldom moves unless disturbed, and then will generally drop to the ground and remain motionless; but after pairing the male becomes more active, and will fly about if touched, when of course it soon gets damaged. In the natural state I have no doubt it keeps concealed among the *Artemisia*, and so escapes observation.

The larva was first found by Mr. Machin, quite accidentally, a few years back, and he kept the secret of its food-plant; but two years ago I had the pleasure of taking the larva myself, again quite by accident, and recorded its discovery in the *Entomologist* (vol. xviii., p. 235). As stated in that note, I did not then know what the larva fed on; and through my ignorance of the food-plant made many fruitless journeys to the Essex coast in search of it. One day, while taking some cases of *Colrophora* off the *Artemisia*, I noticed what was apparently a withered shoot move; it then stretched itself out with a tremulous motion, and I at once saw it was a larva of some kind, and, being so much like *bajularia*, I concluded it must be the species I had so many times looked for, viz., *smaragdaria*. My surmise proved correct, and I have since been able to find the larva at many places on the
Essex coast, over an extent of ground at least thirty miles in length. It will, in my opinion, be found anywhere along this coast, where its food-plant is growing; and will thus afford another instance of, what is apparently, a great rarity becoming a comparatively common species as soon as its food-plant and the habits of the larva are known.
PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY
OF
LONDON
FOR THE YEAR 1886.

February 3, 1886.

ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Nomination of Vice-Presidents.

The President nominated Mr. F. Du Cane Godman, M.A., F.R.S., Mr. H. T. Stainton, F.R.S., and Mr. J. Jenner Weir, F.L.S., Vice-Presidents for the year 1886.

Election of Fellows.

Dr. Livett, Lieutenant Goodrich, Mr. Eustace Bankes, and Mr. F. Enock were elected Fellows, and M. Ragonot, of Paris, Ex-President of the Entomological Society of France, was elected a Foreign Fellow.

Exhibitions, &c.

Mr. C. O. Waterhouse exhibited some scales of Coccidae (Eriopelta); some of them were found by Mr. F. Moore on blades of grass at Ilfracombe, and were oblong-ovate in form and of a dirty white colour. The others were found by Mr. Waterhouse on blades of grass in the Warren, at Folkestone, and
were probably a distinct species from those found by Mr. Moore, as they were fusiform and pure white. Both kinds differed somewhat from those exhibited by Mr. Fitch at a previous meeting of the Society.

Mr. Fitch said that when he exhibited the specimens of *Eriopeltis festucae* (Signt.), he considered these curious woolly *Coccideae* had not been previously noticed in Britain, but he had lately found a reference to that species, or to those now exhibited by Mr. Waterhouse (which appeared to be abundantly distinct), in the 'Proceedings' for 1856, pp. 26, 27.

Mr. Douglas communicated the following extract from a letter addressed to him on December 30th by M. J. Lichtenstein, of Montpellier, and the specimens referred to therein were exhibited:—"I send you some Coccids, *Chionaspis euonymi*, described and figured by Comstock in his Second Report, 1883, part 2, p. 217, pl. v., fig. 2, and pl. xvii., fig. 2, begging you to show them to the Entomological Society, and to say that the fine shrub, *Euonymus japonicus*, is largely cultivated here and at Nismes as an ornamental plant in our public gardens, and was thought to be free from insect-damage. But some two or three years ago there began to be observed a little Coccid, very rare at first, but now become quite a plague, and threatening to render the culture of the *Euonymus* impossible, as all the shrubs attacked are killed. I hope this species is not yet a British Coccid, but it might well become a nuisance in England. It would be interesting to know if it is a Chinese or Japanese insect, and how and when it invaded America and Europe."

Mr. Douglas added that *Euonymus japonicus* was introduced into England from Japan in the year 1804, and, as it is now a common shrub, there should be no difficulty in stating whether this *Chionaspis* has yet been noticed here. It will be observed that all the white scales with which the leaves are covered are those of the males, those of the females being grey, of an entirely different form, and fewer in number.

The President exhibited specimens of *Tettix Australis* (Walker) received from Mr. Olliff of the Sydney Museum, who had captured them at the River Nepean, New South Wales; Mr. Olliff stated that the insect was decidedly subaquatic; he had found the insects not only on the surface of pools, but eight or ten inches below the surface on the stems of water-plants, and they descended
when approached. The President remarked on the interesting nature of this exhibition, and stated as his belief that many _Acridiidae_ and _Locustidae_ voluntarily took a bath by leaping on to the surface of streams and swimming to the bank after a short time.

Mr. Kirby exhibited, on behalf of Mr. Raffe, who was present as a visitor, a series of very remarkable specimens of _Lyccena corydon_, and the President, Mr. Weir, and others made remarks thereon.

The Rev. W. W. Fowler exhibited the second recorded British example of the beetle, _Harpalus calceatus_, taken by himself at Bridlington, Yorkshire; also _Apion Lemoroi_ (Brisout), a new French _Apion_, taken on the coasts of Normandy and Brittany on _Polygonum aviculare_; and he observed that it was likely to be found on our southern coasts, if looked for. He also exhibited several species of British _Helophori_, and read notes on their synonymy.

_Papers read._

Mr. H. Goss read the following analysis of M. Brongniart's recent work on 'Les Insectes Fossiles des Terrains Primaires,'* which he had prepared at the request of M. Brongniart:—

After some preliminary remarks on Palæozoic insects, and the large number recently discovered near Commentry, the author referred to the proposed classification of insects by Packard and Scudder into two series,—_Metabola_ and _Heterometabola_,—the former including insects with a complete metamorphosis, such as the Lepidoptera, Diptera, and Hymenoptera, and the latter consisting of insects for the most part with incomplete metamorphosis, _i.e._, the Hemiptera, Neuroptera, and Orthoptera, the Coleoptera being in Brongniart's opinion an intermediate group, or, if placed amongst the _Heterometabola_, are to be regarded as in course of progression towards the _Metabola_. It was observed that all the insects known from Palæozoic rocks belong to the section _Heterometabola_, and the classification of Packard and Scudder is therefore the one which best accords with the data of Palæontology and Embryology. In this paper M. Brongniart enumerates in the order of their apparition the known Palæozoic forms, and, after briefly alluding to the Silurian _Blatta_ and the Devonian

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wings, reviews in detail the Carboniferous insects, which he refers to four orders, viz., the Orthoptera, the Neurorthoptera, the Pseudo-Neuroptera, and the Hemiptera.

(1) Orthoptera.

In this order Brongniart places the Thysanura; they are generally considered as primordial types of insects. No author has previously described them as occurring in the Carboniferous period. Brongniart has, however, identified forty-five specimens from the Commentry coal-fields.

The author states that upon one of the specimens some abdominal plates are seen, as have been observed on Machilis; and he adds that the specimen resembles Lepisma and Machilis, but differs from them in several characters, the principal difference consisting in the presence of a single abdominal filament in the fossil species. He designates this as the ancestor of the living Thysanura, and names it Dasyleptus Lucasi, after Mons. H. Lucas, of the Museum of Paris.

Among the Orthoptera a great number of Blattae or of Palaeobblattarie (Scudder) have been described.

Another family of Orthoptera, which is tolerably well represented, he calls Palaeacridiodea. The first group contains several genera; the Oedischia, of which the third pair of legs resembles those of living locusts. The Sthenaropoda, near allies of the Oedischia, but with thicker legs.

The genus Protogryllacris, represented by an insect called Corydalis, then Gryllacris, and afterwards Lithosialis Brongniarti by Scudder.

A fourth genus, Paolia (Scudder), including many species, should be placed in this first group.

The second group contains three genera:—

Sthenarocera, insects with strong and long antennae, short and thick body, long legs, and long narrow wings, recalling those of Pachytylus. These insects do not measure less than 11 centimetres from the anterior part of the head to the extremity of the wings, when the latter are folded over the back.

Caloneura, which is allied to the foregoing; but the legs and the antennae are more slender, the wings are shorter, and not so narrow.

Macrophlebia Hollebani (Goldenberg) is placed in this family.
All the insects belonging to these genera may be regarded as the ancestral type of the Saltatoria of the present day.

(1) _Neurorthoptera._

This order, which is created by Brongniart, includes two suborders—that of Neurorthoptera properly so called, and that of the Palæodictyoptera (Goldenberg).

The first suborder comprises:—

1. The family of the _Protophasmida_ (Brong.), represented by the genera _Protophasma, Lithophasma_ (which he created for a wing figured by Goldenberg under the name of _Gryllacris Lihantraca_); _Titanophasma_ (Brong.), of which only the gigantic body, measuring 28 centimetres in length, is preserved; and the genus _Archeoprygillus_ (A. _priscus_, Scudder).

2. The family of the _Stenodictyopterida_, which includes _Meganoeura Monyi_, a wing measuring 33 centimetres in length—previously named by Brongniart _Dictyonoeura Monyi; Archaoptilus ingens_ (Scudder), and _A. Lucasi_, wings which must have attained 25 to 30 centimetres in length.

In this first suborder of the Neurorthoptera, Brongniart has placed some insects of large size, whose wings have strong nervures united by a rather loose reticulation, insects which have some likeness to living Phasmians by the form of their bodies, but which are separated from them by the neuration of the wings. He considers the Phasmians as much modified descendants of these ancient types.

The second suborder has been created by Goldenberg, and has been adopted by other authors. It contains a series of insects of rather large size, which seem to have completely disappeared from the existing fauna.

The first family, that of the _Stenodictyopterida_, is composed of insects which have a thick and short, but broad body, strong legs of moderate length.

This family contains six genera:—

1. The genus _Eugereon_ of Goldenberg (_Eugereon Boeckingii_, Gold., _Eugereon Heeri_, Brong.) is characterised by a short and thick but broad body; the head is small, the prothorax is scarcely broader than the head, whilst the mesothorax and the metathorax are much broader and longer. The legs are short and thick, and seem to be spined.
2. The genus *Scudderia* is proposed for an insect whose neuration is different from that of *Eugereon*, and which is of larger size, the wing measuring 9 centimetres in length.

3. Brongniart names *Megaptilus Blanchardi* that large wing that he previously supposed to have belonged to *Titanophasma Fayoli*. Its neuration recalls that of *Eugereon* and of *Scudderia*. It must have measured 18 to 20 centimetres in length, and 5 centimetres in breadth.

4. *Haplophlebium Barnesii* and *H. longipennis* of Scudder are placed here.

5. Then come the genera *Goldenbergia* (Scudder) and *Dictyoneura* (Goldenberg).

   The genus *Dictyoneura* comprehends *D. Goldenbergyi* (Brong.), *D. libelluloides* (Gold.), and *D. jacunda* (Scudder).

   The abdomen measures 45 millimetres in length, and is terminated by two long filaments and by two recurved hooks. The wings are about 25 mm. wide, and have a very distinct neuration. The reticulation resembles that of the preceding genera.

   The second family, that of the Hadrobrachypoda, comprises two genera, *Miamia* (Scudder) (*M. Bronsoni*), and *Leptoneura* (*L. Oustaleti*, *L. delicatula*, *L. robusta*, and *L. elongata*).

   All these insects have a very distinctive facies. They resemble slightly the living Termes; but they cannot be placed in the same group, though they may have been the ancestral type of Termes.

   The third family of these Palaeodictyoptera includes some new insects; Brongniart designates them by the name of Platyptera. The wings are broad, generally rounded at their extremity, resembling, morphologically speaking, the wings of the Proto-phantasmida, but differing from them by the neuration.

   This family comprises three genera:—


   3. *Spilaptera*: *S. Packardi*, *S. venusta*, *S. libelluloides*.

(3) *Pseido-Neuroptera*.

Brongniart makes this a separate order, and places in it six families:—

1. The family of the Megasceopterida, in which he has established eight genera, viz., *Protocapnia*, *Brodia* (*Br. priscotineta*),
Scudder, *Trichaptum*, *Campyloptera*, *Sphecoptera*, *Breyeria*, *Woodwardia*, and *Corydaloides*.

With the Megasecopterida he classes an ancestral type of the *Libellulidae*.

A single wing only has been found at Commentry. It measures 10 centimetres in length, and 2 centimetres in breadth. In form, neuration, and reticulation it reminds one of the living Odonata.

The third family, that of the Homothetidae of Scudder, contains some insects of smaller size, more slender body, more sessile wings, and with more delicate neuration. The nervules are also more numerous than in Megasecopterida.

In this family are classed *Hemeristia occidentalis* (Scudder), *Pachytylopsis Persenavarii* (Preudhomme de Borre), *Chrestotes* (C. lapidea, Scudder); *C. Danae*, Scud.; (Synon. *Miamia Danae*, Scud.); *C. Lugaevensis*, Sterzel: *Omalia macroptera* (Cœmans and Van Beneden); then three new genera from Commentry (genera *Oustaletia*, *Brachyptilus*, *Diaphanoptera*).

The last three families of this group include some ancestral types of Ephemerida, Perlida, and Ascalaphus. The Protephemerina (genus *Homaloneura*, near to the living *Potamantbus*). The Protoperlida (genera *Protodiamphipnous*, *Protokollaria*, *Pictetia*, *Protoperla*). The Protomyrmeleonida (genus *Protascalaphus*).

(4) Hemiptera.

Up to the present only those types have been found which can be classed in the group Homoptera: these are the ancestors of the *Fulgoridae* and of the living *Cicadella*: such are *Fulgorina Ebersi* and *F. lebachensis*, insects very near to our *Fulgora*.

In this same genus Brongniart places some insects from Commentry, *F. Goldenbergii*, *F. ovalis*, and *F. minor*. He is of opinion that the creation of several genera is necessary in order to include some of the specimens that he has received from Commentry, *viz.*:—

*Rhipidioptera elegans* (Brong.).
*Dictyocicada antiqua* (Brong.).
*Palaeocixius Fayoli* and *P. antiquus* (Brong.).
*Protocicada parvula* and *P. fusca* (Brong.).

Mr. Scudder names *Phthanocoris occidentalis* a wing that he considers as belonging to the Hemiptera-Heteroptera. Brongniart does not share his opinion, and states that he finds a great
analogy in the neuration between this wing and those of *Pzcera olivacea* (Blanchard), which belongs to the Homoptera.

Mr. Baly communicated a paper entitled "Descriptions of New Genera and Species of *Galerucida*.

The Rev. W. W. Fowler read a paper "On a Small Collection of *Languriidae* from Assam, with descriptions of two new species."

Mr. J. Edwards communicated the first part of a Synopsis of the British *Homoptera—Cicadina*.

March 3, 1886.

Robert McLachlan, Esq., F.R.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

*Election of Fellows.*

Mr. John M. C. Johnston was elected a Fellow, and Cavaliere Piero Bargagli, of Florence, formerly Secretary to the Entomological Society of Italy, was elected a Foreign Fellow.

*Exhibitions, &c.*

Mr. Pascoe exhibited a remarkable form of larva with two horn-like processes from Pará; also a pupa-case of *Anosia plexippus (Danais archippus)* from the same locality.

Mr. W. J. Williams exhibited, on behalf of Mr. C. Bartlett, a gigantic hairy and spiny larva, perhaps allied to *Gastropacha*, which was believed to have been brought from Madagascar.

Mr. Waterhouse exhibited *Rutela rufipennis* (Waterh.), *Doryphora Haroldi*, and several other species of Coleoptera from Colombia belonging to the genera *Prepodes*, *Cholus*, *Antichira*, *Halecia*, *Trachyderes*, *Passalus*, *Chalciolepidius*, &c., which were believed to be undescribed.

Mr. Billups exhibited a specimen of *Cholus Forbesii*.—a South American beetle belonging to the *Curculionidae*,—found alive in a Horticultural Sale Room in London.

Mr. Eland Shaw referred to the exhibition at the February meeting of specimens of *Tettix australis*, sent by Mr. Olliff from
the Nepean River, and quoted the following remarks of Leopold Fischer ('Orthoptera Europaea,' p. 47):—“Certainly the faculty of swimming is given to some Orthoptera, ex. gr., to certain exotic species of Xya and Tettix, which are reported to inhabit water. *Tettix harpago*, Serville, as recorded by Capt. Boys occurring at waterfalls in Mhow, Malwa (East Indies).” For the record of Capt. Boys’ observations he refers to vol. iv. of the ‘Transactions’ of this Society; where at page 97 of the ‘Proceedings’ we read that at a meeting held October 7th, 1844, an extract from a letter to Prof. Westwood from Capt. Boys was read, containing various observations on the habits of Indian insects. The Journal goes on to say—“Capt. Boys describes the habits of a species of Orthoptera belonging to Latreille’s genus Tettix, about an inch long, which readily takes to the water and dives under it, remaining at the bottom attached to a stone for many minutes together, the dilated foliaceous appendages of the hind legs being well adapted for swimming—being the first instance recorded of a natatorial orthopterous insect.” Further on, at page 106 of the ‘Journal of Proceedings,’ in the report of a meeting held June 2nd, 1845, and referring to another letter from Capt. Boys to Prof. Westwood, we read:—“A specimen was forwarded with this communication of *Acrlydium (Tettix, Latr.) harpago*, Serville, with the observation that the insect is a true swimmer; the formation of its posterior legs might alone lead one to make a shrewd guess of the fact. It is found abundantly near the waterfalls at Mhow, in Malwa, frequenting the sedges on the banks of the stream. He had often seen them swim under water from one bank to the other, a distance of three or four yards; and they had several times tried his patience by remaining under water, attached to a stone. He had constantly observed a small, silver-like bubble of air on each side of the thorax, close under the base of the lengthened scutellum, and not unfrequently a third at its apex (as is seen at the caudal extremity of the Dytiscet). They swim with rapid strokes of both posterior legs thrown out together, and at no small pace, turning as freely as a Gyrius when a capture is attempted. Occasionally they will walk steadily down a reed some feet under water, and there appear to feed on the small weed which is attached to it. The steps of the bathing-ghat from which the water had receded, being covered with the above-mentioned weed, were a fine field for them. Their masti-
cation of this weed he had repeated opportunities of witnessing; but they seemed to prefer that which was submerged, as they were more abundant on the steps below water, except where basking in the sun."


**Papers read.**

Dr. Fritz Müller communicated the following notes on Fig Insects:—

"In his valuable paper on fig-insects (Feigen Insecten. Wien, 1885), Gustav Mayr has described thirty-seven species, which some years ago I had gathered on the River Itajahy. Among these there are four new genera (*Nannocerus, Physothorax, Critogaster*, and *Ganosoma*) established on wingless males, while there is but one genus (*Tetragonaspis*) of which females only are described. Thus Gustav Mayr was led to think that without doubt one sex only of several genera was represented among the insects at his disposal. This, however, is not the case. By carefully collecting the insects from a large number of figs, and examining separately those taken from each fig, I have been able to refer all of these genera of wingless males to females of other genera.

"*Ganosoma* is the wingless male of *Tetragonaspis*, as was already suspected by G. Mayr, *G. robustum* being the male of *T. flavicollis*, and *G. attenuatum* (pro parte) that of *T. gracilicornis*.

"*Critogaster* is the wingless male of *Trichaulus, C. singularis* being the male of *T. versicolor*, female (*T. versicolor*, male, I suspect to be the winged male to *C. nuda*). When I formerly collected the fig insects of *Pharmacosycea*, to which the genera *Tetrapus* and *Critogaster* appear to be limited, I had met with
this one species of *Trichaulus* only; now I have found the females of *Critogyaster pilicentris* and *C. nuda* also. In these two species there are at the same time winged and wingless males, the latter being by far more numerous; of *C. nuda* I found one winged male to about ten females; of *C. pilicentris* I have met with but one winged male among hundreds of females; of *C. singularis* (*Trichaulus versicolor*), though this is by far the most common species of the three, I have seen none. "*Physothorax disciger* is the wingless male of *Diomorus variabilis*. *Diomorus* produces very large galls, not connected, as far as I can judge, with the flowers of the fig. From these galls I raised numerous females and winged males of *Diomorus*, a few *Physothorax*, and one extremely curious male, intermediate in any respect (colour, antennæ, wings, &c.) between the winged males of *Diomorus* and the almost wingless *Physothorax*. I may add that the structure of the hind legs and of the genital armature of the male is quite the same in the two forms. The wingless males (*Physothorax*) are incomparably less frequent in this species than the winged ones.

"As *Plesiostigma bicolor*, of which G. Mayr described winged males, is nearly allied to *Diomorus*, I think it to be rather probable that *Physothorax annuliger* should be the wingless male of this species. I did not see, this year, either of these two forms; perhaps they may be only aberrant forms of the polymorphic *Diomorus variabilis*, of which I have even seen two wingless females.

"*Nannocerus biarticulatus* is the wingless male of a *Diomorus*, distinguished from *D. variabilis* by its ovipositor being shorter than the body, while it is considerably longer in *D. variabilis*. The galls, of which I have seen but very few as yet, are pedunculated, while those of *D. variabilis*, of which I have gathered more than 800, are always sessile with a broad basis. I have not yet seen the winged male of this *Diomorus*.

"Of the genus *Heterundrium* G. Mayr describes two species of wingless males (*H. longipes* and *H. nudiventre*), which he could not refer to any female. Now *H. longipes* is the wingless male of *Colpophichus longicaudis*, and *H. nudiventre* that of *C. brevicaudis*.

"Thus we have among the fig-insects of the Itajahy at least seven trimorphic species, consisting of females, winged and wingless males, viz., *Critogyaster nuda*, *C. pilicentris*, *Diomorus variab-
bils (Physothorax disciger), Heterandrium unianulatum, H. longipes (Colyostichus longicaudis), H. nudiventre (C. brevicaudis), and Aepocerus inflaticeps (the female of which is A. emarginatus). To these probably may be added Dionorus sp. (Nannocerus biarticulatus) and Plesiostigma bicolor (Physothorax annuliger).

"In the Old World but one trimorphic species of fig-insects has as yet been found, viz., Crossogaster triformis, G. Mayr."

Mr. E. B. Poulton read "Further Notes upon Lepidopterous Larvae and Pupæ, including an Account of the Loss of Weight in the Freshly-formed Pupa." The paper included notes upon points in the ontogeny of Smerinthus larvae, and a description and figure of the bifid and hairy caudal horn in the newly-hatched Smerinthus populi. The adult larva of Acherontia atropos was compared with that of Sphinx ligustri, and the as yet unknown appearance of the former in earlier stages was predicted. Hitherto unnoticed eye-like marks were pointed out in the terrifying attitude of Chorocampa elpenor, and the terrifying attitude of Dicranura vinula was described, and its defensive fluid was shown to be strong formic acid. An eversible gland was described in Orgyia pudibunda, and the protection of Acronycta leporina was explained by its resemblance to a cocoon and the darkening of its hairs when full-fed. A valvular aperture in the cocoons of Chloephora prasinana, &c., was described, enabling the imagos to emerge. There were also notes upon Paniscus cephalotes parasitic on the larva of D. vinula, and tables showing the immense loss of weight in newly-exposed lepidopterous pupæ due to evaporation from the moist skin.

Mr. W. F. Kirby observed that Rennie ('Insect Transformations,' pp. 298 & 299) quotes some observations of Réaunur relative to the evaporation from pupæ (Réaunur, vol. i., pp. 371-373; Kirby & Spence, iii., p. 262). The transformations of Acherontia Lachesis, Fabr., and A. Styx, Westw., two well-known East Indian species, have been figured by Moore in his 'Lepidoptera of Ceylon.' It would be very desirable if entomological draughtsmen would always make drawings of lepidopterous larvae in their natural positions on their food-plants; drawings of larvae in which this was neglected were shorn of half their value for scientific purposes. Mr. Kirby could not answer Mr. Poulton's inquiry as to whether the Esquimaux had any instinctive horror of snakes, but serpents played a considerable
part in both the Scandinavian and Finnish mythologies.

Mr. White stated that he had during the last four or five years given some attention to the caterpillars of the *Sphingidae*, and was therefore able to corroborate many of the minute and important points Mr. Poulton had so faithfully described respecting the characters of these larvae. The pair of red tubercles upon the head of the young *Smerinthus ocellatus* he had frequently noticed in *S. tiliae*, and it sometimes continues far on in the life of the species. With regard to the spotted variety of the *Smerinthidae*, he stated that he had collected a number of them, including two specimens of *S. populi* of the pale bluish white form, having the spots—a complete double row in each instance—of a pale rosy-pink colour. He added that he had made an analysis of a series of these varieties, and came to an opposite conclusion to that arrived at by Mr. Poulton. He found, in accordance with what Prof. Meldola had described, that the spots appeared chiefly in the later stages of the larvae, and also that they had a regular order of development upon the segments, thereby evidencing the character to be newly acquired, and not the recurrence to an earlier ancestral form. In one instance, however, he observed single spots, which were very minute dots, during the third stage, and they might occasionally appear even earlier; but, as a rule, they increased in intensity rather than diminished with the growth of the caterpillar, and were most strongly pronounced in the last stage. He fully endorsed what Mr. Poulton had said respecting the abnormal stripes, as they practically were, which occasionally occur on *S. tiliae*, and he possessed in his collection two fine examples of this remarkable variation. He mentioned that in one blown specimen which he had there was an additional reddish purple stripe upon the 8th abdominal segment partially developed, and which, being newly acquired, has no white stripe below it, thus bearing out Mr. Poulton's explanation of the stripes of *A. atropos*. This specimen had the markings throughout very strongly pronounced, and had an additional character, namely, two red spots upon the top of the 1st thoracic segment. There is also another fact which he had observed in several specimens, which was, that the purplish stripes of *S. ligustri* were really composed of two stripes; there was first the reddish purple stripe, and on closer inspection another darker brownish purple stripe was to be seen overlying the lower portion of this lighter stripe;
in some examples it was more apparent than in others, and it did not always occur. This seemed to bear further witness to the truth of the connection between the characters of *Sphinx ligustri* and *Acherontia atropos*, to which Mr. Poulton had called attention.

Mr. Slater remarked that Mr. Poulton's detection of formic acid in the secretion ejected by the larva of *Dieranura vinula* was very important, and he thought it probable that this acid was contained in the offensive or defensive liquid secretions emitted by other insects. Its presence in the secretions of the Hymenoptera had been long recognised, and it was also known to exist in those of some Coleoptera, e.g., *Cytherus rostratus*. He added that it might be interesting if entomologists, who had the opportunity, would search for the presence of cantharidine in such secretions, as the substance was soluble in formic acid, and would doubtless enhance the effect.

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April 7, 1886.

**Robert M'Lachlan, Esq., F.R.S., President, in the chair.**

Donations to the Library were announced, and thanks voted to the respective donors.

**Election of Fellows.**


**Exhibitions, &c.**

Mr. Philip Crowley exhibited a number of Lepidoptera, including a long series of species belonging to the genus *Rhonalwosa*ma, containing many unusual forms lately received from Accra, West Africa also, from the same locality, about sixteen species of the genus *Charaxes* in remarkably fine condition, and represented in nearly all instances by specimens of both sexes. He also exhibited a specimen of *Philognoma licitus* and a supposed female of *Papilio phorcas* (Cram.), the markings of which were very similar to the male; but differed in colour, being brown,
with a pale straw-coloured band, not so broad as in the male. Mr. Crowley further exhibited a large number of specimens of *Saturnia* from Natal, concerning the habits of which he read the following extract from a letter, received by him that morning (April 7th) from a gentleman who had sent over a number of the pupae of this genus:—"The larvæ of all our big moths burrow into the soil to a depth of from two to three inches, and there they remain, some for six months, some for ten. *A. dione* is an example of the former, and *A. tyrhrhea* of the latter. . . . I search in due season for the young caterpillars, which, having found, I remove to bushes and trees as near my own residence as possible. I then watch them carefully day by day until I consider them large enough to remove into my breeding-cages, all of which have at least six inches of good clean soil at the bottom. When full fed they burrow, as I have said before, and exactly six weeks after the disappearance of the last one I dig up all the pupae and lay them carefully side by side on moss, which I keep moistened from time to time." Mr. Crowley added that he had received pupæ, from this source, of *A. capensis*, *A. wahlbergi*, *A. dione*, *A. rubricunda*, and *A. tyrhrhea*, all without cocoons and so alike that he could not separate the species. He stated that the surface of the pupæ was dull, rough, and black, like our own *Smerinthus populii*.

The Rev. W. W. Fowler exhibited four beetles belonging to the family *Carabidae*; three of them had been taken, twenty years ago, on the banks of the Clyde, and had lately been identified as *Anchomenus Sahlbergi*, Chaud, a species new to Europe, having hitherto only been found in Siberia. The remaining specimen was *Anchomenus archangelicus*, Sahlb., a North European species nearly related to *A. Sahlbergi*, but easily distinguishable therefrom by the greater depth of the striae of the elytra.

Mr. J. W. Slater exhibited, on behalf of Mr. Mutch, a spider belonging to the genus *Galeodes*, and a Lamellicorn Beetle from the neighbourhood of Port Elizabeth, South Africa, belonging to the genus *Cetonia*, which was at first supposed to be a monstrousity, but was afterwards found to owe its unusual appearance to the right elytron having been broken off and fixed on in a reversed position. He further exhibited an undetermined species of a beetle belonging to the family *Curculionidae*, also from Port Elizabeth.
Mr. Billups exhibited a specimen of Bassus hizonarius (Gravenhorst),—an ichneumon new to Britain,—taken at Peckham in May, 1885: also a number of specimens of another parasite belonging to the Braconidae,—Dimeris mira (Ruthe),—taken in Headley Lane, Surrey, in March last.

Mr. Wm. White exhibited preserved specimens of the larva of two species of Catocala, for the purpose of calling attention to some remarkable processes upon the under side, which seem to have been unrecognised hitherto. He stated that, having lately submitted to a microscopical examination the characters on the under side of lepidopterous larvae of numerous groups, he found this new character to exist in the case of the Catocalidae, but in no other family. Upon the lower side of the English species C. fraxini, there are curious markings of a fleur-de-lis shape between the legs of the 2nd and 3rd thoracic segments, and a further series of marks of various forms upon the 3rd, 4th, 5th, 6th, and 7th abdominal segments. These markings are of a dark mahogany-brown colour, fading into deep orange all round, and in connection with them there is found to be (when examined with a strong lens) a development of some strange processes of a pocket-like appearance. Upon attempting to insert the point of a fine pin into this pocket he found that they were subcutaneous, and not actually upon the surface, as they appeared through the perfectly transparent cuticle to be. The German species C. electa attains an extended and rather fuller development than C. fraxini in bearing the characters upon each segment. The processes vary considerably in grade of development amongst the segments, and he said he had not yet been able to make out their precise order, but he submitted a somewhat rough sketch of the appearance of the abdominal segments of C. electa as shown by a 2-inch objective. The first drawing exhibited the internal structure of the dissected portion before the fatty tissues were removed; but little of the processes could be made out from that point of view, and they were more clearly to be seen from the other aspect; also a side view showing the contour, of the natural size. The large view of four of the spots presents an idea of the diversity of form in the individual animal, and the two additional sketches show the processes diagrammatically. Mr. White said that the only conclusion he could arrive at respecting them was that they were functional organs of a special nature, and he observed that he
should be very glad if anyone present could suggest an explanation of any such function, or throw some light upon the question of their purpose. Although the whole of the viscera and other fatty portions of the caterpillar had been squeezed out, these organs were perfectly retained, apparently in their proper form, and it was quite certain that they must fulfil some purpose.

In reply to some observations from Prof. Meldola, Mr. White said he had not found any similar organs in any other species, though he had looked well for them; and in reply to Mr. J. Jenner Weir, who suggested that they might act as suckers, he stated that the objection to that explanation was that the skin covering them was perfectly tight. There were in some instances pairs of minute holes which might communicate with the atmosphere, and probably did, but otherwise air was closed from them. There appeared to be a motile closing of the arrangement of tentacles like the clasping together of fingers, but this could not apply to the open continuation of the serrated edge of tentacles above this seam of the lip, which is not unlike the labellum of some orchid.

Mr. S. Edwards exhibited an, apparently, unknown exotic spider, found in his orchid-house at Blackheath.

Mr. H. Goss exhibited two remarkable varieties of the male of *Argynnis paphia*, taken in Sussex and Hampshire respectively.

Papers read.

Mr. A. G. Butler communicated a paper entitled "Descriptions and remarks upon five new Noctuid Moths from Japan."

The Rev. W. W. Fowler read a paper "On new genera and species of *Languriidae,*" chiefly from specimens in the British Museum, the Cambridge Museum, Mr. Lewis's Ceylon collection, and the collection of the Rev. H. S. Gorham. In alluding to a species described in this paper, Mr. Champion remarked that he had taken the elongate form, and also the broader form, on trees as well as on low herbage, in Central America. Dr. Sharp remarked that Mr. Lewis's experience of the habits of the species in Ceylon appeared to have been different.

Dr. Sharp read a paper "On some proposed transfers of generic names." This paper called attention to a practice advocated by Mons. Des Gozis, which was apparently extending on the Continent, of transferring the names of some of the commonest genera to other genera. The extreme confusion caused by the practice
was pointed out, and the author showed briefly that the theory on which Mons. Des Gozis's system was based was as unsound as the practice itself was objectionable. Considerable discussion followed the reading of this paper, in which the Rev. W. W. Fowler, Mr. Waterhouse, Mr. M'Lachlan, Dr. Sharp, Mr. Pascoe, and Mr. Dunning took part. The last-named gentleman said that the discussion of the evening reminded him of a very similar discussion on the application of the law of priority to genera which took place at a meeting of the Society nearly twenty years ago.* The project was then condemned as unanimously as it had been to-night; and he trusted that entomologists would hear no more of it.

May 5, 1886.

Prof. J. O. Westwood, M.A., F.L.S., Hon. Life-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

* Election of Fellows.

The Rev. E. N. Bloomfield, M.A. (formerly a Subscriber). Mr. Frederick Fitch (formerly a Subscriber), Mr. A. J. Rose, and Mr. William E. Nicholson were elected Fellows.

Exhibitions, &c.

Mr. Jenner Weir exhibited a large lepidopterous larva which he had received some years ago from the late Andrew Swanzy, who had obtained it in Western Africa; it was about four inches long, and was furnished with six large spines on each segment (except the first), arranged in two dorsal and four lateral rows; the dorsal spines were about one-third of an inch in length, the lateral were shorter.

Mr. Stevens exhibited a number of Coleoptera recently obtained in the Isle of Wight, including Apion Sorbi.

Mr. Crowley exhibited four specimens of Leto Venus, a large moth belonging to the family Hepialidae from Natal.

Mr. Howard Vaughan exhibited a long series of *Cidaria immanata* from Kent, Surrey, and other southern counties, Perthshire, Isle of Man, Isle of Arran, the Orkneys and Shetlands. He also exhibited *C. russata* from various localities in the South of England, and from Perthshire, Argyllshire, and the islands of Arran, Lewis, and Hoy. Mr. Vaughan further exhibited varieties of *C. suffumata* from Dover and Darlington.

Prof. Westwood commented on the interesting nature of the exhibition of *C. immanata*, and stated that he had never before seen such a wonderful collection of varieties of a single species.

Mr. M'Lachlan exhibited for Mr. G. Lewis living specimens of *Paussus Farieri* (L'airm.), lately collected in Portugal by Mr. Lewis in nests of the ant, *Pheidole megacephala*, var. *pallidula*.

The Rev. W. W. Fowler exhibited *Staphylinus latebricola* and *Quedius truneicola*, both from the New Forest.

The Secretary, exhibited, for Mons. H. de la Cuisine, of Dijon, coloured drawings, life-size, of a variety of *Urania cresus*, and a variety of *Papilio mennon*; and Professor Westwood made some observations on them.

Mr. G. Elisha exhibited specimens of *Antispila Pfeifferella*, together with the cases, and the leaves mined by the larvæ.

Papers read, &c.

Mr. J. W. Slater read the following paper "On the Origin of Colours in Insects";—

"It may not be time lost to examine, as far as insects are concerned, a very plausible theory of the genesis of colour in the animal world, especially as it has gained no small degree of popularity. The theory in question is that of Mr. Grant Allen, as promulgated in his work, 'The Colour Sense, its Origin and Development; an Essay on Comparative Psychology.' He there contends that the most beautiful insects are such as haunt flowers and fruits, either feeding directly upon their pollen, nectar, sweet juices, &c., or preying upon minute insects which are attracted there for the same purpose. To quote Mr. Grant Allen's own words:—'Only those animals display beautiful colours, due to Sexual Selection, in whom a taste for colour has already been aroused by the influence of flowers, fruits, or brilliant insects, their habitual food.'
"It seems to me, on the contrary, that carnivorous insects, preying upon creatures far from brilliant, are not inferior in beauty to flower- and fruit-haunting groups, inhabiting similar climates; and secondly, that among the flower- and fruit-haunting groups themselves there are abundance of dull, sombre-looking species.

"To begin with the former proposition: every one must admit that the Cicindelidae are a decidedly carnivorous group, alike in their larval stage and when mature. Mr. Allen himself acknowledges their beauty. If we take C. campestris, probably their most gaily-coloured European species, we find it not merely eschewing fruits and flowers as food, but not seeking its insect prey on or among flowers. Its favourite haunts are sandy and gravelly tracts, where there are no striking flowers to frequent. Nor can it be said to capture, habitually, brightly-coloured insects as its prey.

"If we turn to the Carabidae, we find splendid coloration frequently accompanying carnivorous habits. No one can question the beauty of several species of Procerus. In Carabus proper we find certain species, such as C. splendens, hispanus, and rutilans, which, to say the least, equal in brilliant colouring our finest European Cetonia, say Cetonia fastuosa. I have never had the opportunity of studying the habits of the three species I have just named, but I can say that Carabus fastuosus, superbis, auratus, auronitens, and nitens agree in their habits and diet with our common British species, such as C. mouliis, C. granulatus, &c., pursuing their prey in the night and at early dawn, and hiding in the day under stones and leaves. I will admit that I have seen C. granulatus come to sugar on the trunk of a tree, and have fed a specimen in captivity on bits of apple. But the most beautiful Carabs inhabit places where fruits are not easily found.

"One of the cases where Mr. Allen's law most signally breaks down is that afforded by Calosoma sycophanta, generally regarded as the most splendid Europeancoleopteron. The locality where I have observed it in great abundance was a sandy region, bearing a scanty growth of Scotch firs, and where fruits and flowers were alike out of the question. Nor had its prey any striking coloration, consisting of the larvae of Lasioenampa pini, with occasionally a few of those of Smerinthus pinastri. Yet in that locality, about fifteen miles north-west of Gölitz, the Calosoma was quite
plentiful. I may add that specimens which I had in captivity refused fruits.

"It will be needless to take up time by giving a catalogue of other gaily-coloured, yet carnivorous, Coleoptera. Yet I cannot pass over Mr. Allen's assertion that 'first in the order of ugliness must be placed the carrion-feeders who live upon decaying bodies or animal excrements.' Surely any one who is acquainted with the great Neotropical genus *Phanaeus*, all dung- and carrion-feeders, or even with many species of *Copris*, will strongly demur to this assertion. Our common *Geotrupes* display on their under surfaces rich shades of purples, deep blues, and golden greens.

"Even the burying-beetles (*Necrophagus*) display both in their colours and in design a very close approach to certain *Buprestidae*, such as several species of *Stigmodera*. Thus we see that extreme difference of diet may coexist with approximate identity in coloration, whilst, on the other hand, identity in diet may coexist with the most complete difference in point of colour.

"In the order Lepidoptera we find no purely carnivorous forms, so that here the question cannot be discussed from this point of view. At the same time it must not be forgotten that *Vanessa Atalanta* and *Apatura Iris* and *Clytie* will sip the juices of a dead rat or weasel as eagerly as those of the sweetest flower, and the same is said of the tropical *Papilios* and *Ornithoptera*.

"The Hymenoptera supply some very decisive evidence. Their most splendidly-coloured family, the *Chrysididae*, of which the common *Chrysis ignita* may serve as a familiar instance, are decidedly carnivorous, and in their larval state parasitic. Nor do they generally seek their food among flowers, since they preferentially haunt walls, rocks, sand-banks, and palings.

"In the order Neuroptera we find beauty and purely carnivorous habits very strikingly developed. Of the beauty of the *Libellulidae and Agrionidae* every naturalist is well aware. I have never seen or heard of any case of their feeding on fruits or seeking for insects upon flowers or fruits.

"Many of the Hemiptera are well known to have splendid colours, but the information I have found as to their diet is not sufficiently precise.

"Thus, I think, that a general survey of the insect world establishes our first proposition, that 'carnivorous insects are not inferior in beauty to flower- and fruit-haunting groups.
"Secondly, there are, I submit, among the flower and fruit frequenters themselves, a very large proportion of dull, sombre-coloured forms. On running over the species of 'Lamellicornia Melitophila'—in other words, the Cetoniidae in the widest sense of the term—described in Burmeister's great work, I find no fewer than 192 species which are black, grey, drab, fawn-colour, dirty olive, &c. Of course the habits of all these species are not accurately known. But in their slow, awkward flight, and the construction of their jaws, they are quite unfit for a predatory life. In the black species which I have had the opportunity of observing closely, Oxythyrea stictica and Gnorimus variabilis, I could find no difference in diet and general habits from Cetonia aurata.

"Even among the Buprestidae we find not a few dull-looking species which sadly contradict the character of splendour popularly ascribed to this family.

"In butterflies, or we might say in the Lepidoptera generally, we have striking instances of similarity of diet accompanying dissimilarity of coloration. We may say that substantially all Lepidoptera feed upon the green leaves and stalks of plants when larvæ, and that when mature they suck the nectar of flowers, some few preferring the juices of fruits, especially when over-ripe. But every lepidopterist knows that whilst many butterflies are splendidly coloured, numbers of others, equally flower-frequenting, are black, white, brown, grey, &c. If the influence of the flowers they visit is the cause of the rich coloration of the Papilioninae and Nymphalinae, why does it not have a corresponding effect on the Satyrinae and the bulk of the Pierinae? This consideration alone seems to me fatal to Mr. Grant Allen's theory.

"The Orthoptera offer another crucial and fatal instance. If any insect lives in and feeds upon flowers, it is the common earwig. Yet in coloration it is inferior to perhaps the majority of those refuse or carrion devourers, to which Mr. Allen assigns 'the first place in ugliness.'

"Another fatal instance is afforded by the order of Hymenoptera. We have here the group significantly called Anthophila, 'flower-lovers,' including the Andrenidae and Apidae. These, including the hive-bee, are more purely honey- and pollen-feeders than any other Hymenoptera; yet in coloration the species found in Britain, or we might say in Europe, fall far short of the carnivorous and parasitical Chrysididae.
"In short, it cannot be said that Mr. Grant Allen's theory of the origin of brilliant coloration in insects is sustained by an examination of even moderate extent. We find abundance of flower- and fruit-haunting species dull and sombre in aspect; an equal abundance of Carnivora and refuse-devourers richly and brilliantly clad; we find groups of species closely similar in colour, yet quite opposed in their diet, whilst other groups, again, alike in their food, signal difference in their coloration.

"If a very few words in digression may be permitted, I would point out that all the theories which we have concerning the coloration of insects, such as sexual selection, mimetism, and that of Mr. Grant Allen's, just discussed, point to final causes, telling us that a certain colour is evolved to bring about a certain end. But, I submit, we want also to know the efficient causes. If a colouring matter is concerned, from what, how, when, and where is it elaborated? How is it conveyed to those parts of the insect where we find it, and how is it deposited in the designs which we see? I know that this is a most difficult investigation, but it is one which I would earnestly recommend to young entomologists who are fortunate enough to have ample time at their disposal."

Mr. M'Lachlan said that the physiological question in connection with colour had not been paid sufficient attention to; he thought that colour in many insects was, to a great extent, dependent upon the circulation of fluids in their wings. The discussion was continued by Prof. Westwood, Mr. Goss, the Rev. W. W. Fowler, Mr. Jacoby, Mr. Weir, and others.

June 2, 1886.

ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Fellows.

Mr. C. Baron Clarke, M.A., F.R.S. (formerly a Subscriber), Mr. H. Wallis Kew, Mr. W. Dannatt, Mr. J. P. Mutch, Mr. B.
W. Neave, Mr. A. C. F. Morgan, and Mr. W. Warren were elected Fellows.

Death of a Fellow.

The President announced that Mr. F. E. Robinson, a Fellow of the Society, and formerly a pupil of Prof. Westwood, had been killed by a tiger in India on the 27th April last.

Exhibitions, &c.

Mr. Stevens exhibited a specimen of *Heydenia auromaculata* (Frey), from the Shetlands, a species new to Britain.

Dr. Sharp exhibited a number of specimens of *Staphylinidae* prepared by him some years ago with a view to their special protection and permanent preservation. The insects were placed in cells of cardboard, and these were covered above, or above and below, with cardboard, the whole being hermetically sealed by applications of successive layers of bleached shellac.

The President said the plan appeared to be very successful where the cardboard cells were left open on both sides, but when the cell was complete below only one surface of the insect could be examined.

Dr. Sharp also exhibited a specimen of the cockchafer vivisected by a bird. The whole of the dorsal surfaces of the abdomen, meta- and meso-thoraces, were removed, and all the contents of these parts quite eaten out, but the pro-thorax and head remained untouched. In this condition the insect walked about with the four front legs, and directed its movements apparently without inconvenience, and was killed by the exhibitor after having remained in this state more than twenty-four hours after its discovery.

Mr. Billups exhibited *Meteorus luridus* (Ruthe), a species of *Ichneumonidae* new to Britain, obtained by Mr. Bignell.

Mr. W. White, in exhibiting cocoons of *Cerura vinula*, called attention to the vexed question as to how the perfect insect escapes from these solid structures. He was inclined to think that formic acid, secreted by the insect, was a probable factor in the operation. The question as to the mode of escape from these cocoons of the parasitic *Ichneumonidae* and Diptera was also raised, and the President, Baron Osten-Sacken, Mr. Waterhouse, and Prof. Meldola made remarks on the subject.

Mr. Elisha exhibited living larvae of *Geometra smaragdaria*
from the Essex Marshes. He also exhibited the singular pupae of *A. Bennettii*.

Mr. Howard Vaughan exhibited a series of several hundred bred specimens of *Peronea hastiana*, showing the innumerable varieties of the species. He also exhibited, on behalf of Mr. Sydney Webb, of Dover, an interesting series of *Cidaria suffumata*, with especial regard to the progeny of particular females, the parent and the produce of the eggs laid by her being carefully separated.

*Papers read, &c.*

Mr. Howard Vaughan read the following notes on the subject of the specimens of *Cidaria suffumata* exhibited, communicated by Mr. Sydney Webb, of Dover:

"*Notes on Cidaria suffumata, with an account of an attempt to rear some of the more peculiar forms which the Dover specimens assume.*"

"The larvae from which the accompanying specimens were bred were severally kept apart, although under similar conditions of aspect and atmosphere. One person attended to them, the cages were duly labelled, and every care taken that no error of observation should in any way arise.

"*Description of the Parents, &c.*"

"No. 1.—A not uncommon form of the insect as taken at Dover. The ground colour is a little lighter than ordinary, which causes the stripe beyond the central band to show conspicuously, the more so in consequence of its intersecting transverse lines not being very distinct. The band in the middle of the wing is of a slightly darker shade than usual. The moth laid 38 eggs in all, and died the fourth night after capture.

"Nos. 2 and 3. — Ordinary typical *suffumata*: they laid respectively 37 and 45 eggs, and died the third and fifth days after capture. The young larvae of these were not kept separate, and the results were for convenience simply booked as No. 2.

"No. 4.—A very beautiful specimen of an unusually rare form, with a pale ground colour but dark central band, the tips of the wings with few markings, and colour of the hind wing in a strong
contrast of two shades, the darker interiorly. Died the fourth day after capture, having previously laid 10, 19, and 4 eggs, 33 in all.

"No. 5.—Another pale specimen, but not so striking as the last, having more dark markings towards the hind margin of the wings. Laid 18 eggs on the second night, 19 on the third, 13 on the fourth, and died on the seventh after capture.

"No. 6.—Caught three days later. Very dark central band, the spaces on either side of it pale umber-brown; an occasional, but scarce, form at Dover. Laid 9, 16, and 2 eggs, and, the weather turning cold, died third night after capture: 27 eggs in all. [Note.—The umbrous ground colour became lighter in appearance as the insect showed signs of wear.]

"Nos. 7 and 8.—Not very distinct examples of a peculiar type. Colour of central band and markings blackish brown, the paler subterminal stripe distinctly divided by one or two waved unbroken lines. Kept these, hoping to rear a lined var. like that shown. Laid respectively 19 and 34 eggs, and died the third day.

"These specimens were all caught on the wing, consequently the appearance of but one sex is known.

"Notes on the Life-history.

"The eggs of C. suffumata, like those of russata, are large in proportion to the size of the insect. They are not laid in any order, but scattered about in ones or twos; from 35 to 40 would appear to be the average number deposited, but out of a number of freshly-developed specimens the extremes of 25 and 78 have been noted. They hatch about the ninth day, and the caterpillars grow very quickly, being full-fed about thirty days afterwards; thus but few are likely (in the South of England) to continue feeding, even under exceptionable circumstances, longer than the second week of June; yet Newman, in his 'British Moths,' gives the month of July for the date of their occurrence, whilst other text-books assume the larvae to feed in the autumn and to hibernate before attaining their full growth, which is quite contrary to the experience of those who have reared the insect in this country, and only explainable by an hypothesis of a second brood, which we have not as yet ascertained to exist in nature.

"The habits of the species whilst feeding are exceedingly filthy, and, after shedding their skins for the last time, the larvae,
in confinement, grow very quickly, not infrequently distending themselves so much that they die of repletion. Only a few go down into the soil to change to pupae; these do not make a cocoon, but, like many other Geometrina, simply spin a few lines of silk connecting the loose earth surrounding them; the remainder turn to pupae on the surface without any covering.

"An extraordinary circumstance attending the pupation is that all the markings of the perfect insect are distinctly visible through the pupa-shell, in at least 75 per cent., from four to six months before the imagines appear. This peculiarity has been noticed in three successive years, so that it cannot be said to be an isolated occurrence.

"Forcing specimens prematurely to emerge by means of a warm atmosphere, although adopted with many species with success, is to be deprecated with this moth. By trying this mode one season we lost all the insects by the pupae contracting and drying up, although the earth continued moist; whilst another year it caused the chrysalids to stand over to the succeeding, or rather second, spring, with, of course, a proportionate loss of vitality. Notwithstanding, they may be successfully coaxed forward about a month earlier than their usual appearance out of doors.

"Statistics of results of breeding, and summary.

"A very small proportion of these specimens emerged in the autumn and winter months, viz., one about Oct. 31st from cage No. 6, one on Nov. 13th from No. 2, two on Dec. 26th from Nos. 1 and 7. Of these but one resembled its parent, viz., No. 6; the others were purely normal.

"Every specimen bred in 1886 was pinned, with the exception of a few cripples of Nos. 1, 2, and 6.

"The earliest, or we may call them untimely, instances were bred on Jan. 14th: two specimens from cages 4 and 7, one from cage 2 (a cripple) on the 26th, one from cage 1 on Feb. 1st, one from cage 2 on the 14th, and one on the 15th, on which date also appeared one from cage 1, and the following day one from cage 7. These arrivals seeming to suggest that a little warmth would bring the remainder forward, they were removed from a northern into a southern aspect, and a fortnight afterwards the moths began to come out freely, excepting when the wind was N. or N.E., when, however warm the room might be kept, they continued
dominant. (This agrees with our observation of the insect at large. They will only fly when they consider the weather quite favourable.) The first 28 (i.e., until March 19th) left the chrysalis from 1.30 to 3 p.m. without exception; after that date the moths emerged in the evening from 5.30 to 6.15, and again from 8.15 to 10.

"To those who do not know C. suffumata other than as cabinet specimens, it may be advisable to mention that the perfect insects are restless in confinement, and therefore useless unless speedily killed. A curious subdiaphanous specimen from No. 1 cage, which left the pupa too late at night to dry its wings properly before pinning, was found with its cilia considerably damaged by the next morning, although alone and in a roomy receptacle.

"Progeny of No. 1.—Fourteen specimens were bred this spring; only one (the 11th) follows the mother. Five are normal; one approaches No. 6; three No. 5; whilst four are peculiar in their characters, and different from either of the exhibited parents (these are marked with a X). The autumn-bred specimen placed above the pencil line is also very distinct. This is a variable and interesting series, showing one-third markedly progressive and one-third falling away. The results from another female of the same type, the eggs of which were sent to a friend, show a proportionate number of finely-banded examples.

"No. 2.—Normal in the earlier bred specimens, those last to emerge approaching nearer No. 1 in the pale stripe, but central band not intensified. The first and eleventh are interesting, but the series may shortly be dismissed as closely following the parent.

"No. 4.—The facies of the female original strongly marked on her progeny, but none so beautiful. They mostly resemble No. 5, with the exception of the first, sixth, and seventh specimens, which are like No. 6 in the ground colour. There is no perpetuation of the characters of the parent, excepting the contrast of the deep central band with the pale ground colour. The series shows a retrogression of one degree.

"No. 5.—Another curious series illustrating a reversion from the parent towards the type. The strongest marked specimens are not superior to the darkest banded ones of No. 1; some are quite normal, and two approach No. 6. The best character is the colour of the veins of the primaries at the apex, which are orange-brown.
“No. 6.—Has better held its own than the foregoing series, but three specimens would intimate that this, too, may retrograde in the next generation. The rich colour of the ground, although rare at Dover, does not seem an individual peculiarity; it may be seen in the progeny of Nos. 1, 4, and 5. The insects of this series appeared weakly and wanting in moisture to enable them to extrude from the pupa. Most of them would have been sad cripples but for assistance rendered.

“Nos. 7 and 8.—Like the normal 2 and 3, closely follow the parents. The specimen, which emerged in the winter, is of a deeper colour. This series does not suggest much change of appearance.

“From eggs deposited on the setting-boards by two strongly-marked captured females, the three further examples were bred; they corroborate the argument, and show like Nos. 4 and 5, a retrogression similar to the advance of No. 1.

“Summary of results.

“The summary of this exhibit would seem to be that a race or form of Cidaria suffumata is not being set up in the neighbour-
hood of Dover, but that there is a see-saw from the common to the pale form, with distinct black central band, and vice versa. That both the progression and retrogression is one of stages, the first either way being very gradual and much assimilating the characters of the parent, whilst from the second to the third transition there is a great advance in the desired direction. The extremely white specimens belong apparently to a stage that is seldom attained.”

In the discussion which followed, the President, Mr. Jenner Weir, Mr. Waterhouse, Mr. Distant, Dr. Sharp, and Mr. Stainton took part.

Mr. A. G. Butler communicated a paper on “New genera and species of Lepidoptera-Heterocera from the Australian region,” in which 21 new genera and 103 new species were described.

Mr. J. S. Baly communicated a paper on “Uncharacterised species of Diabrotica.”
July 7, 1886.

J. Jenner Weir, Esq., F.L.S., Vice-President, in the Chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of a Fellow.

Mr. S. H. Scudder, of Cambridge, Mass., United States, was elected a Foreign Member of the Society.

Exhibitions, &c.

The Rev. H. S. Gorham exhibited specimens of Eucnemis capucina (Ahr.), a species new to Britain, discovered in June last in an old beech tree in the New Forest. He also exhibited specimens of Cassida chloris.

Dr. Sharp exhibited larvae of Meloë. He stated that on the 17th June last, when walking in company with Mr. Champion at Southampton, he observed some brown masses at the extremities of some blades of grass, and on stooping to examine them more carefully was pleased to find that they were the insects now known to be the larvae of Meloë, formerly considered to be a Pediculus living on the bee. Meloë proscarabæus had been abundant in this spot a few weeks previously, and he had no doubt these insects were the newly-hatched larvae of that species. They were agglomerated in masses at the ends of stems of grass, from 100 to 400 or 500 specimens in each mass, and there were altogether on the spot fully 4000 individuals: these masses were only to be found on two tufts of grass quite near to one another, and were probably the larvae hatched out from one brood of eggs; and Newport estimated the number of eggs laid by a single female as fully 4000. The larvae in these agglomerations were in a state of great activity, holding on to one another, but each twitching about in a peculiar manner, and the outside ones jerking up the head and thoracic segments. Being desirous of ascertaining whether they would go on to a bee, Dr. Sharp tried to procure one, but the day was so bleak and windy that he could not find one at hand, but he procured a dipterous insect of moderate size, a species of Musca, and presented its thoracic region to one of the masses; the moment the dipterous insect touched one of the
most external of the minute Meloë larvac it was seized, and the
little larva held on with such tenacity that on taking the dipteran
away he removed fully half the mass of larvac (some fifty or sixty
examples at least) clinging to it; the larva passed with great
rapidity on to the body of the dipteran, and seemed to be quite
contented therewith. He then presented a hemipterous insect (a
Limnoabates) to one of the masses, but the little creatures would
not accept this as a host, and were in fact quite indifferent to it.
He put a number of the larvac into a tube and took them home
with him, and procured a small bee from the flowers in his
garden—a small Halictus,—to try some fresh experiments. He
turned some of the larvac out on to a sheet of paper, and taking
the bee, touched several larvac one after another with it; each
time any hairy portion of the bee touched a larva, the latter
instantly held on and passed on to the body of the bee with great
rapidity, taking up a position where it was protected, such as at
the base of the abdomen, and becoming quite quiescent, in
striking contrast to the constant jerking motion it had previously
exhibited. Dr. Sharp further said, that from what he observed
he did not think there was anything worthy of the name of
instinct in the operations of the larvac. They were more like
reflex actions; the instant a suitable surface was touched by the
larvac it was clung to, and thus, as is well known, large quantities
of these larvac must starve from getting on to insects other than
bees, and thus failing to be carried to the homes of the bees,
where only they can continue their existence.

Mr. Saunders exhibited a specimen of Halictus infested with
about 30 Meloë larvac. Mr. Billups remarked that he had
recently found 47 larvac of Meloë on the body of a specimen of
Eucera longicornis. The discussion was continued by Professor
Riley, who disagreed with Dr. Sharp, and believed these larvac
were guided by instinct, as they showed a decided preference for
particular hosts.

Mr. Jeuner Weir exhibited a male of Lycena bellargus, and
a female of L. icarus, which had been captured in copula by
Mr. Hillman, and shown to the exhibitor at the time of capture.
Mr. Weir also exhibited a specimen of L. icarus which appeared
to be a hybrid, being of the colour of L. bellargus, and another
male, which although approaching nearer to L. bellargus than
L. icarus, yet had the left wings of the purplish blue of L. icarus,
and resembled that species in having spotless fringes to the wings. Mr. Weir further exhibited, on behalf of Mr. J. H. A. Jenner, of Lewes, four specimens of *Phosphanus hemipterus*, taken at Lewes. They were all males, and were usually found running in the middle of the day on sunny walls. Mr. Jenner had observed that they emitted their light freely when excited.

The Rev. W. W. Fowler exhibited two specimens of *Chrysomela cerealis*, lately taken by Dr. Ellis on Snowdon; and also two specimens of *Actocharis Readingii*, found at Falmouth by Mr. J. J. Walker.

Mr. E. B. Poulton called attention to the fact that the larvae of some Lepidoptera, if fed in captivity on an unusual food-plant, subsequently refused to eat their ordinary food-plant. He stated that he had observed this with the larvae of *Pyrgara bicephala* and *Smerinthus ocellatus*. Mr. Stainton, Mr. Fowler, and Mr. Goss made some remarks on the subject.

Mr. Elisha exhibited a series of bred specimens of *Geometra smaragdaria*, together with the cocoons, containing the empty pupa-cases, attached to the stems of the food-plant.

Mons. Alfred Wailly, who was present as a visitor, exhibited a long series of silk-producing moths, including some remarkable hybrids between *Platysamia cecropia*, and *P. ceanothi*; and Prof. Riley and Mr. Weir made some observations on these hybrids.

Papers read, &c.

Dr. Sharp read a paper on "Eucnemis capucina (Ahr.) and its larva."

Mr. Dunning read the following report on the subject of the importation of humble-bees into New Zealand:

"I have on more than one occasion called the attention of the Society to the attempts that were being made by the Canterbury (N. Z.) Acclimatisation Society, with the assistance of our colleague, Mr. Thomas Nottidge, of Ashford, to import humble-bees into New Zealand. In December, 1883, and January, 1884, two parcels, containing 80 impregnated queens, were sent out (see Proc. Ent. Soc. 1884, p. iii.), but this experiment was a failure. It was repeated on a larger scale in the following winter, and with complete success. Mr. Nottidge shipped 282 queen humble-bees on board the 'Tongariro,' which arrived at Wellington early in January, 1885, whence the bees were
forwarded by coasting-steamer to Lyttelton, and were delivered at the Society's Gardens on the 8th of that month. When the case was opened, it was found that 48 were alive; of these, 36 were strong and healthy, took to the wing at once, and flew off in the sunshine to some clover-heads hard by; they soon dispersed, and many of them were noticed to fly high in the air, giving a parting buzz, and were then lost to sight. The weakly ones were fed with honey and kept warm; and on the following day, which was bright and sunny, they too were liberated, and flew away like the others. The registering thermometer in the case was broken in transit, so that no record of the temperature remained. A second batch of 260, sent out by Mr. Nottidge in the 'Aorangi,' arrived on the 5th February, 1885, and in this case the temperature had ranged from 35° to 80°; there were 49 survivors, and when taken to a favourable locality and exposed to the warm sun, they all flew off with a strong healthy hum, and were soon lost to sight. Mr. Farr, the Hon. Sec. of the Acclimatisation Society, reports that moss is the best packing, and that it should not be too wet, as wherever the moss became mildewed the bees were dead; but when the moss was free from mildew they were strong and healthy, so that after a few minutes in the sun, during which a thorough cleansing of wings, legs, body, and especially of the eyes, was effected, away they went with a cheery hum. A correspondent of the 'Lyttelton Times,' in recording this as the first successful attempt which had been made to introduce them, and in happy ignorance that the females had been impregnated before export from England, wrote that 'from the habits of the humble-bee, it seems probable that, as they were apparently taken during the winter period, when the drones have generally died off, the shipment will be found to be only composed of females; if this should be so, of course their numbers will not increase.' This prognostication was, however, falsified. A few of the bees were seen occasionally in the suburbs of Christchurch during the autumnal months, after which they hibernated, and in the spring were seen again; then for a while, as Mr. Farr reports, 'none were seen; doubtless this was the procreating season, for, shortly after, their numbers were legion, amusing many with their monotonous buzzing. This was the beginning of September, at which time two were brought to me as something new in the insect-world. Large numbers of nests were found, some of which
were destroyed, either from curiosity or ignorance by some, but in wanton mischief by others. Soon afterwards reports came to hand from every quarter, far and near, some having travelled as far as Timaru (100 miles south), West Coast Road (86 miles west), beyond Glenmark (55 miles north), and in many parts of Banks’ Peninsula (east). By the end of summer, many pleasing evidences reached us of their ubiquity and utility. On the 3rd February a farmer from Avonhead Farm called on me, to make known to the Society that a field of red clover, in which he had in previous years been able to find but a small quantity of seed, only a few in each head, was this season a perfect mass of seed, each head being completely full.' Mr. Farr’s account is corroborated by our colleague, Mr. R. W. Fereday, who, writing from Christchurch on the 3rd May, 1886, says that 'the humble-bees have thriven and multiplied in a most wonderful manner; they already abound all over the country.' There is no longer any doubt that Bombus terrestris has established itself in New Zealand; the rapidity with which it has colonized a large tract of country is remarkable. By this time another generation, pro-created as well as born in the Colony, will be on the wing; and we may expect soon to hear that the long-wanted clover fertilizer has become a nuisance, and that an antidote is required for the fecundity of the imported pest.”

Mons. Louis Peringuey communicated the following "Notes on some Coleopterous Insects of the family Paussidae":—

"Since the publication of my notes on three Paussi (Transactions Ent. Soc. 1883, Part II.) I have carried on my observations of the habits of those insects, which at last have elucidated the hitherto unaccounted-for presence of the Paussi among ants.

"The Paussi feed on the larvae of the ants. I had in captivity numbers of P. lineatus, P. Burmeisteri, P. Linnei, a few P. cucullatus, and one specimen of P. Shuckardi.

"The difficulty of observing exactly the movements of such sluggish insects was enhanced by the depth of my glass receptacles, but having at last located my colonies of ants in very shallow vessels, thus following Sir John Lubbock’s plan, I saw the Paussi deliberately seize the larvae between their jaws and devour them, using often their fore legs to hold the prey to the
ground; they would abandon it when thoroughly mangled and begin with another. In vain did the workers try to remove the beetle from the heap of larvae, their efforts were unequal to the *vis inertiae* of the Paussus. So far, I have not seen the latter attack the newly-born ants, although I have tried repeatedly the experiment of seclusion. The process of manducaion might be called one of suction, because all the Paussi I placed under the microscope always held the larva with one fore leg, sometimes with both, but hardly moved their head and never swallowed it entirely.

"The fact that the Paussidae are predatory beetles may now be said to be well established, and it is a proof of Lacordaire's assertion that the nearest affinity of the Paussidae lies with the Carabidae. Nevertheless they are true parasites,—of that there can be no doubt. With the exception of a few stray specimens caught on the wing, all the South-African Paussidae I have seen or possess were met with in ants' nests, and those friends or correspondents of mine who, following my instructions, have searched for Paussi, have invariably found them there only. In some cases many specimens were found together:—Pentaplatarthrus paussoides, *P. paussoides* var. natulensis, Paussus cucullatus, *P. Klugi*.

"But in the neighbourhood of Cape Town, with the exception of Pentaplatarthrus, I never found more than three specimens together. Yet the ants' nests were in such close proximity to one another, that within three hours I captured 37 specimens of *P. Burmeisteri*, *Linnei*, and *lineatus*. Had the nests any ramification, which I did not perceive, and were they parts of a huge colony? I doubt it; because, whenever I stored together two lots of ants taken from the same locality, they certainly did not agree, and for a long time the soldiers would be engaged in a most deadly fight.

"But why do not the ants get rid of their enemy? *P. lineatus* is certainly more bulky than the Acantholepis capensis among which it was, and which have no soldiers; there brute force might carry the day, but in the case of *P. Linnei* and *P. Burmeisteri* the former is smaller and the latter certainly not much larger than the soldiers of *Pheidole capensis*, their host, who is a very savage and plucky ant indeed; and what are we to say of Pentaplatarthrus paussoides selecting the abode of Aphano-
gaster barbara var. capensis, the soldiers and neuters of which
are truly very large. But, besides, ants act generally in a body, and if one soldier or worker could not eject the intruder, several could. Instead of that they evidently tolerate them, and yet it is distressing to watch the efforts of the nurses to protect the larvae under their care; they go so far as to remove whole heaps of eggs and larvae in the midst of which a Paussus is busy munching. They certainly try to coax him away; they do not bite tenaciously as is their wont, of that I am absolutely certain, but in return the Paussus does not crepitate.

The only conclusion I can draw, and it is a speculative one, is that the crepitating power of the beetle is so well known to the ants, that they make a virtue of necessity, or that the ants I have had under observation have been so accustomed, through hereditary consciousness, to the destructive crepitating power of Paussidæ, that they no longer struggle against it. This latter view may explain why so many species of Paussi are found in the nests of ants belonging to the genus Pheidole.

"Through the courtesy of Professor C. Emery, of Bologna, who has kindly identified the specimens of Formicidæ I sent him for that purpose, I am able to state that P. Linnei and P. Burmeisteri live with Pheidole capensis, Mayr.; P. cucullatus and P. Shuckardi with Pheidole megacephala, Fab. (at least probably that species). P. Plini and P. Curtisi, I am informed by my friend, Mr. Ayres, are found in the Transvaal among ants, which from his description I judge to be also Pheidole megacephala; and lastly, Signor Emery writes to me that P. Favieri, of Southern Europe, also haunts the nests of Pheidole pallidula. Now, all Pheidole are, I believe, remarkably alike. Why should so many Paussi select the nests of ants belonging to that genus, unless they were certain of their supremacy?

"Paussus lineatus (which I believe to be the same as P. latus, Genl.), lives with Acantholepis capensis, Mayr., and is never found, as far as four years' close observation in the same locality enables me to judge, in the galleries of Pheidole capensis, although the nests of A. capensis and of the latter are often separated from one another by a thin partition only, so much so that often, on upturning a stone, I laid open both nests.

"I have no doubt that when collectors will carefully capture ants and Paussi the number of those parasites of the Pheidoles will be greatly increased. I believe, from communications made
by fellow-collectors, that *P. Klugi, P. spinicovis*, and *P. ruber* are found among them, but of course I can only speak at present of those species which have come under my personal observation.

"*Pentatlatarthurus paussoides* lives, as stated above, in the large nests of *Aphanogaster barbara, var. capensis*, Mayr, and in such numbers that close to the sea-side Mr. R. Trimen has captured no less than 76 specimens in one nest.

"In spite of all my attempts I have not been able to rear the *Paussi*. They copulate freely in captivity, but their eggs, if laid, have not been hatched."

Mr. J. B. Bridgman communicated "Additions to the Rev. T. A. Marshall's Catalogue of British *Ichneumonidae*.

Professor Riley read "Notes on the Phytophagic Habit, and on Alternation of Generation, in the genus *Isosoma*." In this paper Professor Riley described, from direct observation, the phytophagic habit in two species, and, from other evidence, in three other species of the genus. He also established the existence of alternation of generation, which was believed to be the first recorded instance in the *Chalcididae*

August 4, 1886.

Prof. J. O. Westwood, M.A., F.L.S., Hon. Life-President, in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.

*Election of Fellows.*

Lord Dormer, Mr. J. H. A. Jenner, Mr. James Edwards, Mr. Morris Young (formerly Subscribers), Mr. E. V. Theobald, Mr. E. A. Atmore, and Mr. Wm. Saunders, President of the Entomological Society of Ontario, were elected Fellows.

*Exhibitions, &c.*

Mr. Theodore Wood exhibited and made remarks on the following Coleoptera, viz., an abnormal specimen of *Apion pallipes* (Kirby), with a tooth upon the right posterior femur; a series of *Langelandia anophthalma* (Aubé) from St. Peter's, Kent
taken in decaying seed-potatoes; a series of Adelops Wollastoni (Janson), and Anommatius 12-striatus, also from decaying seed potatoes; and a series of Barypeithes pellucidus (Boh.), from the sea-shore near Margate. Mr. Wood also exhibited, on behalf of Dr. Ellis, of Liverpool, a specimen of Apion annulipes (Wenck).

Professor Westwood exhibited five specimens of a species of Culex, supposed to be either C. cantans or C. lateralis, sent to him by Mr. Douglas, who had received them from the Kent Waterworks. It was stated that they had been very numerous in July last, and that persons bitten by them had suffered from "terrible swellings." Professor Westwood also exhibited some galls found inside an acorn at Cannes, in January last.

Mr. Billups exhibited a male and female of Cleptes nitidula (Latr.), taken in copula in July last, at Benfleet, Essex, on the flowers of Heracleum sphondylium. He stated that it was probably the rarest of the twenty-two known species of British Chrysididae, though it had been recorded from the New Forest and from Suffolk; and that the late Mr. Frederick Smith was unacquainted with the male. Professor Westwood, the Rev. W. W. Fowler, Mr. Fitch and Mr. Champion, made some remarks on the species.

The Rev. W. W. Fowler announced that a series of specimens of Homalium rugulipenne (Rye) had been received from Dr. Ellis, of Liverpool, for distribution amongst members of the Society.

Mr. William White exhibited a group of three specimens of the common British stag-beetle, Lucanus cervus, consisting of two males and one female, arranged in a fighting attitude precisely as observed by him. He stated that having found several individuals of both sexes in a field near Guildford, he took them into a room for the purpose of observing them, and placed a female on the floor, with two males at equal distances from her. One of the males (which is hereafter referred to as No. 1), soon began to wave his antennae up and down, advanced straight towards the female and copulated at once. Presently male No. 2 waved his antennae and began to move slowly, not towards the pair, but in a parallel direction, as if he were taking no notice of them, until he had advanced a few steps beyond them, when he faced round towards them and paused at about six inches from them. Then suddenly, without any warning, he rushed at male No. 1, seized him by the thorax with his mandibles,
and tried to drag him off the female. At the moment of
attack, however, male No. 1 caught hold of the thorax of the
female in his mandibles with such a firm grasp that he became
immovably fixed, and the only effect was that she was pulled
sideways with him. Male No. 2 then relinquishing his hold for
a moment, stood back as if thinking what he should do next,
then again made a dash at No. 1, seized him below the thorax,
this time more from behind, and again endeavoured most
ferociously to tear him away. In an excited and angry state he
next went round and attacked him on the other side, with no
deeper success; then going behind the pair he placed his closed
mandibles underneath the body of the male, who remained quite
passive throughout, and tried to creep in between him and the
female. This, however, he was unable to accomplish, as No. 1's
mandibles were locked too closely to the female's thorax. He
was now very wroth, and seizing hold of No. 1 savagely below
the thorax, he lifted him off the ground, the female also being
still firmly embraced, and held them both up above his head,
their backs downward and their legs in the air, while he supported
the whole weight of the two. Letting them down again, No. 2
then inserted the point of his right mandible between his enemy's
elytra, prized them up, and serenched them fearfully again and
again, damaging the elytra badly. Having used all these resources
of attack without moving, No. 1, No. 2 finally proceeded to
demolish the organs of generation of No. 1, which had been
withdrawn at the first onslaught. Mr. White stated that he
then separated the female and No. 1 male, as he wanted to see
how No. 1 would act, but he, instead of retaliating, continued
perfectly passive. No. 2, now realising the situation, attacked
No. 1 no longer, but evidently determined to presently secure the
female; fearing, however, lest his hated rival might attempt to
regain his spouse, he kept all his attention turned upon him;
No. 1 had evidently had enough attacking and was not eager to
renew his pretensions, but nevertheless, the moment he dared to
advance a step, the other (No. 2) instantly turned towards him
and menaced him, while at the same time he gradually contrived
to take up his position between the enemy and his quarry. Not
quite satisfied, he then scouted round and climbed to the highest
vantage-ground of a slipper, for the evident purpose of watching
No. 1; at last, receiving no challenge,—No. 1 having gone off
in another direction,—No. 2 turned to seek the female, who had by this time comfortably ensconced herself under the carpet, where his mandibles prevented him from reaching her. Mr. White said he thought there were several points of interest in connection with this struggle that were worthy of note. 1. No duel took place previous to the attack. 2. The successful rival maintained his position passively, and even when his mandibles were free to combat his enemy he did not fight him, as might have been expected. 3. The great strength of the thorax of the female is a very remarkable provision, necessary as a protection against the powerful jaws of her suitor, which would otherwise crush her in the encounter; it has evidently been developed under natural selection, as the result of severe conflicts, and must continue to be subject to those conditions. 4. The peculiar specialisation of the tibiae and tarsi of the anterior legs of the female is to be similarly accounted for. 5. No choice in pairing is exercised by the female; it is simply a question of power of resistance on the one part, and strength to resist and endure the attack of rival males. He remarked also that the extreme development of the male armature in several large species of various genera seemed to be specially fitted for particular methods of attack; and that the extraordinary thoracic processes obtaining in such species as Xylotrupes dichotomus, Megacerus nasicornis, Golofa claviger, G. Porteri, and especially Dynastes Hercules,—of which outline sketches were produced in illustration of this point,—might well be used with success as wedges, if inserted in the manner attempted by the Lucanus cervus under notice. Professor Westwood, Mr. Jenner Weir and Mr. Trimen took part in the discussion which ensued.

Papers read.

Mr. E. A. Fitch read a paper, communicated by Mr. G. Bowdler Buckton, "On the Occurrence in Britain of some undescribed Aphides."

Professor Westwood read a paper "On a Tube-making Homopterous Insect from Ceylon."

September 1, 1886.

Robert McLachlan, Esq., F.R.S., President, in the Chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Fellows.

The Rev. Professor Dickson, D.D., of Glasgow University, Mr. P. Cowell, of Liverpool (formerly Subscribers), Mr. A. O. Walker, F.L.S., of Colwyn Bay, North Wales, and Mr. Lyddon Surrage, of Hertford College, Oxford, were elected Fellows.

Exhibitions, &c.

The President remarked, with regard to the gnats from the Kent Waterworks, exhibited at the last meeting, that Professor Westwood had since informed Mr. Douglas that they were only *Culex pipiens*.

Mr. Slater exhibited certain parasites found on the body of a larva of *Smerinthus tilia*, which Mr. Waterhouse believed to be *Uropoda vegetans*, a species of *Acarus*.

Mr. W. Warren exhibited the following Lepidoptera, viz., *Eupithecia fraginata*, caught in Regent's Park; *E. innotata* (Hüb.), bred from *Artemisia maritima*; a variety of *E. satyrata*; a *Gelechia*, caught in Wicken Fen twenty years ago by Mr. Bond, and believed to be a new species; *Gelechia fumatella* (Dgl.) or *celerella* (Stn.) from Hayling Island; *G. villetta* (Zell.), bred from larvae collected on the Essex coast on mallow; *Lithocolletis scabiosella* (Dgl.) bred from larvae found near Croydon; and *Catoptria parallela* (Wlk.) bred by Mr. Vine, of Brighton, from *Serratula tinctoria*. He also exhibited larvae of *Gelechia villetta*.

Mr. South exhibited specimens of *Diceroramphus distinctana* (Heinmann). He said that the first example in the series (one of two captured in North Devonshire, 1881), having been identified by Mr. C. G. Barrett as *D. distinctana* (Heinmann), the occurrence of the insect in Britain had been recorded in the Ent. Mo. Mag. xviii. 278, and Entom. xv. 110. In May of the present year Mr. South found, in some shoots of *Chrysanthemum leucanthemum* sent him from North Devon, several larvae which from
their mode of feeding he thought must be those of *D. consortana*, and this suspicion was afterwards confirmed when he compared a full-grown larva with a description in his note book of the larva of that species. Between July 15th and August 7th fourteen imagines emerged, all of which were of the same type as the examples exhibited, and were identical with the specimen determined by Mr. Barrett as Heinemann's *distinctana*. Seeing that in the larval stage the insect exhibited was not to be separated from *D. consortana*, and that the imago is only distinguished from the typical form of *consortana* by the brighter and more pronounced character of its markings, Mr. South said he was of opinion that it was not specifically distinct therefrom, and that he could only regard it as a local form of that species.

Mr. Stevens exhibited a living specimen of *Clerus formicarius*, recently found under the bark of an ash tree, in Arundel Park, Sussex.

Mr. Billups exhibited *Chrysis succineta* (Linn.), obtained by sweeping, at Chobham, on the 28th of July last. He stated that this very rare species was recorded by Shuckard as having been taken in a sandy lane near Brockenhurst, in the New Forest, and at Blackwater, on the borders of Berks and Hants: and he further stated that the late Mr. Frederick Smith had also taken two specimens of this species in Hampshire. Mr. Billups also exhibited *Microphysa elegantula* (Baer), found at Broadstairs, Kent, on the 23rd of August last.

The Rev. W. W. Fowler exhibited, on behalf of Mr. Theodore Wood, a larva of *Langelandia anophthalma* (Aubé), a species new to Britain.

Mr. H. Goss exhibited specimens of *Oxygastra Curtisi* (Dale), recently taken near Christchurch, Hants. He stated that he had met with the species in the same locality in 1878, but had never seen it anywhere else in the United Kingdom, nor was he aware of any recent record of its capture. Mr. McLachlan observed that the species was taken many years ago in Dorsetshire by the late Mr. Dale, but that he knew of no recent captures except those recorded by Mr. Goss. He also made some remarks as to the distribution of the species on the continent of Europe.

Mr. McLachlan exhibited a specimen of *Dilar meridionalis* (Hagen), taken by him in July last, in the Pyrénées Orientales; also about 150 examples of the genus *Chrysopa* from the same
district, where these insects abounded. Amongst them were *C. vulgaris* (Schneider), *perla* (L.), *Walkeri* (Brauer), *viridana* (Schneider), *tenella* (Schneider), *prasina* (Burm.) and varieties, *flava* (Scop.), *septempunctata* (Wesm.), *flavifrons* (Brauer), and others not yet fully identified. Mr. McLachlan stated that he had obtained about 1500 specimens of Neuroptera in all families, during his recent visit to the Pyrenees, which were being prepared for study. He also exhibited a few Coleoptera from the same district, and remarked on the extraordinary abundance of the pretty Lamellicorn, *Hoplia caerulea*, which was so common as to give the meadows the appearance of being studded with multitudes of brilliant blue flowers.

Mr. C. O. Waterhouse called attention to the numerous reports, which had lately appeared in the newspapers, of the supposed occurrence of the Hessian Fly (*Cecidomyia destructor*) in Britain, and inquired whether any communication on the subject had reached the Society.

The Rev. W. W. Fowler stated, in reply, that he had been in communication with Miss Ormerod on the subject, and that she had informed him that neither the imago nor larva of the species had been seen, and that the identity of the species rested on the supposed discovery of the pupa.

*Paper read.*

Mr. A. H. Swinton communicated a paper, entitled "The dances of the Golden Swift." In this paper the author expressed an opinion that the peculiar oscillating flight of the male of this and allied species had the effect of distributing certain odours for the purpose of attracting the females. Mr. Jenner Weir made some remarks on the subject.

October 6, 1886.

Robert McLachlan, Esq., F.R.S., President in the chair.

Donations to the Library were announced, and thanks voted to the respective donors.
Election of a Fellow.

Mr. William Bartlett Calvert, of Collegio Ingles, 13 Nataniel, Santiago, Chili, was elected a Fellow.

Exhibitions, &c.

Mr. McLachlan exhibited a number of seeds of a Mexican species of *Euphorbiaceae*, popularly known as "jumping seeds," recently received by him from the Royal Horticultural Society. He stated that these are known to be infested with the larvae of a species of *Tortricidae*, allied to the apple *Tortrix*; they were first noticed by Prof. Westwood at a meeting of the Society held on the 7th June, 1858, and the moths bred therefrom were described by him as *Carpocapsa saltitans* (cf. Proc. Ent. Soc. 2nd series, vol. v. p. 27). These seeds have since from time to time been referred to, both in Europe and America. A discussion ensued, in which Mr. Pascoe, Mr. Poulton, and others took part.

In connection with the subject of these "jumping seeds," Mr. Roland Trimen called attention to a gall larva, which he stated was found very numerousy on a common shrub (*Rhus viminalis*) in the vicinity of Cape Town. He said the galls usually occurred singly on the leaves, but sometimes there were more than one on a leaf. On carefully paring off the green substance of the leaf investing the gall, a white inner case or cyst was exposed, elongate-ovate in form, and not unlike the small sugar-plum known as a "caraway comfit." When fully developed, this cyst parted pretty freely from the investing membrane of the leaf, and in most cases surprised its liberator by springing obliquely into the air. The substance of the cyst or cocoon was, though thin, tough and like very fine parchment, and the yellowish white larva which it contained was much thicker anteriorly than posteriorly, with the segments generally rather prominent, and with blunt tubercles. It appeared to be only the full-grown, or nearly full-grown, larva that had the power of projecting itself and the surrounding cyst into the air; for on opening those cysts which did not jump, Mr. Trimen said he invariably found the larva to be of small size. The freed cysts jumped to a distance of from four to nine inches, and the action was maintained for many hours, or even several days, with very brief
intervals (from half a minute to nine or ten minutes) between the jumps. It is a curious fact that when the highly muscular larva is removed from the case, although it perpetually maintained an alternate forcible doubling up and sudden extension of its body, it evidently could not leap, or in any way project itself, from the surface on which it rested, but merely wriggled sideways. Mr. Trimen said it was difficult to conjecture the origin or use, to the insect, of this peculiar action, as it seemed clear that in nature, with the cyst tightly and completely invested by the substance of the leaf, such motion could never be exerted at all. Mr. Trimen further stated that the resulting imago was not known to him; but, from the appearance of the larva, he was inclined to think that it was coleopterous rather than hymenopterous.

Mr. Trimen exhibited some singular seed-like objects found in the nests of Termites, and also in those of true ants, in South Africa. They were apparently of the same nature as those from the West Indies, described in 1833 by the Rev. L. Guilding as Margarodes formicarius, which was usually referred to the Coccidae, as allied to Porphyrophora. They were of various shades, from yellowish pearly to golden and coppercolour, and were strung together by the natives like beads, and used by them as necklaces and other personal ornaments, as, according to Mr. Guilding, was the case with the West Indian species.

Mr. W. F. Kirby exhibited, on behalf of Mr. John Thorpe, of Middleton, a long series of buff and melanlic varieties of Amphi. dasis betularia, and read notes on them communicated by Mr. Thorpe. Mr. Kirby also exhibited, on behalf of Mr. Nunney, who was present as a visitor, a dark variety of Argynnis aglaia from Caithness, and a tawny coloured variety of Vanessa urticae from Bournemouth.

Mons. Alfred Wailly exhibited a fine series of Saturnias and other Bombyces, mostly bred by him, from South Africa; also Dirphia tarquinia, Attacus orizaba, Platyamina cecropia and P. ceanothi, Callosamia angulifera, C. promethaea, Philosamia cynthia, and other species from Central America. He also exhibited ova of Saturnia tyr rhaca, pupae of this and other South African species, and a cocoon of Bombyx ochadama from Madagascar. Mons. Wailly stated that several of the large South African Saturni dae formed no cocoons, the larvae entering the earth to
undergo the change to the pupal state. Mr. Trimen said he was able to confirm this statement.

The Rev. W. W. Fowler exhibited a number of minute Acari, which had been doing injury to fruit trees near Lincoln.

Mr. E. B. Poulton gave an account of the experiments recently made by him, with the object of ascertaining the cause of the relation of pupal colour to that of the surface on which the larval skin is thrown off, and also exhibited a frame he had devised for making these experiments. He stated that he had repeated Mr. T. W. Wood's experiments, communicated to the Society a few years ago, and had quite confirmed the accuracy of his results. The experiments were extended to the Vanessaidae, and it was found that the metallic colour, which is common on these pupae, could be controlled by the choice of appropriate surroundings for the larva before pupation—a gilt surface producing the metallic appearance in the great majority of pupae employed, to an extent which is rarely seen under other conditions; while a black surface, on the other hand, produces very dark pupae, with the slightest trace (if any) of the gilded appearance. In order to investigate the subject further, and to find out the organ which was affected by the surroundings, and caused the appropriate appearance in the pupa, it was necessary to first ascertain the exact period during which the influence exerted itself. Mr. T. W. Wood had assumed that the change was caused immediately after the larval skin was thrown off, the moist freshly-exposed pupal skin being supposed to be photographically sensitive to surrounding colours. Mr. Poulton, however, took the view that the cause works on the larva before pupation, as this agreed with the results of a very similar investigation upon the changes of colour in larvae, upon which he had been engaged for some years. Further, Mr. Wood's theory was unsupported by any proof, and did not explain such an obvious objection as the position of pupae which throw off the larval skin on a dark night. Mr. Poulton therefore investigated the period which intervenes between the cessation of feeding and pupation in the larvae of the common Vanessa (V. urticae), and found that the influence works during a considerable period, of very many hours, before the final change,—long enough to include many hours of daylight in all cases. The subject was investig:ed by choosing two conditions which produced the most opposite results (black and gilt or black and white surroundings),
and transplanting the larva from one to the other, and *vice versa*, and at various points, in the above-mentioned period, before pupation. If the transplantation took place a short time before the larval skin was thrown off, the pupal colour corresponded with the *previous* surroundings in which a far longer time had been spent. In this way it was found that the pupae are affected, to some extent, by the colour of their surroundings during the time when the larva are suspended, head downwards, for many hours before pupation, although to a much greater extent if the same surroundings were also present during the quiescent state *before* suspension. Still the fact was very important, because the suspended larva might be subjected to experiments which could not be tried upon the free, although passive, larva. The first and obvious theory, as to the larval organs which were affected by the colour, was that the ocelli performed this function, but no difference was caused when these were covered carefully with a thick layer of opaque varnish which, if necessary, was renewed. It was then thought that the large and complex spines might contain a terminal organ with such a function, but no effect was produced when they were snipped off. Then the frame, exhibited to the Society, was devised with the object of deciding whether the influence makes itself felt through some organ in the head, or by the general surface of the body. The frame consisted of a shallow box, divided into parallel areas of equal size, which were alternately gilt and covered with black paper. Along the lines of junction of the areas, which extended across the box, cardboard shelves were fixed, which were in each case gilt on the side towards the gilt area, and black towards that which was black. The shelves were perforated with holes, pierced at equal distances, close to the gilt and black surfaces of the box, the holes being of such a size that the larva of *V. urticae* would pass through easily, but leaving as small a space as possible between the latter and the sides of the aperture. As soon as suspension had taken place the boss of silk, with the larva attached, was carefully removed and pinned on to one of the areas, in such a position that the head and thoracic segments could be pulled through one of the holes in the shelf which separated the area from the one below it. Hence nearly the whole of the body of the larva was exposed to one condition, and its head and anterior part to an opposite condition. When the frame was filled (*i.e.*, when a suspended larva passed through
( xlviit )

every hole in the shelves), it was placed in such a position that the bottom of the box, divided into alternating areas, was vertical, and every larva was suspended vertically over the hole through which it passed. The frame was then placed in a window, so that as much light as possible fell upon the larvae and the surface around them. As the larvae invariably curve the anterior part of the body during suspension, the head was always brought close to the underside of a shelf, and there was no chance of the larva seeing the colour of the area above the shelf, through the narrow chink between the side of the hole and its own body. Finally, the time which elapsed before pupation was noted, and the results compared. These experiments seemed to confirm those in which the larvae were blinded, for the colour of the pupa corresponded with that of the upper area rather than the lower. These experiments were conducted upon large numbers of larvae. The single frame shown to the Fellows of the Society would hold sixty individuals at once; and Mr. Poulton had also made two other smaller frames, and had tried the same experiments in other ways, by means of compartmented tubular boxes which were fixed over the suspended larvae. It thus appeared, almost certain, that there was some terminal organ in the skin which was affected by surrounding colours, or that the latter acted directly on some superficial element in the larval tissues, without the intermediation of the nervous system.

The President, and Messrs. Trimen, Waterhouse, White, Hall, and others, took part in the discussion which ensued.

Mr. Slater exhibited a specimen of *Prionus coriarius*, found in Devonshire, on fennel, and a specimen of *Calandra palmarum*, found alive at Pembroke Dock.

Mr. Enock exhibited *Mymar pulchellus*, and a specimen of *Atypus piceus* recently taken on Hampstead Heath.

Mr. Elisha exhibited a series of *Gelechia hippophaëlla* (Schr.), bred from larvae collected at Deal on *Hippophaë rhamnoïdes*.

Mr. Billups exhibited *Echthrus lanceifer*, Gr., a species of *Ichneumonidae* new to Britain, taken at Walmer on the 15th of August last, and stated that he was indebted to Mr. J. B. Bridgman for the identification of the species. He remarked that Brischke had bred members of this genus from *Sesia spheciiformis*, *S. formicaformis*, and *Leucania obsoleta*; but that in this country the genus was little known, only one species (*Echthrus relucator*) being mentioned in Marshall’s list of British *Ichneumonidae*. 
Mr. E. A. Butler exhibited male and female specimens of *Macrocoleus tanacetii*, from Bramley, near Guildford; living specimens of *Chilacis typhic*, received from the Rev. E. N. Bloomfield, of Guestling, Hastings; and a pair of *Harpalus discoideus*, obtained in August last, on a heath near Chilworth, Surrey.

Mr. A. J. Rose exhibited specimens of a mountain form of *Lycana Virgaurea*, recently collected by him in Norway.

Mr. Champion exhibited *Teratocoris antennatus* and *Drymus pilicornis*, taken near Sheerness.

Mr. W. White exhibited specimens of *Proctotrypes ater* (Nees); also a specimen of *Chelonia caja* with abnormal antennæ.

**Papers read.**

Mr. William White read the following remarks on the specimen of *Chelonia caja* exhibited by him:—"On Sept. 8th, I received a letter from Mr. George C. Griffiths, of Clifton, Bristol, in which he told me of a remarkable imago of *Chelonia caja* which he had reared from a nearly full-fed larva. Mr. Griffiths found the larva crawling upon a path outside the door of his house, on or about July the 7th of this year, and put it into a chip box, thinking it might perhaps produce a variety. He did not observe anything at all unusual in the appearance of the larva, and I have not been able to detect anything abnormal in its skin. Not knowing the food-plant on which the larva had fed, he supplied it with leaves of marigold, which it ate freely for the few remaining days of its existence; it then spun its cocoon, and pupated about the 11th of July. Mr. Griffiths then removed the top and bottom of the chip box and placed it in a large breeding-cage, kept specially for pupæ. On August the 6th the moth emerged, somewhat small in size, but presenting no other peculiarity than that of having extraordinary antennæ, which were not only extremely short, but altogether abnormal in form, and suggestive in appearance of the club ends of a butterfly’s antennæ cut off short and affixed to the insect. It was noticed that they were of a brownish colour, and unequal in size, "the basal portion with transverse flutings, but the broad ends having rather a dried-up and shrunken appearance." Since receiving the insect I have examined it microscopically, and the sketches of the antennæ, which I submit, will illustrate their character more fully than can be described verbally."
The antennae consist of elongated glandular protuberances, rather irregular in shape and slightly dissimilar from one another, the left one being more fully developed in its characters, so that the following details have more especial reference to it. The cuticle composing this left antenna may be described as a series of more or less imbricated segments, though without any visible articulations, the annules being inflated, and retaining their form fairly well: the whole antenna is perfectly empty, and is somewhat clavate, or dilated at the point, which when looked at from above appears to be cup-shaped. The sex of the insect is, I believe, female.

With regard to the cause of this singular abnormality, one or two suggestions may be considered, and I shall be glad to hear remarks respecting them from others more capable of forming an opinion on the subject.

I was at first inclined to think the peculiarity of the antennae might be due to an abortion, in conjunction with a development of glands similar in nature to those proper to the larvae of most Papilios; but as those glands do not occur upon the head itself, but on the first segment of the thorax, and, moreover, are confluent at the base, the case does not appear to be an analogous one. Whether these antennae were retractile or not, and whether they had any fluid contents, I am unable to state. My correspondent wondered whether the abnormality were due to either a change of diet, or to the darkness of the box in which the pupa was kept; but I do not think either circumstance would produce an effect of this nature. With respect to the former suggestion, however, it may be worth while to add, that in answer to some questions I put on the subject of food, Mr. Griffiths informed me that during the three or four days of his experience with the larva, he supplied it daily with three or four small leaves of seedling marigolds, each measuring about two square inches in area, and that it ate most of them, until the last day of its existence; so that it consumed perhaps fifteen to twenty square inches of the leaves during the time he had it. It was some ten or eleven yards from any plant when he found it, but as it was crawling away from the direction of a bed of marigolds, it may have come from them; and as the larva took to the marigold leaves as a pabulum so readily, it is most probable, I think (in accordance with the general principle of self-feeding lately referred
to here by Mr. Poulton), that these plants were the food it had from the first lived upon.

There is something peculiar about the pupa skin, which—though it was so much broken by the moth in emerging that its details are not very easy to make out clearly—may, I think, furnish an explanation of the abnormity. The position of the encased antennæ appears to have been irregular, and this might alone be sufficient to account for a change in growth. Another very curious point is that, after searching in vain for the skin of the larval head in connection with the exuviae contained in the cocoon, I at last found it within the pupa skin, adhering to the anal extremity.

There is a fact connected with the escape of this species from its pupa which I believe has not received notice. I found, on comparing this cocoon with another I had by me, that there is a special device for assisting emergence; the whole interior of the silken web is coated with a glutinous paste, by means of which the pupa-skin becomes attached firmly to the cocoon.

The conclusion I arrive at is, that the abnormity of the specimen exhibited is due to the dislocation of the antennæ under pupation, in consequence of which their development became aborted.”

Mr. Roland Trimen read “Notes on insects, apparently of the genus Margarodes, Lansd.-Guilding, stated to occur abundantly in the nests of White Ants, and also in those of true Ants, in certain Western Districts of the Cape Colony.”

Mr. Elisha read a paper “On the life-history of Geometra smaragdaria.”

Mr. C. O. Waterhouse communicated a paper “On the Tea-bugs (Helopeltis) of India and Java.”

November 3, 1880.

Robert McLachlan, Esq., F.R.S., President, in the Chair.

Donations to the Library were announced, and thanks voted to the respective donors.
Election of Fellows.

Mr. Peter Cameron, of Sale, Cheshire; Mr. F. Archer, of Crosby, Liverpool; Mr. H. J. S. Pryer, of Yokohama, Japan (formerly Subscribers); Mr. H. Norris, of St. Ives, Hunts; Mr. N. P. Fenwick, of Surbiton Hill; Mr. John Brown, of Cambridge; Mr. J. W. Tutt, of Westcombe Park, Blackheath; and Mr. A. P. Green, of Colombo, Ceylon, were elected Fellows.

Exhibitions, &c.

Mr. E. B. Poulton exhibited a mass of minute crystals of formate of lead, caused by the action of the secretion of the larva of Dicranura vinula upon suboxide of lead. He stated that a single drop of the secretion had produced the crystals which were exhibited, and he called attention to the excessively high percentage of formic acid which must be present in the secretion, and to the pain and probable danger which would result from being struck in the eye by the fluid which the larva had the power of ejecting to a considerable distance. A discussion ensued, in which Messrs. White, Kirby, Slater, and others took part.

Mr. S. Stevens exhibited a specimen of Laphygma exigua, recently captured by Mr. Rogers, in the Isle of Wight.

Mr. W. F. Kirby exhibited a specimen of Perilampus maurus, Walk., recently bred by Mr. Walter de Rothschild from Antheraea tirrha, Cram., one of the rarer South African Saturniidea. Mr. Kirby stated that the species of Perilampus do not seem to be particular about their food; Dalman supposed his P. micans to be parasitic on Hister picipes; and Westwood observed P. augustus on posts perforated by Anobia. Snellen Van Vollenhoven mentions that Lichtenstein bred P. auratus, Panz. from the cocoon of a species of Crabro; and that Reissig obtained P. violaceus, Fab., from a cocoon found dangling by a thread from the remains of the caterpillar of a Tortrix. G. Thomson says briefly that Dalman supposed Perilampus to be parasitic on Coleoptera, but that it is really parasitic on Lepidoptera.

Mr. T. W. Hall exhibited a number of specimens of Xanthia fulvago (cerago), somewhat remarkable in their variation, and showing a graduated series, extending from the pale variety flavescens of Esp. to a form almost melanico in its markings. Mr.
Hall stated that they were bred from sallow catkins collected in Derbyshire. As regarded the darker forms the question of hybridism between *X. fulvago* (*cerajo*) and the next species, *X. florago* (*silago*) had been suggested; but this theory did not seem plausible, because the two species were easily distinguishable in the larval stage. If a batch of larvae of the two species were turned out on to an open newspaper, *X. fulvago* would be found to be of a darker and more variegated colour than *flavago*; and besides its distinctive colouration, *X. fulvago* was a more active larva than its congener.

Mr. W. C. Boyd exhibited, and made remarks on, the larva of a species of *Ornithoptera* from New Guinea.

Mr. H. Goss exhibited a series of *Bankia argentula* collected by him in Cambridgeshire in June last, and also, for comparison, a series of specimens of the same species taken at Killarney in June, 1877. It appeared that the Irish form of the species was larger and more brightly coloured than the English form.

Mr. Eland Shaw exhibited a female specimen of *Deecticus verruciorus* (Linn.), taken in July last, at St. Margaret's Bay, Kent.

Mr. Waterhouse recorded the recent capture of *Deiopeia pulchella* at Ramsgate, by Mr. Buckmaster; and the capture of *Anosia plexippus* at Gibraltar was also announced.

Jonkeer May, the Dutch Consul-General, asked whether the reported occurrence of the Hessian Fly (*Cecidomyia destructor*) in England had been confirmed. In reply Mr. McLachlan said he believed that several examples of an insect thought to be the Hessian Fly had been bred in this Country; but that everything depended upon correct specific determination in such an obscure and difficult genus as *Cecidomyia*.

*Paper read.*

Mr. J. W. Slater read the following paper: "A question on the relation between Insects and Flowers."—

"Although the action of insects in the development of entomophilous plants is generally admitted, some points of this subject seem to need further enquiry. We find among plants some which give off odours very attractive to insects, and others whose perfumes, though pleasant to us, seem unattractive to bees,
butterflies, and Diptera. The question is, How have the odours of this latter class been evolved?

"To take a simple instance: I have this summer repeatedly observed two large, flourishing Petunias, covered with bloom. In addition to the rich purple colour of the flowers their scent is very pleasant, resembling that of the Pink and Carnation. But though I often watched the plants in full sunshine, I never once saw any insect enter the flower as if in quest of honey or pollen. Sometimes a cabbage-white or a bee would sail over the plants, a Syrphus would hover over them, or a blow-fly (!) would settle on the outer margin of the corolla. But no further notice did the flowers receive. By way of contrast, a patch of French poppies, growing between the two Petunias, was abundantly visited, as well by butterflies as by bees.

"Thus the neglect of the Petunia-flowers was not due to the absence or the scarcity of flower-haunting insects.

"If, therefore, the colour and the perfume of the Petunia have been evolved in the way of natural selection, the most conspicuous and most odoriferous flowers being preferentially fecundated by some insect, the question arises, what insect? The most plausible reply is that it must have been effected by some insect which has not been introduced into Britain along with the plant. Further, such insect, as far as perfumes are concerned, must have preferences more nearly approaching those of man than are those of our bees and butterflies.

"The case of the Petunia is by no means singular. About two years ago I observed a number of Privet-shrubs in full bloom. The air was saturated with their sugary but sickly odour. The flowers were crowded with hive-bees, humble-bees, cabbage-whites, and small tortoise-shells, and were from time to time visited by other butterflies. By way of contrast, I noticed that among the Privet-bushes there stood a Syringa, likewise in full blossom, but its flowers, so much more pleasant to the human sense of smell, had scarcely ever an insect visitor. If by chance a bee or butterfly strayed over it seemed plainly a mistake, and the visitor lost no time in getting back to the Privet-flowers.

"Now, to the best of my knowledge, neither the Privet nor the Syringa is indigenous to Britain. Hence it is curious that so many of our native insects should have accommodated themselves to the Privet but not to the Syringa.
"I have come across a few further cases of plants whose odour is attractive to bees and butterflies, but unpleasant to man. Thus the flowers of prickly Comfrey, which are of a dull, washed-out, reddish violet, give off a herbaceous odour blended with a sugary sickliness. Yet every patch of this plant is so beset with bees, that in sunny weather it would be easy to capture half-a-dozen at a single stroke of the net. The plant is less frequented by butterflies than by bees.

"The so-called 'African Sedum,' another plant with flowers of an impure red colour and a dull sugary smell, is a remarkable favourite with Lepidoptera, less so with bees. No plant more deserves cultivation by lovers of butterflies and moths in country districts, and even in the suburbs. Marjoram, which much resembles the African Sedum both in the colour and the scent of its flowers, is much haunted by butterflies.

"If we compare with the aforesaid plants some which possess odours most agreeable to man, such as the Clove-pink, the Carnation, and especially the Lavender, we find them relatively neglected by insects.

"Of course it may be replied that the true perfume plants are frequented and fertilised by nocturnal Lepidoptera. This can scarcely be the case as far as the Noctua group is concerned, since the sugaring-mixtures, to which these insects come very eagerly, approach in their smell much more nearly to the Privet and the Comfrey-blossom than to the Clove-pink or the Lavender.

"I should venture to suggest that the fertilisation of the true perfume-flowers is effected in warmer climates by hawk-moths. I know, at least, that in Dalmatia the flowers of the Oleander and the Orange are much haunted by Sphingidae."

Mr. Distant, Mr. Stainton, Mr. Weir, Mr. Stevens and the President took part in the discussion which ensued, and stated that, in their experience, Petunias were often most attractive to insects. Mr. Stainton referred to the capture, by himself, of sixteen specimens of *Sphinx convolvuli* at Petunias, in three evenings in 1846.
December 1, 1886.

Robert McLachlan, Esq., F.R.S., President, in the Chair.

Donations to the Library were announced, and thanks voted to the respective donors.

Election of Fellows.

Mr. W. H. Miskin, of Brisbane, Queensland (formerly a Subscriber); Mr. R. E. Salwey, of Folkestone; and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Exhibitions, &c.

Mr. Howard Vaughan exhibited a long series of Gnophos obscurata, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey Hills. The object of the exhibition was to show the variation of the species in connection with the geological formations of the various localities from which the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand Coleoptera by Freiherr von Schiereth, which, though executed in pencil, were remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of Cidaria reticulata, recently bred by Mr. H. Murray, of Carnforth, from larvae collected by him near Windermere on Impatiens noli-me-tangere. Mr. Adkin said that as the food-plant was so extremely local, and consequently difficult for Mr. Murray to obtain, he had endeavoured to get the larvae to feed on some other species of Balsam, including the large garden species, usually known as Canadian Balsam, but that he had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society, on the habits of lepidopterous larvae with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of Aleurodes vaporariorum (Westw.) obtained from a greenhouse at Snaresbrook, where they had caused great havoc amongst Tomato plants (Lycopersicum esculentum). He remarked that the species had been first figured and described by Professor Westwood, in
the 'Gardener's Chronicle,' 1856, and that attention had been recently called to it by Mr. Douglas in the Ent. Mon. Mag. for December. Mr. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the bright green blood of the pupa of Smserinthus tiliae, which is one of many lepidopterous pupæ possessing a chlorophyll-like pigment in the blood. The blood of the larva contains the same pigment in a much smaller amount, while in the pupa the additional colouring-matter fixed in the larval hypodermis cells also passes into solution in the blood. By means of a Zeiss micro-spectroscope, Mr. Poulton was able to show the most characteristic absorption-band of the pigment, together with its resemblance to that of chlorophyll.

Mr. G. T. Porritt exhibited forms of Cidaria suffumata from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc. 1886, p. xxv.); and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed Hypsipetes elutata from Huddersfield, showing green, red-brown, and black forms.

Mr. Stevens exhibited forms of Camptogramma bilineata and Emmelesia albulata from the Shetland Isles, and a curious variety of Chelonia caja from Norwich.

Papers, &c., read.

The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larve and pupæ of certain species of Lepidoptera collected in Demerara.

Mr. McLachlan read the following "Note concerning certain Nemopteridae":—

"My friend Dr. Hagen has recently published some critical notes on this family in the 'Proceedings of the Boston Society of Natural History,' vol. xxiii. pp. 250—269, prompted by my description of a South American species that appeared in our 'Transactions' for 1885, pp. 376—377.

"It occurs to me to make the following remarks on some points that seem of interest, but they are only casual, and must not be looked upon in the light of an analysis.
"Nemoptera lusitanica, Leach.—The specific name under which this insect is commonly known was bestowed by Leach in the 'Zoological Miscellany' (not "Zool. Hist." as quoted by Hagen), vol. ii. p. 74, pl. 85, in 1815. But in Germar and Ahren's 'Fauna Insectorum Europee,' fasc. i., fig. 16, 1812, it is figured and described as Panorpa bipennis, Illiger, and the specific name was also adopted by Westwood, in his paper in the Proc. Zool. Soc. Lond., 1841, p. 10. Hagen says that he is now unable to compare Ahren's Fauna. I can assure him that the species therein figured as P. bipennis is N. lusitanica, and the former specific name should prevail. Hagen had already called attention to it in the Stettiner entom. Zeitung, 1866, p. 451, under 'Nematoptera,' Burm.; but under 'Nemoptera,' pp. 452 and 453, he then adopted the more recent name lusitanica.

"The insect is essentially Iberian; but in Brauer's Catalogue of 1876 the South of France is given as a locality, and Hagen alludes to it in his recent paper. I am not sure if there exist any separate record to this effect. But when I passed through Paris in July last, the Abbé David assured me that he had seen a Nemoptera in the hill district north of Marseilles, and it could scarcely have been other than N. bipennis (lusitanica).

"Nemoptera Hutti, Westwood.—In addition to the examples recorded for this very rare insect, I may say that a very bad specimen from West Australia is in my collection.

"Nemoptera Imperatrix, Westwood.—The type-specimen of this insect is generally supposed to be unique. It was described by Westwood in our 'Transactions,' ser. 3, v., p. 507, and figured by him in his 'Thesaurus,' pl. 35, fig. 8. I have a specimen, in miserable condition, given to me many years ago by the late Thomas Chapman, of Glasgow; it is (like the type) from Old Calabar. Hagen, in his recent paper, places it in a special unnamed division or genus, and a generic term will no doubt have eventually to be found for it.

"Stenotenia Walkeri, McLach.—Hagen (at p. 257) justly states, in a footnote, that the term Stenotenia was previously in use. I propose to substitute that of Stenorrhachus."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (Cecidomyia destructor) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this
country, specimens, obtained in Hertfordshire, having been submitted to, and identified by, Professor Westwood, and by Mr. W. Saunders, of London, Ontario. Professor Westwood said the specimens agreed exactly with Austrian specimens in his possession, sent to him some years ago by Mons. Lefèvre, who had received them from the late Dr. Hammerschmidt, of Vienna. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood, and others took part.

At the close of the Ordinary Meeting a Special Meeting was held, for the purpose of considering certain proposed alterations in the Bye-Laws. The proposed alterations having been explained to the Meeting, were, after some discussion, agreed to, and the proceedings terminated.

ANNUAL MEETING,
January 19th, 1887.

ROBERT M'LACHLAN, Esq., F.R.S., President, in the Chair.

An abstract of the Treasurer's accounts for 1886 was read by Mr. H. T. Stainton, one of the Auditors.

The Secretary read the following:—


In accordance with the Bye-Laws the Council begs to present the following Report:—

As the Charter of the Society does not provide for the existence of Subscribers, it was decided by the Council to invite the 23 Subscribers remaining on the list to become Fellows.

In response to the application made by the Secretary to these 23 Subscribers, in accordance with the wishes of the Council, 2 of them resigned, and the remainder acceded to the invitation.

The distinction between Foreign and Ordinary Fellows having been abolished at the Special General Meeting held on the 1st of
December last, the Society now consists of an Honorary Life President, and Honorary and Ordinary Fellows.

No vacancies have occurred in the list of Honorary Fellows during the year, but since our last Annual Meeting 6 Ordinary Fellows have died, and 6 have been struck off the list for non-payment of their Subscriptions. On the other hand, the Society has elected 35 new Fellows during the year, in addition to the 21 who were formerly Subscribers, making the total number elected 56, a number never before reached in any previous year of the Society's existence.

The Society at the present time consists of an Honorary Life-President, 10 Honorary Fellows, 40 Life Fellows, and 231 paying the Annual Subscription, making the total number of Members now on the Society's list 281, which, after allowing for the losses by death, exclusion, and resignation, is an increase of 21 on the number at the date of the Annual Meeting last year.

At a Special Meeting held on the 1st December last, in pursuance of a notice given to the President and Council, such amendments in the Bye-Laws as were referred to in the notice and were deemed necessary to adapt them to the altered status of the Society in consequence of the grant of the Charter were agreed to. Since the date of such Meeting a copy of the amended Bye-Laws has been sent to every Fellow of the Society resident in the United Kingdom.

The Transactions for the year form a volume of 468 pages, containing 19 memoirs contributed by 14 authors and illustrated with 11 plates, of which 7 are coloured. Of these 19 memoirs 6 relate to Lepidoptera, 6 to Coleoptera, 5 to Hemiptera, 1 to Hymenoptera and 1 to Entomological Nomenclature.

The Proceedings, containing an account of the exhibitions and discussions at the Meetings, besides several short papers not published in the Transactions, extend to over 80 pages.

The finances of the Society are in a far more satisfactory condition than they have been for many years past, and may be stated as follows:—
Receipts. | Payments.  
--- | ---
| £ s. d. | £ s. d.
Balance in hand 1st Jan., 1886 | 3 19 11 | Rent, Office Expenses and Salary to Assistant Librarian | 131 0 4
Contributions of Fellows | 357 0 0 | Printing, Plates, &c. | 236 2 0
Sale of Publications | 55 12 8 | Library | 13 18 2
Donations | 21 13 7 | *Balance | 66 11 10
Interest on Consols | 9 6 2 | *Of this Balance £52 10s. has been invested and £14 1s. 10d. remains in hand. |  
--- | ---
£447 12 4 | £447 12 4

11, Chandos Street, Cavendish Square, London, W.  
January 19th, 1887.


The following are the officers elected:—President, Dr. David Sharp, F.Z.S.; Treasurer, Mr. Edward Saunders, F.L.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S.; Librarian, Mr. Ferdinand Grut, F.L.S.

The President then delivered an address, at the conclusion of which Mr. E. B. Pouton proposed a vote of thanks to Mr. M'Lachlan for his services as President during the year, and for his address. The proposal was seconded by Professor Meldola and carried unanimously. The President returned thanks.

Mr. M'Lachlan proposed a vote of thanks to the Treasurer, Secretaries, and Librarian, which was seconded by Mr. Stainton and carried. Mr. Goss and Mr. Grut made some remarks in acknowledgment.

Mr. C. O. Waterhouse proposed a vote of thanks to the other Members of the Council, which was seconded by Mr. White and carried.
Abstract of Receipts and Payments for 1886.

Receipts.                  | Payments.  
---|---
£ s. d. | £ s. d.

Balance 1st Jan., 1886    | Rent, Salary to Assistant Librarian,  
3 19 11                    | Library & Expenses  
Subscriptions             | 131 0 4  
"                        | Printing  
Entrance Fees             | 181 0 4  
"                        | Plates, Colouring, &c.  
Compositions              | 55 1 8  
"                        | Books, Binding, &c.  
Donations                | 13 18 2  
"                        | Investments  
Arrears                  | 52 10 0  
"                        | Balance in hand  
Transactions (Sale of)    | 14 1 10  
Interest on Consols       | 55 12 8  
                           | 9 6 2

**£447 12 4**              **£447 12 4**

**ASSETS.**

Subscriptions, considered good  | £ s. d.
-                               | 8 8 0
Consols, £364 19s. 8d.          | (cost) 345 14 0

**LIABILITIES.**

(None.)

Examined and found correct.

H. T. STAIXTON.
S. MUEL STEVENS.
J. JENNER WEIR.
J. W. DUNNING.
ROBERT ADKIN.
S. EDWARDS.
THE PRESIDENT'S ADDRESS.

GENTLEMEN,


From many points of view the past year has been one of unparalleled success with respect to our Society. No doubt the acquisition of a Charter has influenced this to some extent. There are always prudent men who hesitate to join a Society held together by no legal ties. But I venture to think there are also other causes at work: an increased interest in the Society exhibited by its existing Fellows, and a spirit of emulation amongst them as to introducing additions to our number: I trust this spirit of emulation will continue and intensify.

The Reports of the Council and Auditors you have just heard read are very satisfactory. Notwithstanding the publication of a respectable volume of 'Transactions' for the year, which includes certain important arrears left over from the preceding year on account of want of funds, our Treasurer has a balance in hand, and the sum of £52 10s. 0d. has been invested. And this without having had to rely upon extraordinary donations in order to equalise the balance-sheet. But the generous hand that has so often helped us in years of adversity was not to be denied the opportunity of so doing during one of comparative prosperity. It is not for me to divulge the secrets of the Council: suffice it to say the amount does not appear under the head of donations.
The attendance at our monthly meetings has been unprecedentedly large. I have the figures before me. In January 33 Fellows and visitors attended, in February 32, in March 37, in April 37, in May 35, in June 34, in July 35, in August 26, in September 25, in October 42, in November 39, and in December 40; or an average of over 34 for each meeting. In the early years of my connection with this Society 20 was considered a very large attendance at any one meeting, and it was but rarely that such a gathering occurred.

And I believe the interest of what we may term the business of the meetings has been in proportion to the attendance. The papers read have, if not numerous, been of great value, and there has been no lack of interesting exhibitions in nearly all orders of insects. In connection with exhibitions, it occurs to me to suggest that occasionally the exhibitors have come to the meetings not sufficiently posted up in their subject. It must be remembered that we come here not knowing what objects may be exhibited; it usually happens that some of us are able to say something about these objects; but the field of Entomology is vast, and occasionally there are subjects on which the combined knowledge and memory of the meeting are at fault, and perhaps on points on which reference to our own library before the meeting would have furnished the desired information. Moreover, it would greatly assist our hard-worked acting Secretary if exhibitors would arm themselves and him with written notes at the meeting.

But amidst all these subjects for mutual congratulation there is one which, to my mind, is not so satisfactory as it might be, and before alluding to it prominently, I have questioned some of the older Fellows, so as to be quite sure that I am not placing myself in the position of a pessimist or alarmist. There are some notable exceptions, but, considering our increased numbers, and the increase in the pursuit of Entomology exhibited generally, I do not detect amongst our younger Fellows so many indications as existed formerly of a desire to take up special branches of original research, and thoroughly work them out. And this applies especially to our metropolitan Fellows, who have the advantage in having vast collections and libraries easy of access. In the country there is no falling off in the number of quiet plodding workers, diligently studying their local insect-flora, and patiently
observing life-histories, and thereby enriching entomological science. But in our great centres the pursuit is too liable to take the form of what may be termed sensuous intellectual gratification, much to be preferred to the aimless pursuits of the vast majority, but causing a certain amount of regret that so much energy should result in so little scientific gain.

Obituary.

There is a mournful side to everything, even to prosperity. Since our last Anniversary it has come to the knowledge of the Council that six Fellows have died, viz.:—Baron Edgar von Harold, Mons. Jules Lichtenstein, Mr. F. E. Robinson, Mr. E. Shuttleworth, Mr. G. G. Webbsdale, and the Rev. C. A. F. Kuper.

Baron Edgar von Harold, of Munich, who joined this Society in 1858, died on August 1st, 1886. Down to the present time there does not appear to have been published any detailed account of his life and labours as an entomologist, and this short notice has been drawn up from imperfect data. His speciality consisted in Lamellicorn Coleoptera, and his first essay appeared in the 'Berliner entomologische Zeitschrift' for 1859: his last, so far as I am aware, appeared in the same 'Zeitschrift' for 1885, and was a critique on the latest Catalogue of European Coleoptera. In the interval between these dates his activity was very great. He produced a multitude of papers, chiefly, but by no means exclusively, on Lamellicorns, and they proved him to be a systematic worker of the highest order. In 1867 he started a periodical under the title 'Coleopterologische Hefte,' which continued down to 1879, and then he became editor of the 'Mittheilungen des münchener entomologischen Vereins,' until it ceased to appear in 1881. His name will ever be remembered in connection with the 'Catalogus Coleopterorum,' commonly known as the 'Munich Catalogue,' a gigantic undertaking commenced in conjunction with Dr. Gemmingen in 1868, and finished in 1876. Probably nothing has given a greater impetus to the study of Coleoptera than this Catalogue, although, naturally, there was considerable outcry during its publication on account of changes in nomenclature, an inconvenience inseparable from every publication of this nature conscientiously compiled from an investigation of the published literature. For a few years he compiled the order
Coleoptera for the 'Zoologischer Jahresbericht,' to which I shall have occasion to refer later on in this Address. In 1877, possibly in an unlucky moment, he accepted a position in the Entomological Department of the Berlin Museum, as successor to Dr. Gerstäcker, who had resigned. A letter written by him to an English friend at that time shows that he entered upon his duties with no light heart, and that the chief inducement consisted in the facility for reference to the vast stores of that establishment. I believe there was no necessity whatever for his seeking such a position as a source of income. His tenure of office was brief; the letter referred to explains why he accepted office, but the reasons for his early resignation I know not. By profession Von Harold was a soldier, and, as an officer of the Royal Guard of Bavaria, he saw active service in the Austro-Prussian war of 1866, during which campaign he received a very severe wound at the battle of Kissingen.

Wilhelm Auguste Jules Lichtenstein died at Montpellier on the 30th November last, aged 68. He became one of us in 1876. In the summer of last year it was known in this country that he had been disabled by a paralytic stroke. Lichtenstein was, I think, a direct descendant of the German naturalist of the same name who published a good deal on Entomology, and some of whose papers appeared in the 'Transactions' of our Linnean Society quite at the end of the last, and beginning of the present, century. He was related by marriage to M. Planchon, the well-known Professor of Botany at Montpellier. If I mistake not he was for some time resident in this country; be that as it may, his knowledge of our language was perfect; the numerous notes and papers he published here were not translations. Lichtenstein appears to have published nothing on Entomology until he was about fifty years of age; his first paper saw the light in 1869. He was a vineyard proprietor in the South of France, but I think he retired from active business-life just about the time the *Phylloxera* appeared in France. Indeed, it is very probable the *Phylloxera* largely determined his career as an entomologist; he studied the insect thoroughly, and, in connection therewith, the Aphides generally, and most of his very numerous writings show that his bias lay distinctly in the direction of solving problems concerning the life-histories of *Aphides, Coccidoæ, Psyllideæ, Cynipidoæ*, and others, in connection with the plants they attack. The complex life-cycle of *Aphides* were especially studied by him,
and for an intelligent résumé of his not generally accepted views I cannot do better than refer you to the Address delivered by my predecessor, Mr. Dunning, at the Annual Meeting of this Society on January 16th, 1884. One of the points strongly insisted upon by Lichtenstein is that certain *Aphides*, at one period of their existence, constitute a "species" with a certain food-plant, but subsequently migrate to another food-plant having no connection whatever with the former, and become another "species." Thus the *Aphis* of the plum may become the *Aphis* of the hop, and so on. I think the idea was not original, but the experiments instituted by Lichtenstein have been repeated by others, and are apparently so far confirmed as to induce one to believe the theory has developed into fact.\

* Having prominently mentioned the *Phylloxera* in connection with our deceased colleague, I ask your permission to make a digression. In July last I had opportunities for learning more about the ravages of the *Phylloxera* in France, from personal observation and conversation, than I had ever before been able to do. A sojourn of some length in the Pyrénées Orientales brought the extent of the ravages vividly before me. I was in a district once covered with smiling vineyards. Now there are only the dead stocks left in the ground, half concealed by weeds, ghastly reminders of the past. Or occasionally the dead stocks are piled in huge stacks for firewood, and the vines have been replaced by maize, a poor substitute from a financial point of view. I met men once prosperous proprietors, now impoverished peasants, still clinging to the scenes of former prosperity. The state of affairs there is repeated in very many other districts, and it was lamentably evident in that of Angoulême in passing through it by train. The famous Bordeaux district, however, seems largely to have recovered itself, and in passing through it one would not imagine that it also had recently gone through the same ordeal. In this district remedial measures and the introduction of new blood in the form of American stocks said to be *Phylloxera*-proof have told successfully. And, speaking as an economic entomologist, I cannot resist the opinion (in holding which I think I am in a minority) that the want of introduction of new blood may have had a large share in rendering the vines, cultivated too much "in and in," ready victims to the pest when it first appeared. I am not armed with official statistics, but there appeared to be hopeful feeling to the effect that the *Phylloxera* was exhausting itself (so far as France is concerned); let us hope such is the case. But I met and conversed with intelligent and far-seeing Frenchmen, who held that the future of their country depends more upon what turn the *Phylloxera* may take, than upon political affairs. Never before has an insidious insect-pest caused such widespread and con-
Frank Edward Robinson, who joined the Society in 1880, met a tragic fate in India in the course of last year, a young man much under thirty years of age. He showed a taste for Natural History when a pupil at Dulwich College, where he obtained an Indian Civil Service Scholarship, which occasioned his removal to Oxford; there he attracted the notice of Prof. Westwood, and made a tolerably complete MS. catalogue of all described Indian insects for future use. He held a judicial appointment in India; but the promise of a useful career, officially and scientifically, was prematurely cut short. Having taken part in a tiger-hunt, an infuriated animal, wounded by one of his companions, attacked and killed him.

Edmund Shuttleworth. Again we have to deplore the premature decease of a promising worker. Mr. Shuttleworth, of Preston, died in London in December 1885, after a brief illness from scarlet fever, aged twenty-seven; he joined the Society in 1884. He was a member of the legal profession, and held an official position under the Clerk of Assize for the county of Lancashire. As an entomologist he paid special attention to Lepidoptera, and at the time of his death was devoting himself to the Tortrices and Tineina with much ardour.

I am not able to give any information concerning C.G. Websdale, of Barnstaple, a comparatively old member of the Society, who was elected in 1869, and died in 1886.

In yesterday's 'Times' (January 18th) is the announcement of the death of the Rev. Charles Augustus Frederick Kuper, M.A., on the 13th inst., aged eighty-one, elected in 1842, and one of our oldest colleagues. For the last forty-four years he had been vicar of Trelleck, Monmouthshire; therefore he joined this Society about the time of his appointment. I think that on our present list there are only eight who were elected prior to Mr. Kuper, and of these, five are Original Members.

Of British entomologists not immediately connected with this Society, a once familiar figure disappeared for ever from amongst us in 1886. Dr. John Arthur Power died suddenly at Bedford on June 9th, aged seventy-six. He was, I believe, of Irish descent, but his family had long been settled in England. He was born at Market Bosworth on the 18th March, 1810, was educated at Merchant Taylors' School, and subsequently entered at Clare College, Cambridge, where he took his B.A. degree (followed by
the M.A.), and obtained a Second Class in the Classical Tripos. He adopted the medical profession, which culminated in his brother establishing a training institution for medical students, in which their success was very great, and their reputation such that it used to be said that the fact of a pupil having been under the Powers contributed in no small degree to his chances of passing successful examinations. When at Cambridge he showed a taste for Entomology, and joined this Society in 1834, but resigned in 1843, and was never again one of our number. Power was essentially a British coleopterist (though afterwards he also collected British Hemiptera). His house in Burton Crescent became a rendezvous for British coleopterists. As a collector he was unequalled. No one possessed a keener eye for specific differences, and no one knew more of the habits of the insects he was in search of. In the field he was a study when engaged in his favourite pursuit, utterly regardless of personal appearance, and utterly unconscious as to surroundings. In book-work he was less at home, and if ever he showed an occasional testiness it was when some younger man, with more book-knowledge than he, forestalled him, as he considered, in the determination of new or obscure species; but it was only temporary. In private life he was beloved by all who knew him; even his eccentricities had a charm about them. About five years ago he had a paralytic stroke, which permanently disabled his right hand, and which, though it left his keen intellect quite unimpaired, practically ended his career as a working entomologist. He removed to Bedford, probably in connection with educational facilities for his grand-children, and turned his attention to horticulture. His end was extremely sudden, and in no way connected with the seizure that held him lingering for several days between life and death a few years before.

Of prominent foreign entomologists, not connected with this Society, who died in 1886, I mention the following:—

Maurice Girard, a past President of the Entomological Society of France, died suddenly, on Sept. 16th, at Lion-sur-Mer, on the French shores of the Channel, whither he had gone to spend the vacation, in his sixty-fourth year. He held an official position on the Commission for Primary Education. His studies tended in the direction of economic and applied Entomology, and he published, in 1876, a very important memoir on the Phylloxera
and its ravages in Charente. He was a fertile writer and a conscientious skilled compiler. Probably his best-known and most useful works are his ‘Métamorphoses des Insectes,’ and his ‘Cours Élémentaire d’Entomologie,’ the latter extending to several volumes.

Prof. Hermann Courad Wilhelm Hering died at Stettin on February 1st in his eighty-sixth year. For fifty-four years he was connected with educational duties in Stettin, and became Professor so long ago as 1837. He was a diligent lepidopterist, and fellow-worker for many years with the late Prof. Zeller. Most of his not very numerous writings concerned the Lepidoptera of Pomerania; the first was published in the ‘Iis’ for 1835, the last in the Stettiner entomologische Zeitung for 1881.

Carl Plötz, of Greifswald, died by his own hand, under dread of approaching blindness, on August 12th. As an entomologist he was an iconographer in Lepidoptera, and also published much on Hesperidae, of which family he had made a speciality. His first published notice appeared in the Stettiner Zeitung for 1861, his last in the same journal for 1886, the latter a lengthy memoir of nearly forty pages.

Adolf Werneburg, of Erfurt, died there on January 21st, 1886. He held the position of “Oberforstmeister,” a position unknown in this country, but which has furnished many prominent entomologists in Germany and elsewhere. Werneburg was a diligent lepidopterist, and commenced publishing so long ago as 1853; his writings soon showed his bent, which lay distinctly in the direction of literature, and culminated in his ‘Beiträge zur Schmetterlingskunde,’ consisting of two thick volumes, published at Erfurt in 1864, devoted to a critical consideration of the works on European Lepidoptera published during the 17th and 18th centuries. His researches induced him to suggest great changes in the then existing nomenclature on the ground of priority, and to a considerable extent formed the basis upon which Staudinger’s modern list is founded.

Our Library.

To turn to our Library. The additions by donation have been as numerous and valuable as heretofore. The sum spent in the purchase of books has not been large, but the necessary item of binding has not been neglected. That the Library has been extensively used is evident by the fact that, in addition to the
consultation of books by Fellows who can satisfy their requirements on the spot, no less than 215 volumes have been borrowed during the year, spread over 40 borrowers. I have more precise details before me, but it is scarcely necessary to enter into particulars. That no considerable purchases of books have been made during the year is perhaps in part due to the fact that the Library is at the present moment in a somewhat transition condition. In my last Address I said that our indefatigable Librarian (who exhibits so much energy in connection with his duties as to suggest the idea that they must form the one object of his life) had nearly completed a new Catalogue of the Library. During the year it has been completed, and no doubt many of you have already had occasion to consult it. But there is another point. Many of us (and more especially our country colleagues) would wish to be able to consult a printed Catalogue, so as to be sure that a visit to our rooms might not be fruitless. The printing of a Catalogue would entail heavy expense. But I hope the Council may soon see their way to effect it, and that a moderate sum charged to those of our Fellows who desire to possess copies may largely recoup the cost. With regard to this I may mention that there exists a minute on the Council-book to the effect that the surplus sum resulting from the whole or a portion of the Admission Fees received by the elevation of our former Subscribers to the rank of Fellows may be placed towards the first expense of printing the Catalogue. Until this matter be decided I think a prudent Council should hesitate as to incurring large liabilities in the purchase of books.

Our Librarian estimates the number of volumes (including pamphlets and separate papers) in the Library at approximately 5569. And he has, unsolicited, supplied me with some interesting details, which it may be well to make public. Under the head of authors there are 3925 entries, distributed as follows, according to the initial letters of their names:

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3925
Under the head of Transactions of Societies and Serials, there are 156 entries, distributed as follows, according to the countries in which they are published:

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Publications of existing Entomological Societies, and Entomological Journals.

As a prominent feature in my short Address this evening I have chosen the subject of existing Entomological Societies publishing Transactions, and existing Journals devoted exclusively to Entomology, under which head may be included the whole of the *Arthropoda*, for most of the Societies, and many of the Journals, do not confine themselves solely to *Insecta*. To have made the list retrospective with regard to publications that have ceased to appear would have been almost impossible. Still more impossible is it to glance at the innumerable publications of Societies and Journals of which Entomology forms a greater or lesser portion of the contents. Furthermore, I have not attempted to collect information as to publications concerning Bee-keeping, and other allied departments of Applied Entomology.

**GREAT BRITAIN.**

*Transactions of the Entomological Society of London,* consisting of three series of 5 vols. each, and annual vols. since 1868 inclusive, so that the vol. about to be completed brings the total to 34. Vol. i. of the first series was completed in 1836. I am sure you will all echo the wish—May our Society exist for ever!

*Entomologist's Monthly Magazine,* and *Entomologist;* monthly Journals both commenced in 1864.

*Cistula Entomologica,* commenced in 1872, chiefly devoted to descriptive work, appearing at irregular intervals.

Although perhaps scarcely within my province, I here mention Mr. C. O. Waterhouse's 'Aid to the Identification of Insects,'
commenced in 1880, devoted to the figuring of type-specimens in all orders, and appearing quarterly.

I am obliged to consider such publications as Miss Ormerod's annual 'Reports on Injurious Insects' outside my strict province, and they here receive mention, just as will happen with analogous Reports issued in other countries.

It is impossible to notice for Great Britain, as for other countries, the annual reports of local entomological Societies, or of entomological sections of Societies devoted to general Natural History, &c.

FRANCE.

Annales de la Société Entomologique de France, the oldest existing Entomological Society as a continuity, the publications of which have appeared with commendable regularity, notwithstanding the periods of severe political troubles that have more than once shaken the country since the founding of the Society. Including that for 1886, 54 annual vols. have appeared (the first having been published in 1832) in series, the first consisting of 11 vols., the succeeding of 10 vols. each, and the vol. for 1886 is the 3rd of the 6th series. In addition there have been supplementary vols. devoted to special subjects; the whole forming a mine of entomological information. The fortnightly 'Bulletins' are distributed as soon as published to members on payment of a small fee.

Revue d'Entomologie, the organ of the Société Francaise d'Entomologie, published at Caen. A monthly Journal of general Entomology, commenced in 1882, the current vol. being the 5th. It is edited by M. Fauvel.

L'Abeille, a Journal devoted to Coleoptera (notwithstanding its title), edited by our colleague l'Abbé de Marseul, commenced in 1864; the current vol. is the 20th.

ITALY.

Bullettino della Società Entomologica Italiana, commenced in 1869, and forming yearly vols. of 4 parts each; thus the vol. for 1886 is the 18th.

BELGIUM.

The publications of the Belgian Entomological Society were commenced in 1857 under the title Annales de la Société entomologique Belge, but after the 7th vol. the title was slightly modified, 'de Belgique' being substituted for 'Belge.' They appear in annual vols., and that for 1886 is the 30th, in consequence of an additional vol. (the 24th) having been published in 1880, on the
occasion of the 25th Anniversary of the Society. The Comptes-Rendus of the meetings, which are much extended, and often contain lengthy papers, are distributed monthly to the members.

HOLLAND.

_Tijdschrift voor Entomologie_, the organ of the 'Nederlandsche entomologische Vereeniging.' The present publication was preceded from 1854 to 1857 by _Handelingen_ of the Society, the first vol. of the _Tijdschrift_ appearing in 1859. Since then it has been continuous in 4 parts annually, the vol. for 1886 being the 29th. There are only two meetings of the Society during the year, the "summer" and "winter" respectively, reports of which are distributed to the members. The contents of the _Tijdschrift_ have always consisted largely of memoirs concerning the insects of Holland and of the Dutch Indies, and are remarkable for the beauty and fidelity of the plates. Latterly several papers have been published in English; and in connection with this I may remark that another Dutch publication (_Notes from the Leyden Museum_), of which Entomology is the prominent feature, is wholly in English.

GERMANY.

_Entomologische Zeitung_, published by the Entomological Society of Stettin, the oldest of the existing Societies devoted to Entomology in Germany. It commenced in 1840, and for some years was published monthly, 12 numbers forming an annual vol.; but subsequently it appeared, as now, in quarterly parts, each purporting to consist of three numbers. Since July, 1843, it has been edited by the veteran Dr. C. A. Dohrn, one of our honorary colleagues, and President of the Society, who, now in his eighty-first year, continues to show an amount of vigour to be envied by some men half his age. The information scattered through the 47 vols. of this Journal is enormous, and probably no other German entomological publication is so widely read in this country.

_Berliner entomologische Zeitschrift_, and _Deutsche entomologische Zeitschrift._—Force of circumstances compels me to couple these two, now very distinct, publications. The Berl. ent. Zeitschr., as the organ of the Entomological Society of Berlin, commenced in 1857, and continued under that title down to 1874, after which it became the Deutsche ent. Zeitschr., still purporting to emanate from the original Society. This distinction, in title only, lasted down to 1880. Then a division in the camp of the entomologists of the German metropolis took place. The Berl. Ent. Zeitschr. was revived as representing the Entom. Soc. of Berlin, and the Deutsche ent. Zeitschr. was continued as representing the German
Entom. Soc. Strange to say, each claims continuity since 1857, the vol. for each, published in 1886, being styled the 30th. The old Society (or title) is now mostly representative of the Berlin Zoological Museum, the younger Society (or title) those who are more or less antagonistic: there is news to the effect that our colleague Dr. Kraatz, who represents the German Society, has recently presented his collections and a large sum of money to the Stadt Museum of Berlin. It is not for me to enter into the merits or demerits of the disagreement. Both publications continue to give to the scientific world memoirs of great value, just as was the case when they were one. The contents of the Deutsche ent. Zeitschr. mainly concern Coleoptera, those of the Berl. ent. Zeitschr. are more varied. There appears to be room for both, but the confusion caused through both claiming continuous existence is very great.

Zeitschrift für Entomologie, published at Breslau by the Silesian Entomological Society. A comparatively small Journal under the above title was started in 1847, and existed down to 1861. It was resuscitated in 1870, and continues.

Entomologische Nachrichten.—This fortnightly Journal, originally edited by Dr. Kutter, and published at Putbus, commenced in 1875, 24 numbers forming a vol., but after the close of the 9th vol. in 1883 it became the property of Messrs. Friedländer und Sohn, of Berlin, edited by Dr. Karsch, and continues.

Correspondenzblatt des entomologischen Vereins †Iris‘ zu Dresden.—Of this three numbers have appeared, dated October 1884, May 1885, and March 1886, respectively, largely devoted to exotic Lepidoptera. The Society and the publication appear to have developed from a private entomological club established in 1862.

Correspondenzblatt des entomologischen Vereins zu Halle.—I find amongst my notes an indication of this Society and publication as recently established.

Insekten-Börse is published fortnightly at Leipzig, and may be rendered as †Exchange and Mart.‘

AUSTRIA-HUNGARY.

Wiener entomologische Zeitung.—An exceedingly useful and well-illustrated publication commenced in 1882, and conducted by well-known entomologists. Originally 12 parts formed a vol., but latterly there have been 10 parts annually; nevertheless the bulk of the vols. has increased.

Revüvani Lapok (which may be translated as †Entomological Leaves‘) is a Journal in the Hungarian language, with occasional
brief résumés in French, published at Pesth. It is chiefly devoted to local insects, and succeeded, in 1884, another Journal of a somewhat similar title that had only a brief existence. Indeed, I fear the later one has met a similar fate, for I have seen no recent numbers.

SWITZERLAND.

Mittheilungen der Schweizerischen entomologischen Gesellschaft.—The first Heft of this very useful publication (then, as now, edited by Dr. Stierlin) was published in February, 1862. Ten Hefte form a vol., and the current vol. is the 7th. Tourist entomologists are everywhere in Switzerland during the summer months, but native entomologists are unfortunately too few, considering the almost unequalled advantages (for Europe) the country possesses. And these few are widely separated; therefore there is only an annual gathering. Naturally the contents of the ‘Mittheilungen’ largely concern Swiss insects, but there is much other matter.

Societas Entomologica. Journal de la Société entomologique internationale.—Under this high-sounding title I received, in 1886, two numbers of a periodical (the first dated the 1st April) published at Zürich. I have seen no more, but believe it continues to appear. In No. 2 there is an elaborate list of rules, in French, German, and English (the latter being a literary curiosity). These two numbers contain some useful biological and local notes, and also descriptions of new species of Ichneumonidae.

SWEDEN.

Entomologisk Tidskrift, issued by the Entomological Society of Stockholm. This is under the editorship of Dr. Jacob Spangberg. Four parts form a vol., and the first was published in 1880. The vol. for 1886 is the 7th. The contents largely, but not exclusively, concern Scandinavian insects. The Swedish text is supplemented by copious résumés in French. There are periodical lists of all papers on Entomology published in Sweden, Norway, and Finland, which are very useful, for some of the publications in which these appear are not well known in this country.

RUSSIA.

Horia Societatis Entomologicae Rossicae, commenced in 1861, and continued in annual vols. A certain portion of the contents are published in Latin, German, and French, but much is wholly in Russian. The plates are usually excellent. The same Society also issues (I believe in annual vols.) another publication, which may be rendered as Acta ("Trudi"), wholly in Russian. It is not
my intention here to enter into a discussion of the advisability on the one hand, or the inconvenience on the other, of publishing valuable scientific memoirs in a language so little generally understood as is Russian. The naturalists of that vast country have latterly shown extraordinary activity, and their original work, especially in anatomy and physiology, has proved of the highest order. The inconvenience of the vernacular has been so far recognised that a publication has been started in Paris, under the title 'Archives Slaves de Biologie,' for the purpose of giving to the scientific world French translations of the more important memoirs, but it does not include systematic and descriptive works.

Revue mensuelle d'Entomologie, pure et appliquée.—A Journal under the above title, edited by M. Doukhtouroff (the Secretary of the Russian Entomological Society), was commenced in 1883. Nothing has been received since the number for October, 1884, and it is probably defunct.

UNITED STATES.

Transactions of the American Entomological Society, published at Philadelphia. Virtually a continuation of the 'Proceedings of the Entomological Society of Philadelphia,' of which the last (6th) vol. bears the date 1866-7. The 1st vol. under the new title is dated 1867-8, and in it are the 'Constitution' and Bye-Laws of the Society under its more extended title. With vol. ix. (1881-2) there is an addition to the title-page by the words "and Proceedings of the Entomological Section of the Academy of Natural Sciences." The current vol. is the 13th. The contents may be said to wholly concern American insects, and include some of the most important memoirs on that subject.

Psyche; organ of the Cambridge (Mass.) Entomological Club. Commenced in May, 1874, as a monthly Journal. At first the numbers appeared with tolerable regularity, but it became evident that a struggle for existence prevailed, and the numbers were more and more in arrear. It contains very much useful matter, and very copious bibliographical records, though compiled on an inconvenient plan. No public announcement of its decease has been made, so far as I know, but nothing has been seen by me since the treble number for April—June, 1885 (published long afterwards); so far as I am aware only one more number is wanted in order to complete vol. iv.

Proceedings of the Entomological Society of Washington.—This Society was established a year or two ago, with Prof. Riley as President. At present I have seen only vol. i., No. i., published in 1886.
Entomologica Americana.—Commenced in 1885 by the amalgamation of two previously existing Journals, viz., the 'Bulletin of the Brooklyn Entomological Society' and 'Papilio.' It is published monthly, and promises to be very useful.

I have already said that the Annual Reports of Economic Entomologists scarcely come within the purpose of my present notes. But I may here allude to the Reports of the United States Entomological Commission, the Annual Entomological Reports, and the Bulletin, of the Department of Agriculture, in which the names of Riley, Packard, Thomas, and Comstock figure conspicuously, and the Reports of the various State Entomologists, of which those for Illinois, Missouri, and New York are especially valuable; there are others of which we know less in this country.

Canada.

Canadian Entomologist.—A thin annual vol. of 12 monthly parts, always containing useful information. Edited down to vol. v. by the Rev. C. J. S. Bethune, and subsequently down to the present time by our colleague Mr. W. Saunders, of London (Ontario). The vol. for 1886 is the 18th.

The Reports of the Entomological Society of Ontario, published at Toronto "by order of the Legislative Assembly," are here mentioned, but they are outside my province, just as are several other allied publications previously alluded to. The current annual vol. is the 16th. They are analogues of the United States Official Reports.

I can scarcely hope the foregoing analysis, the outcome of an idea originated scarcely more than a fortnight ago, is complete. But I think it may prove useful. No doubt there are errors, both of omission and commission: I shall be very glad of information concerning them.

Aids to Reference.

In my Address last year I alluded to the fact that notwithstanding the enormous increase of entomological literature latterly, the facilities for reference had increased in proportion, in consequence of the improved condition of our great Natural History Libraries as compared with that of years gone by, and the existence of "keys" or aids to reference. To go to a great library for information on some special point without having a clue as to where to find the reference, would be equivalent to seeking the proverbial needle in the proverbial bottle of hay. No librarian
can be expected to prove a "walking dictionary," familiar with the contents of every page of the books under his charge. The student must arm himself with a reference. Let us see how this can be best obtained.

First and foremost comes Hagen's 'Bibliotheca Entomologica,' as a list of authors and titles of books and papers down to 1862. That this work is not on the shelves of every working entomologist is a marvel to me, and it is still more a marvel that I find those who possess it do not always avail themselves of the analytical "Register" at the end of the second volume.

Then there is the 'Catalogue of Scientific Papers compiled by the Royal Society,' an enormous undertaking, embracing Science as a whole, and of which a second supplementary volume is now in course of preparation.

I may mention also that two volumes of a new edition (edited by Dr. O. Taschenberg, of Halle) of Carus and Engelmann's 'Bibliotheca Zoologica' have lately appeared.

Furthermore there is the invaluable 'Zoologischer Anzeiger,' published fortnightly, giving a classified list of very recent papers and books on Zoology; and 'Nature Novitates,' published monthly by Friedländer und Sohn, the enterprising Berlin firm of booksellers, should not be forgotten.

But something more than the names of authors and the titles of their productions is usually necessary; a minute analysis is required. For this purpose there are now three distinct channels of reference, and it must be very extraordinary if the student fail in this case to find the information, be it positive or be it negative, he is in search of.

In order of priority the 'Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie,' commonly known as the Bericht, takes the first place. Although foreshadowed to a certain extent, it commenced in the year 1840 by an analysis of the work done in 1838, and continues to appear now, as originally, in Wiegmann's 'Archiv für Naturgeschichte,' and also separately. With it are associated names honoured in Entomology—Erichson, Schaum, Gerstäcker, Brauer, Bertkau. This publication took the initiative in furnishing a comparatively ready clue to entomological students in search of a reference, and in its earlier years the difficulties that beset the recorder, or compiler, must have been far greater than those now existing.
It is now not far short of a quarter of a century ago that the idea of a book of reference in Zoology, published in English, was started. This culminated in the appearance of the first volume of the Zoological Record in 1865, dealing with the literature for 1864, under the editorship of Dr. Günther, and published at his own risk by Mr. Van Voorst. Of the advantages of a book of reference in our own language there could not be two opinions, but the public did not respond as it was considered they would have done, and at the end of the sixth volume the enterprising publisher, after sustaining considerable loss on the venture, abandoned it. However, an association was formed—the Zoological Record Association—with Mr. Stainton as Secretary, for its continuance, Professor Newton succeeding Dr. Günther as Editor. By means of grants, liberal donations, and an annual call on the members of the Association, it has continued down to the present, the Record for 1885 having appeared last month. After the publication of the volume for 1872, Mr. E. C. Rye replaced Professor Newton as Editor, and, on the death of the former in 1885, the vacancy was filled by the appointment of Prof. F. Jeffrey Bell. In the first five volumes of the Zoological Record the entomological portion was compiled solely by Mr. W. S. Dallas. In vol. vi. (1869) the subject was subdivided under various recorders, and in it I undertook the Neuroptera and Orthoptera, which I have continued down to the volume just published. From vols. vii. to xv. inclusive the subject was done by Mr. Rye, Mr. W. F. Kirby, and myself; from vols. xvi. to xxi. Mr. Kirby compiled all excepting the two orders continued by me, and substituting the name of our new President for that of Mr. Kirby the remark applies equally to vol. xxii. After seventeen years of service I consider I have earned my right to retire; Dr. Sharp will in future probably furnish the portions hitherto supplied by me. In the Record for 1876 a new system of pagination was commenced, each broad division being paged separately, and this plan has continued. Presuming the method of treatment to have been nearly the same throughout, an analysis of the part occupied by Insecta for each year will be instructive. For 1876 the subject occupied 240 pp.; 1877, 234 pp.; 1878, 291 pp.; 1879, 250 pp.; 1880, 238 pp.; 1881, 303 pp.; 1882, 292 pp.; 1883, 299 pp.; 1884, 319 pp.; and 1885, 257 pp.; in this last volume the method of treatment
was somewhat changed. It is no secret that a crisis has again arisen in the history of the Record. I am not in a position to state with certainty, but I have reason to hope a plan for its continuance has been decided upon this day.

The third channel of reference in order of priority is the Zoologischer Jahresbericht, issued under the auspices of the Zoological Station at Naples. It commenced with the literature for 1879, and continues. In Entomology each order has practically a separate recorder, who is usually a specialist. A notable feature is the detailed information for Anatomy, Physiology, and Palaeontology, which are recorded apart from the ordinal position of the subjects from which the observations have been made, a plan not without its advantages. Everything that emanates from the Naples Zoological Station is exhaustive.

Let us picture to ourselves the benighted condition of entomologists before such keys to reference existed, and let us imagine how much synonymy (the plague of succeeding students) might have been avoided had they existed! But the greater the help the greater the responsibility.

A Chapter of an Autobiography.

As concluding my Address, I give you a very brief chapter of an otherwise unwritten Autobiography. I do so at the request of a scientific friend to whom many of the details are already familiar. The chapter indicates why my studies eventually took a certain definite direction, and the history of my case may probably find an echo in that of many of my hearers, differences in incident always excepted.

In early childhood I was located some ten or twelve miles from London on the borders of what was then Hainault Forest, where I remained until fifteen years of age. There could scarcely have been a better position near London for arousing the latent instincts of a born naturalist. These instincts once aroused took a general form, and embraced the whole 'Systema Naturae.' The Forest afforded unusual facilities for ornithological observations, and entire holidays were spent watching the London birdcatchers who frequented the locality, and from them I gleaned much

* The 'Zoological Record' will be continued by the Zoological Society of London.
practical information, not only as to the birds themselves, but also as to their habits, migrations, &c., and above all there was the occasional capture of a rara avis beyond the knowledge of these experts. Conchology was also a favourite subject, necessarily almost limited to land and fresh-water shells, for I had then never seen the sea. But amongst my early schoolfellows was a small boy about my own age, whose father owned a fleet of fishing-smacks hailing from Barking; there was no special community of taste, but he was readily induced to obtain for me shells, &c., brought up in the nets, and occasionally very odd fish, such as "lump-suckers," and so on. Butterflies and moths were collected and bred, and a hornets' nest in an old tree had an especial interest, at a distance. It had been instilled into my juvenile mind that the sting of a hornet was fatal, and also that three large dragonflies could kill a horse!

But in connection with this tendency to take an interest in Natural History as a whole, there was one subject that especially engaged my attention from childhood to early manhood, and that was Botany, and this largely contributed to shape my future course as an entomologist. At first the only works I could consult were one or two old Encyclopædias and one or two childrens' books on general Natural History. At about the age of seven or eight, Botany took more decided possession of me. At that time an elder brother, a youth of eighteen or nineteen (whom the Thames claimed soon afterwards as a tribute from those who dare to bathe in its waters), gave me, as a present, Macreight's 'Manual of British Botany,' a curious present to a mere child, technical, without figures, probably intended for medical students, with the one advantage that it embodied the plants commonly cultivated as well as the indigenous. It opened up a new light, and, by means of the old encyclopædias previously referred to, I managed to master most of the technical terms, and to identify most of the wild plants of the locality and many of those cultivated in the garden; my herbarium was commenced forthwith, for which certain ponderous volumes did duty in the place of drying-paper, much to their detriment. That technical 'Manual of British Botany' was the thin end of the wedge; it is now before me, extensively "thumb-marked," to use a bookseller's term, and I find that, being based on the Natural System, the Linnean classes and orders were added by me as marginal notes.
Time went on, and conditions changed. I found myself located in London, and it was but rarely I could pursue my still-absorbing study in the field. But the changed conditions gave me an opportunity of consulting the literature I had craved for. My evenings were spent at the London Institution in Finsbury Circus. The Librarian was E. W. Brayley, to whose memory I pay a debt of gratitude. Brayley was not a naturalist, but an archaeologist of repute; he took an interest in my pursuits, and to some purpose, as the sequel will show.

In 1855 it was deemed advisable I should take a long voyage, and, during one of thirteen months' duration, two months or more were spent in New South Wales, where all my energies were devoted to plant-collecting, plants of a strange land, and for which my earlier studies afforded little help. I managed to name most of them at the Sydney Botanic Gardens, but there remained a residuum of indeterminata. Upon arriving home I sought the late R. Kippist, Librarian to the Linnean Society, to whom I had a previous introduction from my friend of the London Institution, and he in turn gave me an introduction to Robert Brown, then Keeper of the Botanical Department of the British Museum. Could anything have been more auspicious? I had Australian plants to name, and Robert Brown was the chief authority on the Botany of Australia. He received me courteously, but, as I then thought, somewhat austerely (I now wonder why he took so much trouble over a mere boy). He brought down bundle after bundle of plants, and satisfied most of my requirements; and then he proceeded to read me so severe a lecture that my heart sank within me. The burthen of it was to the effect that I should not have come to him to get names for plants without having previously endeavoured to determine them from descriptions. The rebuke was accepted meekly; my previous studies had made it so far applicable that I could not do otherwise. Whether Robert Brown acted on the spur of the moment, or whether he thought my case a suitable one on which to experiment, I know not. We never met again, but his memory lives in my respect—he drove the wedge home to its thick end.

What induced me to practically abandon Botany for Entomology, as a speciality, I scarcely know. My Autobiography ends here. I joined this Society in 1858, and the rest is pretty well known.
At the termination of my second year of office as President, I again thank you for the uniform courtesy with which I have been received at our monthly meetings. I have the satisfaction of vacating the Chair with the knowledge that our Society is in a healthy condition. That it shall so continue depends much upon receipts on the one hand and cautious expenditure on the other. You have chosen as my successor one of my earliest entomological companions, a gentleman whose knowledge of Coleoptera, taken as a whole, is probably not to be equalled here or elsewhere. All I ask of you is to—speed the parting, welcome the coming, man.
CHARTER & BYE-LAWS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON.
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CHARTER.

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, TO ALL TO WHOM these presents shall come Greeting:

Whereas Joseph William Dunning, of Lincoln's Inn, in the County of Middlesex, Barrister-at-Law, Esquire, Master of Arts, formerly Fellow of Trinity College, Cambridge, Fellow of the Cambridge Philosophical Society and of the Linnean and Zoological Societies of London, has by his Petition humbly represented unto US, That in the year 1833 certain of our loyal subjects formed themselves into a Society for the Improvement and Diffusion of Entomological Science, and subscribed and expended considerable sums of money for such purposes, and have collected and become possessed of a valuable library and other property, and have been and continue to be actively employed in promoting the objects for which the said Society was founded, especially by the publication of Volumes of Transactions composed of Original Memoirs, read before the Society. And whereas the said Petitioner, believing that the well-being and usefulness of the said Society would be most materially promoted by obtaining a Charter of Incorporation, hath therefore, on behalf of himself and the other Members of the said Society, most humbly prayed that WE would be pleased to grant a Royal Charter for incorporating into a Society the several persons who have already become Fellows, or who may at any time hereafter become Fellows thereof, subject to such Regulations and Restrictions as to US may seem good and
expedient. NOW KNOW YE that WE, being desirous of encouraging a design so laudable, and of promoting the improvement and diffusion of Science in all its branches, have of Our especial Grace, certain Knowledge and mere Motion, given and granted, and We do hereby give and grant, That the said Joseph William Dunning and such others of Our loving subjects as are now Fellows of the said Society, or who shall at any time hereafter become Fellows thereof in pursuance of the provisions of this Our Charter and according to such Bye-Laws as are hereinafter mentioned, shall be a Body Corporate by the name of "The Entomological Society of London," having perpetual succession and a common seal, with power to sue and be sued in their Corporate name, and to acquire and hold any goods and chattels whatsoever.

And our Will and Pleasure is, That John Obadiah Westwood, Esq., Master of Arts, Hope Professor of Zoology in the University of Oxford, shall be Honorary President of the said Corporation during the term of his natural life. And that Robert MacLachlan, F.R.S., shall be the first President of the said Corporation and shall continue such until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we do hereby declare, that there shall always be a Council to direct and manage the concerns of the said Corporation. And that the thirteen persons, who were elected to form the Council of the said Society at the Annual Meeting held in the month of January last, shall form the first Council of the said Corporation, and shall continue in Office until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we further grant and declare, that the existing Bye-Laws of the said Society, as revised and amended at a General Meeting held on the 2nd day of May, 1883, shall be the Bye-Laws of the said Corporation, until the same shall be revoked or altered as hereinafter mentioned. And that it shall be lawful at General Meetings of the said Corporation to revoke or alter any former Bye-Laws, and to make such new Bye-Laws as
shall be deemed useful and necessary for the regulation of the said Body Corporate.

Provided always: And we lastly declare it to be our Royal Will and Pleasure, That no Bye-Law or Resolution shall, on any account or pretence whatsoever, be made by the said Corporation in opposition to the general scope, true intent, and meaning of this our Charter or the Laws and Statutes of this Realm, and that if any such Bye-Law or Resolution shall be made, the same shall be absolutely null and void.

In Witness whereof We have caused these our Letters to be made Patent.

Witness Ourself at Westminster the twentieth day of July, in the Forty-ninth year of Our Reign.

By Warrant under the Queen's Sign Manual.
BYE-LAWS.

As amended at a Special Meeting held 1st December, 1886.

Chap. I. Object.

The Entomological Society of London is instituted for the improvement and diffusion of Entomological Science.

Chap. II. Constitution.

The Society shall consist of Honorary and Ordinary Fellows.

Chap. III. Management.

The affairs of the Society shall be conducted by a Council consisting of thirteen Fellows, to be chosen annually, four of whom shall not be re-eligible for the following year. Five shall be a quorum.

Chap. IV. Officers.

The Officers of the Society shall consist of a President; three Vice-Presidents; a Treasurer; two Secretaries; and a Librarian. The Officers shall be chosen annually from amongst the Members of the Council. No Fellow shall be President, or a Vice-President, more than two years successively.

Chap. V. Removal or Resignation of Officers.

1. For any cause which shall appear sufficient to a majority thereof the Council shall have power to suspend any Officer of the Society from the exercise of his office, or to remove him and declare such office vacant.
2. In the event of any vacancy occurring in the Council or Officers of the Society, at the next meeting of Council after such vacancy has been made known, the Council shall recommend to the Society the name of some Fellow to be elected to fill the vacancy; and the next Ordinary Meeting of the Society shall be made a Special Meeting and the Fellows summoned accordingly, and the Election shall take place as provided for at the Annual Meeting, Chap. XIX.

Chap. VI. President.

1. The duty of the President shall be to preside at the Meetings of the Society and Council, and regulate all the discussions and proceedings therein, and to execute or see to the execution of the Bye-Laws and orders of the Society.

2. In case of an equality of Votes the President shall have a double or casting Vote.

Chap. VII. Vice-Presidents.

1. The Vice-Presidents shall be nominated by the President. Such nomination shall be declared at the Ordinary Meeting next after the election of the President in every year.

2. In the absence of the President a Vice-President shall fill his place, and shall for the time being have all the authority, power, and privilege of the President.

3. In the absence of all the Vice-Presidents a Member of the Council shall preside; and if no member of the Council be present at any Ordinary Meeting the Fellows present shall appoint by a majority to be Chairman such Fellow as they shall think fit; and the Member of Council so presiding, or the Fellow so appointed, shall for the time being have all the authority, power, and privilege of the President.

Chap. VIII. Treasurer.

1. It shall be the duty of the Treasurer to demand and receive for the use of the Society all sums of money due or payable to the Society, and to disburse all sums payable by the Society out of the Funds in his hands.
2. No payment exceeding £5, excepting for rent or taxes, shall be made by the Treasurer without the consent of the Council.

3. The Treasurer shall keep a book of Cheque Receipts for admission fees and annual payments; each Receipt shall be signed by himself, the date of payment and name of the Fellow paying being written both on the Receipt and on the part of the Cheque which is left in the book.

4. The Treasurer shall demand all arrears of annual payment after such payment shall have been due three months.

5. The accounts of the Treasurer shall be audited annually, previously to the Annual Meeting, by a Committee of six Fellows (of whom three shall be Members of the Council), to be appointed by the President at the Ordinary Meeting in December, of which Committee three shall be a quorum. The Treasurer shall furnish the Auditors with a detailed account of all receipts and disbursements down to the 31st December.

Chap. IX. Secretaries.

1. It shall be the duty of the Secretaries to keep a list of all the Fellows of the Society, together with their addresses; to summon Meetings (when necessary) of the Society and the Council; to conduct and produce to the Council all correspondence in any way connected with the Society at the next Meeting after such correspondence shall have been received or taken place; to take Minutes of the Proceedings at Meetings of the Society and the Council; to edit the Transactions and Journal of Proceedings; and, generally, to act under the direction of the Council in all matters connected with the welfare of the Society.

2. In the absence from any Meeting of the Society, or the Council, of both the Secretaries, Minutes of the Proceedings shall be taken by a Fellow whom the President shall appoint for the occasion.
Chap. X. Librarian.

1. It shall be the duty of the Librarian to take care of the Library and MSS., and keep a Catalogue thereof, with the names of the Donors; to call in all Books borrowed, and see that the Library Regulations are carried into effect.

2. The Council may employ a Sub-Librarian, who shall receive such remuneration as the Council shall from time to time determine, and shall be subject to such Rules and Orders as shall from time to time be given to him by the Council.

Chap. XI. Library Regulations.

1. No Fellow shall, without special permission of the Council, be allowed to borrow from the Library more than four volumes at one time, or, without leave of the Librarian, to retain any volume longer than one month.

2. If any book be torn, injured, lost, or not forthcoming when demanded by the Librarian, full compensation shall be made for the same by the borrower.

3. The Librarian shall call in all books borrowed from the Library on the 5th day of January and 5th day of July in each year; and in case the same be not returned on or before the Ordinary Meeting of the Society in the following month, notice thereof shall be given by him to the Council, who shall then direct a second notice to be sent to the Fellow retaining any book, and in case the same be not returned within the further space of four weeks from the date of such second notice so sent, such Fellow shall in future be disqualified from borrowing books from the Library without the special permission of the Council.

4. The Library shall be open to the Fellows between the hours of one and six p.m. on every week-day, except Saturday, and on that day between one and three p.m.

5. No stranger shall be allowed access to the Library unless introduced by a Fellow; but a note addressed to the Librarian or Secretary shall be deemed a sufficient introduction.
CHAP. XII. *Election of Fellows.*

1. Every Candidate for admission into the Society shall be proposed by three or more Fellows, who must sign a Certificate in recommendation of him. The Certificate shall specify the name and usual place of residence of the Candidate.

2. The Certificate having been read at one of the Ordinary Meetings shall be suspended in the room, read again at the following Ordinary Meeting, and the person therein recommended shall be balloted for at the next Ordinary Meeting.

3. The method of voting shall be by ballot, and two-thirds of the Fellows balloting shall elect.

4. Fellows shall sign the Obligation Book of the Society at the first Ordinary Meeting of the Society at which they are present, and shall then be admitted by the President.

CHAP. XIII. *Admission Fee and Annual Contribution.*

1. The Admission Fee shall be £2 2s., the Annual Contribution £1 1s.

2. Foreigners not resident in the United Kingdom shall pay the Annual Contribution, but shall be exempt from payment of any Admission Fee.

3. The composition for Life Fellowship, in lieu of the Annual Contribution, shall be £15 15s.

4. The Annual Contribution shall become due on the 1st day of January in advance; any Fellow elected after September will not be called upon for his Contribution for that year.

CHAP. XIV. *Withdrawing and Removal of Fellows.*

1. Every Fellow, having paid all sums due to the Society, shall be at liberty to withdraw therefrom upon giving notice in writing to the Secretary.

2. Whenever written notice of a motion for removing any Fellow shall be delivered to the Secretary, signed by the President or Chairman for the time being on the part of the Council, or by six or more Fellows, such notice shall be read
from the Chair at the two Ordinary Meetings immediately following the delivery thereof, and the next following Ordinary Meeting shall be made a Special Meeting and the Fellows summoned accordingly, when such motion shall be taken into consideration and decided by ballot; whereas if a majority of the Fellows balloting shall vote that such Fellow be removed, he shall be removed from the Society.

3. Whenever any Fellow shall be in arrear for three years in the payment of his Annual Contribution, notice thereof in writing shall be given or sent to him by the Treasurer, together with a copy of this section; and in case the same shall remain unpaid, the Treasurer shall give notice thereof to the Council, who shall cause a second similar notice to be sent to the Fellow, with an intimation that at the expiration of three months he will be liable to have his name erased from the list of Fellows. In default of payment, the Council may order his name to be erased accordingly.

Chap. XV. Privileges of Fellows.

1. Fellows have the right to be present, to state their opinions, and to vote, at all General Meetings; to propose Candidates for admission into the Society; to introduce Visitors at General Meetings of the Society; to have personal access, and to introduce scientific strangers, to the Library; and Fellows who have paid the Annual Contribution for the year shall be entitled to receive a copy of the Transactions published during the year.

2. Fellows shall be eligible to any office in the Society, provided they are not more than one year in arrear in the payment of the Annual Contribution.

3. A Fellow shall not be entitled to vote on any occasion until he shall have paid his Contribution for the year last past.

Chap. XVI. Honorary Fellows.

1. Every person proposed as an Honorary Fellow shall be recommended by the Council; and shall be balloted for, and, if elected, be liable to be removed in the like form and manner, and be subject to the same rules and restrictions, as an Ordinary Fellow.
2. Honorary Fellows shall be exempt from the payment of Fees and Contributions, and shall possess all the privileges of Ordinary Fellows.

3. No resident in the United Kingdom shall be an Honorary Fellow.

4. The number of Honorary Fellows shall not exceed ten.

Chap. XVII. Ordinary Meetings of the Society.

1. The Ordinary Meetings of the Society shall be held on the first Wednesday in each month (except January), beginning at seven o'clock in the evening, or at such other days or times as the Council shall from time to time direct.

2. At the Ordinary Meetings the order of business shall be as follows:—

(1.) The names of the Visitors present at the Meeting shall be read aloud by the President.

(2.) The Minutes of the last Meeting shall be read aloud by one of the Secretaries, proposed for confirmation by the Meeting, and signed by the President.

(3.) The Presents made to the Society since the last Meeting shall be announced and exhibited.

(4.) Certificates in favour of Candidates for admission into the Society shall be read, and Candidates shall be balloted for.

(5.) Fellows shall sign their names in the Obligation Book, and be admitted.

(6.) Exhibitions of specimens, &c., shall be made.

(7.) Entomological communications shall be announced and read either by the Author or one of the Secretaries.

(8.) When the other business has been completed, the persons present shall be invited by the President to make their observations on the communications which have been read, and on the specimens or drawings which have been exhibited at the Meeting.
3. All Memoirs which shall be read at any Meeting of the Society shall become the property of the Society, unless otherwise stipulated before the reading thereof.

4. No Motion relating to the government of the Society, its Bye-Laws, the management of its concerns, or the election, appointment, or removal of its Officers, shall be made at any Ordinary Meeting.

**Chap. XVIII. Special Meeting.**

1. Upon the requisition of six or more Fellows, presented to the President and Council, a Special General Meeting of the Society shall be convened; a notice thereof shall be sent to every Fellow whose last known residence shall be in the United Kingdom, at least seven days before such Meeting shall take place; and any proposition to be submitted to such Meeting shall be stated at length in such notice.

2. No vote shall be taken at any Special Meeting unless nine or more Fellows shall be present.

**Chap. XIX. Annual Meeting.**

1. The Annual Meeting of the Society shall be held on the third Wednesday in January.

2. The objects of the Meeting shall be to receive from the Council, and hear read, their Annual Report on the general concerns of the Society; and to choose the Council and Officers for the ensuing year.

3. The Council for the time being shall annually cause to be prepared two Lists, one of which (No. 1 in the Schedule hereto) shall contain the names of Fellows whom they shall recommend to be re-elected, and of other Fellows to be elected into the Council; and the other list (No. 2) shall contain the names of such Fellows as they shall recommend to fill the offices of President, Treasurer, Secretaries, and Librarian for the year ensuing; which Lists shall be read at the Ordinary Meeting in December, and shall then be fixed up in the room until the day of election. And copies of such lists shall be transmitted to every Fellow whose last known residence shall be in the United Kingdom, before the 20th December.
4. If any four or more Fellows shall desire to substitute the name or names of any other Fellow or Fellows to be elected into the Council or to fill any of the offices of President, Treasurer, Secretary, or Librarian, such four or more Fellows shall give notice in writing to that effect, specifying the name or names of the Fellow or Fellows proposed to be substituted; such notice to be given on or before the 31st December to one of the Secretaries, who shall before the second Wednesday in January transmit a List of the names proposed to be substituted to every Fellow whose last known residence shall be in the United Kingdom.

5. If no such notice be given to either of the Secretaries on or before the 31st December, the Fellows named in the Lists prepared by the Council shall be the Council and Officers for the ensuing year.

6. If any such notice be given, the election shall be by Ballot at the Annual Meeting, and the President shall appoint two or more Scrutineers from the Fellows present, not being Members of the Council, to superintend the Ballots and report the results to the Meeting. The Secretaries, assisted by the Treasurer, shall prepare a List of the Fellows entitled to vote, and each Fellow voting shall give his name to the Scrutineers to be marked on the said List, and shall then put his balloting lists into the respective glasses to be provided for such occasion.

7. Any balloting List containing a greater number of names proposed for any office than the number to be elected to such office, shall be wholly void, and be rejected by the Scrutineers.

8. No Ballot shall be taken unless nine or more Fellows shall be present.

9. If from any cause an election shall not take place of persons to fill the Council, or any of the offices aforesaid, then the election of the Council and Officers, or the election of Officers, as the case may be, shall be adjourned until the next convenient day, of which notice shall be given in like manner as is directed for the Annual Meeting.

1. The Transactions shall consist of such papers communicated to the Meetings of the Society as the Council shall order to be published therein.

2. The Transactions shall be published quarterly, and at such prices as the Council shall direct for each Part or Volume.

3. Authors of Memoirs published in the Transactions shall be allowed twenty-five copies of their communications gratis. If any additional number be required, the entire expense thereof shall be paid for by the Authors.

4. A Journal of Proceedings of the Society shall also be published, containing Abstracts of the Papers read and Notices of other Matters communicated at the Ordinary Meetings of the Society. The Proceedings shall be bound up with the Transactions.

Chap. XXI. Alteration of the Bye-Laws.

Any of the Bye-Laws of the Society may at any time be repealed or altered, or others adopted in lieu thereof, at a Special Meeting of the Society, to be held after a Notice given to the President and Council, signed by six Fellows at least, and specifying the intended repeal or alteration, has been read at three Ordinary Meetings of the Society.
THE SCHEDULE REFERRED TO IN CHAPTER XIX.

No. 1.

*Form of List for the Council.*

List of Members of the present Council recommended to be re-elected at the Election on the day of January, 18 —

| A. B. |
| C. D. |
| E. F. |
| G. H. |
| I. J. |
| K. L. |
| M. N. |
| O. P. |
| Q. R. |

List of Fellows recommended to be elected into the Council:

| S. T. |
| U. V. |
| W. X. |
| Y. Z. |

* If any of the Names in this List be objected to, they must be struck out before the Ballot, and other names, notified as provided by Sec. 4 of Chapter XIX. of the Society’s Bye-Laws, may be substituted in the blank spaces left for that purpose.
No. 2.

Form of List for the Officers.

List of Fellows recommended by the present Council to be appointed to the offices of President, Treasurer, Secretaries, and Librarian, at the Election on the day of January, 1818.*

President ..........Z. A.
Treasurer ..........Y. B.
Secretaries ..........X. C., W. D.
Librarian ..........V. E.

* If any of the Names in this List be objected to, they must be struck out before the Ballot, and other names, notified as provided by Sec. 4 of Chapter XIX. of the Society's Bye-Laws, may be substituted in the blank spaces left for that purpose.
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