

THE  
ENTOMOLOGIST'S ANNUAL.

FOR

MDCCLVIII.

1858

WITH A COLOURED PLATE.



LONDON:  
JOHN VAN VOORST, PATERNOSTER ROW.

MDCCLVIII.

*Price*]

[*Half-a-Crown* ..













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" Shall we not as well discern the riches of Nature's warehouse  
as the benefit of her shop ?"

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## P R E F A C E.



“WHY should he catch us? Does he live on moths?” was the pertinent question of *Pronuba* to *Fimbria's* assertion, that trees were *sugared* for a sinister purpose.

We have ourselves more than once been posed by the somewhat similar inquiry, when surrounded by the small fry which prevail in Charlton sand-pit and similar localities, “What do you catch 'em for? Are they good to eat?”

From which we gather that these inquisitive specimens of the human race and the loquacious *Pronuba* alike regard eating and drinking, as the “summum bonum;” that there is another kind of *pabulum*, namely, *food for the mind*, seems beyond the compass of their ideas.

The present volume of the Annual endeavours, like its predecessors, to furnish a varied repast for the Entomological palate; hence the papers are purposely constructed of variable scientific intensity, and embrace the four orders, LEPIDOPTERA, COLEOPTERA, HYMENOPTERA and NEUROPTERA; the collectors and students of the last group we fear are not numerous, but we trust to a gradual increase in

their ranks, as papers like that of Dr. Hagen's ought certainly to tend to such a consummation.

The numerous inquiries we receive each season from beginners respecting saw-fly larvæ, which they mistake for those of *Lepidopterous* larvæ, has led to the paper, by Mr. Westwood, "On the Larvæ of the Saw-flies," which will be read with interest by every Lepidopterist, though perhaps he may merely view it as a guide as to "what to avoid."

The notice of New Books has purposely been much compressed, as almost all the works therein mentioned have been already noticed in the "Intelligencer," and we fancy there are very few readers of the "Annual" who do not take in that weekly publication.

Professor Frey's notice of the Tineæ of the Higher Alps, though of course more specially interesting to the true Tinea-hunters, will attract attention from the bearing it has on the geographical distribution of species at various altitudes from the earth's surface; but the opening portion with the account of the ascent to the Alpine hunting-ground will, we believe, be found to the taste of every palate, so that the readers may be tempted to exclaim

"It's very kind

"Of that great creature to provide us food."

On the present occasion, we have reverted to the single *original* Edition. Though a few people had been clamorous

for a Library Edition, we found practically there was no call for it whatever, and the People's Shilling Edition has certainly not been appreciated in the way we had anticipated; no doubt the vast correspondence which is stimulated amongst Entomologists by the "Intelligencer" runs away with many of the "People's Pennies," and hence a gradual absorption in other Entomological channels of the "People's Shillings."

H. T. STANTON.

MOUNTSFIELD, LEWISHAM, S.E.,

*December 12th, 1857.*

## EXPLANATION OF PLATE.

- Fig. 1. *Læmoplæus Clematidis*, see page 73.  
2. *Laverna Phragmitella*, see page 110.  
3. *Coleoptera chalcogrammella*, see page 93.  
4. *Sciaphila cinctana*, see page 88.  
5. *Stathmopoda? Guerinii*, see page 152.  
6. *Acentropus niveus*, see page 102.  
7. *Dorcatoma flavicornis*, see page 75.  
8. *Euryusa Kirbyi*, see page 64.  
9. *Rhyncolus truncorum*, see page 75.



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“ If we knew how to use our boys, Martin would have been seized upon and educated as a Natural Philosopher. He had a passion for Birds, Beasts and Insects, and knew more of them and their habits than any one in Rugby; except perhaps the Doctor, who knew everything.”

*Tom Brown's School Days, p. 275.*

## DO YOU STUDY ENTOMOLOGY?

(BY THE EDITOR.)



“WHAT a question!” exclaims some reader. “Dear me, no! I catch insects, and like the fun of the thing, but I never thought of making it a *study*.”

“What a bore!” exclaims another, “to talk of *studying* Entomology; why I took it up as a relief from my studies.”

“Oh!” says a third, “it’s all very well for big-wigs to make a *study* of insects; it may answer their purposes to do so, but it wo’nt answer mine. At any rate, Entomology is a more intellectual pursuit than partridge shooting, without bothering one to probe into the very arcana of science.”

“I am very sorry,” says a fourth, “but I can’t *study*; it always gives me a headache. My doctor tells me I mustn’t do anything that requires close application.”

Need we go further to cite the excuses which almost every individual who reads these pages will suggest to himself, in order to show how it is utterly, morally and physically impossible that *he* should *study* Entomology!

Is Entomology worthy of being studied? Perhaps every reader will be disposed to say, “It is:” though quite ready to give some excellent reason why he should be excused. “What is every body’s business is nobody’s business;” hence apparently it is that nobody (or almost nobody) takes to the *study* of Entomology.

Some kind friend suggests we are too sweeping in our denunciation of this idle, frivolous and degenerate age. Too sweeping? It is impossible.

We have for some time been occupied in sounding with a plummet the depth of the Entomological minds of the country, and lo, what do we find! Such an amount of shallowness, laziness and unwillingness to study as is really appalling. Whatever appliances have been brought forth to facilitate the study of Entomology, we continually receive applications, again and again reiterated, to furnish something easier and simpler still. The Entomological digestion cannot dispose of meat; that we had anticipated, and had accordingly offered it bread and milk, but lo, it clamours for pap! This is really too bad: we turn a disgusted ear to the whining cry, and take up the pen to rate right soundly this grumbling spirit.

Study requires attention, diligence and application.

Attention: to concentrate the attention on the subject before us, to keep our thoughts from wandering, and to take in and understand what we are reading, not skimming over the pages, only half taking in the sense of the writer (as you, gentle reader, have just this moment been doing), is imperatively required of all who wish to study.

Diligence: the subject of study must be taken up repeatedly; it must not be looked at only once a week, as a sort of penance. "There, now, I have done my lesson, no more till next week," is not the way to profit by our lessons; they must be turned to *con amore*, and looked on as a "labour of love."

Application: when you have been studying for some little time, and find the fresh vigour of the mind has worn off, don't put the book away and think you have done enough; stick to it a little longer, force the rebellious, lazy intellect to

do a little more work ; you will find that day by day it will become less rebellious and more obedient to your wishes, and you will reap the benefit of the continued application.

To what does all this tend ? Well, we don't want people to leave off asking questions, but we want them to leave off asking stupid questions. Nine-tenths of the inquiries we get are simply questions by lazy people who are too idle to take the trouble to find out the answers for themselves. It is very convenient when you can get another person to think for you ; what a world of trouble it saves ! But a person who is too lazy to find out the answer to some question, which he would probably meet with in some of the Entomological works which he assures us he has on his bookshelf (though, by the way, they might just as well have been left in the bookseller's shop, for the little use he appears to have made of them), is hardly likely to profit by our reply, and, if treated as he deserves, should be told to "read and he will know."

Entomologists are —. Well, we won't be too severe ; but seriously, is there not something utterly wrong in the amount of apparent votaries of the science and the little progress it makes. It is more than twelve months ago since we inquired, "Who bids for the Bugs ?" Several have complimented us on the tone of this inquiry, but no one has bid ! Fancy an auctioneer complimented by his audience on his George Robins' style of oratory, yet who failed to get a single offer ! Surely, he would rather have bids than compliments !

When we survey the number of juveniles who will read these pages—and a correspondent has reminded us that "*boys* are the raw material out of which *men* are made"—surely, we must needs think that *some one* will feel his

spirit stirred within him, and that he will be incited to a more *studious* Entomological career : perhaps, however, his good resolutions will all have evaporated before the morrow.

No doubt it is felt by some as a difficulty that they have no Entomological examinations to undergo : a Westwood and a Newman may keep each other mutually up to the mark, for if either makes a blunder, the other pounces on it and parades it with great glee, as if it were a grand prize, but the mass feel that their blunders are devoid of this intrinsic value, and probably think that if they had a few examinations, a sort of little-go and great-go in Entomology, it would enable them to take more interest in it as a study ; but judging from what one sees at present, it would only be about once in ten years that any one would be found going in for his "great-go," so poor is the crop of first-class Entomological students.

Another difficulty is that many of our younger readers have no personal acquaintance with older Entomologists ; they are in fact studying "without a master," and that class of studies is very apt soon to degenerate so much as to be no longer worthy of the name of study. It is only a few of peculiarly persevering habits who are likely to examine themselves thoroughly, to see clearly for their own satisfaction what they have learned and what they have only skimmed over.

"What is to be done?" some of our readers of course exclaim, and expect we are going to enter into a full and detailed explanation. In this they will be disappointed : we are content with calling attention to the disease, leaving to each person to find out and apply the remedy which in his case will be most beneficial ; if we prescribed they would think they had only to try our prescription and to find it

didn't answer, and of course the lazy ones would soon find that, and then they would think they need take no further trouble.

Some who have been purring very complacently over these pages would perhaps wish us to specify more particularly what class of our readers we are attacking; of course they conceive themselves exempted, and have been pleasantly passing on all our castigations to their neighbours.

Now these remarks are intended especially to apply to all those (a pretty numerous class, too) who think they don't need them; the true worker is always painfully aware of his short-comings, and is always feeling that he neither works long enough, well enough, nor with sufficient vigour and determination. The lazy, on the contrary, are often half appalled at the amount of work they think *they have done*, so that of course those who need the castigation most will be the readiest to pass it over to their friends.

We are perfectly aware that it is far pleasanter to apply a lecture to a neighbour than to ourselves, but then our applying it to our neighbour does him no good, whilst at the same time it fosters our vanity and self-conceit, already inordinate enough, in all conscience; and the joke of the thing is, that at the very same time our neighbour is applying all the self-same lecture *to us*. It is astonishing how ready we all are to think *other people* would be the better for a little good advice!

Our complaint is this, that hardly one collector in a hundred thinks of *studying* Entomology, and not one in ten of those who do makes anything out of his studies. Can this be a satisfactory state of things?

Of course our views of the existing race of Entomologists are founded very much on our own experience. There may

be contemplative, quiet students, who trouble us with no letters, because they solve all their own problems; and it would be to us a real pleasure to find that half a dozen such good men and true existed, though hitherto unknown to us: true merit is ever modest, and so these Entomological philosophers may be shy of obtruding themselves upon us and upon the public.



SECOND SUPPLEMENTAL LIST  
OF  
BRITISH ENTOMOLOGISTS.  
(BY THE EDITOR.)

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HAVING given, in the Annual of 1856, a List of British Entomologists, and in last year's Annual a Supplemental List, we now give a Second Supplemental List. Many of the names are those of Entomologists who are no incipients, but have been collecting for many years quietly. We have been assured by one Entomologist that he has found the Lists of great service in enabling him to decypher the almost illegible signatures and addresses of his Entomological correspondents. We are sorry to hear there is so much bad writing abroad; more pains ought to be taken to write distinctly.

The following alterations have taken place in the Address or Title of the Entomologists enumerated in our previous Lists:—

CHANGES OF ADDRESS.

Braim, John, *Densbury Moor, Densbury, Yorkshire.*

Brockholes, J. F., *16, Cleveland Street, Birkenhead.*

Chapman, Thos., *Bothwell Street, Glasgow.*

Chappell, J., *17, Franchise Terrace, Pendleton, near Manchester.*

Clark, Rev. Hamlet, *33a, Red Lion Square, Holborn.*

Clarke, A. H., *18, Kensington Park Gardens, Notting Hill.*

Colquhoun, Hugh, M. D., *16, Grosvenor Terrace, Glasgow.*

- Cooke, Nicholas, *Spring View, Liscard, Cheshire.*  
 Crotch, G. R., *Uphill House, Weston-super-Mare.*  
 Crotch, W. D., *Uphill House, Weston-super-Mare.*  
 Crump, T. L., *Winchcomb, Gloucestershire.*  
 Drane, Robert, *11, Bute Street, Cardiff.*  
 Gibbs, H. F., *27, Upper Manor Street, Chelsea.*  
 Greene, Rev. Jos., *32, Lower Pembroke Street, Dublin.*  
 Hodgkinson, J. B., *30, Fishergate Hill, Preston.*  
 Hunter, John, *16, Robert Street, Hampstead Road.*  
 Jordan, Dr., *Springgrove Terrace, Edgbaston, Birmingham.*  
 King, George, *158, Higher Union Street, Torquay, Devon.*  
 Reading, J. J., *11, Ham Street, Plymouth.*  
 Reeve, G. W., *Forest House, Woodford Wells, Essex.*  
 Scott, John, *Southfield Villas, Middlesbro'-on-Tees.*  
 Shield, Richard, *8, Alpha Place, Angler's Lane, Kentish Town.*  
 Smith, W. H., *County Court Office, Nottingham.*  
 Tearle, Rev. F., *Grammar School, Kettering.*  
 Thomas, J. P. jun., *7, Montague Place, Islington.*  
 Thompson, W., *4, Dutton's Buildings, Mill Street, Crewe.*  
 Tompkins, Henry, *44, Guildford Street, Russell Square.*  
 Weir, J. Jenner, *6, Haddo Villas, Blackheath.*

#### CHANGES OF TITLE, &C.

- Beale, Rev. S. C. Tress, *Alkham, near Dover.*  
 Crozier, Lieut. H. D., *Royal Engineers, Brompton Barracks, Chatham.*  
 Fuller, Rev. A., *Kirk Hallam, Ilkeston, Notts.*

Erratum in last year's Annual, p. 23:

for Peckover, Algernon, Wisbech;  
 read Peckover, Alexander, Wisbech.

## SUPPLEMENTAL LIST OF BRITISH ENTOMOLOGISTS.

- ALLCHIN, Dr. W. H., 7, Pembridge Villas, Bayswater. *British Lepidoptera.*
- ALMOND, F., Bedern Bank, Ripon, Yorkshire. *British Lepidoptera.*
- ANDERSON, ROBERT, St. Martin's Le Grand, Coney Street, York. *British Lepidoptera.*
- ANDREW, C. H., 129, High Street, Cheltenham.
- ATKINS, T. W., High Street, Poole. *British Lepidoptera, &c.*
- BACKHOUSE, WILLIAM, Shotley Bridge, near Gateshead. *British Lepidoptera.*
- BAILY, W. A., Cirencester.
- BAKER, J., 25, Trumpington Street, Cambridge.
- BARTON, Lieut. Robert, R. E., Stonehouse, Donnybrook, Ireland. *Lepidoptera.*
- BATTERSBY, H. W., Oakfield, Torquay. *British Lepidoptera.*
- BATTY, JAMES, 133, South Street, Park, Sheffield. *British Lepidoptera.*
- BAYLIE, W. E., Longfleet, near the Turnpike, Poole, Dorsetshire. *British Lepidoptera.*
- BEDFORD, T., Appleby, Westmoreland. *British Lepidoptera.*
- BERRIDGE, E. W., Buttermarket, Ipswich. *British Lepidoptera and Coleoptera.*
- BEWLEY, Rev. F., Ballymoney, Co. Antrim, Ireland. *Irish Lepidoptera and Coleoptera.*
- BISHOP, H. S., 1, Catherine Street, Plymouth. *British Lepidoptera.*
- BLANDY, C. J., Mill Lane, Reading. *British Lepidoptera.*
- BLANDY, J. F., Mill Lane, Reading. *British Lepidoptera.*
- BOCKETT, Rev. B. BRADNEY, Vicarage, Epsom. *British Lepidoptera.*
- BODDY, G., 3, Bridge Road, Hammersmith. *British Coleoptera and Lepidoptera.*
- BONNEY, E. S., Churchdale House, Rugeley. *British Lepidoptera.*
- BONNEY, F., Marlborough College, Wilts. *British Lepidoptera.*
- BONNEY, Rev. T. G., 3, Great College Street, Westminster. *British Lepidoptera.*
- BRADLEY, FRANCIS, Thompson's Square, Portobello Street, Sheffield, Secretary to the Sheffield Entomological Society. *British Lepidoptera.*

- BROWN, D. E., 11, St. John's Street, Longsight, Manchester.
- BROWN, J., Westgate, Ripon, Yorkshire. *British Lepidoptera.*
- BRYANT, F. C., Plymouth. *British Lepidoptera.*
- BURNAND, W. W., High Street, Poole, *British Lepidoptera.*
- BURNS, ROBERT, 63, Edmond Street, Birmingham.
- CAIRNES, W., Head of Church Street, Durham. *British Lepidoptera.*
- CANHAM, G. W., 28, Osborne Terrace, Kennington (S. W.). *British Lepidoptera.*
- CASH, WILLIAM, at Mr. Oddy's, Delph Street, Halifax.
- CHALLIS, CHARLES ED., 2, Old Cambridge Terrace, South Lambeth (S.).  
*Lepidoptera.*
- CHURCHILL, J., West Street, Poole, Dorsetshire. *British Lepidoptera.*
- CLARKE, MRS. L. L., Woodeaton Rectory, Oxford. *British Diptera.*
- CLEMENTS, THOMAS, 11, Brandon Street, Bermondsey New Road.
- COOPER, SIDNEY, Stone Bridge, Tottenham. *British Lepidoptera.*
- COOPER, WALTER E., 21, Burton Terrace, York. *British Lepidoptera.*
- CRANSTONE, JOSEPH, 32, Claverton Street, Widcombe, Bath. *British Lepidoptera.*
- CROWTHER, JAMES, Sister Lane, Halifax.
- CUBITT, CHARLES, Denbies, Dorking. *British Lepidoptera.*
- DE LA CHAUMETTE, F. T., 9, Gloucester Terrace, West Green Road, Tottenham.
- DIGBY, HENRY SOMERVILLE, Trinity Hall, Cambridge. *Coleoptera of whole world.*
- DONE, Master JOHN, J. Hickman's, Esq., Brockton, near Worthen, Salop.
- D'ORVILLE, H., Alphington, near Exeter. *British Lepidoptera.*
- DOVE, WILLIAM, 28, Cross Street, Green Street, Bethnal Green. *British Lepidoptera; also purchases insects for sale.*
- DRAKEFORD, JOHN, Bromsgrove Street, Birmingham. *British Lepidoptera.*
- EATON, JAMES, Friar Gate, Derby.
- ENTWISTLE, HENRY, Burnden, Great Lever, Lancashire. *British Lepidoptera.*
- FAWCETT, J. K., House of Correction, Kendal. *British Lepidoptera.*
- FLATMAN, JAMES, Little Waltham, Chelmsford. *British Lepidoptera.*
- FRY, G. T., 29, York Street, Plymouth. *British Lepidoptera.*

- FRY, HUBERT, 18, Medina Villas, Cliftonville, Brighton. *British Lepidoptera.*
- GALLOWAY, A., Birr Castle, Parsonstown, King's County, Ireland. *British Lepidoptera.*
- GARNER, ROBERT, F. L. S., Stoke-upon-Trent.
- GIBSON, W. G., 75, High Street, Dumfries, N. B. *British Lepidoptera.*
- GLOYNE, C., Jun., 5, Terrace, Kensington (W.). *Coleoptera.*
- GOLDNEY, GEORGE, Slough, Bucks. *British Lepidoptera.*
- GORHAM, H. S., 10, Alfred Street, Montpelier Square, Brompton. *British Lepidoptera.*
- GREENFIELD, J. T., Shirley, Southampton. *British Lepidoptera.*
- GRENFELL, J. G., Rugby. *British Lepidoptera.*
- GRIFFITH, J. R., Brighton College, Brighton. *British Lepidoptera.*
- GROGGINS, JAMES, Port Road, Caldergate, Carlisle. *British Lepidoptera.*
- GROOM, CHARLES OTTLEY, 18, Nova Villas, Cliftonville, Brighton. *British Insects, Arachnida and Crustacea.*
- GWATKIN, R. L., The Park, Millbrooke, near Southampton. *British Lepidoptera and Coleoptera.*
- GWYNNE, H. A., Richmond Villa, St. John's Wood, London. *British Lepidoptera.*
- HALL, THOMAS, 75, London Wall, City.
- HARDS, H. ROBINSON, Royal Victoria Mill, Dartford. *British Lepidoptera.*
- HARRISON, THOMAS, 48, Rochdale Road, Manchester. *British Lepidoptera.*
- HARVEY, A. S., 4, Sussex Place, Southampton. *British Lepidoptera.*
- HARVEY, ROBERT, 4, Sussex Place, Southampton. *British Lepidoptera.*
- HARWOOD, W. H., St. Peter's Street, Colchester. *British Lepidoptera.*
- HASTINGS, SYDNEY, Weston Grove, Thames Ditton, Surrey, and 14, Albenmarle Street, London. *British Lepidoptera.*
- HAWARD, ALFRED, Eagle Cottage, Gloucester Road, Croydon Common. *British Coleoptera.*
- HAY, Master ALEX. JOHN, Uckfield, Sussex. *British Lepidoptera.*
- HAYDEN, Rev. F. W., Skelton Rectory, York.
- HELLINS, Rev. J., St. David's Hill, Exeter. *British Lepidoptera.*
- HERTSLET, J. G., 19, Grove Place, Brompton. *British Lepidoptera.*
- HICKS, W., Cricket Inn, near Sheffield. *British Lepidoptera.*
- HILL, Master MATTHEW, Little Eaton, near Derby. *British Lepidoptera.*

- HIND, J. R., 22, Grove Road, St. John's Wood. *British Lepidoptera and European Rhopalocera.*
- HIND, ROBERT, 24, Gillygate, York. *British Lepidoptera.*
- HODGKINSON, THOMAS, Grey Stone, off London Road, Carlisle.
- HUDSON, GEORGE, 27, Stansfield Row, Burley, near Leeds.
- HUME, W., 20, Victoria Road, Kentish Town.
- HUNTER, Miss, of Thurston, Dunbar, N. B.
- INGALL, W., 2, Altorf Cottages, Loughborough Road, Brixton. *British Insects.*
- INGLE, T. W. B., 4, Commercial Street, Huddersfield. *British Lepidoptera.*
- ISAAC, J. C., 10, East Street, Stonehouse. *British Lepidoptera.*
- JAZDOWSKI, BRONISLAS, 120, Crown Street, Aberdeen. *British Lepidoptera.*
- JENNER, HERBERT, Jun., The Limes, Carshalton, Surrey. *British Lepidoptera.*
- JERRARD, F., Long Stratton, Norfolk.
- JOHNSON, E. R., Woodlands, Sidmouth, Devon. *British Lepidoptera.*
- JOHNSON, F. P., Woodlands, Sidmouth, Devon. *British Lepidoptera.*
- JOHNSON, W., 1, Coronation Square, Gas Street, Great Bolton, Lancashire. *British Lepidoptera.*
- JORDAN, WM. JAS., Commercial Schools, Ilminster, Somerset.
- KELSALL, THOS., 21, Franchise Terrace, Pendleton, near Manchester. *British Lepidoptera and Coleoptera.*
- KEMP, J. E., 12, Portland Street, Cheltenham. *British Lepidoptera.*
- KENT, HENRY, 31, Willow Walk, Bermondsey. *British Lepidoptera.*
- KIDD, R. C., Edrom House (Ayton), Berwickshire. *British Lepidoptera.*
- KILLINGBECK, JAMES, Wesleyan Schools, Selby. *British Lepidoptera.*
- KING, JOSIAH, Lankford Road, Biggleswade.
- KIRBY, REV. H., Great Waldingfield, Sudbury, Suffolk. *British Lepidoptera and Coleoptera.*
- KNAGGS, H. G., 1, Maldon Place, Prince of Wales' Road, Kentish Town. *British Lepidoptera.*
- KNAPP, W. H., 21, Lampeter Street, Islington. *British Coleoptera.*
- LAING, JAMES ARTHUR, 1, Haddo Villas, Blackheath. *British Lepidoptera.*

- LAMB, JAMES, 7, King Street, Perth. *British Lepidoptera.*
- LANGLEY, W., B.A., Ganarew, Monmouth (Bishop Cosins' Hall, Durham, during Term time). *British Lepidoptera.*
- LATCHMORE, F., 75, High Street, Strood, Kent. *British Lepidoptera.*
- LATTIMER, J., Corporation Road, Carlisle. *British Lepidoptera.*
- LAWSON, REV. E., Little Barford Rectory, St. Neot's.
- LEWIS, GEORGE, 6, Kidbrooke Terrace, Blackheath, S.E. *British Coleoptera.*
- LINNELL, THOMAS, Redstone Wood, near Reigate, Surrey. *British Coleoptera and Lepidoptera.*
- LINTON, CHARLES, 5, Europa Place, John's Row, St. Luke's. *British Lepidoptera.*
- LIVERSIDGE, WILLIAM, 35, Stansfield Row, Burley, Leeds.
- MACDONALD, S. R., The Villa, Castle Cary, Somersetshire. *British Lepidoptera and Neuroptera.*
- M'LACHLAN, J., Hethersett, near Wymondham, Norfolk.
- M'LACHLAN, ROBERT, 1, Park Road Terrace, Forest Hill, S.E. *British Lepidoptera.*
- MAILER, DANIEL, New Road, Town Head, Auchterarder, Perthshire.
- MAIN, JAMES, Port Road, Carlisle. *British Lepidoptera.*
- MARSTON, G., Bedern Bank, Ripon, Yorkshire. *British Lepidoptera.*
- MASON, ANTHONY, Grange, Ulverston. *British Lepidoptera.*
- MELDRUM, T., Millgate, Ripon, Yorkshire. *British Lepidoptera.*
- MERRIMAN, H. H., 4, Kensington Square, W.
- MERRIN, JOS., 1, Caroline Villas, Falkner Street, Gloucester. *British Lepidoptera.*
- MILLER, EDW., Jun., Bank, Wellington, Somerset.
- MOIR, DAVID, Hilldowntree, Bauchory Devenick, N.B. *British Lepidoptera.*
- MOON, J. F., Hanover House, Ryde, Isle of Wight. *British Lepidoptera.*
- MOORE, BENJAMIN J., Union Terrace, York.
- MORGAN, W., 27, Emma Street, Cambridge Heath, Hackney. *British Lepidoptera.*
- MORLEY, GEORGE, 4, Pleasant Row, Wellington Street, Camberwell. *British Lepidoptera.*
- MORRIS, WILLIAM, Kent Water-works, Deptford. *British Lepidoptera.*
- MORTON, EDWARD, Ripon, Yorkshire.
- MULLINS, Master E. HERBERT, Corsham, Wilts. *British Lepidoptera.*

- NICHOLLS, H., 12, Rydon Street, New North Road, Islington (N.).  
*British Lepidoptera.*
- OLDHAM, F. H., Market Place, Mansfield, Notts.
- OWEN, JAMES, Horwich, near Bolton-le-Moors, Lancashire.
- PAGE, F., Jun., Newmarket, Cambridgeshire. *British Lepidoptera.*
- PERKINS, C. M., Wootton-under-Edge. *British Lepidoptera.*
- PERKINS, V. R., 9, Staple Inn, Holborn. *British Lepidoptera.*
- PICKERING, WILLIAM, 24, Burnden; near Bolton, Lancashire. *British Lepidoptera.*
- PIFFARD, B., White Swan, Epping. *British Lepidoptera.*
- PORTER, JOHN, Jun., 8, East Street, Lewes. *British Lepidoptera.*
- POTTER, JOHN, 37, St. Mary Street, Woolwich. *British Lepidoptera.*
- PRATT, JOHN and HENRY, 35, Duke Street, Brighton.
- PRESCOTT, W., 40, Mount Street, Salford.
- PREST, WILLIAM, 7, Castlegate, York. *British Lepidoptera.*
- PRIME, J., 17, Coronation Street, New Town, Cambridge.
- PRYER, WILLIAM, Grafton Villas, Kentish Town (N.W.).
- PYLE, G., Amesbury, Wilts. *British Lepidoptera.*
- RAWLINSON, W. G., Taunton, Somersetshire. *British Lepidoptera.*
- REYNOLDS, R. S., Mansfield. *British Lepidoptera and Coleoptera.*
- ROBERTS, L., Rosehill, Bideford, North Devon. *British Lepidoptera.*
- ROBERTS, T. VAUGHAN, Solicitor, Oswestry.
- ROGERS, B., Marden, near Devizes, Wilts. *British Lepidoptera.*
- ROGERS, H., Freshwater, Isle of Wight. *Collects for sale.*
- ROTHWELL, RICHARD, Bullfield, Gas Street, Great Bolton, Lancashire.  
*British Lepidoptera and Coleoptera.*
- RUFFLE, G. W. H., 21, Princess Road, Kennington Cross, Lambeth (S.).
- RUSSELL, A., Ashford. *British Lepidoptera.*
- RYE, E. C., 14, King's Parade, Chelsea (S. W.).
- SAGE, THOMAS, 3, West Street, Cambridge Heath, Hackney. *British Lepidoptera.*
- SANDERS, JOHN, Eastover, Bridgwater. *British Lepidoptera.*
- SAUNDERS, SYDNEY J., 104, London Wall (E.C.). *British Coleoptera and Lepidoptera.*
- SAYER, JOHN, 4, Martha Street, Haggerstone. *British Lepidoptera.*



- SCOTT, HENRY, Eaves Lane, Chorley, Lancashire.
- SELLWOOD, Rev. JOHN BINFORD, Woodhayne, Combe Raleigh, near Honiton, Devon. *British Lepidoptera.*
- SERGEANT, LEWIS, Boston Spa, Tadcaster. *British Lepidoptera.*
- SIMS, C., 5, Pomeroy Street, New Cross (S. E.).
- SKEELS, S. C., Little Waltham, Chelmsford. *British Lepidoptera.*
- SMITH, JOHN, 25, Booth Street, Salford. *British Lepidoptera.*
- SMITH, W. H., County Court Office, Nottingham. *British Lepidoptera and Coleoptera.*
- STANDISH, F. O., 2, Alfred Cottages, Warner Road, Camberwell.
- STEPHENSON, HENRY, 63, Chorley Street, Little Bolton, Lancashire. *British Lepidoptera.*
- STEVENS, JOSEPH, Upper Richmond Road, Wandsworth. *British Lepidoptera.*
- STOCKDALE, Master ERNEST, Linwood Rectory, Wragby. *British Lepidoptera.*
- STOKES, JAMES, 1, Thanet Street, Burton Crescent, London. *British Coleoptera.*
- STUBBS, H. J., Henley-on-Thames. *British Lepidoptera.*
- STURGESS, W., Kettering. *British Lepidoptera.*
- SUTCLIFFE, JOSEPH, Warley, Halifax.
- TALES, WILLIAM, 2, Windsor Street, Putney. *British Lepidoptera and Coleoptera.*
- TAVERNER, HENRY THOMAS, 7, Savile Row, Mile End Road.
- TAYLOR, D. R., 4, Alpha Cottages, New Road, Hammersmith. *British Lepidoptera, Coleoptera and Hymenoptera.*
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- TAYLOR, W. H., Tolson Street, Sunny Bank. *British Lepidoptera.*
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- THOMSON, Master CHARLES, Frisby, Leicester. *British Lepidoptera.*
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- THORNE, J., 12, Morpeth Street, Green Street, Bethnal Green. *Insect Cabinet Maker, Dealer and Collector of all Orders.*
- TIDY, LEWIS, 16, Crown Gardens, Brighton. *British Lepidoptera.*
- TILLY, J. H., 3, Bernard Street, Regent's Park North, London. *British Lepidoptera.*
- TROTTER, JAMES, 308, High Street, Perth. *British Lepidoptera.*

- TRYE, R. E., Leckhampton Court, near Cheltenham. *British Lepidoptera.*
- TUDSBURY, R., Jun., Edwinstowe, Ollerton, Notts. *British Lepidoptera.*
- TURNER, EDWIN, Lostock Hall, near Bolton-le-Moors, Lancashire.
- TURNER, W. C., 33, Bermondsey Square, Southwark. *British Lepidoptera.*
- TUTIN, J. HASLEDINE, M.R.C.S., A.K.C., Ripon, Yorkshire.
- TYRER, R., Jun., Row Lane, Southport, Lancashire. *British Lepidoptera and Coleoptera.*
- TYSSEN, AMHERST, Manor House, Hackney. *British Lepidoptera.*
- TYSSEN, RIDLEY, Manor House, Hackney. *British Lepidoptera.*
- VALENTINE, W. H., Somerton, Somersetshire. *British Lepidoptera.*
- WADHAM, A., 14, High Street, Barnstaple. *British Lepidoptera.*
- WARD, CHRISTOPHER, Horton Street, Halifax.
- WATKINS, W., Agincourt Square, Monmouth. *British Lepidoptera. No longer collects.*
- WHEELER, E., 1, Promenade Place, Cheltenham. *British Lepidoptera.*
- WILLETTS, HENRY, 63, Edmond Street, Birmingham.
- WILLIS, T. W. B., Wick Episcopi, near Worcester. *British Lepidoptera.*
- WINTER, WILLIAM, Ranworth, Blofield, Norfolk. *British Insects of all Orders, except Hymenoptera; also collects for Entomologists.*
- WOOD, C., Dulwich Common. *British Lepidoptera.*
- YOUNG, S. W., 12, Portland Street, Cheltenham. *British Coleoptera and Lepidoptera.*
- ZACHARY, HENRY, Jun., Cirencester.

## NEUROPTERA.



## SYNOPSIS OF THE BRITISH PLANIPENNES.

BY DR. HAGEN.

THE following synoptical attempt contains the whole of the true *Neuroptera*, excepting the *Phryganidæ*; consequently all the *Neuroptera*, with complete metamorphoses. The *Phryganidæ*, being the family in which the separation of the species is most difficult, is held back to allow time for a thorough examination of the types of Mr. Curtis and M. Pictet. I have only introduced in the following synopsis those species of which I have seen in British collections authentic British specimens. The given number of species may be considered as comparatively large, since the published lists for the other countries of Europe give smaller numbers. It is true that the British Fauna has been more thoroughly investigated, and there are but a few countries (Sweden, Austria), or even provinces, for which there exist complete notices on all the Neuropterous families, as those by Wesmael, Schummel, Schneider, Brauer. Nevertheless, it may be anticipated with certainty that, by close research, the number of the British *Neuroptera* may yet be considerably increased. From the peculiar curve of the isothermal lines, as is well known, species which in Provence, and which are unknown in

the interior of France, are again met with in the south west of England and south of Ireland. On the other hand, the north of Scotland produces nearly all the known Scandinavian, and even some of the Arctic species. On looking through the present synopsis, we find no southern species, and yet where *Cordulia Curtisii* and *Agrion tenellum* fly their southern consorts *must* occur. I have called attention to the probable occurrence of *Bittacus Italicus* in England; it is so like a *Tipula* that it has probably always been overlooked on that account, although the presence of four wings easily distinguishes it. That *Myrmeleon*—and probably more than one species—occurs in England, appears to me very probable, in spite of all assurances to the contrary, and I hope that careful search will be made for these remarkable insects in particular. Indeed, without extravagance, we might go further still. I even expect that one species of *Ascalaphus* (perhaps *A. longicornis*) will some day come to light; I should not be surprised, if the remarkable *Mantispa pagana* were to be met with in the south west, and I do not consider it beyond a possibility that Southern Ireland may possess the extraordinary *Nemoptera Lusitanica*. Of the remaining genera, it may be anticipated with certainty that the genera *Chrysopa*, *Hemerobius* and *Raphidia* will all have more indigenous species to be added to them. If it is wished to investigate these genera further, of all methods of capture, the best, according to my experience, is to beat into an umbrella. Most species are nocturnal insects of prey, and, therefore, are not often exposed to view. The best trees to beat are pines and firs, and after them oak. It must be expressly noticed, that the characters given are only applicable to the determination of the *British* species, and the synonymy given does not aim at completeness. I have throughout selected only

those references which were absolutely necessary to elucidate the species.

As in the Synopsis (last year) of the British Dragon flies, the characters of several species not yet found in Britain are given, in order to facilitate the naming of new British species by those who may meet with them. These probable British species have no numeral prefixed to their names, which are printed in *Italics*, not in CAPITALS.

### PLANIPENNES.

Mandibles completely developed; under lip rounded, not cleft; tarsi five-jointed; the veins only hairy, the membrane of the wing never. Metamorphosis complete, larvæ generally carnivorous.

#### Family I. HEMEROBIDÆ.

Wings deflexed; the subcosta parallel to the costa, but never united with it; labial palpi three-jointed; anal area wanting.

Larva with sucking apparatus, always carnivorous.

Pupa reposing in a cocoon till its final transformation.

1. Antennæ short, with clubbed tip. Sub-family MYRMELEONIDÆ.

#### Genus MYRMELEON, Linné.

According to Stephens (Illustrations, Mand. vi. p. 98), the ant-lions are wanting in the British Fauna, although Barbut counts *M. formicarius* as indigenous. In the collections of British insects I have examined, I have never met with this genus. Nevertheless, we may assume as almost certain that at least two species will be found in Britain, and probably more. The perfect insects being nocturnal, and bad fliers, are easily overlooked; the larva is always very local, and easily escapes discovery. Fir woods

on sandy places are their favourite resort. The two following species occur in Belgium and France:—

*Myrmeleon formicarius*, L., Burm. ii. 996, 15.

Exp. 26 lin.

Brown; thorax spotted with yellow; tarsi with pale annulations; fore wings with a white stigma and black spots; hind wings with two black spots on the costa.

*M. formicalynx*, Burm. ii. 994, 4.

Exp. 26 lin.

Brown; thorax with pale border; wings unspotted, with a white stigma.

2. Antennæ long, the tip not thickened. Sub-family  
HEMEROBIDÆ.

A. The veins in the marginal area of the fore wings which are nearest to the thorax are straight, and do not ramify.

a. Ocelli visible.

### Genus OSMYLUS, Latreille.

The larva lives partly in water; cocoon of irregular form, of spun silk. (See Linnæa Entomologica, vii.)

1. OSMYLUS CHRYSOPS, L.; *O. maculatus*, St.; C.

Exp. 19 lin.

Brown; head reddish; tarsi yellowish; wings spotted with black; the fore wings most so on the hinder margin, the hind wings most near the costa.

Habitat England, local, in June. This pretty insect appears to prefer stony, rapid streams which are fringed with alders.

- b. Ocelli wanting.  
 † Antennæ filiform.

Genus CHRYSOPA, Leach.

Larva aphidivorous; cocoon of the form of a barrel, of thick spun silk.

\* Upper lip rounded in front.

§ The partition vein of the third cubital cell does not reach the adjoining cell.

2. CHRYSOPA VULGARIS, Schn. Mon. 68, 2; Walk.; *C. perla*, Wesm.; *C. cornea*, St. 103, 7; C.; *C. alba*, St. 104, 9; C.; *C. affinis*, St. 104, 11; C.

Exp. 12 lin.

Sap-green; thorax and abdomen with a yellow line down the middle; face on each side with three reddish streaks; wings narrow and pointed; *the veins in the third cubital cell easily distinguishes this species from all others.* The specimens which come forth in autumn or winter are more or less reddish.

Habitat England, Scotland. Common in June.

§§ The partition vein of the third cubital cell reaches to the adjoining cell.

¶ The second joint of the antennæ unspotted.

3. *C. FLAVA*, Scopoli; *C. vittata*, Schn. Mon. 65, 1; Walk.; *C. subfalcata*, St. 105, 13; C.

Exp. 16 lin.

Sap-green; thorax and abdomen with a yellow line down the middle; the first joint of the antennæ shorter than the head; *the costa of the wings strongly excised.*

Habitat London, in June, sparingly.

4. *C. VITTATA*, Wesmæl; *C. integra*, Hag.; *C. perla*, St. 105, 12; C.

Exp. 21 lin.

Sap-green; *the first joint of the antennæ longer than the head*; the costa of the wings not excised; wings broad, some of the basal nervures brownish.

Habitat England, Scotland, common.

5. *C. ALBA*, L. Schn. Mon. 77, 7.

Exp. 14 lin.

Pale greenish-white; *head small*, unspotted, wings with numerous black, long-haired, transverse veins; *eyes during life dark coppery*, not golden.

Habitat England. In the collection of the British Museum.

6. *C. ANGUSTIPENNIS*, St. 104, 10; *C.*; *C. Heydenii*, Schn.?

Exp. 15 lin.

Pale-green, unspotted; wings narrow, long, with some brown transverse veins.

Habitat England, in June.

I am not clear about this species; the types of *Heydenii* seem different, so that this species appears to be wanting with the Continental authors.

7. *C. FLAVIFRONS*, Brauer, Mon. 6, 3.

Exp. 16 lin.

Pale blue-green; head unspotted; antennæ as long as the wings; *prothorax with two S-shaped red spots*; the numerous transverse veins black.

Habitat England. In the collection of the British Museum.

8 ? *C. TENELLA*, Schn.; Mon. 94, 19.

Exp. 10 lin.

Pale green; face spotted with black at the sides;



*wings narrow, pointed, the transverse veins in the marginal area strongly spotted with black.*

Habitat England. A doubtful specimen in the collection of the British Museum.

9. *C. 7-PUNCTATA*, Wesm. ; Schn. Mon. 101, 24.

Exp. 18 lin.

Sap-green ; face spotted with black at the sides and *between the antennæ* ; prothorax black in front at the sides ; wing-veins dark green, a number of the transverse veins black ; antennæ shorter than the wings.

Habitat England. In the collection of the British Museum.

10. *C. ASPERSA*, Wesm. ; Schn. Mon. 112, 31 ; *C. ventralis*, St. (partim).

Exp. 16 lin.

Pale green ; face spotted with black at the sides and *between the antennæ* ; *palpi black, with pale annulations* ; *prothorax with four black spots* ; transverse veins in the marginal area with a black dot at each end.

Habitat England. In the collection of the British Museum.

11. *C. VENTRALIS*, Curtis ; Stephens, 103, 8.

Exp. 14 lin.

Pale green ; face spotted with black at the sides and *between the antennæ* ; *palpi black, with pale annulations* ; antennæ with the tip darker ; prothorax with four black spots ; abdomen (even during life) *beneath black* ; transverse veins of the wings mostly with a black dot at each end.

Habitat England, June.

¶¶ The second joint of the antennæ black.

12. *C. ABBREVIATA*, Curtis; St. 103, 6; Schn. Mon. 119, 35; *C. immaculata*, St. 103, 7.

Exp. 10 lin.

Sap-green; a black spot *between the antennæ* and on their first joint, a black crescent round their base; face spotted with black at the sides; *wings short, blunt and rounded*, with the veins quite green; *tarsal claws with the base expanded into a sort of tooth*.

Habitat England, June and July.

13. *C. PHYLLOCHROMA*, Wesm.; *C. abbreviata*, St. (partim).

Exp. 12 lin.

Sap-green, a black spot *between the antennæ*; a black crescent round their base; face spotted with black at the sides; *wings bluntly rounded*, longer, some of transverse veins blackish; *base of the tarsal claws not expanded*.

Habitat England. In the collection of the British Museum.

14. *C. PERLA*, L.; Schn. Mon. 136, 43; *C. reticulata*, St. 102, 3; *C. maculata*, St. 102, 4.

Exp. 14 lin.

Pale blue-green; a spot before the eyes, a crescent round the base of the antennæ, a spot between them, *an ocellar spot on the crown*, spots on the thorax, abdomen *and all the transverse veins black*.

Habitat England, common in June.

\*\* Upper lip in front emarginate.

15. *C. FULVICEPS*, Steph. 101, 1; Schn. Mon. 146, 47.

Exp. 20 lin.

Reddish; head orange, abdominal segment in the middle

and at the sides yellowish; first joint of the antennæ yellowish; transverse veins of the wings black, *the marginal veins reddish*.

Habitat England, local and scarce, June.

16. *C. CAPITATA*, F.; St. 102, 2; Schn. Mon. 144, 46.

Exp. 16 lin.

Brown; head, prothorax, and *the two first joints of the antennæ, orange*; legs reddish, with brown knees.

Habitat England; June, scarce.

†† Antennæ moniliform.

- \* Last joint of the maxillary palpi four times as long as the penultimate.

Genus *SISYRA*, Burmeister.

Larva lives in water (*Branchiostoma Spongillæ*, Westw.); cocoon?

17. *SISYRA FUSCATA*, F.; *Hemer. fuscatus*, St. 114, 29; *H. nitidulus*, St. 30; *H. confinis*, St. 31.

Exp. 5½ lin.

Black; wings shining, brownish, with few transverse veins; *antennæ black*.

Habitat England; June, not scarce.

18. *S. TERMINALIS*, Curtis.

Exp. 5½ lin.

Pale brown; crown of the head reddish; wings pale ash-coloured, less shining, with few transverse veins; legs pale yellow; *antennæ dark brown, the tip pale yellow*.

Habitat England. (Lakes of Killarney, Ireland.)

[A. H. H.]

- \*\* Last joint of the maxillary palpi little longer than the penultimate. Marginal area narrowed at the base.

Genus MICROMUS, Rambur.

19. MICROMUS VARIEGATUS, F.; Wesm.

Exp. 5 lin.

Brown; antennæ and legs pale; wings white, the fore wings with black spots and transverse veins, *the hind wings with three black spots at the apex of the outer margin.*

Habitat England. In the Stephensian collection there is a specimen amongst *H. hirtus* (with a special label *H. fimbriatus*).

20. M. INTRICATUS, Wesm.; *H. angulatus*, St. 106, 2.

Exp. 7 lin.

Ochre-coloured; thorax and abdomen spotted with brown; fore wings hairy, *pale ash-coloured, sprinkled with brown.*

Habitat England, Scotland, scarce.

21. M. PAGANUS, Vill.; *H. nemoralis*, St. 110, 15.

Exp. 7 lin.

Rust-coloured; antennæ yellowish; wings broader, ochre-coloured, *with two brown fasciæ parallel to the outer margin, the outer one intersected by three shorter fasciæ.*

Habitat England, not scarce.

- B. The vein nearest to the thorax in the marginal area of the fore wings recurrent and branched.

a. Outer margin of the wings rounded.

Genus HEMEROBIUS, L.

Larva aphidivorous, clothing itself with the empty skins of its prey; cocoon oval, of a gauzy silken texture.

\* Two sectors.

22. *HEMEROBIUS PYGMÆUS*, Rambur; *H. elegans*, St. 113, 27; *H. Marshami*, St. 114, 28.

Exp.  $4\frac{1}{2}$  lin.

Small, rusty-brown; head black; legs pale; wings grey, at the hinder margin with faint brown spots.

Habitat England in June, not common.

\* \* Three sectors.

23. *H. HUMULI*, L. Wesm.; *H. nebulosus*, St. 107, 5; *H. Humuli*, St. 108, 7; *H. obscurus*, St. 108, 8; *H. lutescens*, St. 109, 13; *H. affinis*, St. 109, 14; *H. paganus*, St. 110, 16; *H. apicalis*, St. 110, 17; *H. sub-fasciatus*, St. 111, 19; *H. irroratus*, St. 111, 20; *H. marginatus*, St. 109, 12.

Exp. 6—8 lin.

Yellow; thorax and abdomen above on each side spotted with brown. Wings yellowish-white, fore wings sparingly spotted with brownish-grey, more so towards the hind margin; the veins dotted with brown; *near the base of the fore wings a distinct black dot.*

Habitat England, common in June.

This species varies much in the colour of the fore wings; sometimes the spots unite to form fasciæ, as in *H. marginatus*, St. It may always be easily recognized by the black dot near the base of the wings.

24. *H. MICANS*, Wesm.; *H. punctatus*, St. 111, 18; *H. palidus*, St. 112, 24.

Exp.  $6\frac{1}{2}$  lin.

Yellow; prothorax with a rust-red stripe at the side; *wings yellowish, the veins spotted with brown.*

Habitat England, June, July.

25. *H. NERVOSUS*, F.; Wesm.; *H. fuscus*, St. 107, 4;  
*H. subnebulosus*, St. 107, 6; *H. nervosus*, St. 108, 10.

Exp. 7 lin.

Brown; *a broad yellow stripe goes over the head and thorax*; abdominal segments paler at the base; legs pale, anterior tibiæ with two brown spots; wings whitish, fore wings at the margin and on the veins alternately spotted with brown and white, the membrane shaded with ashy-grey.

Habitat England, not scarce.

26. *H. PHALERATUS*, Hoffmanssegg; Schn.; *H. fasciatus*, St. 108, 9; *H. perelegans*, St. 109, 10; *H. Pini*, St. 111, 21; *H. stigma*, St. 112, 22; *H. crispus*, St. 112, 23.

Exp. 6 lin.

Brownish; fore wings pale brown-yellow, with brown spots on the costa, *only the sectors and the third marginal vein dotted with brown*; brown fasciæ on the disc.

Habitat England, Scotland; June.

\* \* \* Four sectors.

27. *H. CONCINNUS*, Steph. 106, 3; *H. cylindripes*, Wesm.

Exp. 9—11 lin.

Ochreous; *the veins of the fore wings dotted with black*, the intermediate spaces with many ashy-grey clouds; *tibiæ cylindrical*.

Habitat England, Scotland; July.

\* \* \* \* Seven sectors.

28. *H. HIRTUS*, L.; Wesm.; St. 106, 1; *H. fimbriatus*, Curt.

Exp. 8 lin.

Brown; very hairy; crown of the head piceous; legs yel-

lowish; fore wings ashy-grey, the veins dotted with brown, the intermediate spaces with brown clouds; *hind wings with faint brown fascia and the tip edged with brown.*

Habitat England, June.

b. Outer margin of the wings scolloped.

Genus DREPANOPTERYX, Leach.

29. D. PHALÆNOIDES, L.; St. 100, 1.

Exp. 15 lin.

Clay-coloured; back brownish; about 12 sectors; fore wings with two brown fasciæ traversed by a third; *a white streak at the anal angle.*

Habitat Scotland, local; England.

Genus CONIOPTERYX, Curtis; *Coniortes*, Westwood.

Small; the entire creature, wings and all, with a white mealy covering. Antennæ moniliform; last joint of the labial palpi very long; neuration very simple; 2 sectors.

Larva aphidivorous, on fir trees; cocoon oval, of close-spun silk.

30. CONIOPTERYX TINEIFORMIS, Curt.; Steph. 116, 1.

Exp. 3 lin.

Whitish-grey; antennæ shorter than the body; abdomen ochreous; hind wings *hardly smaller* than the fore wings.

Habitat England, common in June.

31. C. ALEYRODIFORMIS, Steph. 116, 2.

Exp. 4 lin.

Snow-white; antennæ *evidently longer* than the body, brownish; abdomen piceous; hind wings *rather smaller* than the fore wings.

Habitat England, in June.

32. *C. PSOCIFORMIS*, Curt. ; Steph. 117, 3.

Exp. 4 lin.

Snow-white ; antennæ *twice as long* as the body, ochreous ; hind wings *hardly half the size* of the fore wings.

Habitat England, Scotland.

## Family II. SIALIDÆ.

Wings deflexed ; subcosta unites with the costa before the apex of the wing ; labial palpi 3-jointed ; anal area present (in *Raphidia* very small).

Larva with the mouth formed for biting, always carnivorous.

## A. Ocelli wanting.

## Genus SIALIS, Latreille.

33. *SIALIS LUTARIUS*, L. ; Steph. 133, 1.

Exp. 19 lin.

Black ; the brownish wings with a multiplicity of veins ; marginal vein brownish ; fore-wings yellowish at the base.

Habitat England, Scotland ; very common.

## B. Ocelli present.

## Genus RAPHDIA, L.

(A species which does not occur in England, *R. crassicornis* (*Inocellia*, Schn.), has no ocelli.)

\* Stigma with only one transverse vein ; below it four rows of cells.

34. *RAPHDIA OPHIOPSIS*, L. ; *R. affinis*, St. 131, 4 ; *R. maculicollis*, St. 131, 5.

Exp. 8 lin.

Black-brown ; head conical, *convex*, a red spot above



and at the sides; stigma short, brown, extending far beyond the cell beneath it, *both internally and externally*.

Habitat England, in June.

35. *R. XANTHOSTIGMA*, Schummel; *R. confinis*, St. 131, 6.  
Exp. 8 lin.

Black-brown; head triangular, *smooth*; stigma long, yellow, extending beyond the cell beneath it, *externally only*.

Habitat England, June.

36. *R. LONDINENSIS*, Steph. 130, 3; *R. Schneiderii*, Ratzeburg.

Exp. 10 lin.

Black-brown; head conical, convex, *coarsely punctured beneath*; stigma long, narrow, yellow, *of equal length with the cell beneath it*.

Habitat England.

- \* \* Stigma with two transverse veins; beneath it five rows of cells.

37. *R. MEGACEPHALA*, Steph. 130, 2; *R. ophiopsis*, Steph. 131, 1; *R. media*, Burm.

Exp. 15 lin.

Black-brown; head quadrangular, convex; stigma long, brown, projecting *inwardly far beyond* the cells beneath it.

Habitat England, common.

### Family III. PANORPIDÆ.

Wings horizontal, narrow; subcosta unites with the costa before the apex of the wings; mouth prolonged like a beak; labial palpi two-jointed; anal area wanting.

Larva with the mouth formed for biting, phytophagous, living underground.

Pupa quiescent, without a proper cocoon.

A. Wings wanting.

Genus BOREUS, Latreille.

38. BOREUS HYEMALIS, L.; Steph. 51, 1.

Length 3 lin.

Small brown, with a metallic gloss; beak, legs and ovipositor yellowish.

Habitat England, local.

B. Wings present.

\* Tarsi with two claws.

Genus PANORPA, L.

39. PANORPA COMMUNIS, L.; Steph. 52, 1.

Exp. 16 lin.

Black; wings with *two transverse fasciæ*, and two spots on the costa, and the apex black: in the ♂ the two penultimate joints of the forceps *of equal length, conical*.

Habitat England, very common.

40. P. GERMANICA, L.; Rbr.; *P. affinis*, Steph. 52, 2.

Exp. 14 lin.

Brown; wings with *detached scattered* brown spots, one at the internal angle of the yellow stigma larger, the apex brown; in the ♂ the two penultimate joints of the forceps *of equal length, conical*.

Habitat England, very common.

41. P. ALPINA, Rambur; *P. Germanica*, Steph. 53, 5;  
*P. borealis*, Steph. 53, 4.

Exp. 14 lin.

Brown; wings with *one* transverse fascia, and the apex

grey-brown; in the ♂ the penultimate joint of the forceps shorter, *cylindrical, with turned up edges.*

Habitat England.

42. *P. APICALIS*, Steph. 52, 3.

Exp. 10 lin.

Black; the wings *only* spotted with black *at the tip*; in the male the penultimate joint of the forceps *shorter, conical.*

Habitat England, June.

\* \* Tarsi with one claw.

Genus BITTACUS, Latreille.

*Bittacus Italicus*, Müller; *Tipularius*, F.

Exp. 24 lin.

Clay-coloured; wings yellowish; tibiæ with brown tip.

Habitat. Not yet found in England; collected in Belgium by Wesmael, and very probably indigenous in the south-west of England.

## HYMENOPTERA.



## NOTES ON ACULEATE HYMENOPTERA, WITH SOME OBSERVATIONS ON THEIR ECONOMY.

BY FREDERICK SMITH.

“ Come with me

And I will show thee where the wild bee haunts,  
 And which the flower each toilsome wanderer loves.”

OF all the insect tribe, there is none whose appearance in abundance, or their scarcity, is more dependant on sunny days than the aculeate *Hymenoptera*; many indeed, of the fossorial division, are never seen excepting on the hot days of July and August. It will therefore be premised, that the record which it is now our task to draw up will enumerate the appearance of all, or most of the rarities of the *Aculeatæ*. The oldest living Entomologist will, we presume, look back vainly—in vain will he try to recall to memory a season surpassing that of 1857; from the earliest days of spring to the final close of autumn, a succession of glorious entomological days succeeded each other. We believe it will be acknowledged by every one, when he has scanned the pages of this Annual, that such a record of appearances of rarities in unusual abundance, in all orders of insects, was never before compiled. We have, however, only to treat upon one order of the insect world, and here we meet our difficulty, that is to say, which species has not appeared in abundance. The earliest bee, which harbingers

the coming throng (*Andrena Clarkella*), appeared in profusion in the spring; and during the month of September, so fine and spring-like were the days, that some bees, apparently deceived by it, came forth before their winter's sleep; of these we observed *Andrena Grynana* and *Afze-liella*, both sexes of the latter; we also met with *Melecta punctata*, *Anthophora acervorum* and *Nomada succincta* and *Marshamella*. Such appearances are seldom observed, but we have elsewhere recorded one or two similar occurrences.

The success of the insect-hunter, like that of the hunter after larger game, will of course be greatly enhanced by experience; thus he who has made himself acquainted with the "private lives" of his favourites, and the whereabouts they dwell, will start with immense advantages over the young and inexperienced.

We have explored many localities, and have from time to time directed others to such spots as we have found prolific; it has been our lot, during two seasons previous, to explore the sand-hills near Deal, and some other spots along the line of coast to Dover. During the latter part of July and the beginning of August last we made some further explorations, some at different points and at right angles with the coast line, penetrating short distances inland. It was on one of these inland excursions that we discovered—

"A populous solitude of Bees—

And fairy-formed and many-coloured things."

And to this we shall specially direct attention. In no one spot have we ever found such an assemblage of rarities, including one or two we had not seen alive before.

Our attention has during the past season been particularly attracted to the habits of the leaf-cutting bees; the circumstance which, in the first instance, directed our attention to

the subject, was so fraught with disappointment, was so calculated to raise in our minds certain misgivings of a long-cherished belief, that we even now recall the circumstance to mind with a sort of melancholy unwillingness. Sitting one day, looking out of the open window of our parlour, which overlooked the Channel at Deal, we were suddenly aroused from our afternoon's rest, by observing a little bee alight on the flower of a scarlet Geranium which adorned the window-sill; with the well-known adroitness of a leaf-cutter bee it quickly disengaged a circular piece from one of the scarlet petals. *Anthocopa papaveris!* we exclaimed, and were outside in front of the window in a moment, net in hand; in a few minutes a bee again alighted on the Geranium, it was captured—*Anthocopa!*—no—*Megachile argentata*.

Now we have no wish, in fact we cannot—will not—give up our firm conviction and belief,—that there once existed a veritable Ali Baba,—that Jack ascended the bean-stalk,—or that Robinson Crusoe lived in his desolate island and could not make a wheelbarrow; neither can we allow the circumstance above recorded, to shake our belief in there being a species of leaf-cutter bee, which *always lines* its subterranean chambers with the petals of the scarlet poppy. We have hitherto regarded the little creature as a sort of regal upholsterer, who prepared gorgeous dwellings for its young brood; this belief was instilled into our minds on reading Rennie's chapter on the Upholsterer-Bee; and now, after the lapse of years, the little bee cutting the scarlet geranium, we reluctantly confess it, somewhat shakes our belief in what we fear may possibly prove to be an entomological romance. The observations recorded below have, we must admit, created a suspicion in our minds that *Anthocopa* selects the poppy, *when the poppy* chances to grow nearer to her

dwelling than any other *suitable leaf or flower*; but we will now proceed to detail our observations.

*Megachile maritima* frequently selects the leaves of a species of *Salix* for the outer-covering of her cells, but the inner lining is a much more flexible and delicate leaf, such as the laburnum; at another time we have found her cells composed of rose leaves for the outer coatings, but within lined with the soft leaves of the Trefoil; usually, the divisions between the cells are formed of *several* circular pieces of leaf placed close together, but we have seen the sagacious creature cutting the thick leaves of the laurel, *one* circular piece serving in the place of half a dozen cut from thinner and more flexible leaves. On the sandhills at Deal, where, during July and the beginning of August, *Megachile argentata* is to be found burrowing in almost every mound, we have had innumerable opportunities of examining its burrows; we have usually found the cells composed outwardly of the leaves of the Trefoil, but within, almost invariably, of the yellow petals of *Lotus corniculatus*. We, however, found the same species of bee burrowing in an enclosed piece of ground, within two or three hundred yards of the sandhills, lining her cells with the petals of the scarlet Geranium, some plants of which grow along one side of the enclosure, which is laid out as a flower-garden.

*Megachile centuncularis* is perhaps the most widely distributed species of the genus, it is found in all parts of Europe; we have seen it burrowing in sandbanks and also in decaying trees, posts and rails; this species cuts the leaves of the rose, the willow, the lilac, and of several other trees and shrubs; and, like the other species, selects softer leaves for the inner lining of the cells. At Deal we observed several individuals which had formed their burrows in an old brick wall, we watched them in their flight to and from a

rose tree, which grew a few yards from their burrows; and these bees also, I was delighted to observe, like the *M. argentata*, resorted to the scarlet Geraniums for the inner lining of their cells. These observations, and others made on previous occasions, are convincing proofs to us, that the leaf-cutting bees resort to those plants which they find nearest to their burrows, when suited to their purposes; at any rate, such plants which they first discover; at one time lining their cells with the sober-coloured green leaves of the laburnum, and at another selecting the petals of the gorgeous scarlet Geranium.

The observations made induce us to think it quite possible that the *poppy-bee* only occasionally appears in that character, and that at another time she may be the Geranium, the Lotus or the Laburnum-bee; it *may* prove that this species is really an inhabitant of Great Britain, but has been overlooked, from the fact of its not having been detected cutting the leaves of the *poppy*. Should the latter prove to be the case, the above observations on leaf-cutting bees will have attained their object, and the writer will be pardoned having thus much trespassed on the patience of his readers.

#### CAPTURES OF FORMICIDÆ.

Three years ago we described all the known British species of the genera *Formica* and *Myrmica*, amounting at that time to twenty-eight, to these five have since been added; and there can be little doubt of the number of species being greatly increased when Scotland and its adjacent islands are carefully searched. We would particularly direct the attention of the Coleopterist to these insects when searching in the nests of the wood-ant and also of the other species of *Formica*; there are two or three species of *Myrmica*, well known on the Continent, which appear always to



inhabit the nest of the wood-ant, never constructing a nest of their own; one of these, *Myrmica lucidula*, has during the past season been discovered by Mr. Waterhouse; this very distinct and beautiful species is a fine addition to our Fauna, it was found at Weybridge, Surrey.

*Formica congerens*. Only males of this species have been obtained; they were found amongst a few *Hymenoptera* taken in Scotland by Mr. Foxcroft in 1846; this is the species in the nests of which *Tinea ochraceella* was discovered by Nylander in Finland.

*Formica brunnea*. This species has long been included in the British list of Mr. J. F. Stephens, but in his cabinet it was represented by the female of *F. umbrata* of Nylander; amongst a number of ants collected at Deal we have discovered a single female of this species.

*Ponera contracta*. This rare insect we never had the good fortune to capture; Dr. Power, whose eye a novelty cannot escape, took a couple of workers at Brighton.

*Myrmica unifasciata*. A colony of this scarce species was discovered by Mr. Baly; it consisted of not less than 150 individuals; its formicarium was constructed in a decaying post, at Lower Shorne, near Gravesend.

*Myrmica lippula*. A single specimen was taken by Mr. Reading, in July, near Plymouth, under a stone, amongst a colony of *F. fusca*.

The *Myrmica graminicola* of Smith's Essay, is synonymous with *M. lippula*. We have obtained a large number of the *Myrmica acervorum*, and, after a careful examination, we agree with Nylander in considering *F. graminicola* a variety of that species; *M. lippula* is readily distinguished from the other minute species of the genus by its small eyes, and the long petiole of its abdomen; we have taken the female as late as November, on the wing, in the London

district; the late Mr. W. Wing captured it on the ninth of December.

*Myrmica nitidula*, Nylander. This species was added to the British List by Mr. G. R. Waterhouse, who found it in the nests of *Formica rufa*; it is readily distinguished by being entirely smooth, shining, and destitute of pubescence. Nylander finds it in the nest of *F. rufa* and *F. congerens*; it is singular that this species, and also *Myrmica muscorum*, an insect not yet found in this country, appear always to establish their colonies in the nests of species of *Formica*; we have little doubt, if our Coleopterists look carefully for minute ants when searching in the nests of the wood ant, they will find the *Myrmica muscorum*; it is distinguished from *M. nitidula* by being very pubescent.

#### FOSSORES.

*Pompilus pectinipes*. This species is not rare at Deal; we captured both sexes on the west side of the sand-hills, opposite the first battery.

*Ammophila lutaria*. This species we took at the same time and place as the former insect.

*Miscophus spurius?* Dahlb. Having discovered this species last season to be an inhabitant of Great Britain, we were anxious to obtain more specimens, in this we were not disappointed; both sexes occurred on the west side of the sand-hills, about half-way between Sandown Castle and the battery.

*Trypoxylon attenuatum*. This species has been captured by Mr. Parfitt in Devon, and by myself at Reigate Common.

*Astata boops*. This species was captured in June on Reigate Common, a new locality for this very local insect.

*Crabro Lindenius*, *C. capitatus* and *C. hyalinus*. Mr.

Parfitt informs me that he has captured specimens of each of these very local and rare species.

*Crabro melanarius*. Mr. Bold captured this species, new to the British Fauna, in July, 1856, near Lannercost, Cumberland; it is described by Dahlbom in the first volume of his *Hymenop. Europ.* page 339.

*Cerceris labiata*. This very local species was captured in the beginning of August at Kingsdown, by my son Edward Smith.

*Phylanthus triangulum*. This very local insect is still plentiful in Sandown Bay, where Mr. Unwin found it last July.

#### Family APIDÆ. Captures of ANDRENIDÆ.

*Colletis marginata*. This rare species was again taken at the latter part of July along the south-west side of the sand-hills near Deal; the specimens were old and worn; the end of June is probably the best time to capture it.

*Sphecodes rufescens*. A very remarkable specimen has been captured by Mr. C. F. Allen, in which the anterior wing has the second submarginal cell obsolete; such occurrences are of extreme rarity amongst the bees, although frequent in some groups of fossorial insects.

*Halictus maculatus*. Mr. Parfitt has captured the male of this species, near Exeter; the female was taken by Mr. Unwin in July, in Sandown Bay, Isle of Wight.

We are now about to direct the steps of the Hymenopterist to one of the richest localities, which during upwards of twenty years we have had the good fortune to discover; here appeared to be the *metropolis* of all those autumnal species of extreme rarity, which belong to the genus *Andrena*, and its close ally *Cilissa*. We have always had a belief that the spring species of *Andrena* were extremely *numerous* in individuals,

and pretty generally distributed over the country, whilst the summer and autumnal ones were extremely local and *few in numbers*; the first position certainly appears to be correct, the latter is dissipated by our experience of the past season.

*Andrena Hattorfiana*, *A. Rosæ*, *A. Cetti* and *A. pilipes* are certainly four of the finest species of the genus, the first being the largest and handsomest found in this country; not only these, but others of great rarity, are to be found at the locality above alluded to. Walking from Deal along the coast to Dover, the Entomologist will pass Walmer Castle; on arriving at this memorable fortification, he will of necessity cast a passing thought on the great "Captain of a hundred fights," who once dwelt there in quiet, when his campaigns were over. The insect hunter has his own more peaceful campaign before him—and at Walmer Castle it begins. At this point, or at a short distance beyond, the land begins to rise to the right of the road, and continues to do so until it ascends to the point of the high cliff, at a mile's distance, at Kingsdown; the gradual rise of the fields is, at certain distances, broken by short and much more sudden slopes, which divide the fields and run at right angles with the road up into the country, to different distances. These sudden slopes are uncultivated. The slope on the right hand of the road, before reaching Kingsdown, is also a glorious locality for *Hymenoptera*; the following species of *Andrena* were all taken on that slope.

*Andrena Hattorfiana*. The fine red variety and also the black, in about equal numbers; in all, thirty fine specimens of the female, the male we were too late for—all were taken on the flowers of *Scabiosa arvensis*.

*Andrena Cetti*. This pretty little species was plentiful on the Scabious; we found every variety, including the "*affinis*" of Kirby; the male varieties include the *A. frontalis* of Smith.

*Andrena Rosæ.* This species was scarce, it frequents the flowers of the blackberry.

*Andrena pilipes.* Not so abundant as we have found it in other localities in Kent; it frequents the blackberry and the Mallow.

*Andrena thoracica.* Not uncommon on thistle heads.

*Andrena bicolor.* Very plentiful on the flowers of the common mallow; the male proves to be, as we conjectured, the *Melitta pilosula* of Kirby.

*Andrena nigriceps.* Two specimens were taken in company with *A. simillima*.

*A. simillima.* Extremely abundant on the flowers of the blackberry; this species was taken at the foot of the cliffs, half a mile beyond Kingsdown. Although the two preceding species closely resemble each other, and were taken in company, still, to a practised eye, their specific differences are obvious; *A. nigriceps* is a larger insect, covered with black pubescence on the face, cheeks and clypeus; the floccus on the posterior femora is sooty-black.

*Andrena Coitana.* Very plentiful, frequenting the flowers of the Mallow; we were too late for the males.

*Cilissa hæmorrhoidalis.* This very local bee we took on the slope which runs up into the fields at the foot of the first cliff beyond Kingsdown; it frequents the Harebell; we never saw it on any other flower.

*Cilissa leporina.* The male of this species we have frequently met with, the female always being rare; except on one occasion, we never met with more than single specimens; on the slope at Kingsdown it abounded; unfortunately we were too late to get fine examples, but their numbers were astonishing; it frequented a species of Vetch, but we have taken it on the white Dutch clover.

*Nomada Jacobææ*. This local species we found in some numbers on the slopes at Kingsdown on the Ragwort.

*Nomada atrata*. This species we took in the same situation as the former; it is by far the most important capture we have made this season; the only examples which were known previously were taken in Sussex by my friend Mr. Samuel Stevens, both were males. Of three taken at Kingsdown two are females; this sex scarcely differs from the male, it is black, with the extreme base of the flagellum beneath, and the mandibles, ferruginous; the anterior and intermediate tarsi, the posterior tibiæ at their base outside, the tubercles, tegulæ and two ovate spots on the scutellum, ferruginous; the tibiæ with a black stain outside; wings with their apical margins very dark fuscous; abdomen with the apical margin of the basal segment, and the basal margin of the second, ferruginous; the sides of the metathorax, and some spots on the sides of the abdomen, with silvery white pubescence. The male is rather brighter than those captured in Sussex; taken on *Reseda lutea*.

*Epeolus variegatus*. Taken plentifully at Deal on the sand-hills.

*Stelis aterrима*. Taken in company with the preceding species; this insect we have always found on the flowers of the Mallow; it is probably parasitic on *Osmia fulviventris*, as that bee is extremely abundant in the same situation, the sand-hills, Deal.

*Osmia parietina*. This very local species was taken at Loch Rannoch, by Charles Turner, the collector.

*Osmia xanthomelana*. This rare, or very local, species was captured near Exeter by Mr. Parfitt.

*Osmia spinulosa*. This little bee may be found on nearly every thistle-head at the foot of the cliffs beyond Kingsdown during July and August.

*Megachile versicolor*. This very rare species was captured near Exeter by Mr. Parfitt; only two or three specimens are at present, I believe, in collections, the male has not been taken.

*Apathus rupestris*. In the Monograph on the Bees of Great Britain, we quoted, with a doubt, the *Bremus pomorum* of Panzer as one of the varieties of the male; all doubt is now removed, as we captured three fine fresh specimens of this highly coloured variety at Kingsdown.

*Variety Pomorum*. Black; the pubescence on the head black; the clypeus nearly naked, very smooth and shining. Thorax clothed above with white pubescence, with a band of black between the wings; the tarsi beneath, and the posterior tibiæ within, with short fulvous pubescence; the wings hyaline, faintly clouded at their apex. Abdomen: the first segment with white pubescence, on the second it is pale fulvous, on the third and following segments it is rich rufo-fulvous.

The capture of this very beautiful variety is a great acquisition; we have only seen a single example before, we think in the collection of Mr. Curtis, who has collected a good deal at Dover; probably it was taken there, ours being found at Kingsdown; the variety may be peculiar to the south-east coast.

Several instances of the capture of *Bombi* (*in coitu*) have been recorded; indeed, we ourselves have met with two-thirds of the species under such circumstances, but until August last we never met with any species of *Apathus*; but at Kingsdown we took *A. rupestris* (*in coitu*); we also took three pairs of *B. lapidarius*, and the male of *lapidarius* connected with *B. terrestris*; this is the first instance, which we have observed, of the sexes of different species of *Bombi* copulating.



Another phase in the economy of these bees is worthy of notice; for two or three days we noticed a number of males of *B. Latreillellus* buzzing and flying about the entrance to a nest, occasionally alighting and entering, then issuing out and buzzing in a most excited manner; now and then a worker returned home laden with spoil. Although we sat quite close to the hole into which they entered, they took no heed of us, never attempting to fly at or sting us; in fact, so harmless they appeared, that we picked up several in our fingers as they issued forth; the males, it is true, kept up a continual buzzing about our heads, and we occasionally captured a fine highly coloured specimen; at last we observed the cause of this assemblage of males; a fine fresh example of the female at last showed herself at the entrance to the nest, this was a signal for a more furious buzzing than before; numbers alighted within a few inches of the female, and a fierce combat ensued; about ten or twelve of these males clung together and rolled over and over, struggling in close combat; the female, who had retreated into the burrow, again appeared, and this time took flight; in a moment every male was gone, the whole host, not less than twenty or more, flew off in chase of the female,—we saw them no more. We noticed another day an assemblage of males as before, but we saw no second female take flight.



## COLEOPTERA.



NOTES ON BRITISH GEODEPHAGA, WITH DESCRIPTION OF  
ONE NEW SPECIES (SUPPLEMENTARY TO THE GEO-  
DEPHAGA BRITANNICA).

BY J. F. DAWSON, LL.B.

*Cicindela hybrida* and *maritima*. Some surprise has been expressed that I should persist in maintaining these insects as distinct species, contrary to an increasing opinion that they are only varieties of the same. I have never found reason to question the fact of their being distinct. They present structural differences, which, though slight, are well defined, besides the invariably dissimilar form of the central band. Take, for instance, *the claw*,—in that we have a structural character, which may be patent to any one who will examine it. With the aid of a damp camel-hair pencil moisten and expand the *unguiculi* of each, so as to examine them fairly, and it will be found that the claw in *hybrida* is invariably *larger* and *stouter* than in *maritima*.

The authors of the *Faune Française* refer to *maritima* as an accidental variety. Surely such cannot be the case. If they are varieties at all, they must be permanent local varieties. Near Burnham Market, and on the north coast of Devonshire, for instance, *maritima* is found in immense profusion, and in not one example will the form of the central band be found to approximate to that of *hybrida*; whilst on the Lancashire coast every specimen of *hybrida* presents the

same uniform characters, without a single instance of approximation to *maritima*; the central band in some is slightly more bent than in others, but that is all; there are no intermediate gradations.

The question has again been revived—to which of these species ought the *C. hybrida* of Linnæus to be referred. It will be remembered that Stephens (following the arrangement previously adopted in Sowerby's British Miscellany, 1806) assigned it, in his *Illustrations*, to *maritima*; and gave the name *aprica* to the *C. hybrida* of authors. In the *Manual*, however, he adopted the generally recognized nomenclature. The opinion of our early English writers on the subject was no doubt based upon the authority of the Linnæan types of *hybrida*, which will, I believe, be found to belong to *maritima*; and if these are to be accepted as conclusive, the original arrangement of our English authors would prove to have been correct.

*Dromius agilis*, Fab. Mant. i. 204 (*Carabus*); Dawson, Geod. Brit. p. 8. *Carabus fenestratus*, Fab., is, we are assured by Dr. Schaum, entirely distinct from the variety *fenestratus*, Steph., and has not been captured in England. It will be necessary, therefore, to make the following corrections in the *Geodephaga Britannica*. At page 8, erase "Fab. S. El. i. 209; Sturm, D. F. vii. 168;" and at page 9, line 24, &c., erase the sentences beginning "Dr. Schaum considers," and ending with "*D. agilis*."

*Dromius glabratus*, Dufts., Faun. ii. 248 (*Lebia*); Dawson, Geod. Brit., p. 13. Mr. Wollaston has called our attention to an apparent oversight with reference to this species. He is of opinion that *Lebia glabrata*, Dufts., and *Dromius maurus*, Sturm, are in reality two distinct species, though they have hitherto been considered mere varieties of the same insect by previous writers on the subject. Compare

Mr. Wollaston's paper in the *Zoologist* (p. 5637) with Dr. Schaum's copious remarks at pp. 275—6 of the enlarged edition of *Erichson's Insecten Deutschlands*, now in course of publication.

*Errata* omitted to be noticed.

Geod. Brit. p. 14. For *D. foveolus* read *D. foveola*, both here and wherever the species is mentioned; but the synonym must stand as it is.

Page 21, lines 17, 18, for Vigors read Sowerby.

[*Zuphium olens*, Fabr. A specimen of this insect has been captured near Forest Hill. The locality is somewhat suspicious, and one cannot help associating the insect with the idea of the roots of the palm trees and of other exotic plants which have been brought to the people's palace.]

*Dyschirii*.—With reference to *D. inermis*, Curtis; *nitidus*, Dejean, and *impunctipennis*, Dawson, remark as follows:—In arranging the species of this genus, I was led into the error of taking it for granted, that *D. inermis* of Curtis and of Stephens were identical. I observe also, that in the re-issue of Erichson's "Insecten Deutschlands," now in course of publication, Dr. Schaum assigns *impunctipennis* as a synonym to *inermis*, Curtis, on the authority of a typical example of the former insect, which was communicated to him by Mr. Wollaston. I am informed, however, by Mr. Curtis, that Dr. Schaum never saw his type at all, and the conclusion at which he (Dr. Schaum) arrived was the result of the same erroneous supposition (entertained in common with myself), that *D. inermis* of the Stephensian cabinet was identical with it. I have recently had an opportunity of examining Mr. Curtis's typical specimen, and, after the most careful investigation and comparison of these several species, have elicited the following results: 1st. That *D. inermis*, Curtis, is neither more nor less than a large dark-coloured example

of *nitidus*, Dejean, with the external denticulations on the anterior tibiæ perhaps slightly less developed than in ordinary specimens; 2ndly, that *D. inermis* of Stephens's Cabinet must be referred to *impunctipennis*, as Dr. Schaum has correctly determined. It presents, indeed, some slight variations from it, but to these I am not disposed to attach any importance. The following alterations must consequently be made at pages 26 and 29 of *Geodephaga Britannica*. Erase the species *D. inermis* entirely, together with its synonyms and descriptions, and let the synonymy of *D. nitidus* stand thus.

*D. nitidus*, Dej. Spec. i. 421 (*Clivina*); Steph. Mand. i. 40, &c.

*D. inermis*, Curtis, Ent. pl. 354.

And that of *impunctipennis* as follows:—

*D. impunctipennis*, Dawson, Geod. Brit. p. 29.\*

*D. inermis* (nec Curtis), Steph. Mand. v. 369, et Manual, p. 11.

*D. digitatus* (nec Dejean), Steph. Mand. i. 42, et Manual, p. 12.

*D. fulvipes* (nec Dejean), Steph. Mand. v. 370, et Manual, p. 12.

*D. arenosus* (nec Stephens), Putz, Mon. 48.

*D. lævistriatus*, Fairmaire, Faun. Franc. p. 47.

[The two latter synonyms are given on the authority of Dr. Schaum; and *D. fulvipes*, Steph., has no representative bearing that name now in the Stephensian Collection; the label is removed, though possibly the insect may still be there.]

*Dyschirius nitidus*, Dej. Spec. i. 421 (*Clivina*); Dawson,

\* It may perhaps be objected that the name *arenosus* justly claims the priority; but if the rule be made absolute (and it appears to be accepted as one of the primary laws of nomenclature), that a name previously employed to represent a different species in the same genus shall not be revived, *impunctipennis* must stand.

Geod. Brit. p. 26. Taken plentifully in Preston Marsh, and at Lytham, by Messrs. Graham and Constantine, to both of whom I am indebted for some interesting varieties.

*Dyschirius obscurus*, Gyll. Ins. Suec. iv. 456 (*Clivina*); Dawson, Goed. Brit. p. 297. This species was introduced by me at the last moment before going to press, and I had no opportunity of describing it from actual types; this deficiency I am now able to supply from specimens before me; therefore erase the paragraph beginning "This species," and substitute the following description.

*Head* small, flat, dull black; antennæ black, with the base pitchy red. *Thorax* dull metallic black, sides globose and rounded, being widest just behind the middle, dorsal line deep and entire. *Elytra* brassy or bronzed, humeral angles a little distinct, sides moderately rounded; deeply striated, the *striæ entirely impunctate*, finest near the extremity; underside black; legs pitchy; anterior tibiæ armed externally with two distinct teeth, the one at the extremity largest.

Length  $1\frac{3}{4}$  lines.

It resembles *thoracicus* in form, but differs in several important respects, more especially in the *deeply impressed and entirely impunctate striæ* of the elytra, and the form of the dentations of the epistoma.

*Chlænius Schrankii*, Duft., Faun. ii. 131 (*Carabus*). *Head* shining green, glabrous, the hinder part sometimes coppery; mandibles pitchy red; palpi and three joints at the base of the antennæ testaceous red, the upper joints fuscous. *Thorax* green-coppery, subquadrate, the sides rounded and widest in front below the angles, thence obliquely narrowed to the base; posterior angles nearly right angles, the surface coarsely punctulated, the punctulation in some places confluent, the base with two foveæ. *Elytra* green, clothed with a rich shining rusty pile, striated, the

striæ distinctly and all the interstices very coarsely punctured; underside greenish-black; legs testaceous red or ferruginous, according to its different degrees of maturity.

Length 5 lines.

Besides the general habit of this species, which sufficiently distinguishes it from *nigricornis* (var. *melanocornis*), it differs in the following important respects:—the mouth (often entirely), palpi, and THREE joints at the base of the antennæ, are red. The form of the thorax is especially dissimilar, being distinctly widest and more rounded in front below the angles, and more obliquely narrowed behind, with the lateral margins near the base not reflexed, the posterior angles also being more rectangular; the punctulation also of the thorax and of the elytra is coarser, and the legs are always testaceous or red.

It is stated by the authors of the *Faune Française* that the most reliable characters are to be found in the absence of any coppery appearance on the head, and in the acute hinder angles of the thorax; but in the several European examples which I have examined, I have observed a coppery tinge at the back of the head in some of them, and cannot call the posterior angles of the thorax, in any instance that has come under my notice, *acute*. After all, the different form of the thorax, and the general habit of the insect, offer the most reliable points of distinction.

Two examples have been captured in England; one by Dr. Power, under the cliff, beyond Kemp Town; and a second by Mr. F. Bates, at Luccombe, in the Isle of Wight.

*Additional localities for the following species.*

*Nebria livida.* Crevices in the cliffs at Cromer.

*Calathus nubigena.* Taken on the Pentland Hills, N. B.: being the first time of its occurrence in Scotland.



*Calathus micropterus*. Same locality.

*Anchomenus atratus*. Plentiful at Hammersmith marshes, and at Clonmore, near Waterford.

*Anchomenus gracilis*. Near Hythe, Kent; and in a swampy spot near Lewisham.

*Amara curta*. Not uncommon on the coast at South Wick and Shoreham.

*Amara strenua*. Isle of Sheppey, being the second locality recorded for this species, hitherto found only in the Isle of Wight.

*Amara ingenua*. Taken rather plentifully by Mr. H. Adams, near Swansea. Only one example of this species had previously been taken in this country.

*Amara oricalcica*. Bridlington and South Repps, Norfolk.

*Amara rufocincta*. Crwmllyn Burrows, near Swansea.

*Harpalus melancholicus*. Near Tenby; Conway; and at Glengarriffe in Ireland, in August and September.

*Harpalus litigiosus*, Dej. Spec. iv. 361; *H. Wollastoni*, Dawson, Geod. Brit. p. 144. A single example has been found by Mr. Adams, near Purfleet; others have been taken by Dr. Power and myself below the cliffs, at Kemp Town and at South Wick, near Brighton; and on looking over Mr. Curtis's Collection recently, I detected therein three examples, which, for almost twenty years, had remained unidentified, having, however, a label attached to each, indicating their respective places and dates of capture. One was taken at Wrentham, Suffolk, in April, 1838; another at Slaughter, Gloucestershire, in June, and the third in the Isle of Wight, in September. To Mr. Curtis, therefore, the credit is due of having first captured it in England.

*Trechus longicornis*, Sturm. D. F. vi. 83, pl. 151; Dawson, Geod. Brit. p. 167. A single example was captured by

Mr. Pinder last August, at Sawley, Lancashire. This is the second instance only of the occurrence of this rare species in England.

*Bembidium bistriatum*. In profusion at the beginning of October at Holme Bush, near Hurst, Sussex.

*Bembidium Stomoides*. Under rejectamenta on the banks of the river Ribble, near Preston, Lancashire.

*Bembidia*.—In the supplementary notes on the European *Bembidia* by M. Jacquelin-Duval, which were read before the Entomological Society of France on the 25th of July, 1855, and subsequently published in the third volume of the “Annales” of that society, the author takes exception to the nomenclature which I have employed for certain species, inasmuch as it differs from that which, after mature deliberation, he himself had adopted in his monograph on this group of insects. These critical remarks seem to call for some notice on my part, and will hardly be considered out of place in a paper which is avowedly accepted as supplementary to the “Geodephaga Britannica.”

1. Our author observes, that, in four instances, I have declined to connect a (supposed) variety with an alleged type, namely, *B. testaceum* with *tricolor*; *tibiale* with *fasciolatum*; *Stomoides* with *rufipes*, and *affine* with *nitidulum*; partly on the ground, that the alleged types of the three former have never been found in England, and partly for the (to myself at least) very essential reason, that I have not been able to connect them. At the same time, our author adds, that I express no doubt as to the value of his conclusions, and that the mere absence of the type does not authorize the substitution of a name used for a variety in lieu of that of the type itself. The truth embodied in the last observation, I readily admit; but it might



have been inferred, that I did question the statement of any one of these insects being no more than a variety. I give M. Jacquelin-Duval full credit for *believing* that he has found the necessary links to connect the species respectively with their alleged types, but my object has been to weigh the probabilities till I had arrived at a conclusion satisfactory to my *own* mind, and I could not, after an examination of the supposed types and varieties, feel that I *had* arrived at a result in accordance with the opinion of our ains-taking author. In the two instances first cited the authors of the *Faune Française*, and Dr. Schaum, in his critical remarks on M. Jacquelin-Duval's monograph, coincide with me in treating them as distinct species. I must also note that with respect to *Stomoides*, our author doubts the fact of its reputed type being found in England, because Dr. Schaum, in his notes on the Stephensian Collection, refers *P. decorus*, and *albipes*, of that Collection, to the aforesaid type; but *P. albipes* of Stephens's Cabinet is, unquestionably, an immature example of *B. decorum*, and *P. decorus* is made up of several species, which I shall refer to presently. It must, therefore, be accepted as a *fact*, that up to this time, the alleged types of these three species have not been found in England, and this, though of itself perhaps insufficient to prove them distinct, at any rate tends to that conclusion.\*

It is fair to add, that the authors of the *Faune Française* adopt M. Jacquelin-Duval's opinion that *Stomoides* is only a variety of *rufipes*, but not so the Stettin Catalogue. I have recently had also an opportunity of examining and comparing a series of examples, and can find

\* In one respect our author has clearly misunderstood my meaning. I could hardly be supposed to express a doubt as to whether *rufipes*, Ill., were distinct from *rufipes*, Gyll., when having declared that the former is not found in England, I unite the latter as a synonym to *B. nitidulum*.

no reason to alter my formerly-expressed opinion. With respect to *B. nitidulum* and *affine*, I must also say the same, and though in this I differ from those Entomologists who in the above instances have agreed with me, I must confess, that, after examining and comparing an infinite number of examples of each species, I have never found the slightest difficulty in separating them. The different form of the head, less prominent eyes, and the protracted joints of the antennæ, and other variations of structure which I mentioned, together with the general habit of *affine*, appear to me too remarkable to admit of its union with *nitidulum*.

M. Jacquelin-Duval next objects to the employment of the name *Cicindela rupestris*, Linn., for *B. fumigatum*, Dej., on the ground of the anomaly which I referred to (Geod. Brit. p. 197) in respect to the colour of the legs; and he considers my citation of Paykull as unfortunate, because that author probably alluded to *B. obliquum*. Now this matter simply resolves itself into the question as to the amount of value we are disposed to attach to the Linnæan types. Admitting even the *certainty* that Paykull refers to a different species, yet the main fact remains unaffected. There in the Linnæan Collection stands an example (mutilated indeed) of *B. fumigatum*, labelled *Cicindela rupestris*, Linn. We may assume that it *has* stood there as a type from a period antecedent to the date at which the collection was brought to England; because although we can easily imagine that specimens (particularly if unlabelled) may have been misplaced through the carelessness of parties examining them (as for instance the two examples of *B. littorale* referred to by M. Jacquelin-Duval), yet this specimen could scarcely have been introduced at a more recent period, because it is so extremely rare in England that I know of but four British

examples—those contained in the Stephensian Collection. But it will be said, it does not agree with the Linnæan description, which states that the legs are black, and the description must be correct; I am not so sure of that. That descriptions can and do err may be shown from a case in point: M. Jacquelin-Duval argues that Dr. Schaum, as well as myself, must be in error in assigning *B. pusillum* as the type of *Lopha pulicaria* of the Stephensian Cabinet, because Stephens expressly states that the latter has *oblique frontal foveæ*; yet it is a matter that admits of not the slightest question that the type is *B. pusillum*, and has *parallel frontal foveæ*, though the Stephensian *description* says that they are *oblique*. Suppose Stephens's Collection, instead of coming to us direct from the hands of its compiler and owner, three years ago, had become antiquated like the Linnæan; or, suppose the question of the types to be discussed some sixty or seventy years hence, with no more definite knowledge on the subject to assist the inquirer than the Stephensian types and the Stephensian descriptions would supply, might it not be argued with equal show of reason, that the types in the present instance must be ignored, as they never could have been intended to represent the true *Lopha pulicaria*, Steph., because they are antagonistic to the descriptions? With all their acknowledged authenticity, M. Jacquelin Duval discredits the fact. In the Stettin Catalogue for 1852 Dr. Schaum adopted the name *rupestre*, but our author remarks that he has since abandoned it.

M. Jacquelin-Duval affirms that *B. punctatulum*, Drap. (*Tachypus striatus*, Steph.), cannot be the *Carabus velox*, Linn., of the *Fauna Suecica*, because that species is not found at all in Sweden, but is confined exclusively to Central and Southern Europe. It is to be presumed that our author is intimately acquainted with every square inch of collecting

ground in Sweden, or he would scarcely have hazarded so broad and sweeping an assertion that a species which has actually been taken within the same parallel of latitude, does absolutely not exist *in any part* of that extensive country; indeed the Orkney Isles, where the species is found in plenty, is in the same parallel of latitude with Stockholm, and can hardly be considered (according to the rules of geography) as part of *Central Europe*.

M. Jacquelin-Duval's remaining observations have reference to an alleged discrepancy between Dr. Schaum and myself as to the identity of some of the Stephensian types; which our author presumes to be all in favour of the correctness of his own opinion respecting them. I think, however, we shall find upon examination that in several of the instances adduced, this alleged discrepancy exists more in appearance than in actuality. Dr. Schaum invariably refers to the Stephensian *types*; my references are frequently given to Stephens's *Works*, *irrespective of the types*. Now we are well aware that these do not always correspond, but that, on the contrary, a considerable difference is often found to exist between them; it became absolutely necessary that my references should be determined by some fixed rule, in order to avoid endless repetition and confusion. The rule which I adopted is stated in the "Preliminary Observations" to the "Geodephaga Britannica," p. vii, and is briefly this:—With respect to those species of Continental authors, which are *erroneously reputed* to be British, the references apply to the Stephensian representatives *only* (except where it is otherwise stated); whilst with respect to the *veritable* species of authors, which are *correctly* designated by Stephens as British, the references are applicable to Stephens's *Works*. Let us apply this rule. The first instance quoted by M. Jacquelin-Duval is *B. guttula*; and here the latter portion of

the rule applies. It is *B. guttula*, Fab., which Stephens describes, and my reference is given to his Works, though the *supposed* types in his cabinet for the most part equal *biguttatum*. Again *P. maritimus* is Rudd's species, and described by Stephens as such, and I refer it to *B. femoratum*, because (as I stated) I had *seen* Rudd's type, and found that it belonged to that species. But M. Jacquelin Duval assigns it to *B. concinnum*, after the types *collectively* (and quotes Dr. Schaum's authority, who, however, speaks of but *one* specimen as *concinnum*). For the sake of consistency, our author ought likewise (with me) to have referred it as a synonym to *B. femoratum*—as a synonym to *B. littorale*, according to the types, because the Stephensian representatives comprise these species also.

Again, I refer *P. decorus*, Steph. Mand., to *B. decorum*, on the same principle; *it is correctly recorded by Stephens as British*, though the representatives in his cabinet consist of several species besides. Our author, on the contrary, refers *P. decorus* to *B. rufipes*, Dufts., always after these delusive types collectively. But to be consistent again, he ought likewise to have referred it as a synonym, in part to *B. nitidulum*—to *B. affine* (species or variety)—to *B. Stomoides* (species or variety), and (with me) to *B. decorum*; because the supposed types in the Stephensian cabinet do in fact = 1 *decorum* (the first in the row, and therefore probably the *true* type), 1 *Stomoides*, 1 *affine*, and 3 *nitidulum*!!! Into what a jolly mess of confusion and repetition would a synonymy founded consistently upon the types involve us.

Again, our author objects, that I refer *P. agilis* to *B. monticulum*, and, herein, that I am again in opposition to Dr. Schaum, who refers it to *decorum*. I reply, that I so assigned it for the reason stated at the time—because *P. agilis*,

Spence, which Stephens recorded under that name, does *really* appertain to *B. monticulum*, as *proved* by the original types in the museum of the Entomological Society. But *I also remarked* (at p. 188 of my Work), that “it is represented in the Stephensian Cabinet by specimens of *decorum* ;” a statement in perfect *accordance* with that of Dr. Schaum, and *not* antagonistic, as our author would lead us to suppose.

In the four remaining instances quoted by our author, Dr. Schaum and I do really differ respecting the Stephensian types. Dr. Schaum makes *P. albipes* = *brunnipes*, Dej., whilst I identify it with *decorum*, as an immature example : Dr. Schaum makes *Lophia assimilis* = *B. doris* — I assign it to *normannum*, because it has *parallel* frontal foveæ, though Stephens describes these as *oblique* : the same difference exists respecting *hæmorrhoidalis* ; and, fourthly, we differ in our estimate as to which *variety* of *lampros* the supposititious Stephensian species belong. As I considered it far more probable that so experienced an Entomologist and accurate observer as Dr. Schaum should be correct than myself, I have lately re-examined those Stephensian types, but I find no reason to alter my former opinion respecting them in any essential particular.\*

M. Jacquelin-Duval adheres to his opinion, that *P. elegans*, Steph., must be assigned to *saxatile* ; if his opinion were correct, the specimen would be a *monstrosity* ; being equal in length to any *B. littorale*, of which, in fact, it is only an eccentric variety. Our author still affirms that *L. pulicaria*, Steph., belongs to *B. tenellum* (which has not hitherto been found in England), though Dr. Schaum as

\* I think Dr. Schaum is correct in referring one supposed example of *P. monticulus* in Stephens's Cabinet to *concinnum*, but three out of the four individuals are immature.



well as myself pronounced it, without the shadow of a doubt, to be *pusillum*; and though Dr. Schaum and myself at any rate agree, that *L. assimilis* and *hæmorrhoidalis*, Steph., are one species, and certainly not *B. assimile*, our author determines that they are two different species, and that *hæmorrhoidalis* shall be *assimile*, and the other *doris*: and, lastly, our author "persists" in assigning *P. viridiæneus*, Steph., to *B. tibiale*, though I confidently affirmed that it is a veritable *decorum*; and such it as certainly is, as that *B. impressum*, Steph., is not the Fabrician species of that name, but, as Dr. Schaum correctly stated, "an ill preserved specimen of *B. flavipes*."

The persistency with which our author adheres to his preconceived opinions respecting these Stephensian types would be beyond all praise, if those opinions were equally correct; but as the matter stands, I may perhaps be permitted to express my surprise that, since Dr. Schaum and I differ, in some few instances, as to the identity of the said types, *after a careful examination and consideration of them*—that (I say) the possibility—just the mere possibility—did not suggest itself to our author, that he himself might be in error, when, for the second time, he pronounced so decided an opinion (antagonistic to one or both of us) as to what they are—*without ever having seen them at all*.

J. F. DAWSON.

THE WOODLANDS, Oct. 31st, 1857.

## COLEOPTERA.

NEW BRITISH SPECIES NOTICED IN 1857.

BY E. W. JANSON, Sec. Ent. Soc.

1. *BOLITOCHARA LUCIDA*, Grav., Eric., Kraatz; Waterhouse, Zool. 5633 (1857).

Placed to represent *lunulata* in the Stephensian cabinet, but does not answer to his description, which is probably copied from some continental work, and refers to the true *Bol. lunulata*, Payk., a species I believe not hitherto ascertained to be indigenous.

Appears to be a scarce insect; my specimens I found in boleti, near Reigate, Surrey, in July.

2. *BOLITOCHARA BELLA*, Maerkel, Kraatz; Waterhouse, Zool. 5633 (1857).

Also a scarce species: I have taken it near Reigate, in company with the preceding, and likewise near Croydon in the autumn.

3. *PHYTOSUS NIGRIVENTRIS*, Chevrolat; Bold, Zool. 5448 (1857); Wollaston, Cat. Col. Ins. Mad. 169, 482 (1857); *P. spinifer* ♂, Curtis.

“Taken beneath Algæ, on the Durham and Northumbrian coasts” ♂, ♀.

4. *SILUSA RUBIGINOSA*, Eric.; Waterhouse, Zool. 5633 (1857).



Whence Stephens's description, Man. Brit. Col. 372, 2929, is taken, I know not; it appears, however, to be translated from Erichson's diagnosis, with certain additions: there is no specimen thus designated in his cabinet, although the absence of the asterisk before the specific title in the Manual indicates that he possessed an insect to which he considered his description applied. An individual which I sent to Dr. Kraatz in the autumn of 1854 was returned ticketed "*Silusa trinotata*, mihi." This insect occurs, but very sparingly, beneath the bark of dead trees, and at the fermenting sap oozing from the wounds of living trees, especially elms; occasionally also among the decomposing frass in the galleries of the larvæ of the Goat-moth (*Cossus ligniperda*).

5. *OCALEA RIVULARIS*, Miller, Kraatz; Waterhouse, Zool. 5633 (1857).

My specimens of this and of the greater number of the *Aleocharidæ* enumerated in Mr. Waterhouse's List, being still in that gentleman's hands, I am unable to furnish any information respecting them, my memoranda being available only by the numbers and tickets attached to the insects.

6. *OCALEA BADIA*, Eric., Kraatz; Waterhouse, Zool. 5633 (1857).

7. *LEPTUSA FUMIDA*, Eric., Kraatz; Waterhouse, Zool. 5633 (1857); *Oxypoda fumida*, Eric.

Beneath bark, Colney Hatch, October; rare.

8. *LEPTUSA RUFICOLLIS*, Eric., Kraatz; Waterhouse, Zool. 5633 (1857).

*Oxypoda ruficollis*, Eric.

Taken very sparingly by myself, within the London district, in moss on the trunks of trees, and beneath the bark, in winter and early spring.

9. *THIASOPHILA INQUILINA*, Maerkel; Kraatz, Naturgesch. d. Insect. Deutschl. ii. 71, 2 (1856).

*Aleochara inquilina*, Maerkel in Germar, Zeitschr. f. d. Entom. v. 69 (1844).

Two examples were exhibited at a recent meeting of the Entomological Society by Mr. Waterhouse in behalf of their captor, Dr. Power, who obtained them during the current year, one from a nest of *Formica fuliginosa*, the other from a nest of *Formica rufa*; a circumstance totally at variance with the observations of our continental brethren, who accord this species to *F. fuliginosa* exclusively, its near ally, *Thias. angulata*, to *F. rufa*, and which renders it desirable that a very careful examination should be bestowed upon these specimens.

10. EURYUSA KIRBYI, n. sp. Fig. 8.

*E. nigro-picea, sub-opaca, crebre sat fortiter oblique punctata, palpis, antennarum basi et apice, ano, pedibus abdominisque basi rufo-testaceis; thorace coleopteris latiore, basi profunde bi-sinuato, angulis posticis obtusis; elytris thoracis haud brevioribus, castaneis; abdomine nitido, apicem versus sensim angustato, supra crebre punctato.*

*Mas. Abdominis segmentis dorsalibus duobus apicalibus (6to. et 7mo.) subtiliter carinatis, ultimo (7mo.) margine apicali acute serrato.*

*Long. 1½ lin.*

*E. pitchy-black, sub-opaque, obliquely thickly and rather deeply and coarsely punctate, palpi, base and apex of antennæ, legs, base and apex of abdomen rufo-testaceous; thorax wider than the elytra, its base deeply bi-sinuate, posterior angles obtuse; elytra scarcely shorter than the thorax, castaneous; abdomen shining, narrowed towards the apex, thickly punctate above.*

*Male with the two terminal abdominal segments (6th*

*and 7th) with a somewhat obscure ridge, the posterior margin of the apical (7th) segment acutely serrate.*

*Length 1½ lines.*

Antennæ half as long again as the head, robust and compact, gradually incrassate towards the apex, joints 5 to 10 fully twice as broad as long, the apical joint as long as the two preceding united, acuminate, pitchy black, the two basal (1st and 2nd) and the apical (11th) articulations and the palpi rufo-testaceous. Head thickly and finely punctate, opaque, pitchy-black. Thorax nearly twice as broad as long, wider than the elytra, narrowed in front, rounded at the sides, the posterior margin lobed in the middle, deeply notched towards the angles, which, although prominent, are obtuse, sub-opaque, very thickly and rather deeply and coarsely punctate, the punctures oblique and confluent, thus giving to the sculpture a peculiar undulated appearance, with a short scattered golden pubescence, pitchy-black, the margins obscurely rufous. Elytra barely as long as the thorax, similarly but not quite so strongly punctured, the outer posterior angles with a deep notch, sparingly clothed with a short golden depressed pile, sub-opaque, of a bright chestnut hue, the region of the scutellum and the lateral margins faintly pitchy. Abdomen shining, gradually narrowed towards the apex, thickly minutely punctate, the punctures sparser on the terminal segments, clothed, especially at the sides, with a longish somewhat depressed golden pubescence, rufo-testaceous, the fifth entirely and the base of the sixth segments pitchy-black. Legs of a clear testaceous red.

N.B. The above description was drawn up soon after the specimens were captured; the rufo-testaceous colour of the abdomen has since deepened into brown, the apical half of the penultimate (6th) and the entire terminal segment alone now retaining that hue.

Apparently nearly allied to *Euryusa castanoptera*, Kraatz, which I know by description only, and from which it differs in having the thorax wider than the elytra, the peculiar sculpture of those parts, and the serrated posterior margin of the seventh abdominal segment of the male. I have not dissected the mouth.

A pair only of this interesting creature have hitherto come under my notice; they were taken within the London district, during the past summer, by Mr. H. Squire, in a nest of *Formica fuliginosa*.

11. *ALEOCHARA MYCETOPHAGA*, Kraatz; Waterhouse, Zool. 5633 (1857).

12. *DINARDA DENTATA*, Grav.; Kraatz, Naturgesch. d. Ins. Deutschl. ii. 111, 2 (1856).

*Lomechusa dentata*, Grav. Mon. Col. Micr. 181, 4 (1806), but not of Curtis, Brit. Ent. ix. Fab. and Fo. 410 (1832), cited by Dr. Kraatz, which, having carefully examined the specimen in the national collection, figured by Mr. Curtis, I have already, Proc. Ent. Soc. 1st Sept. 1856, Zool. 5305 (1856), shown must be referred to the nearly allied species *D. Maerhelii*, Kiesenw., Kraatz.

The present insect may be distinguished from *D. Maerhelii* by its uniformly smaller size, its deeply longitudinally furrowed head, slenderer antennæ, more acute posterior angles of its thorax, brighter hue, and by its more thickly punctate thorax, elytra and abdomen.

This beautiful and interesting addition to our list of indigenous *Coleoptera* was discovered by Mr. J. J. Reading, in the spring of the present year, in company with *Formica fusca*, in the vicinity of Plymouth, and to that gentleman's liberality I am indebted for the species.

In Germany, it is said to be found with *Formica rufa*, but Dr. Kraatz distinctly states that it occurs with a species

of ant allied to *F. rufa*; MM. Fairmaire and Laboulbène inform us, that in France it generally inhabits the small nests of yellow ants under stones, "*se trouve généralement dans les petits nids de Fourmis jaunes, sous les pierres.*"

13. *ILYOBATES PROPINQUA*, Aubé, Fairm. et Laboulb.; Waterhouse, Zool. 5634 (1857).

*Calodera propinqua*, Aubé, Ann. d. l. Soc. Ent. de France, Ser. 2, viii. 302, 3 (1850).

*Ilyobates rufus*, Kraatz, Naturgesch. d. Insect. Deutschl. ii. 135, 2 (1856), is possibly, as indicated by its author, not specifically distinct.

14. *ILYOBATES FORTICORNIS*, Boisd. et Lacord.; Waterhouse, Zool. 5634 (1857).

*Bolitochara forticornis*, Boisd. et Lacord. Faun. Ent. des Env. d. Paris, 543, 4 (1835).

15. *CALLICERUS RIGIDICORNIS*, Eric., Kraatz; Waterhouse, Zool. 5634 (1857).

*Homalota rigidicornis*, Eric., Gen. et Spec. Staph. 82, 3 (1839).

*Semiris fusca*, Heer, Faun. Col. Helv. 343, 1 (1839).

16. *CALODERA NIGRITA*, Mannhm., Kraatz, Naturgesch. d. Insect. Deutschl. ii. 141, 1 (1856).

*Calodera, nov. sp.?*" Waterhouse, Zool. 3634 (1857)?

I have not seen Mr. Waterhouse's insect, but have nevertheless good reason for believing that it will prove to be the *C. nigrata* of the authors above cited, and identical with the specimens thus denominated in my collection, and which I owe to the kindness of Mr. Edwin Shepherd, by whom this apparently rare species has been taken within the London district in the early spring and late in the autumn.

Stephens's description, Man. Brit. Col. 354, 2753 (1839), probably copied from Count Mannerheim, applies very well, as far as it goes, to the insect before me; indeed, the size

given,  $2\frac{1}{4}$  lines, will not accord with any other black *Calodera* known to me; Spry's figure, however, Brit. Col. Del. Tab. 24, f. 5 (1840), can, I think, scarcely be intended to represent it.

17. *CALODERA ÆTHIOPS*, Grav., Eric.; Waterhouse, Zool. 5634 (1857).

18. *CALODERA UMBROSA*, Eric., Kraatz; Waterhouse, Zool. 5634 (1857).

19. *TACHYUSA SCITULA*, Eric.; Waterhouse, Zool. 5634 (1857).

20. *TACHYUSA SULCATA*, Kiesenw.; Waterhouse, Zool. 5634 (1857).

21. *OXYPODA EXIGUA*, Eric.; Waterhouse, Zool. 5634 (1857).

22. *OXYPODA EXOLETA*, Eric.; Waterhouse, Zool. 5760 (1857).

*Oxyroda præcox*, Waterhouse, Zool. 5634 (1857).

23. *HOMALOTA CURRAX*, Kraatz; Waterhouse, Zool. 5634 (1857).

24. *HOMALOTA DEBILICORNIS*, Eric.; Waterhouse, Zool. 5634 (1857).

Mr. Waterhouse subsequently (Zool. 5760) expresses a doubt whether the insect he has thus designated is the species so called by Erichson.

25. *HOMALOTA FRAGILICORNIS*, Kraatz; Waterhouse, Zool. 5634 (1857).

26. *HOMALOTA PAGANA*, Eric.; Waterhouse, Zool. 5635 (1857).

27. *HOMALOTA NITIDULA*, Maerkel; Kraatz; Waterhouse, Zool. 5635 (1857).

28. *HOMALOTA LANGUIDA*, Eric.; Waterhouse, Zool. 5635 (1857).

29. *HOMALOTA HYGROTOPORA*, Kraatz; Waterhouse, Zool. 5635 (1857).

30. *HOMALOTA LURIDIPENNIS*, Mannerh., Kraatz ; Waterhouse, Zool. 5635 (1857).

Frequents the muddy margins of streams. I have met with it at Colney Hatch ; specimens sent by me to Dr. Kraatz have been identified by him.

31. *HOMALOTA FRAGILIS*, Kraatz ; Waterhouse, Zool. 5635 (1857).

32. *HOMALOTA LABILIS*, Eric. ; Waterhouse, Zool. 5635 (1857).

Taken by Mr. H. Squire in the London District.

33. *HOMALOTA FALLAX*, Kraatz ; Waterhouse, Zool. 5635 (1857).

34. *HOMALOTA MONTICOLA*, Thomsson, Kraatz ; Waterhouse, Zool. 5635 (1857).

35. *HOMALOTA EXCELLENS*, Kraatz ; Waterhouse, Zool. 5635 (1857).

36. *HOMALOTA NIGELLA*, Eric. ; Waterhouse, Zool. 5635 (1857).

Hammersmith Marshes ; amongst reeds in the early spring.

37. *HOMALOTA ÆQUATA*, Eric. ; Waterhouse, Zool. 5635 (1857).

Beneath bark of dead trees, London district, in the early spring.

38. *HOMALOTA PILOSA*, Kraatz ; Waterhouse, Zool. 5635 (1857).

39. *HOMALOTA DEBILIS*, Kraatz ; Waterhouse, Zool. 5635 (1857).

40. *HOMALOTA DEFORMIS*, Kraatz ; Waterhouse, Zool. 5635 (1857).

41. *HOMALOTA EXILIS*, Eric. ; Waterhouse, Zool. 5635 (1857).



42. HOMALOTA INCONSPICUA, Eric. ; Waterhouse, Zool. 5635 (1857).
43. HOMALOTA HEPATICA, Eric. ; Waterhouse, Zool. 5635 (1857).
44. HOMALOTA TRIANGULUM, Kraatz ; Waterhouse, Zool. 5635 (1857).
45. HOMALOTA SUBLINEARIS, Kraatz ; Waterhouse, Zool. 5635 (1857).
46. HOMALOTA NIGRITULA, Grav., Kraatz ; Waterhouse, Zool. 5635 (1857).
47. HOMALOTA SODALIS, Eric. ; Waterhouse, Zool. 5635 (1857).
48. HOMALOTA DIVISA — ; Waterhouse, Zool. 5760 (1857).  
*H. divisa*, Maerkel ; Germar, Zeitschr. f. d. Entom. v. 213, 37 (1844) ?  
*Homalota nigricornis*, Waterhouse, Zool. 5636 (1857).
49. HOMALOTA CORIARIA, Miller, Kraatz ; Waterhouse, Zool. 5636 (1857).
50. HOMALOTA NIGRA, Kraatz ; Waterhouse, Zool. 5636 (1857).
51. HOMALOTA HOSPITA, Maerkel, Kraatz ; Waterhouse, Zool. 5636 (1857).
- An attendant on the larva of the goat-moth (*Cossus ligniperda*), luxuriating in the fermenting frass and oozing sap, and probably subsisting on Dipterous and other larvæ usually abounding in such situations.
52. HOMALOTA SCAPULARIS, Sahlb., Kraatz ; Waterhouse, Zool. 5636 (1857).
53. HOMALOTA OBLITA, Eric. ; Waterhouse, Zool. 5636 (1857).
54. HOMALOTA SORDIDULA, Eric. ; Waterhouse, Zool. 5636 (1857).



55. HOMALOTA INQUINULA, Eric. ; Waterhouse, Zool. 5636 (1857).
56. HOMALOTA SUBRUGOSA —; Waterhouse, Zool. 5760 (1857).  
*H. subrugosa*, Kiesenweter, Ent. Zeit. Stett. 318 (1848)?  
*Homalota putrida*, Waterhouse, Zool. 5636 (1857).
57. HOMALOTA VILLOSULA, Kraatz ; Waterhouse, Zool. 5636 (1857).
58. HOMALOTA MELANARIA, Mannerh., Kraatz ; Waterhouse, Zool. 5636 (1857).
59. HOMALOTA CLIENTULA, Eric. ; Waterhouse, Zool. 5636 (1857).
60. HOMALOTA CÆSULA, Eric. ; Waterhouse, Zool. 5636 (1857).
61. PLACUSA INFIMA, Eric. ; Waterhouse, Zool. 5636 (1857).
62. PHLÆOPORA CORTICALIS, Grav., Eric. ; Waterhouse, Zool. 5636 (1857).
63. SCHISTOGLOSSA VIDUATA, Eric., Kraatz ; Waterhouse, Zool. 5636 (1857).  
*Homalota viduata*, Eric. Käf. d. Mark. Brand. i. 330, 26 (1837); Gen. et Spec. Staph. 111, 61 (1839).
64. GYROPHÆNA LUCIDULA, Eric. ; Waterhouse, Zool. 5636 (1857).
65. GYROPHÆNA MINIMA, Eric. ; Waterhouse, Zool. 5636 (1857).
66. MYLLÆNA INFUSCATA, Kraatz ; Waterhouse, Zool. 5637 (1857).
67. PHILONTHUS CORVINUS, Eric. ; W. C. Unwin, Zool. 5410 (1857).  
 " From moss near Newhaven."

68. *SUNIUS FILIFORMIS*, Latr., Eric. ; Dr. J. A. Power, Proc. Ent. Soc. 4 May, 1857, Zool. 5762 (1857).

*Pæderus filiformis*, Latr., Gen. Crust. et Ins. i. 293, 4 (1806).

Taken by Dr. Power near Brighton, who kindly presented me with a specimen. I subsequently secured a solitary individual beneath *rejectamenta* at Southend, Essex, on the 28th of May, 1856, and I have before me two remarkably fine examples, captured by M. J. J. Reading near Plymouth in company with *Myrmica cæspitum*.

69. *BLEDIUS UNICORNIS*, Germar, Eric. Gen. et Spec. Staph. 764, 7 (1840); E. W. Janson, Proc. Ent. Soc., 2 Feb. 1857, Zool. 5523 (1857).

*Oxytelus unicornis*, Germar, Faun. Ins. Europ. xii. f. 3 (1828).

*Bledius hispidus*, Parfitt, Zool. 5409 (1857).

Captured by Mr. Parfitt at Exmouth, but found some years previously by Mr. Wollaston in the same locality, and also in the Isle of Portland.

70. *EPUREA NEGLECTA*, Heer, Eric. in Germar, Zeitschr. f. d. Ent. iv. 269, 11 (1843); Naturgesch. d. Ins. Deutschl. iii. 147, 9 (1845); Sturm, Deutschl. Faun. Ins. xv. 63, 8, Tab. 295, f. B. (1844).

*Nitidula neglecta*, Heer, Faun. Col. Helv. i. 396, 8 (1841).

Taken near Acrinton, Lincolnshire, by Mr. Constantine, and, on two occasions, by Dr. Power in Hampshire, to whose consideration I am indebted for a comely specimen.

71. *ANOMMATUS DUODECIM-STRIATUS*, Mül.; T. J. Bold, Zool. 5448 (1857).

On a decaying plant of the cultivated pansy, in a garden at Morpeth, Northumberland."

An individual of this species is extant in the Stephensian

cabinet, mixed up with *Aglenus brunneus* (*Anommatus obsoletus*, Steph.), and I have heard it stated that Mr. Parfitt has recently captured it near Exeter, but under what circumstances I know not.

First described by P. W. J. Müller in Germar's *Mag. der Entom.* iv. 190, 5 (1821), under the name of *Lyctus 12-striatus*. The genus *Anommatus* was proposed by Wesmael, in the *Bullet. de l'Acad. de Bruxelles*, ii. 339, Tab. iv. (1836), who, supposing that the insect which served him as type was new to science, bestowed upon it the specific appellation of *terricola*.

72. *LÆMOPHLÆUS CLEMATIDIS*, Eric.; *Naturgesch. d. Ins. Deutschl.* iii. 326, 11 (1846); *Sturm. Deutschl. Fauna, Ins.* xxi. 61, 11, Tab. 384, fig. c C (1851); E. W. Janson, *Proc. Ent. Soc.*, 6 July, 1857.

In the dead stems of the Travellers' Joy (*Clematis vitalba*), near Gravesend, Kent, in July last. Fig. 1.

73. *SILVANUS SIMILIS*, Eric.; A. Adams and Dr. W. B. Baikie, *Zool.* 5554 (1857).

"In sugar. Introduced."

*S. similis* is found, according to Erichson, beneath bark.

74. *ATOMARIA FIMETARII*, Hbst., Eric.; T. V. Wollaston, *Trans. Ent. Soc. Lond. N. S.* iv. 67, 2 (1857).

Taken by Mr. Wollaston near Flamborough, Yorkshire.

75. *ATOMARIA PELTATA*, Kraatz; T. V. Wollaston, *Trans. Ent. Soc. Lond. N. S.* iv. 70, 7 (1857).

"Spridlington and South Ferriby, Lincolnshire; Shenton, Leicestershire; Hitcham, Suffolk; Paisley; and near London."

76. *ATOMARIA ATRA*, Hbst., Eric. (*nec* Steph.); T. V. Wollaston, *Trans. Ent. Soc. Lond. N. S.* iv. 74, 14 (1857).

*Kateretes ater*, Herbst. *Natursyst. Käfer*, v. 15, Tab. 41, fig. 5 (1793).

“Withington, Gloucestershire; Slapton Ley, Devon; Ireland.”

77. *ATOMARIA BASALIS*, Eric.; T. V. Wollaston, Trans. Ent. Soc. Lond. N. S. iv. 76, 16 (1857).

“South of England and near Edinburgh.”

78. *ATOMARIA MUNDA*, Eric.; T. V. Wollaston, Trans. Ent. Soc. Lond. N. S. iv. 76, 17 (1857).

Cellars near London, Mr. H. Squire.

79. *ATOMARIA HISLOPI*, T. V. Wollaston, Trans. Ent. Soc. Lond. N. S. iv. 77, 19 (1857).

Taken beneath dung of grouse, in Perthshire, by Mr. Robert Hislop, to whose kindness I owe the specimen described by Mr. Wollaston.

80. *LATRIDIUS FILIFORMIS*, Gyll. Ins. Suec. iv. 143, 23 1827; Parfitt, Zool. 5544 (1857).

This is the *Latridius angustatus* of the Stephensian cabinet and of his “Systematic Catalogue,” a name subsequently sunk by its author in his Illustrations, Mand. iii. 115, 11 (August, 1830), as synonymous with *L. elongatus*, Curtis, Brit. Ent. vii. Tab. and Fo. 311 (June, 1830), whose description he copies nearly word for word. In the second edition of the “Nomenclature of British Insects” (1853), Mr. Stephens again brings forward *angustatus* as a species, and cites as synonymous therewith *elongatus*, Curtis, and *filiformis*, Gyll., appending to each a mark of doubt; finally, in his Manual Brit. Col. 129, 1046 (1839), he re-adopts *elongatus*, Curtis, and transcribes the description of the Illustrations, with some slight abridgment.

The present species may be at once distinguished from *L. elongatus*, Curtis, by its small flat eyes, more parallel form, transverse thorax, sub-trigonal head, the finer and more closely set punctures of the striæ on the elytra, &c. &c.

A Canadian species found in some numbers in a living

state in cases of insects imported from that country in January last, although greatly resembling the insect now under consideration in size and colour, presents upon a careful examination so many important differences, that I am at a loss to comprehend how any one possessed of only ordinary Entomological acumen, having the two species before him, could even for a brief period assert their specific identity: the sub-quadrate head, slender antennæ, large prominent eyes and comparatively narrow thorax of the Anglo-American insect, not only indicate its specific distinctness from *L. filiformis*, but involve its location in another section of the genus.

81. *DORCATOMA FLAVICORNIS*, Fab.; Sturm, Deutschl. Fauna, Ins. xii. 103, Tab. 245, fig. a A (1837).

*Bruchus flavicornis*, Fab. Ent. Syst. I. ii. 374, 24 (1792); Syst. El. ii. 401, 38 (1801).

Found by myself in a decaying oak, within the metropolitan district, in July last. Fig. 7.

82. *RHYNCOLUS TRUNCORUM*, Germar, (*nec* Steph.); E. W. Janson, Proc. Ent. Soc., 1 June, 1857, Zool. 5768 (1857).

*Cossonus truncorum*, Germar, Col. Spec. Nov. 308, 446 (1824).

Taken by myself in May last, within the London district. Fig. 9.

83. *BOSTRICHUS BISPINUS*, Ratzeb.; T. J. Bold, Zool. 5411 (1857) [*Tomicus*]; E. Newman, Zool. 5631 (1857) [erroneously *bispinosus*]; E. W. Janson, Proc. Ent. Soc. 1 June, 1857, Zool. 5768 (1857); but not of Guyon, Zool. 4815 (1855), cited by me, Ent. Ann. 86, 26 (1856), whose description probably refers to *B. bidens*.

This species will probably be found wherever the Travellers' Joy (*Clematis vitalba*), in the stems of which it feeds, occurs.

I have met with it at Darenth, Croydon, Gravesend, Chatham, Reigate and Dorking.

84. *SCOLYTUS RUGULOSUS*, Ratzeb.; E. W. Janson, Proc. Ent. Soc. 6 July, 1857.

*Eccoptogaster rugulosus* (Koch), Ratzeb. Forst. Ins. i. 187, Tab. x. f. 10 (1837).

Found by Mr. Groves, in the dead branches of a pear-tree, in his garden at Lewisham, who kindly gave me several of the infested twigs, from which I reared a beautiful and variable series.

This species may be at once distinguished from its near ally, *S. intricatus*, Ratzeb., by its smaller size, deeper, coarser and rugulose sculpture, and by the punctures on the interstices of the elytra, arranged in regular rows, being of equal depth and size with those of the true or normal striæ, and by the apex of the elytra being usually more or less broadly red.

I may remark, that there is in Mr. Wollaston's collection, an individual of this species, having the red blotch invading nearly two-thirds of the elytra, and which I had not previously been able satisfactorily to determine, taken by that gentleman several years back at St. Neots.

Ratzeburg appears first to have described this insect under the name which I have adopted, and which had been previously applied to it by Koch, in his collection and *in litteris*. Ratzeburg gives as synonyms *S. punctatus*, *Mus. Berol.*, and *S. hæmorrhous*, Ulrich.

In Vincent Köllar's "Treatise on Insects injurious to Gardeners, Foresters and Farmers," of which an English translation was published in 1840, by the Misses Loudon, with notes by Mr. Westwood, will be found some interesting observations by Canon Schmidberger on the natural history of the present species, specimens of which, he informs us, had

been named for him by Mr. Ulrich, "*Scolytus hæmorrhous*, Meg.;" the vague description, however, there given can scarcely be admitted as a scientific diagnosis, and is moreover, as far as I can ascertain, posterior to Ratzeburg's accurate description and beautiful figure: both works were published in 1837. Ratzeburg's introduction is dated April, 1837,—Köllar's, May, 1837. I give the preference, therefore, in accordance with the course generally adopted on the Continent, even by Köllar's fellow citizen Redtenbacher, to the trivial name of *rugulosus*, Ratzeb.

2, ALMA ROAD, UPPER HOLLOWAY,

14th November, 1857.

## COLEOPTERA.



### NOTES ON ANTS' NEST BEETLES.

BY EDWARD W. JANSON.

IN resuming this interesting topic, my object is, briefly, to record the observations communicated to me by several Entomologists, who have taken up with enthusiasm the examination of Ants' nests, and to whose industry it will have been already remarked, in the List of New Species, we are indebted for the discovery, during the year now well nigh run out, of three additional Myrmecophilous *Coleoptera*, one of them apparently new to science. On my own score I have little to relate. The half-promised essay on the laws affecting landlord ants and tenant beetles must now be deferred *sine die*,—the rush made by certain metropolitan collectors to the only localities accessible to me, and where, by scrupulously abstaining from injuring either the ants or their domicils, I had for three consecutive years tranquilly carried on my investigations,—the diligence with which they “ransacked every nook and corner,” and the ruthlessness with which they grubbed up and utterly destroyed every nest, having brought my favourite pursuit to a sudden, and, I must admit, somewhat unlooked for, termination.

In publishing my Ants' Nest paper in last year's Annual, I was actuated by the desire of sharing with others the



pleasure and profit which I had culled in a path previously untrodden in this country, little expecting that sordid *amor habendi*, which rampant and strong as I well know it to be in the majority of collectors, would have led them to exclude me henceforth from all participation in the dainty dish which I had set before them. And what has science gained at the hands of these unprincipled waste-laying freebooters ?

Have they contributed one solitary fact to our store, thrown one dim ray of light on the mysterious relationship between the ant and its beetle guest ?

Science to these men is a mere outward garb, a sort of west-end paletôt, which imparts an air of respectability to the wearers, and to their sordid selfish acts the semblance of scientific research.

But, granting in full to these buccaneers the validity of the plea, that they, albeit unconsciously, further science,—since when “they to sorrow come,” or he who waits for no man clutches them in his iron grasp, their ill-gotten gain passes into other, mayhap better, hands,—I will stoop to their grovelling understandings, and view the matter in a business light.

What then have they gained commensurate with the dire destruction they committed, and the imminent risk they incurred of an apprenticeship to the art of oakum-picking ?

Not one species have they added to the List, or, I trow, the sycophant the captain of the gang, the ant's nest ravager *par excellence*, would long since have announced his fig with smiles benign, and the pseudo-suavity and affected modesty common to his class, yet in degree peculiarly his own, and which have won for him both tuft and place.

“——— nimium ne credere colori.”—*Virg. Eccl. ii. 27.*

Not a single rarity beyond their own wants. The sycophant's booty has not yet yielded even an ill-set broken specimen in excess of six comely individuals, styled a duplicate; nor has *Hetærius* been proffered to wealthy provincial clients, notwithstanding that the mercenary and his myrmidon both toiled whole summer days at the destruction of the "light loamy bank with aspect to the west," once a world of life, but now a wilderness.

"——, —— quærenda pecunia primum est;  
Virtus post nummos."—*Hor. Epist.* 1. i. 52.

"—— get insects, insects still,  
And then let virtue follow, if she will."—*Pope (adapted)*.

————

*Claviger testaceus*, Preyssler, has been captured, in the spring, on the Kentish Downs, by Mr. Wollaston; in Ireland, in the autumn, by Dr. Power, and in the neighbourhood of Plymouth by Mr. J. J. Reading; specimens from the latter localities are before me.

When shall I have the pleasure of recording, or of seeing recorded, *C. longicornis* as a British-born subject?

*Myrmedonia limbata*, Paykull, of which I have occasionally met with a solitary individual in the purlieus of the nests of *Formica flava*, has been found by my colleague, Mr. Edwin Shepherd, in comparative plenty, associated with *Formica fusca*, in Kent in July, by whom a single specimen was likewise taken in a nest of *Formica fuliginosa*, near Croydon in the spring.

*Myrmedonia humeralis*, Grav. Sparingly with *Formica rufa* in the spring, near Plymouth, by Mr. J. J. Reading, and, in company with *Formica fuliginosa*, in Kent, by Dr. Power.

*Myrmedonia cognata*, Maerkel. Three specimens were taken by Mr. Edwin Shepherd, early in the spring, in a nest of *Formica fuliginosa*, near Croydon, Surrey.

*Myrmedonia lugens*, Grav. A single example of this apparently rare species was captured early in the spring, by Mr. Edwin Shepherd, in a nest of *Formica fuliginosa*, near Croydon.

*Myrmedonia laticollis*, Maerkel. Has been taken with *Formica fuliginosa* near Plymouth, in the spring, by Mr. J. J. Reading.

*Homalota flavipes*, Grav. In nests of *Formica rufa*, in the spring, near Plymouth, by Mr. J. J. Reading.

*Homalota confusa*, Maerkel. Three specimens of this scarce species were taken by Mr. Edwin Shepherd at the end of last May, in the London district, in a nest of *Formica fuliginosa*, see Proc. Ent. Soc., 1 June, 1857, Zool. 5768 (1857), who with his wonted kindness presented me with a specimen.

*Homalota anceps*, Eric. Sparingly, in the spring, in nests of *Formica rufa*, near Plymouth, by Mr. J. J. Reading.

*Oxypoda formiceticola*, Maerkel. In the spring, near Plymouth, in nests of *Formica rufa*, by Mr. J. J. Reading.

*Aleochara ruficornis*, Grav. Dr. Power found, this spring, an individual of this scarce species, beneath dead leaves, in the vicinity of a nest of *Formica rufa*, a few yards distant from the spot in which I captured the specimen mentioned in last year's Annual.

*Thiasophila angulata*, Eric. In the spring and autumn, in nests of *Formica rufa*, near Plymouth, by Mr. J. J. Reading.

*Thiasophila inquilina*, Maerkel, Kraatz. Found by Dr. Power in Kent with *Formica fuliginosa*, and in Buckinghamshire with *F. rufa*, and respecting which I beg to refer

the reader to the remarks under this species in the foregoing List, No. 9.

*Homoeusa acuminata*, Maerkel, Kraatz, hitherto unique, has again been found by Mr. Wollaston in the locality, and under the circumstances mentioned in last year's Annual, viz. on the chalky downs, near Bromley, Kent, in nests of *Formica fusca*, beneath flints; and to that gentleman's kindness, for a long and arduous search had yielded him but a slender store, I am indebted for a comely pair of this elegant little species. On the 16th of May last, I found a specimen, within the London district, running at the base of a fence, where *Formica flava* and *Myrmica rubra* abounded, Proc. Ent. Soc. 1 June, 1857, Zool. 5768 (1857).

*Dinardi Maerkelii*, Kiesenw. Two specimens of this curious insect were secured last autumn, by Mr. H. Adams, near Swansea, in a nest of *Formica rufa*, thus again confirming the accuracy and trustworthiness of the late Dr. Leach, who, Mr. Dillwyn informs us, "Materials for a Fauna and Flora of Swansea and its Neighbourhood," 20 (1848), took it on the sand-hills near that town in the summer of 1809. Dr. Leach deposited this specimen in the national collection, when it remained unique as a British representative for nearly half a century, that is to say, until 1856, in the summer of which year I succeeded in re-discovering it [Proc. Ent. Soc. 1 Sept. 1856, Zool. 5305 (1856)]—the spell was broken—and the day is probably not far distant, when every collection in the land will, in this insect, vindicate the truthfulness of one of the most comprehensive and vigorous minds that have ever been turned to the study of natural history.

*Dinarda dentata*, Grav. Discovered in the spring of the present year, near Plymouth, in nests of *Formica fusca*, by Mr. J. J. Reading, whose Entomological enthusiasm and

extraordinary success are equalled only by his manly straightforwardness, and the disinterestedness and liberality with which he dispenses the numerous rarities which reward his exertions.

*Atemeles paradoxus*, Grav., has been taken in the spring, in the vicinity of Plymouth, by Mr. J. J. Reading; the specimens occurred in nests of *Formica fusca*.

*Atemeles emarginatus*, Grav. Mr. J. J. Reading has captured this species near Plymouth, in the spring, in nests of *Myrmica rubra*.

*Euryusa Kirbyi, mihi*—described in the list of new species and figured on the Plate, Fig. 8.

This interesting and novel addition to our list, we owe to the industry of Mr. H. Squire, who, as already stated, captured a pair in the immediate vicinity of the metropolis, in a nest of *Formica fuliginosa*.

I have dedicated this species to the late Rev. William Kirby, M. A., F. R. S., F. L. S., Honorary President of the Entomological Society of London, etc. etc., as a slight token of respect to the memory of the illustrious Entomologist, whose labours on the tribe to which it pertains, had they been given to the world at the epoch they were accomplished, would have held honourable place beside their coeval, the "Monographia Apum Angliæ." Alas! that those admirable descriptions should, thirty years subsequently, have been published secondhand, clipped, misapplied and buried in a mass of rubbish!

*Leptacinus formicetorum*, Maerkel. Mr. J. J. Reading has taken this species near Plymouth, in the spring and autumn, in nests of *Formica rufa*.

*Hetaerius sesquicornis*, Preyssler. Mr. S. Stevens has recorded the capture of one, and Dr. Power of three, specimens of this curious insect, Proc. Ent. Soc. 4 May (1857),

Zool. 5762 (1857). Dr. Power again met with it late in September; hence it would appear to pass the winter in the imago state.

*Monotoma conicicollis*, Aubé; has been taken in the early spring, in nests of *Formica rufa*, near Plymouth, by Mr. J. J. Reading.

Ants' nests have now contributed, within two years, upwards of twenty species of *Coleoptera* previously unknown as inhabitants of Britain, and have, moreover, yielded in comparative plenty no trifling number, which were previously unique, or of the greatest rarity, in collections. I may instance, *Dinarda Maerkelii*, Kiesenw. (*dentata*, Curtis, nec Grav.), *Dendrophilus pygmæus*, L. nec Steph. (*D. Shepardi*, Steph., Curt.), *Myrmedonia funesta*, Grav., and *humeralis*, Grav., *Atemeles emarginatus*, Grav. (*paradoxus*, Steph., nec Grav.), and *Amphotis* (*Nitidula*) *marginata*, F. Several unrecorded species, which I have not yet satisfactorily identified with descriptions, or whose synonymy I have not yet been able to disentangle, still await, in my boxes, their definitive appellations.

But there remains ample scope for successful exertion,—a great deal to be done; *Lomechusa strumosa*, F., is almost unique, *Myrmedonia Haworthi*, Steph., hath but three masters, and *Claviger longicornis*, Müller, *Myrmedonia plicata*, Eric., *similis*, Maerker, and *fulgida*, Grav., exist, as British, in anticipation only—bright fleecy clouds in the boundless heavens of the imagination.

And now, kind reader, commending the Ant to your sympathy, assuring you not only for her sake but for yours' and the science you serve, that *humanity* is the best *policy*, and tendering you my best aid in case of need, *au revoir*.

## LEPIDOPTERA.



NEW BRITISH SPECIES IN 1857.

(BY THE EDITOR.)

IN spite of a summer, which, for brilliant weather and heat, the Registrar General reports to have been quite unprecedented, our crop of novelties is unusually poor. Insects have generally been abundant, many rare species in tolerable numbers, but of novelties we have hardly any amongst the *Macro-Lepidoptera*.

Probably, if half the energy which has been expended in the pursuit of *Phlogophora Empyrea* (a novelty two years ago, and figured in the Annual of 1856), had been expended in the search for *fresh novelties*, we might have had a better list to produce to our readers.

No doubt much of the increase of Entomological zeal which at present exists in the country is expended on the *Rhopalocera*, but we presume, when these incipients have obtained all the British butterflies (and we believe few collections are so poor as not to contain *reputed* British specimens of *Lathonia* and other rarities), they will turn their attention to the *Bombyces* and *Noctuæ*, and when the "sugaring" force of the country is annually recruited by 200 pairs of hands, results of some sort must follow; either the *Noctuæ* will share in the extinction which now seems likely soon to overtake the *British butterflies*, or local and hitherto undetected species will reward the diligence of the midnight prowler.

The extinction of the butterflies is by no means so im-



probable a contingency as some might be disposed to imagine; *Chrysophanus Dispar* appears actually to have ceased to inhabit these islands; *Polyommatus Acis*, if not altogether extinct, seems very nearly so; the extinction of *Polyommatus Arion* and *Pamphila Actæon* is one of those facts, which we may safely prophesy as certain to come to pass at no very distant day. It must be borne in mind, that now-a-days species, which are at all rare or local, are systematically caught and pinned with an unrelenting ardour, such as our butterflies of yore never experienced. The captures of the Purple Emperor this year must pretty nearly have doubled the number of cabinet specimens in the country: insects, it is true, are prolific, but systematic pursuit in all the stages of their existence must eventually thin their numbers; we hope the rising generation will remember this, and not rashly hasten forward the day of "the last British butterfly."

Our list of novelties includes only two of the *Macro-Lepidoptera*, belonging to the *Geometrina* (and one of these, it is true, may be only an accidental visitor, and as much an indigenous British animal as the tiger which lately perambulated Ratcliffe Highway), and thirteen *Micro-Lepidoptera*; one of which is a *Tortrix*, and a startling addition of our Fauna, eleven are *Tineina*, and one is a *Pterophorus*.

The following is the list of them:—

GEOMETRINA.	Coleophora ibipennella.
Aspilates Sacraria.	„ apicella.
Eupithecia Helveticaria.	„ chalcogrammella.
TORTRICINA.	Tischeria angusticollella.
Sciaphila cinctana.	Nepticula Myrtillella.
TINEINA.	„ Poterii.
Depressaria bipunctosa.	„ Glutinosæ.
Gelechia albipalpella.	„ arcuata.
„ arundinetella.	PTEROPHORINA.
	Pterophorus Loewii.



## ASPILATES SACRARIA, Linnæus.

This conspicuous insect with the anterior wings of a sulphur yellow, with an oblique purple streak from the apex to the middle of the inner margin, and with the posterior wings quite white, has been recorded (see *Intelligencer*, vol. 3, No. 57, p. 36) as occurring at Plymouth. Future investigation must show whether this has been an accidental importation, or whether the species has any claims to be considered truly British.

Mr. Wollaston remarks, "that all the species common to Madeira and the British islands are found in the south western extremity of our country and of Ireland;" the occurrence of a Mediterranean species would therefore be more probable in that portion of Great Britain than elsewhere.

The occurrence of the insect in Sweden was recorded by Thunberg, in 1784.

It will be remarked further on, that one of the *Plumes* first taken at Rhodes, and subsequently in Italy, but not known as occurring in Central or Northern Europe, has been this season met with on the Lancashire coast.

As the capture of Mr. Rogers' specimen in September has been considered very extraordinary, it is interesting to know that Mr. Wollaston took this insect in Madeira *at the end of September*.

## EUPITHECIA HELVETICARIA, Boisduval.

This is not *very* closely allied to any other species. Herich-Schäffer places it next to *Satyrata*, and Boisduval puts it in the immediate vicinity of that species; it has, however, the wavy lines more distinct, and the black spot is as distinct as in *Absinthiata*, only placed more obliquely. The anterior wings are rather broad.

I am strongly disposed to think that Freyer's *Arceuthata*

is the same species, though Herrich-Schäffer gives it as distinct. The larva of *Arceuthata* is bright green; it feeds on the juniper, and the perfect insect appears in March and April; which is precisely the history of *Helveticaria*.

This species is recorded as an addition to our Fauna by Mr. Doubleday in the "Zoologist" for February last, Mr. Logan having bred the insect from larvæ found on juniper the previous autumn on the Pentlands. In confinement, this species makes its appearance in the breeding-cage in January or February.

SCIAPHILA CINCTANA, W. V.

(Fig. 4.)

*Alis anticis albis, basi, fascia obliqua media, maculaque costali ante apicem brunneis.*

Exp. al. 7—8 lin.

Head and thorax rusty-brown. Palpi and antennæ grey. Abdomen grey. Anterior wings white, with the base, an oblique fascia from the middle of the costa to near the anal angle, and a costal spot before the apex, rusty brown; the ground colour is faintly spotted with leaden-grey, especially towards the hind margin. Posterior wings white, faintly spotted with pale lead colour.

Those who are appalled at the idea of a new *Sciaphila*, as involving some species very difficult to determine, will be much relieved to find what a very conspicuous and distinct insect this is. Hübner figures it, No. 132, under the name of *Albidana*. Duponchel, vol. ix., pl. 238, fig. 8, figures it as *Tortrix cinctana*.

Several specimens of this novelty were taken by the Rev. S. C. Tress Beale, "on the sloping bank of a field at Alkham, near Dover, July 9th; it flits over the tops of grass when disturbed, but soon settles again; whilst flying it appears conspicuously white."

## DEPRESSARIA BIPUNCTOSA, Curtis.

*Alis anticis dilutissime ochreis, punctis duobus disci nigris, puncto nigricante dorsi basim versus, venis posticis fusco-irroratis, margineque postico nigricante-punctato.*

Exp. al. 9—10 lin.

Head and face whitish-ochreous. Palpi pale ochreous; second joint beneath fuscous. Antennæ dark fuscous. Anterior wings very pale ochreous, with a blackish spot on the inner margin, near the base; and two black spots on the disc, one before, the other beyond, the middle; a faint fuscous blotch lies between the fold and the inner margin, and posteriorly the surface of the wing is dusted with fuscous scales, sometimes placed principally on the veins; a row of blackish spots is on the hind margin; cilia pale ochreous. Posterior wings whitish, with the veins faintly tinged with fuscous towards the apex, and some fuscous spots along the apical portion of the hind margin; cilia whitish.

This species is very closely allied to *Liturella*, *Pallorella* and *Umbellana*. From *Liturella* it may be distinguished by the paler ground colour, the distinctness of the spots along the hind margin, and the dorsal spot near the base. From *Pallorella* it is distinguished by the absence of the conspicuous fuscous streak, and by the wings being shorter and broader. From *Umbellana* it may be known by the absence of the longitudinal streaks; and though in some specimens of *Umbellana* these seem almost represented in the scattered dark scales, the conspicuousness of the black spot on the disc beyond the middle is far greater than we find it in *Umbellana*.

I believe this insect, several specimens of which were taken by Mr. Bond at Freshwater in the Isle of Wight, at the end of last July, to be identical with the *D. bipunctosa* described

by Curtis in the "Annals of Natural History," 1850, p. 116, from a specimen taken in the New Forest by Sir C. Lyell.

GELECHIA ALBIPALPELLA, Herrich-Schäffer.

*Alis anticis nigris, maculis duabus oppositis albidis pone medium.*

Exp. al. 5 lin.

Head and face grey. Palpi greyish-white, externally with a dark grey line. Antennæ blackish, annulated with whitish. Anterior wings black, rather glossy, with two small whitish opposite spots beyond the middle, which seem to have a tendency to form a straight interrupted fascia; the tip of the wing is a little irrorated with pale grey scales; cilia dark grey, intersected by a blackish hinder marginal line. Posterior wings fuscous, with pale fuscous cilia.

This insect may be readily distinguished from *Anthyllidella* and *Atrella* by the position and colour of the spots. In *Coronillella* the position of the spots is the same, but in that species they are dull yellowish, instead of conspicuously whitish; besides that, in *Coronillella*, both the anterior and the posterior wings are much broader than in *Albipalpella*.

I bred three specimens of this from larvæ I found near Horsell, June 20th, on *Genista anglica*; the larva drew several leaves together round the stem, and then ate them half through, thus discolouring them and forming conspicuous clusters of yellowish white leaves. The larva had considerable resemblance to that of *G. tæniolella*, and I was uncertain whether it would not produce that species. Mr. Scott has this autumn collected the same larva near York.

## GELECHIA ARUNDINETELLA, Zeller.

*Alis anticis angustis dilute griseo-brunneis, maculis oppositis pone medium obsoletis dilutioribus, puncto interjecto nigro, punctuloque costali nigricante.*

Exp. al.  $4\frac{1}{2}$ —5 lin.

Head greyish-brown; face paler. Palpi whitish above, externally and the tip black. Antennæ fuscous. Anterior wings dull greyish-brown, with two very indistinct obliquely placed pale opposite spots beyond the middle, that on the costa rather posterior; between these is a minute blackish spot on the disc, and beyond the costal spot is a small blackish spot on the costa; the apical portion of the wing is very pointed, and is spotted all round the margins pale and dark brown; cilia pale greyish. Posterior wings pale grey, with pale greyish ochreous cilia.

This inconspicuous species was bred by Mr. Boyd, who thus notices the habit of the larva (Int. ii. p. 139):—"The larva, when young, feeds like an *Elachista*, mining up and down the leaves of one of the large *Carices* (*riparia*?), which grows on our river banks; as it grows older it quits the first leaf and enters another, and sometimes a third, but spends the greater part of its life in the last one, of which it eats a large portion, and in which it spins its cocoon and changes to a pupa. It is difficult to collect, for by the time it is full-fed the leaf is generally withered, and the cocoon is scarcely discernible. The plant generally grows in the water, and the cocoon is an inch or so above the water mark. The perfect insect seems shy, and I have only succeeded in taking one; my first appeared on the 22nd of June."

Professor Zeller, who sent me the species in 1850, says,—“found last year amongst *Arundo Phragmites* and *Scirpus lacustris*, not scarce at the end of July, but mostly wasted

and difficult to catch." Those who are acquainted with the appearance of a bred specimen of this species must be puzzled to conceive what a wasted specimen can be like!

COLEOPHORA IBIPENNELLA, Heyden.

*Alis anticis albis, venis obsolete lutescenti-suffusis, apice fusciscenti-squamato; ciliis fusciscentibus; antennis albis fusciscenti-annulatis, penicillo breviusculo albido.*

Exp. al. 6—7 lin.

Head, face and palpi white. Antennæ white, annulated with pale or dark fuscous, the basal joint with a rather short whitish tuft. Anterior wings white, slightly irrorated with fuscous towards the apex, and sometimes with some faint yellowish veins; costal cilia tinged with grey, sometimes very decidedly dark fuscous, the remaining cilia generally rather paler. Posterior wings dark grey (darker than in *Anatipennella*), with dark grey cilia.

This species is closely allied to *Anatipennella* and *Palliatella*, but is distinguished by its smaller size; the anterior wings are less irrorated with fuscous than in *Anatipennella*, and the yellow veining, of which faint traces may almost always be seen along the subcostal nervure, will separate it readily from both species.

A most important character is furnished by the position of the case of the larva; the form of the case is very similar to that of *Anatipennella*, but it is not so well developed behind, but the mouth of the case is cut off so obliquely that the case does not stand up perpendicularly to the surface to which it is attached, as in *Anatipennella*, but it lies almost prostrate, the belly of the case resting on the leaf on which the caterpillar is feeding.

I have a specimen taken some years ago at Lewisham, and which I had overlooked as *Anatipennella*; this year Mr.

Bond sent me some of the larvæ, calling my attention to their peculiarities; and subsequently I found them feeding on birch at Wickham. The larva feeds in May, and the perfect insect appears at the end of June.

COLEOPHORA APICELLA, n. sp.

*Alis anticis albis, venis costam versus pone medium indistinctis saturatioribus, apice acuminato fusco.*

Exp. al.  $5\frac{1}{2}$ —6 lin.

Head grey. Palpi whitish. Antennæ white, annulated with dark fuscous. Anterior wings white, with a faint indication of some darker veins, especially towards the costa beyond the middle, a fuscous streak running more distinctly to the extreme apex, which is rather prolonged; costal cilia whitish; cilia of the hind margin pale grey. Posterior wings grey, with paler cilia.

By the peculiarly sharp apex of the anterior wings, and by the pale colour of the wings and dark apex, it may be distinguished from all the other species. I have had for some years a worn specimen taken by Mr. Saunders at Hastings, which I had placed doubtingly amongst *Argentula*; the sight of several specimens taken by Mr. Bond in the Fens of Cambridgeshire in July has satisfied me that it is really a good species.

COLEOPHORA CHALCOGRAMMELLA, Zeller.

(Fig. 3).

*Alis anticis flavis, lineis duabus ex basi ad marginem posticum orichalceis; antennis nigris, apice albo.*

Exp. al. 4—5 lin.

Head and face bronzy. Palpi pale grey, tip of each joint black. Antennæ black, the tip white, sometimes with an additional white ring near the tip. Anterior wings deep yellow,



with two conspicuous longitudinal bronzy streaks (more or less edged with black scales), one on the fold and one between the costa and the fold; on the inner margin are a few scales of the same colour; apex of the wing dark fuscous; cilia of the apex dark fuscous, otherwise pale grey. Posterior wings dark grey, with paler cilia.

This conspicuous insect, so totally different from every other species of *Coleophora*, was discovered in the larva state by Mr. T. Wilkinson near Scarborough, feeding on the leaves of *Cerastium arvense*, in May; and the following month the perfect insect appeared.

The species had occurred in several parts of the Continent, at Glogau, Jena, Frankfort-on-the-Main, Vienna, in Bohemia and Steyermark; but always sparingly, and a series of the insect had probably never been seen till Mr. T. Wilkinson had them on his setting-board. This autumn (November) the young larva has been found near Scarborough by Messrs. Allis, Scott and Wilkinson.

TISCHERIA ANGUSTICOLLELLA, Heyden.

*Alis anticis fusco-purpurascentibus, macula orichalcea costali ad basim; palpis luteis, antennis nigris, apice albo.*

Exp. al. 4—4½ lin.

Head and face dark violet. Palpi yellow. Antennæ black, the apical third white. Anterior wings dark purplish brown, with a narrow bronzy patch along the costa at the base; cilia grey. Posterior wings pale grey, with pale grey cilia.

Very different from the other British species of the genus; the sloe-feeding *Gaunacella*, it is true, has some resemblance to *Angusticollella*, but in *Gaunacella* the anterior wings are



less purple, and have not the bronzy patch at the base of the costa.

Mr. Edleston has four specimens of this species; two of which he took amongst rose bushes, and two he bred in a jar, which was only supposed to contain *Nepticula Anomalella*; the larva makes slightly puckered blotches on the upperside of rose leaves, very similar to those made by the larvæ of *Tischeria Marginea* in bramble leaves.

NEPTICULA MYRTILLELLA, Edleston.

*Alis anticis saturate fuscis, fascia obliqua, tenui albida pone medium; capillis ferrugineis.*

Exp. al.  $2\frac{1}{2}$  lin.

Head ferruginous. Antennæ dark fuscous. Abdomen and legs grey. Anterior wings dark fuscous, with an oblique, rather slender whitish fascia beyond the middle; cilia whitish. Posterior wings pale grey, with pale grey cilia.

This species comes nearest to *Salicis*, but the fascia is more slender and brighter; its edges more sharply defined. I stated in the "Intelligencer," vol. ii. p. 44, that it was placed nearer the apex than in *Salicis*, but on an examination of more specimens I feel doubtful in this respect.

The larva was first sent to me by Herr Anton Schmid, who found it near Frankfort on the Maine; a few days afterwards I received some from Mr. Edleston, who had collected them near Manchester.

This insect is the solution of enigma No. 25. (See Ent. Annual, 1857, p. 133.)

## NEPTICULA POTERII, n. sp.

*Alis anticis fusco-aureis, fascia latiuscula recta dilute aurea apicem purpureum versus; capillis ferrugineis.*

Exp. al. 2 lin.

Head ferruginous. Antennæ dark fuscous. Abdomen and legs grey. Anterior wings pale golden brown, with a rather broad *straight* pale golden fascia beyond the middle; apical portion of the wing violet, with violet grey cilia. Posterior wings pale grey, with pale grey cilia.

This species seems intermediate between *Microtheriella* and *Plagicolella*; it is about the form and size of *Microtheriella*, thus smaller and with narrower wings than *Plagicolella*, but the fascia is broader and more shining than in *Microtheriella*, though less brilliant than in *Plagicolella*. The fascia in *Poterii* is almost further from the base on the costa than on the inner margin; in the other two species the fascia has a tendency in the other direction.

I discovered this larva at Mickleham, early in June, mining in the leaves of *Poterium sanguisorba*, which grows so abundantly on the chalk there; the mine is rather peculiar; at first slender and nearly filled up with dark grey excrement—going round the edges of the leaf, ultimately the larva eats out the central portion of the leaf, and the mine then appears almost a blotch.

## NEPTICULA GLUTINOSÆ, n. sp.

*Alis anticis purpureo-fuscis, fascia subobliqua albida pone medium, apice violaceo; capillis ferrugineis.*

Exp. al. 2½ lin.

Head ferruginous. Antennæ dark fuscous. Abdomen and legs grey. Anterior wings purple brown, with a yellowish-white, rather oblique, fascia beyond the middle

apical portion violet; cilia grey. Posterior wings pale grey, with pale grey cilia.

Distinguished at a glance from the smaller *Alnetella*, by the purple brown, not golden brown, basal portion of the anterior wings, and by the fascia hardly shining at all, a great contrast from the extreme brilliancy of the fascia in *Alnetella*. In *Glutinosa*, the fascia is nearly as as in *Microtheriella*.

Mr. Wilkinson of Scarborough has bred this species from alder leaves, collected there last autumn; the mine and the larva have not yet been distinguished from those of *Nepticula Alnetella*.

#### NEPTICULA ARCUATA, Frey.

*Alis anticis atris, fascia arcuata argentea in medio; capillis ferrugineis.*

Exp. al.  $2\frac{1}{2}$  lin.

Head ferruginous. Antennæ fuscous. Abdomen and legs grey. Anterior wings black, with a rather slender, central, silvery-white fascia, which on the fold is curved a little inwards; the fascia is attenuated in the middle; cilia whitish. Posterior wings pale grey, with pale grey cilia.

Closely allied to *Angulifasciella* and *Atricollis*; the former is however a larger, blacker insect, with a more brilliant fascia; *Atricollis* is the same size as *Arcuata*, but is blacker, and the fascia is broader and more brilliant.

Mr. Boyd has succeeded in breeding this insect, from the larvæ in the leaves of *Potentilla fragariastrum*.

#### PTEROPHORUS LOEWII, Zeller.

Exp. 9 lin.

Nearly allied to *Bipunctidactylus* and *Plagiodactylus*, but recognized at a glance by the costal cilia from the middle

of the wing to the apex being white. The ground colour of the anterior wings is more of a slaty-grey than in *Bipunctidactylus*, only the inner margin having a brownish tinge.

For this interesting addition to our Plumes, we are indebted to Mr. C. S. Gregson, who met with it at Southport, last August; specimens have also been taken there by Mr. Davis.

Its locality so far north is rather singular, as the species had previously been confined to the Mediterranean, where it occurs at Rhodes and in Italy.

## LEPIDOPTERA.

## RARE BRITISH SPECIES CAPTURED IN 1857.



MANY of the more important of these were announced immediately in the columns of the *Entomologist's Weekly Intelligencer*; we refer accordingly to the volume and page where those captures are mentioned.

*COLIAS EDUSA*; has been repeatedly taken in the south west corner of Scotland (Int. ii. 180, 188, 203; iii. 5), an unusually northern locality. The species had been captured in Scotland, in 1848 and 1852.

*COLIAS HYALE*; has been unusually plentiful on the coasts of Sussex and Kent, and has even occurred near London (Int. ii. 164, 171, 172, 173, 179, 180, 190).

*PIERIS DAPLIDICE*; a specimen is recorded as having been taken near Colchester (Int. ii. 182).

*APATURA IRIS*; has been taken more freely than for many years, Mr. Sturgess having remarked that dead stoats, weasels, &c. were great delicacies to the imperial *haustellum* systematically baited for the insect: in a wood it was known to frequent, the capture of seventeen specimens, on the 14th of July, and twenty on the following day, proves clearly the use of artifice in obtaining the splendid *Iris* (Int. ii. 130, 139, 147, 148, and 155).

*VANESSA ANTIOPA*; the captures of five specimens have been recorded, and another was seen; the captures were two

in Essex, one in Norfolk, one in Lancashire, and one in Northumberland (Int. ii. 181, 182, 190; iii. 12, 13).

ARGYNNIS LATHONIA; has been captured at Margate, Chatham and Colchester (Int. ii. 182, 188).

STEROPES PANISCUS; has occurred in two quite new localities, Netley Abbey, near Southampton, and Charlbury, in Oxfordshire; and also at Kettering, in Northamptonshire.

SMERINTHUS OCELLATUS and POPULI; hybrids of these two species have been bred by Mr. Hague (Int. ii. 188); they all made their appearance in the perfect state, nine weeks after the exclusion of the larva from the egg.

SPHINX CONVULVULI; has occurred in several localities, most of the specimens were taken between the 25th of September and 5th of October. In 1846, the bulk of the captures were made in the *first* fortnight of September.

DEILEPHILA GALII; has been again met with, both in the perfect state, and also as larvæ (Int. ii. 182, 187, 188).

DEILEPHILA EUPHORBIÆ; has been industriously sought on Braunton Burrows, by Messrs. M. A. and G. F. Mathews, who examined acre after acre of the food plant, but without success. The capture of a specimen of the perfect insect at Taunton has been recorded (Int. iii. 29).

CHÆROCAMPA NERII; Brighton has again produced this conspicuous insect (Int. ii. 172).

TROCHILIUM CHRYSIDIFORME; has again been taken near Folkestone.

CERURA BICUSPIS; this insect appears to be gradually turning up in many parts of Yorkshire and Lancashire; the empty cocoons are hardly now considered as rarities.

LOPHOPTERYX CARMELITA; was taken rather freely last spring, at West Wickham Wood, and the consequent rarity of the insect has been much impaired.

PETASIA NUBECULOSA; continues to be taken in some

numbers in the North of Perthshire; the little-bird system of capture begins to be rather doubted (Int. ii. 20, 60).

*HETEROGENEA ASELLUS*; two specimens have been taken in Epping Forest (Int. ii. 123). Mr. Doubleday had never met with this species there.

*CYMATOPHORA FLUCTUOSA*; this continues to occur in the neighbourhood of Sheffield.

*ACRONYCTA ALNI*; has appeared, as usual, in several breeding-cages, and has also been taken at sugar (Int. ii. 100, 101, 197.)

*XYLOPHASIA SCOLOPACINA*; a new locality for this insect is Barnstaple, where two were taken by Mr. G. F. Mathews, flying over bramble-blossom, at the end of July. Mr. Mathews saw several others, but mistook them for *A. gemina*.

*HELIOPHOBUS HISPIDA*; upwards of a hundred specimens were captured in September, near Plymouth.

*LUPERINA DUMERILII*; Mr. Bond met with a queer *Noctua* at Deal, which is perhaps referable to this species.

*MIANA EXPOLITA*; this was taken in Ireland, at the end of June, by Mr. N. Cooke and Mr. Burchell, in Galway.

*TÆNIOCAMPA LEUCOGRAPHA*; has occurred at Barnstaple, North Devon, and near Ticehurst, in Sussex.

*CERASTIS ERYTHROCEPHALA*; one was taken at sugar, November 5th, 1856, in a wood near Plymouth; a capture near Weston-super-Mare has also been recorded (Int. iii. 53).

*DASYCAMPA RUBIGINEA*; has occurred at Newnham in Gloucester (Int. ii. 5; iii. 61); also at Exeter (Int. iii. 62) and Barnstaple (Int. iii. 70).

*HOPORINIA CROCEAGO*; one was taken as far west as Barnstaple, by Mr. G. F. Matthews, who found it on ivy.

*PHLOGOPHORA EMPYREA* ; has been taken in some numbers between Lewes and Brighton.

*CUCULLIA GNAPHALII* ; Mr. Bond has been fortunate in breeding three specimens from the larvæ he obtained last autumn.

*PHORODESMA SMARAGDARIA* ; has been taken at Deal by Mr. Bouchard.

*ENNOMOS FUSCANTARIA* ; has been bred from the egg by Mr. Bolt of Bristol ; from the larva by the Rev. H. Harper Crewe, at Stowmarket ; has been taken at light at Plymouth, at Newnham and at Kensington (Int. iii. 44), and has been kicked off an ash tree at Barnstaple.

*ALEUCIS PICTARIA* ; the capture of ten specimens at Dartford Heath is recorded (Int. ii. 36).

*PRODELIA LITERALIS* ; the capture of a specimen at Newnham has been recorded (Int. iii. 44).

*PIONEA STRAMENTALIS* ; has been met with plentifully in some of the fern districts.

*PIONEA MARGARITALIS* ; the larva and perfect insect have been taken rather freely round Cambridge.

*SPILODES PALEALIS* ; several specimens have occurred at Folkestone, and it has also been taken at Sidmouth (Int. ii. 117).

*BOTYS LANCEALIS* ; fourteen specimens were taken by Mr. G. F. Mathews in different woods in the neighbourhood of Barnstaple.

*CHILO OBTUSELLUS* ; several specimens have been taken in the Norfolk fens (Int. ii. 156).

*ACENTROPUS NIVEUS* ; this insect having been finally handed over by the Neuropterists to the Lepidopterists, we have figured it on our Plate this year (fig. 6). In the summer of 1856, Mr. E. Brown met with this insect on the



Trent, amongst *Potamogeton*, and, following up his observations, he has this year met with the pupa and bred it; "I have bred a male specimen from a chrysalis contained in a cocoon attached, *beneath the surface* of the water, to *Potamogeton pectinatus*. The cocoon was composed of short pieces of the leaves of the *Potamogeton* woven into a light silken fabric. The pupa was of the undoubted Lepidopterous type." E. Brown in litt.

GRAPHOLITA PENKLERIANA; this is the solution of Enigma No. 7, Mr. T. Wilkinson having bred the insect (the *Anchylopera subuncana* of Stephens) from the "vaulted chamber" maker of the oak (Int. ii. 75).

PHOXOPTERYX UPUPANA; has again been taken at West Wickham Wood (Int. ii. 100).

STIGMONOTA PUNCTICOSTANA; has been taken at Black Park by Mr. Tompkins (Int. ii. 116).

CHROSIS AUDOUINANA; has also been taken by Mr. Tompkins in the same locality (Int. ii. 117).

## OBSERVATIONS ON BRITISH TINEÏNA.

(SUPPLEMENTARY to the INSECTA BRITANNICA—LEPIDOPTERA, TINEÏNA; and the ENTOMOLOGIST'S COMPANION, 2nd Edition.)



*Chimabacche Phryganella*, I. B., p. 15. Of this I received a number of adult larvæ from Professor Zeller, all of which appeared to possess the club-shaped third pair of feet. From these I have bred both sexes of the perfect insect. Madame Lienig had stated that it was only the *young* larvæ of the *males* which had these club-shaped feet.

*Tinea picarella*, I. B., p. 28. A remarkably small specimen of this pretty species was taken by Mr. Wailes in July, on the stem of a birch tree. The larva will probably be found in fungi on birches.

*Lamprosetia Verhuellella*, I. B., p. 39. The larva is very plentiful on some walls at Bideford and Barnstaple. Mr. Braim met with the larvæ near Whitby last December, mining the leaves of *Scolopendrium vulgare* (Hart's Tongue).

*Incurvaria pectinea*, I. B., p. 40. The young mining larvæ of this insect have been noticed at Scarborough by Mr. R. Cook; and from him and from Mr. Weaver, I have received some half-grown larvæ feeding on green birch leaves.

*Nemophora Swammerdammella*, I. B., p. 47. This is the solution of Enigma No. 30, the insect having been bred

this spring by Herr Schmid, from the larvæ collected in March, 1856, thus implying that the insect takes *two years* to complete its transformations.

*Adela viridella*, I. B., p. 50. I have this year observed the females apparently in the act of depositing their eggs on the midrib of oak leaves. I could not, however, meet with the eggs.

*Nemotois Scabiosellus*, I. B., p. 52. The females of this species have again been detected ovipositing in the flowers of *Scabiosa arvensis*, and the eggs have been found by Mr. Bond.

*Nemotois fasciellus*, I. B., p. 52. Mr. Douglas met with two specimens at Darenth, July 14th, on the flowers of a dwarf umbelliferous plant (Int. ii. 132).

*Swammerdamia apicella*, I. B., p. 55. Mr. Law has bred this from a larva found in August on plum (Int. ii. 77).

*Swammerdamia griseocapitella*, I. B., p. 56. Mr. Parfitt has bred something very like this from a larva on plum, very different to that of the birch-feeding *griseocapitella*.

*Hyponomeuta vigintipunctatus*, I. B., p. 59. This has been bred in some plenty by the Rev. P. H. Newnham, from the larvæ he collected last autumn and this summer.

*Anesychia funerella*, I. B., p. 63. I have received the larvæ of this species from Mr. T. Brown, who found them near Cambridge feeding on Comfrey at the beginning of August.

*Plutella Dalella*, I. B., p. 69. Dr. Staudinger found the larva in Iceland on *Arabis petræa* at the end of June. The cocoon is of open net work, similar to that of *P. porrectella*.

*P. Annulatella*, I. B., p. 68. I have received from Mr.

Wailes an open net-work cocoon, which he reputes to belong to this species.

*Depressaria Angelicella*, I. B., p. 91. Dr. Colquhoun has collected the larva of this species very freely at Dunoon and Ardrossan, most of the plants there of *Angelica sylvestris* being attacked by the larvæ; Dr. Colquhoun has twice reared this insect from larvæ on *Heracleum Sphondylium*.

*Depressaria albipunctella*, I. B., p. 95. I received the latter from Herr Mühligh, of Frankfort; it differs from *aplana* by the paler subdorsal lines, the less conspicuous spots, and the second segment is spotted with black.

*Depressaria pulcherrimella*, I. B., p. 96. Dr. Colquhoun has again bred this species from a larva feeding on the flowers of *Bunium flexuosum*.

*Depressaria nervosa*, I. B., p. 98. Dr. Colquhoun has called my attention to an error in the Annual of 1856, where, at page 51, I have stated, that "when the larvæ cease feeding they bore into the stem, and then weave a transverse piece of web above and below them;" there is only a *single web* across the stem, which is placed below the larva and immediately above the opening.

*Gelechia cuneatella*, I. B., p. 110. Several specimens were taken by the Rev. J. D. J. Preston on the trunk of a willow tree near York.

*Gelechia terrella*, I. B., p. 112. Whilst searching for beetles amongst moss last March, Mr. Douglas found several specimens of a brown larva, with paler dorsal line, which, from its activity and peculiar motion of the head, seemed likely to be a *Gelechia*. Can this be the long sought larva of *G. terrella*? Unfortunately none of the specimens were reared.

*Gelechia viscariella* (Ent. Annual, 1855, p. 43; 2nd edit.

p. 65; 1st Annual Supp. to I. B., p. 2). I have bred several specimens of this insect from larvæ feeding on *Lychnis divica*, sent me by Mr. T. Wilkinson.

*Gelechia Coronillella*, I. B., p. 133. I have bred this from larvæ sent me by Professor Zeller, feeding between united leaves of *Coronilla varia*; the larva has some resemblance to that of *G. tæniolella*, but is fatter and greener.

*Cleodora Striatella* (Ent. Annal, 1856, p. 36; 2nd Annual Sup. to I. B., p. 4). Several specimens of this insect have been taken by the fen collectors.

*Anarsia Spartiella*, I. B., p. 144. I collected the larva and pupa of this insect freely on Wimbledon Common in June, in the terminal shoots of furze, which they turn brown; the pupa is generally to be found in the shoots.

*Nothris Verbascella*, I. B., p. 148. This insect is still to be obtained near Norwich, whence I had a young larva sent me to name this summer.

*Sophronia humerella*, I. B., p. 150. This larva feeds also in the terminal shoots of *Artemisia campestris*.

*Hypercallia Christiernana*, I. B., p. 153. Having received some larvæ of this species from Professor Frey, I offered them *Polygala vulgaris*, which they ate readily (Int. ii. 85).

*Butalis grandipennis*, I. B., p. 165. I observed the larva of this insect in the greatest profusion on the furze bushes on the steep hill side between Torrington and the river. The webs were in February quite a feature in the landscape.

*Butalis senescens*, I. B., p. 166. I have bred this from larvæ found on Box Hill in May, making little web-galleries amongst moss at the root of Thyme.

*Acrolepia Betuletella*, I. B., p. 172. A specimen was taken by Mr. Sang in Castle Eden, Dene, August 6; from which I have made the following description:—*Alis anticis*

*brunneis, saturatius marmoratis, maculis duabus costæ, una ante, altera pone medium saturate brunneis, maculis duabus trigonalibus dorsi niveis, altera majore ante, altera minore pone medium; plaga pallida ciliarum nulla.* Exp. al. 5 lin.

Head and palpi greyish-brown. Antennæ rather dark brown. Anterior wings brown, mottled indistinctly with dark brown; on the costa are two dark brown spots, one before and the other beyond the middle; beyond the latter, on the costa, are three smaller brown spots, each edged posteriorly with a whitish streak; on the inner margin, before the middle, is a conspicuous white triangle, enclosing a few black scales, and towards the anal angle is a smaller white spot; midway between this and the apex of the wing is a black streak, preceded by a few white scales; cilia reddish-brown, without the pale blotch in the middle so conspicuous in *Pygmæana*. Posterior wings pale grey, with pale grey cilia.

Thorax reddish-brown; abdomen grey. Legs reddish-brown; tarsi spotted with whitish.

Underside of anterior wings dark grey, with faint indication of the dorsal pale spots and costal dark spots; tips of the cilia conspicuously reddish.

Differs from *Pygmæana* by the anterior wings being narrower; the first costal spot is placed *before* the middle, and the dorsal spots are whiter, and there is no blotch in the cilia; it differs totally from the continental *Assectella*, by the different ground colour and form of the wings, and different markings.

The agreement with Curtis's figure is not entire, but at present we know not to what extent the species may vary.

*Tinagma resplendellum*, I. B., p. 179. I bred a specimen

of this from the blotch miner of the alder leaves (Enigma, No. 22), of which I detailed the habit last year in the Annual of 1857, p. 132. Mr. R. Cook and Mr. T. Wilkinson have collected the larvæ freely near Scarborough, at the end of July; I was unsuccessful in my attempts to meet with it near Beckenham this season.

*Argyresthia glaucinella*, I. B., p. 185. I have received the larva from Mr. Edleston, who finds them in April, feeding solitarily in the sound bark of oak and horse-chestnut trees, revealing their retreats by protruding a little reddish *frass* from the hole.

*Argyresthia aurulentella*, I. B., p. 189. The larva mines the leaves of the juniper at the end of April; it enters from the upper surface and eats out the apical portion of the parenchyma, it then leaves its excrement in the mined leaf, and proceeds to repeat the process in another leaf; it never enters the stem.

*Gracilaria Ononidis*, I. B., p. 201. When at Zürich I met with the larva of this species making flat dipterous-looking blotches in the leaves of clover.

*Coriscium Brongniardellum*, I. B., p. 202. The larva of this species is excessively abundant on the oaks between Woking and Guildford.

*Coleophora Vibicella*, I. B., p. 213. The larva has again been met with in Trench Wood, its old locality, by Mr. Crump.

*Coleophora currucipennella*, I. B., p. 215. I met with a single larva of this species on a willow leaf in Burnt Ash Lane, June 24th.

*Coleophora therinella*, I. B., p. 217. A thistle-feeding larva, found this autumn by Mr. Gorham and Mr. Aris, in a long case, somewhat allied to that of *C. Troglodytella*, will perhaps produce this insect.



*Coleophora murinipennella*, I. B., p. 218. The larvæ on the seeds of the wood rush were collected freely by Mr. Wilkinson last June.

*Coleophora juncicolella*, I. B., p. 220. The larvæ were collected in abundance last spring at West Wickham Wood; also at Scarborough and near Manchester.

*Coleophora fuscedinella*, I. B., p. 221. I have actually bred this species from larvæ found *feeding* on mallow, by the side of an elm hedge. Is the larva which feeds on the *Ribes sanguineum* the same species?

*Laverna Phragmitella*, I. B., p. 238. The capture of this insect by dozens in the fens this summer is one of the most startling events of the year—as the specimens from which my previous description was made were in a very poor condition, I subjoin an improved description, and a figure of it is given on the Plate (Fig. 2).

*Alis anticis dilute ochreis, costa pone medium dilutiore, punctis duobus disci saturiore fuscis, albo-cinctis, in stria fusca positis, puncto minore plicæ fusco.* Exp. al. 7—10 lin.

Head and face pale greyish-ochreous. Palpi pale greyish-ochreous, dark fuscous externally. Antennæ pale greyish-ochreous, spotted with dark fuscous, with a dark fuscous line along the elongate basal joint.

Anterior wings pale ochreous. The costa beyond the middle almost whitish, a fuscous streak on the disc from the middle to the apex of the wing, in which are two darker fuscous spots, surrounded with white scales, one in the middle of the wing, the other midway between it and the apex of the wing; beneath the first one, on the fold, is a smaller fuscous spot; hind margin and apex of the costa spotted with fuscous; cilia ochreous. Posterior wings pale grey, with greyish ochreous cilia.

The larva will probably be found to feed in the stem of some plant; much in the style of *Laverna ochraceella*.



*Chrysoclista Schrankella*, I. B., p. 242. A notice of the capture of *Cecophora Woodiella* was sent for publication in the "Intelligencer," with no locality given; on applying for the locality, it was declined; the specimens were *C. Schrankella*!!

*Asychna fuscociliella*, I. B., p. 246. This has been bred by Herr Hofmann; it is a true *Coleophora*, and the *C. fuscocuprella* of Herrich-Schäffer; in habit it appears nearly allied to *C. paripennella*. The larva feeds in autumn on hazel, winters full fed, and eats nothing further in spring. The cases are very different to those of *Paripennella*, and are much larger behind, more after the style of the cases of *C. anatipennella*.

*Elachista trapeziella*, I. B., p. 254. This has been bred by Professor Frey from larvæ mining the leaves of *Luzula pilosa*, in the middle of June (Int. ii. 126).

*Elachista triseriatella*, I. B., p. 261. This has been taken in North Wales, in July.

*Elachista pollinariella*, I. B., p. 261. The larva feeds, according to Professor Frey, "in *Brachypodium sylvaticum*, making a large Lithocolletiform mine" (Int. iii. 24.)

*Lithocolletis quinqueguttella*, I. B., p. 268. I have myself bred this from leaves of *Salix fusca*, sent me by Mr. T. Wilkinson.

*Lithocolletis irradiella*, I. B., p. 269. This species has again been bred by Mr. T. Wilkinson.

*Lithocolletis Caledoniella*, I. B., p. 275. This has been bred by Mr. T. Wilkinson from larvæ mining the upper side of hawthorn leaves, the mines of which were not distinguishable from those of *L. Corylifoliella*.

*Lithocolletis tristrigella*, I. B., p. 281. I have bred this from elm leaves collected near Exeter by Mr. Parfitt; the cocoon is pale brown, not blueish-green as in *Schreberella*.

*Lyonetia Clerckella*, I. B., p. 284. This appears quite polyphagous. Mr. Scott has bred it from birch (Int. ii. 202) and mountain-ash, and its mines have been noticed in quince leaves by Mr. Scott and by myself. Mr. Gorham has found the mines of it in *laurel* leaves! Mr. Curtis recorded its occurrence in elm leaves, and I have understood that, at Paris, the larvæ are abundant in autumn, descending from the elms.

*Lyonetia Padifoliella*, I. B., p. 284. This has been bred from birch by Professor Frey (Int. ii. p. 189).

*Bucculatrix cristatella*, I. B., p. 295. Mr. T. Wilkinson discovered the larva of this species in May, mining the leaves of the yarrow (*Achillea millefolium*), and then eating the leaves half-through from the outside.

*Nepticula Headleyella*, I. B., p. 300. I worked very hard for this species when at Mickleham the beginning of June, but only obtained a single specimen worth pinning.

*Nepticula Cryptella* (Ent. Annual, 1856, p. 41; 2nd Annual Supplement to I. B., p. 9). The larva is very abundant in Headley Lane, but the insect seems difficult to rear. I bred a single specimen in May from the larvæ collected the previous July.

ANSWERS TO ENIGMAS.

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ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1855, 1st Edition, p. 63; 2nd Edition, p. 85.

7. *Grapholita Penkleriana* (*Anchylopera subuncana*,  
Stephens); see ante, p. 103.

11. Not yet solved.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1856, p. 63.

18. Not yet solved.

20. Not yet solved.

22. *Tinagma resplendellum*; see ante, p. 108.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1857, p. 133.

25. *Nepticula Myrtillella*; see ante, p. 95.

26. Not yet solved.

27. Not yet solved.

28. Not yet solved.

29. Not yet solved.

30. *Nemophora Swammerdammella*; see ante, p. 104.

31. Not yet completely solved.

32. Not yet completely solved.

## ENIGMAS STILL UNANSWERED.



11. " An *Elachista* larva, found by Mr. Scott at the end of April, mining in leaves of *Scirpus lacustris*." No one appears to have again found this.

18. " A *Lithocolletis* larva, mining the upper side of birch leaves." Professor Zeller is confident this ought to produce *L. Betulæ*.

20. " A *Depressaria* larva, found by Mr. Boyd, May 2nd, 1855 (it was then young), feeding on a leaf of parsnip (*Pastinaca sativa*), under a turned-down corner; this was expected to be *Depressaria Douglasella*." This has not again been met with.

26. " A *Nepticula* larva, mining the leaves of birch; the mine has some resemblance to that of *Nep. luteella*, but the central track of excrement is broader, not so mathematically linear." I have again met with this larva, but have not succeeded in breeding any.

27. " A *Gelechia?* larva, feeding in the heads of yarrow (*Achillea millefolium*)." I am not aware that this has been collected this autumn.

28. " A *Coleophora* larva, with a case similar to that of *limosipennella*, feeding on birch." None were reared; this autumn the larvæ were collected freely by Mr. Shield at Highgate, and by myself at Abbey Wood.

29. " A *Coleophora* larva, with a case similar to that of *C. siccifolia*, feeding on birch." This has not been reared, but the larva has been collected near Frankfort-on-the-Main

by Herr Schmid, who proposes the name *C. betulifolia* should the species prove distinct.

31. "A *Coleophora* larva, feeding on *Vaccinium Myrtillus* in a longish slender case, somewhat like that of *Viminetella*." I have bred something from these apparently so like *Viminetella* that I cannot distinguish it: moreover, we know that that species feeds on *Myrica gale*, so that possibly it may also feed on the bilbery; the point wants further investigation.

32. "A *Coleophora* larva, feeding on the seeds of *Artemisia vulgaris* at the end of September; the case shaped like a withered flower." I have bred two of these, and they appear identical with specimens taken in the perfect state, amongst *Artemisia vulgaris*, between Bexley and Dartford Heath some years ago. The species, however, if distinct, is so closely allied to *Argentula* and *Virgaureæ*, that, before coming to a definite conclusion on the subject, I should like to see a longer series than I at present possess.

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## NEW ENIGMAS FOR SOLUTION.

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33. A brown *Gelechia*-like larva, found amongst moss by Mr. Douglas last March. This may be *G. terrella*, for whose apprehension a reward of £5 was unsuccessfully offered two years ago.

34. A *Cemiosstoma* larva was found in August by Mr. Wailes, mining in the leaves of *Genista tinctoria*; from its habit this cannot be *C. Spartifoliella*, and the mine is so

totally different from that of *C. Laburnella*, that it is cannot be that species; should the insect prove distinct the name of *C. Wailesella* has been suggested for it. Mr. Weir bred a *Cemiostoma* some years ago from the *Genista tinctoria*; but inexperienced as we then were with regard to the habits of the larva, and there being no *apparent* difference in the perfect insect from *Spartifoliella*, the subject dropped and had got lost sight of.

35. A *Coleophora* larva, feeding on the leaves of thistle, has been collected in September by Mr. Gorham and Mr. Aris. The case is long and whitish. Can this be *C. therinella*?

36. A *Tischeria* larva which makes a brownish blotch with distinct concentric rings, on oak leaves, very different from the uniform white blotches of *T. complanella*; these were very abundant at Abbey Wood and at West Wickham Wood in September; indeed they seem nearly as plentiful, though not so conspicuous, as those of *T. complanella*.

37. A *Coleophora* larva, found on birch in a case which, though somewhat resembling the case of *C. viminetella*, is more globose and has more the appearance of a birch-bud; the blotch it makes in the leaf is of a peculiar brown, like the blotches of *C. limosipennella*. I found one of these at West Wickham, October 31st.

38. A *Lithocolletis*, mining the *upperside* of beech-leaves: of this mine I found two examples on one leaf at Alton Towers, at the end of July. Professor Frey met with this two years ago, and this autumn has obtained ten specimens of the larva.

THE FOLLOWING HAVE NOT YET BEEN FOUND IN THIS COUNTRY, BUT ARE STILL UNSOLVED PROBLEMS IN NATURAL SCIENCE.

39. A *Coleophora* larva on *Potentilla cinerea*, collected at Mombacherhaide by Senator von Heyden, Herr Schmid and myself; none were reared.

40. A *Coleophora* larva on a species of clover, feeding on the *upperside* of the leaves and making conspicuous white blotches; the case is smooth, slightly curved, darkest at the tip, where it is brown; at the mouth part it is dull-ochreous. I found one at Mombacherhaide, but did not rear it.

41. A *Gelechia?* larva, long and thin, of a pale dull-yellowish; feeding on thyme, eating the leaves half through from the underside, and concealing itself in tubes of sand, spun together with silk: of this I received several from Professor Zeller, who found them near Glogau in May; none were reared.

42. A *Gelechia?* larva of dark-red colour, marbled with whitish, making large flat blotches in birch-leaves, and forming inside the mines a circular cocoon. The mine and cocoon very similar to those made by some *Coleopterous* larvæ; these I received from Herr Mühlig, who found them near Frankfort-on-the-Main, at the end of September.

43. A *Coleophora* on birch, found at the same time, with a case curved and flounced, putting one rather in mind of the cases of *C. serenella*.

44. A *Nepticula* larva, found near Ratisbon by Herr Hofmann in October, in the leaves of *Agrimonia Eupatoria*, forming its cocoon inside the mine.

45. A *Nepticula* larva, mining the leaves of *Convolvulus Sepium* and *C. arvensis* at the end of September.

## NATURAL HISTORY OF THE TINEINA.



THOSE who are contributing to the progress of this work are naturally anxious to know to what extent their help becomes serviceable, and with the view of notifying to my coadjutors and others the amount of assistance I have received in the past twelve months, the following Table has been prepared.

I had made known some time since, that assistance in the discovery and forwarding to me of new larvæ would be recompensed in a peculiar manner, namely, by presenting a copy of the entire series of the NATURAL HISTORY OF THE TINEINA to any one who should *first* discover and communicate to me the transformations of twenty species with which I was previously unacquainted.

Now, in finding new larvæ, there are three distinct steps the discoverer has to make:—

The first, and most important, is the *discovery* of the larva.

The second is the *sending* such larva to me, in order that it may be duly figured and described.

The third is the *rearing* of such larva through its transformations, so as to ascertain the perfect insect produced from it.

It will frequently happen that, whilst one person will first *discover* a new larva, some other Entomologist will be the first to *send it* to me, and a third will perhaps be the successful *breeder*. Hence the reward offered for the discovery and first communication of the transformations of a new species may have to be divided into three shares. Accord-



ingly in the annexed table I have apportioned the reward into three parts:—A half, or  $\cdot 50$ , to the discoverer of the larva; a quarter, or  $\cdot 25$ , to the party first sending it to me; and a quarter, or  $\cdot 25$ , to the party who first rears the perfect insect.

And, as was the case last year, a quarter prize, or  $\cdot 25$ , is here awarded to each person sending me some larva that I wanted, even though its history had already been published.

		Discovered.	Sent.	Bred.	Known before.
Chimabacche Phryganella .....	Zeller .....	..	..	..	$\cdot 25$
Solenobia lapidicella .....	Millière .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Tinea fulvimitrella .....	Simmons .....	$\cdot 50$	$\cdot 25$	?	..
quercicolella .....	Mühlig .....	..	..	..	$\cdot 25$
semifulvella .....	Edleston .....	$\cdot 50$	$\cdot 25$	?	..
Nemophora Swammerdammella	Schmid .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Nemotois Violellus .....	Hofmann .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Dumerilellus .....	Hofmann .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Anesychia funerella .....	T. Brown .....	..	..	..	$\cdot 25$
Theristis caudella .....	Schmid .....	..	..	..	$\cdot 25$
Depressaria laterella .....	Zeller .....	..	..	..	$\cdot 25$
Cnicella .....	Schmid .....	..	..	..	$\cdot 25$
albipunctella .....	Mühlig .....	..	..	..	$\cdot 25$
Pimpinellæ .....	Zeller .....	..	..	..	$\cdot 25$
depressana .....	Mühlig .....	..	..	..	$\cdot 25$
Gelechia ferruginella .....	Mühlig .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
maculatella .....	Mühlig .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
pinguinella? .....	Mühlig .....	..	..	..	$\cdot 25$
Viscariella .....	T. Wilkinson ..	..	..	..	$\cdot 25$
Coronillella .....	Zeller .....	..	..	..	$\cdot 25$
arundinetella .....	Boyd .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Ypsolophus limosellus .....	Boyd .....	$\cdot 50$	..	$\cdot 25$	..
	Frey .....	..	$\cdot 25$	..	..
Sophronia humerella .....	Schmid .....	..	..	..	$\cdot 25$
Hypercallia Christiernana .....	Frey .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Butalis inspersella .....	Hofmann .....	..	..	..	$\cdot 25$
Argyresthia glaucinella .....	Edleston .....	$\cdot 50$	$\cdot 25$	?	..
aurantella .....	Frey .....	$\cdot 50$	$\cdot 25$	$\cdot 25$	..
Gracilaria Ononidis .....	Frey .....	..	..	..	$\cdot 25$

NATURAL HISTORY OF THE TINEINA.

		Discovered.	Sent.	Bred.	Known before.	
Coriscium	Brongniardellum .. Schmid .....	..	..	..	·25	
Ornix	Loganella .....	T. Wilkinson ..	..	..	·25	
Coleophora	ornatipennella .... Frey.....	·50	·25	·25	..	
	Vibicella .....	Crump .....	..	..	25	
	pyrrhulipennella .. Crump .....	..	..	..	·25	
	trifariella .....	Mühlig .....	..	..	·25	
	serenella .....	Zeller .....	..	..	·25	
	cælebipennella.... Zeller .....	..	..	..	·25	
	ibipennella .....	Bond .....	·50	·25	·25	..
	palliatella .....	Bond .....	..	..	..	25
	currucipennella .. Schmid .....	..	..	..	·25	
	auricella .....	Frey.....	..	..	..	·25
	virgatella .....	Hofmann.....	·50	·25	·25	..
	murinipennella.. }	Scott .....	·50	..	..	..
		Zeller .....	..	..	·25	..
		T. Wilkinson ..	..	·25	..	..
	Otitæ .....	Zeller .....	..	..	..	25
	Millefolii .....	Hofmann.....	..	..	..	·25
	Artemisiæ .....	Mühlig .....	·50	·25	·25	..
	chalcogrammella .. T. Wilkinson ..	·50	·25	·25	..	
	juncicolella .....	Schmid .....	·50	·25	·25	..
	fuscocuprella .... Hofmann.....	·50	·25	·25	..	
Heliodines	Roesella.....	Frey.....	..	..	..	25
Elachista	quadrella .....	Frey.....	·50	·25	·25	..
	tetragonella .....	Frey.....	·50	·25	·25	..
	Airæ .....	Frey.....	·50	·25	·25	..
	utonella .....	Frey.....	·50	·25	·25	..
Tischeria	gaunacella .....	Hofmann.....	·50	·25	·25	..
Lithocolletis	cerasicolella .... Hofmann.....	..	..	..	25	
	insignitella .....	Hofmann.....	·50	·25	·25	..
	Spinoella.....	T. Wilkinson ..	..	..	..	25
	tenella.....	Shield .....	..	..	..	·25
	agilella .....	Mühlig .....	·50	·25	·25	..
	tristrigella .....	Parfitt .....	·50	·25	·25	..
	pastorella .....	Mühlig .....	..	..	..	25
Bucculatrix	Artemisiella .... Hofmann.....	..	..	..	·25	
	cristatella .....	T. Wilkinson ..	·50	·25	·25	..
Nepticula	Myrtillella .....	Schmid .....	·50	·25	·52	..
	Lonicerarum .....	Frey .....	·50	·25	·25	..

The summary of this Table yields the following results:—

Frey .....	9·	Millière .....	} 1·
Hofmann .....	7·	Parfitt .....	
Mühlig .....	5·50	Boll .....	} ·75
Schmid .....	4·25	Simmons .....	
T. Wilkinson .....	3·	Crump .....	} ·50
Zeller .....	2·	Scott .....	
Edleston .....	1·50	T. Brown .....	} ·25
Bond .....	1·25	Shield .....	
Boyd .....	1·		

The total awards up to this time being:—

Frey .....	16·75	Logan .....	1·25
Mühlig .....	12·75	Ashworth .....	} 1·
Schmid .....	10·75	Machin .....	
T. Wilkinson .....	8·	Millière .....	} ·75
Scott .....	7·50	Weaver .....	
Hofmann .....	7·	Wailes .....	} ·50
Boyd .....	5·25	Boll .....	
Douglas .....	4·50	Miller .....	} ·25
Gregson .....	2·75	Simmons .....	
Zeller .....	} 2·	Crump .....	} 1·25
Grabow .....			
Edleston .....	} 1·75	T. Brown .....	} ·25
Parfitt .....			
Bond .....	} 1·50	Newnham .....	} 1·25
Harding .....			
Brockholes .....	} 1·25	Wildman .....	
Law .....			

## ON THE CATERPILLARS OF THE SAW-FLIES (TENTHREDINIDÆ).

BY J. O. WESTWOOD, F.L.S., &c.



PROBABLY, it would be impossible to find, throughout the entire range of Zoological science, a more perfect instance in which animals, belonging to one group or order, exhibit an extreme resemblance to those of another totally different group (so as even to deceive, not only ordinary observers, but even practised students), than is to be found in that afforded by the caterpillars or larvæ of the family *Tenthredinidæ* or Saw-flies, compared with those of Lepidopterous insects.

On the present occasion, I do not propose to enter into any learned discussion on the principles of analogy and affinity, typicality, &c., so forcibly suggested by the family *Tenthredinidæ*, but shall simply appeal to the experience of the youngest tyro in Entomology, who has doubtless already been misled by the striking resemblance between the larvæ of the saw-flies and those of butterflies and moths.

The present paper will, therefore, consist of the following divisions :—

1. The chief points of resemblance and difference between the transformations of the saw-flies and those of Lepidopterous insects.

2. A more detailed account of a few of the transformations of the species of saw-flies, selecting those which are the most interesting, from their greater or less resemblance to the *Lepidoptera*.

And 3. A Tabular Sketch of the chief variations exhibited in the structure of Tenthredinideous larvæ.

I. It had been suggested to me, that an account of the transformations of the saw-flies, with especial reference to their resemblance to *Lepidoptera*, would be useful to many young Entomologists, who, for want of some such sketch, and ignorant of the characters of the *Tenthredinidæ* in their earlier states, may have wasted their time and attention on caterpillars which they had hoped would have produced some rare moth, but which only yielded "a nasty saw-fly," or, who having reared a saw-fly from what they had supposed was the larva of a Lepidopterous insect, may have come to the false conclusion, that the saw-fly was a parasitic insect, and may, perhaps, have mistaken it for an Ichneumon fly.

It may be advisable to observe shortly, that the females of all the species of the family *Tenthredinidæ* are provided with an instrument at the extremity of the body beneath, resembling a pair of saws, with which they form grooves in leaves or twigs, for the deposition of their eggs. The caterpillars, hatched from these eggs, bear so great a resemblance to the true caterpillars of *Lepidoptera*, that several otherwise deservedly esteemed writers have mistaken them for the latter. Such was the case with Goedart (Obs. No. 77, letters A. and B.), and his commentator Lister, who, supposing that such larvæ only produced Lepidopterous insects, fancied that the two saw-flies reared by Goedart were parasites.

The external tegument of the body, as well as the general form of the larvæ of saw-flies, is very similar to that of the true caterpillars; the bodies of both are variously coloured,

although those of the *Lepidoptera* have the colours generally more distinct and varied.

The breathing pores are placed in both groups along the sides of the body, but they are more indistinct in the larvæ of the saw-flies. Both, also, have three pairs of scaly articulated legs, and a number of fleshy prolegs placed on the hinder segments of the body; these prolegs are, however, considerably more numerous in the larvæ of the saw-flies, the smallest number (where they exist at all) being six pairs, whilst many have seven and even eight pairs, whereas the greatest number of prolegs in any Lepidopterous larva is ten, namely, four pairs of ventral and one pair of anal prolegs; moreover, the prolegs of Lepidopterous larvæ are armed with a coronet of minute curved spines or hooklets, of which the prolegs of the saw-fly larvæ are destitute.

The form of the head and its organs, although presenting a general similarity, offers certain points of difference in the two groups. Indeed the form of the head varies much in different Lepidopterous larvæ, but the head of the larvæ of the saw-flies is formed on a single model, unlike, in its details, that of the head of any Lepidopterous larva, being short, rounded or somewhat spherical and rather flattened in front. Moreover they possess only a single eye on each side of the head, of a size sufficiently large to be seen with the naked eye, whilst the heads of caterpillars are provided with five or six much smaller eyelets on each side, placed a little higher than the base of the mandibles.

With reference to that important organ, the mouth, although the structure of the bilobed upper lip, and the short, triangular, multidentate mandibles, is very similar in the larvæ of both groups, that of the lower parts of the mouth is much more distinct. The saw-fly larvæ (at least

those of *Trichiosoma lucorum*, which I have more carefully examined) have short bilobed maxillæ, not unlike those of many beetles, with a short, thick and nearly conical 4-jointed palpus, arising from the middle of the outer edge of the maxilla, whilst the mentum is short and transverse, with the labial palpi short, thick, conical and four-jointed, very similar to those of the maxillæ; the labium itself is about as long as the palpi, and apparently rounded at the tip. The structure of the lower jaws and lip of Lepidopterous larvæ is very different to that here described. The instruments by which the full grown larva is enabled to spin the silken material which serves for its cocoon are attached to the lower lip, and consist of a silk secretor and a spinneret; but silk is produced in these insects in very small quantities, the cocoons are generally hard, entire, or with particles of mould introduced into the meshes of the silk.

In general, the body of the saw-fly larvæ is only of a single colour, some being entirely white, or very pale green, others black, and others darker green, the last being the more usual colour; others exhibit the appearance of a fine bloom, or are of an opal hue, whilst others have the sides of the body and back ornamented with longitudinal stripes and spots of different colours. It is interesting, however, to observe that certain species of these larvæ are subject to variations in their colours; like caterpillars they change their skins several times, and after the last moult in certain species they are entirely different in their colouring to their previous appearance, so that no one would at first suppose it possible that it was the same animal which was before him previous to and after its change of skin.

The *Tenthredo Scrophulariæ* is an example of this peculiarity. Until nearly full grown, it is of a whitish grey



colour, with longitudinal rows of blackish spots, and with numerous smaller dots of the same colour, each of which emits a small black hair [in short, it is then by no means unlike the larvæ of the Shark-moths, *Cucullia Scrophulariæ* and *Verbasci*, which both feed on the same plant], but after its last moult, whilst still in the larva state, it assumes a uniform greenish colour, with a slight fleshy tinge. This larva also, like many others, after its last moult has the skin very much wrinkled transversely, and, as it were, composed of a very great number of short rings. So also the larva of *Nematus Grossulariæ*, previous to its final moult, is of a green colour, tinged with yellowish, especially towards the head and tail, with numerous small black tubercles. After its last moult it loses all these tubercles, becomes smooth and of a yellowish white colour, with the two fore and two hind segments citron-coloured.

The majority of these larvæ feed, externally, on the leaves of plants and trees; occasionally, as in the case of the turnip and gooseberry saw-flies, occurring to so great an extent as to become the cause of real injury to the farmer and horticulturist. In general the entire substance of the leaf is consumed; the mid-rib and a few of the stronger ribs being only left to show the extent of the devastation; but other species content themselves with eating only one of the surfaces of the leaf, leaving the other entire; some, again, live in galls resulting from the wounds made by the parent fly in depositing her eggs; one, at least, lives in the larva state within the leaf in the manner of the mining larvæ of some of the genera of *Micro-Lepidoptera*, and another species, like the larvæ of some *Tortricidæ*, lives in the interior of fruits. Most of the species live singly (as the *Cimbices*, *Cladii* and *Tenthredinidæ*), but others are social; some of the latter (as various species of *Lyda*) residing in a large



web, like the larvæ of the lackey-moth, whilst others (*Cladius viminalis*, Brischke, pl. 2, fig. 1) feed exposed, but in rows, side by side, like the larvæ of *Bombyx processionea*, and others more irregularly (e. g. *Lophyrus socius*, Fintelmann, pl. 25, fig. 13—16).

Another species of which I noticed the transformations in the garden of my late residence at Hammersmith (which afforded me so many excellent observations), ingeniously rolls up the leaves of the rose in a spiral manner, somewhat similar to that adopted by some of the water-*Pyralidæ*; others, again, secrete themselves beneath a fetid exudation from the pores of the body, which gives them the appearance of small black slugs, and a few have the body armed with numerous short spines, occasionally recurved at the tips. Some, again, when at rest, remain with the hinder parts of their bodies elevated in the air in all kinds of curves, whilst some conceal themselves on the under surface of the leaves, coiled up like a *Julus*; and, lastly, another species burrows into the young stems of roses, consuming the pith, and causing the destruction of the shoot.

To conclude the general and comparative description of these larvæ, I may add the following concise statement.

The adult larvæ of the *Tenthredinidæ* agree with the caterpillars of *Lepidoptera*, in the following particulars:—

Both are plant-feeders.

Both have a nearly cylindrical, elongated body, divided into distinct segments, and provided with many pairs of legs, some of which are cartilaginous, and others membranaceous; the former, six in number, are terminated by a hook, and both are furnished also with a horny head, armed with strong horny denticulated mandibles.

Whilst the following short comparative diagnosis will

serve at once to distinguish these Eruciform Tenthredinideous larvæ, from the larvæ of Lepidopterous insects.

The Eruciform larvæ of the saw-flies have—

Two distinct ocelli ; one at each side of the head ; prolegs simple ; sometimes as many as 8 pairs (never, when the prolegs are present at all, with less than 6 pairs).

The true caterpillars have—

Twelve ocelli ; six arranged in a semicircle on each side of the head ; prolegs furnished with a circle of minute hooks ; never with more than 5 pairs.

II. I now proceed to give a more detailed account of a few of the species of these larvæ, which, from the similarity of their habits to those of different species of *Lepidoptera*, may be supposed to possess a greater degree of interest than the rest.

One of the larger species of this family, *Trichiosoma lucorum*, is by no means rare, and is more especially worthy of notice from the fact, that its cocoon is often mistaken for that of an eggar moth, being hard, brown, oval and fixed to the twigs of whitethorn hedges ; so that, during the winter, when the leaves are fallen from the trees, it is very conspicuous.

This and the larvæ of the other large species, constituting the sub-family *Cimbicides*, have six jointed and 16 (8 pairs of) fleshy prolegs, fourteen being ventral and two anal ; they feed upon the leaves of plants, they are solitary in their habits, rolling themselves up into a spiral flattened coil when at rest, and emitting a viscid, scentless fluid, when alarmed, from the numerous lateral pores on the sides of the body. The larvæ of the *Trichiosoma lucorum* may be met with on the whitethorn, at the end of June and in

July. They are of a pale dull green colour, covered entirely with minute white tubercles which gives them a whitish appearance. The head is of a pale straw colour, more orange on the crown, with a small black spot on each side, in the middle of which is a single eyelet. The discharges of green watery fluid from the pores of the sides of the body can be repeated several times. The object is evidently to deter parasitic enemies, in which, however, it is often unsuccessful, as, not unfrequently, I have found the interior of the cocoon filled with the smaller cocoons of *Ichneumon* parasites, which have lived within the body of the larva, the shrivelled remains of which might be seen lying at one end of the cocoon.

I have, in fact, obtained two distinct species of *Ichneumonidæ* from one cocoon of the *Trichiosoma*, and from another cocoon I have obtained specimens both of an *Ichneumon* and of a *Pteromalus*. On opening the cocoons during the winter month, each is generally found to contain a large green caterpillar rolled up, its head and tail being brought almost into contact, but about the end of April the insect assumes its pupa state, in which it is generally reduced in its length, and exhibits all the parts of the perfect insect, the antennæ and legs lying upon the breast, each enclosed in a distinct membranous case, and the wings of a small size encased in oval sheaths at the sides of the body. On comparing the pupa with the chrysalis of any species of moth, we find there is a complete difference, not only in the way in which the limbs are enclosed under a general covering in the moths, while each has a distinct covering in the *Trichiosoma*-pupa, enabling the insect to move each limb separately when ready to assume the perfect state, but, also, that the head of the pupa of the *Trichiosoma* is also distinct, and furnished with a pair of

long jaws, in both which respects it differs from the pupa of the moth, although the cocoon is almost identical both in form and texture with the cocoons of those moths which are called Eggers. The jaws are of the greatest use to the enclosed insect, as it is by their aid that it is enabled to make its escape out of its cocoon; the moths, it is true, are enabled, without such jaws, to effect their escape, by emitting a peculiar fluid which softens the threads of the cocoon, and thus allows their escape; but the saw-fly is provided with no such fluid, and is obliged to pierce the cocoon near one of its ends with the point of one of its jaws, after which it works them conjointly like a pair of scissors, and so cuts off a small circular cap at the end of the cocoon, and thus effects its escape, which it does immediately after assuming the winged state, the wings extending to their full size on the insect gaining its liberty. It now resembles a large, rather long, hairy, brown bee, with the abdominal part of the body soldered to the thorax.

The leaves of the raspberry plant are often covered with large blotches in July, which are caused by the fleshy portion of the leaf being eaten away, leaving the two surfaces entire; within these blotches will be found one, or, occasionally, two, or even three, small dirty greenish caterpillars, having three pairs of jointed legs, six pairs of ventral and a pair of anal prolegs; the segment next the head is dark brown in front, the head itself fulvous, the 2nd, 3rd and 4th segments having a black dot on the underside, and the anal prolegs surrounded at the base with a black ring. These caterpillars shed their skins several times, leaving the exuviae within the blotch; when full grown they eat their way out of the blotch, which by that time nearly occupies the entire leaf, and then descend to the earth, where they make their cocoons, the perfect insect appearing at the beginning of August, in the shape of one

of the smallest known species of saw-flies (*Fenusa pumila*) measuring only one-eighth of an inch in length, and about a quarter of an inch in the expanse of the fore wings. The presence of these little parasites on the leaves has a decided ill effect upon the plants on which they abound, as I observed some which, in consequence of this visitation, did not produce a proper crop of fruit for two or three years.

A second brood of this larva is to be met with in September and October, and is so abundant in the leaves of the bramble, that, as Mr. Wailes has remarked in the Zoologist, 1856, p. 5074, "every Micro-Lepidopterist must have noticed it;" from these proceed the perfect insects in the following summer, which deposit their eggs on the leaves of the raspberry or bramble.

About the beginning of the month of August, the upper surface of the leaves of pear, cherry and plum trees may be observed to be infested with black shiny looking objects, which, when disencumbered of their viscid coating (which has a strong scent, something like that of bad red-ink), are discovered to be the larva of a saw-fly (*Selandria atra*, Stephens). They vary in length from a quarter to half an inch, are of an elongate pear-shape, and their general appearance is not unlike a drop of resinous matter, such as that which issues from the plum-tree; their ill effects are soon perceived upon the trees attacked by them, the upper surface of the leaves being eaten off in patches, and the remainder soon presenting the appearance of having been scorched. In hot weather, where they abound, the noise of their operations on the leaves may be heard like drops of rain falling upon the leaves. When full grown, the larva falls to the earth, and undergoes its changes to the perfect fly, which appears in the following July. Having reared the

species, I have satisfied myself that it is not the true *Tenthredo Cerasi*, of Linnæus, whose name had been applied to it, but whose description both of the habits and characters of that species disagree with those of the insect produced from these slimy larvæ; indeed, Klug and Hartig applied to it the Fabrician name *Tenthredo Æthiops* (a name given by Fabricius to an English insect in the Banksian Cabinet), but repeated observations have disproved the correctness of the nomenclature of these authors: the insect is, in fact, the *Selandria atra*, of Stephens.

Another saw-fly larva, which is very common in gardens and very injurious to rose trees, next merits our attention, the more especially as it happens to be the true *Tenthredo Æthiops*. It is in the month of June, when the rose tree needs all its energies for the development of fine bloom, that many of the leaves turn pale brown, looking as though they had been scorched, the upper cuticle of the leaf being entirely or partially eaten away, the lower surface being always left entire. In some gardens, every rose leaf will be attacked by these pests, and the injury to the plants must be considerable. The larva which causes these unsightly discolorations is about half an inch long; it is of a pale yellowish green colour, with a darker line down the middle of the back, and an orange-coloured head; it has three pairs of jointed legs, seven pairs of ventral, and two anal prolegs (making twenty-two feet in all). When they have shed their skins several times and arrived at their full size, they descend into the earth, where they form little hollow oval cells of earth, highly polished on the inside, in which they pass the winter, and wherein they undergo their transformations. The perfect insects appear in spring, and lay their eggs on the rose leaves, and the larvæ begin to be hatched about the end of May.

*Lyda inanita* is another species of saw-fly, which in its larva state attacks the leaves of the roses, but it is peculiar on account of the remarkable instinct with which it is endowed, which leads it to construct a moveable case, formed of small strips of the leaves arranged in a spiral direction, within which it resides, and which gives it a general resemblance, not only to the Caddis-larvæ of the *Trichoptera*, but also to the aquatic larva of the China-mark moths (*Hydrocampa*). The larvæ of the genus *Lyda* are the only ones in the family which are destitute of the false or ventral prolegs. Towards the end of June and through the month of July I observed, upon different varieties of roses in my garden at Hammersmith, the cases of these larvæ of various sizes, each being a cylinder or rather an elongated cone, the slender extremity being free, whilst the other end is often still connected with the leaf by the strip not being entirely severed from it. The larva, in fact, by degrees cuts off one edge of the leaf, thereby forming a strip about one-eighth of an inch wide, at the same time eating a portion of the leaf immediately adjoining the slit which it has made; the free end of the strip is gradually fastened in a whorl round the insect's body by the help of slender threads of silk, whilst the other end of the strip is only detached from the leaf when the larva has arrived at its extremity; it has the further instinct to twist the strip downwards, working beneath it, hidden from above; it moreover arranges the serrated edge of the leaf on the outside of its case, so that wet is thrown off, just as by the tiles of the roof of a house. The roll, when the insect is full grown, is nearly two inches long; it is then, however, formed by the addition of strips cut from several leaves. The full grown larva is nearly an inch long, of a dirty-green colour, with three pairs of jointed legs, and a pair of laterally projected, slender, 3-jointed feeler-like organs, at-



tached to the extremity of the underside of the last segment of the body, which is flattened beneath. The larva disappears at the end of July, and the brilliant imago does not appear till the following May, almost regularly making its appearance in the last week of that month; the intervening period is doubtless passed under ground.

The habits of the larvæ of the codling moth or apple *Tortrix* are familiar to everyone. But many will be surprised to hear, that the economy of a species of saw-fly exactly agrees with that of the moth above-mentioned. At the end of June and beginning of July I observed many young apples, not larger than walnuts, and not more than one-fourth of their full size, fallen to the ground; the interior of each was worm-eaten, and in most cases the enemy had made its escape from the apple. However, by collecting some which had but recently fallen, I found the larvæ inside the apple, and thus ascertained that it does not eat its way out of the apple whilst the fruit remains on the tree, and then crawl down the trunk of the tree to go into the earth, but that, like the fruit-eating *Tortrix* larvæ, it waits patiently until the fruit falls, and then eats its way out and buries itself in the earth, where it forms its cocoon, remaining inactive till the following year, when, about the middle of the month of May, the perfect insect may be seen flying amongst the blossoms, on which they settle, and I observed one of the females in the act of depositing her egg within the bloom. The perfect insect is the *Tenthredo testudinea* of Klug and Stephens.

Of course it would be possible to extend, to a much greater length, instances of similarity in habits of economy between the larvæ of the saw-flies and those of *Lepidoptera*, but the foregoing must suffice for the present.



III. The larvæ of the saw-flies may be thus classified :—

A. Larvæ with 22 legs (6 pectoral, 4 ventral and 2 anal).

a. Feeding upon the leaves of plants.

1. Solitary ; whilst resting, coiled in a spiral manner ; ejecting a fluid from the pores of the body ; forming a regular oval cocoon (*Cimbex*, *Trichiosoma*, *Clavellaria*.)

2. Solitary or social ; variable in their mode of resting ; not ejecting a liquid from the pores of the body.

\* Forming a regular cocoon (*Tenthredo*, various species).

\*\* Not preparing a regular cocoon (*Athalia*, and other species of *Tenthredo*, *T. Scropulariæ*, *rufo-cincta*, &c.)

b. Feeding on the leaflets of the pine ; social ; not ejecting a fluid from the pores of the body ; attached, whilst quiescent, to the edges of the leaflets by the widely spread legs ; forming a cocoon (*Lophyrus*).

B. Larvæ with 20 legs (6 pectoral, 12 ventral and 2 anal) ; not ejecting a fluid from the pores of the body.

a. Feeding on the leaves of plants ; either solitary or social.

1. Resting with the legs stretched out on each side of the edges of the leaves.

\* Forming a regular double cocoon, the outer one reticulated and elastic (*Hylotoma atrata*, *ustulata*, &c.)

\*\* Forming an irregular double cocoon ; the outer one vitreous and hyaline ; the inner one brown (*Cladius*).

- \*\*\* Forming an irregular double cocoon; each being vitreous and hyaline (*Pristiphora*).
  - \*\*\*\* Forming a regular simple cocoon (*Nematus*, *Cræsus*, *Tenthredo rustica*, &c.).
2. Resting on the upper side of the leaves, and forming regular shaped simple cocoons.
    - \* Larva eruciform (*Tenthredo De Geerii*).
    - \*\* Larva onisciform (an unknown species observed by Dahlbom).
    - \*\*\* Larva limaciform (*Tenthredo atra*, *cerasi auctorum*, but not of Linnæus).
  - b. Larvæ feeding on the leaflets of pines, and forming a regular simple cocoon (*Nematus abietinus* and *Leachii*).
  - c. Larvæ living within the galls of plants (*Nematus intercus*, &c.)
  - d. Larvæ living within the fruit of the apple (*Tenthredo testudinea*).
  - e. Larvæ living between the two surfaces of leaves (*Fenusa pumila*.)
- C. Larvæ with 18 legs (6 pectoral, 10 ventral and 2 anal); forming a regular double cocoon; the outer one elastic and reticulated (*Hylotoma enodis*, *Rosarum*).
- D. Larvæ with 6 legs (6 pectoral, no ventral feet).
1. Social; feeding within a common web (*Lyda sylvatica*, &c.)
  2. Solitary; residing within a moveable case formed of leaves (*Lyda inanita*).
  3. Solitary; residing within the stems of cereal plants (*Cephus*).

## THE TINEÆ OF THE HIGHER ALPS,

BY PROFESSOR FREY.



To the Lepidopterist it is a moment of his life never to be forgotten, when he, for the first time, eager for sport, enters an Alpine region, and wearily climbs to the summits of the higher mountains.

And truly a greater enjoyment of nature is hardly possible than when at early morn, the "alpenstock" in hand, the blue sky above, having stowed in our pocket all the requirements for the day, provisions for the lunch on the mountain-top, boxes, pins and nets for the long and persevering pursuit, feeling quite fresh and vigorous in the cool air, we enter the shady, dewy meadow, whilst the snowy sides of the magnificent mountain-world around have the rosy glow from the morning sun.

Soon we pass through the meadow-ground of the valley, and enter the wood which clothes the foot of the mountain; we climb up the rough path, by the side of the thundering mountain stream, now over high rocks, now crossing the narrow bridge. The entire insect world is here below, in the shady ravine, still in the soundest repose. At most one perceives a *Geometra* sleeping on a rock, such as the grey *Cæsaria* or the green *Aptaria*, or our tread disturbs some *Crambus*, with its short heavy flight, from the wet grass.

So we go further and further on, higher and higher up. If the air be still cool, yet in the course of some hours the exertion of climbing becomes sensible enough.

At last we leave the wood, and before us lies an extensive meadow land, surrounded by a wooden fence; but still this ascends, though with a more gentle slope, and thousands of feet above us yet lies our destined hunting-ground.

We proceed, now in the full glare of the sunshine, on the rapidly-drying grass. The collector glances eagerly in search of insects, and indeed here we first met with species peculiar to the Alpine world, though still singly and sparingly enough. Brown butterflies of the genus *Erebia* attract our attention; it is *Erebia Melampus*, a constant inhabitant of the lower Alps.

We go further; other allied species join and gradually become more plentiful, and the meadows appear more and more to be tenanted with a peculiar insect-world. There flutters heavily before our feet a brown *Geometra*, with yellow markings; it is *G. equestraria*, and on the flowers sits the yellow *G. tinctaria*. Possibly we already perceive hurrying along a greenish yellow *Colias Phicomone*, as a sample of what awaits us on the summit of the mountain. At last we reach the top, exhausted and streaming with perspiration. Yet all weariness soon disappears in the fresh and pure air, especially as we contemplate our magnificent hunting-ground, begirt with snow-fields. Soon we are hard at work, carrying death and havoc into the peaceful insect world around us, and the harvest is indeed rich in the new and the beautiful, if only the sun shine and blue sky remain true to the collector.

Probably every Lepidopterist, even though his studies are more directed to the smaller than the larger groups of the order, will for the first hours at such a time devote his

attention rather to the latter. Since here almost everything is new; and only sparingly and singly some of the species of the plains fly among the abundance of their Alpine brethren. This abundance in favourable localities and in fine weather, is often something quite extraordinary, far greater than that of the richest wood-meadow of the plain.

At last we are tired. We have probably caught on the rocks *Chionobas Aëlo*, and likewise *Erebia Gorge*. Round the "rose of the Alps" (the rhododendron) *Melitæa Cynthia*, *Merope* and *Parthenie* have been flying. At the brook which runs through the meadow we have caught the magnificent *Parnassius Delius*, and in the flowery parts of the meadow a whole host of other butterflies, the delicate *Orbitulus* and *Pheretes*, as well as the beautiful *Eurybia*. Other groups of the *Lepidoptera* also take care to be well represented here; the thinly-scaled *Zygæna exulans* is in innumerable multitudes, and amongst them the *Noctuæ*, *Ocellina* and *Divergens*. Probably we have also met, towards the edge of the snow, with some small black *Pyralidæ*, which we have only succeeded in catching after several unsuccessful attempts, *Holosericealis*, *Rupicolalis*, and others.

Yet now we are ready to attend to other things; we look round for the *Micros*, which, perhaps, as our favourites, have attracted us up the mountain-heights. But where are they? Nothing but butterflies! no *Tineæ*!

It is certainly a phenomenon of the Alpine Fauna that at elevations of from 5,000 to 7,000 feet above the level of the sea, the *Micro-Lepidoptera* occur but very sparingly, whilst lower down the mountain the same species which frequent the plain still occur. At any rate the lower slopes, which we have so inconsiderately left behind us, are better for the *Tineæ*.

Of course the want of broad-leaved trees, which at such elevations is a very general occurrence, accounts for the non-appearance of many species of *Tineæ*, since their larvæ can only feed on these trees, and the insects consequently here no longer find their necessaries of life. The fir trees, poor in small insects, cannot repair this blank, although they produce some peculiar species of *Micro-Lepidoptera*. But many *Tineæ* larvæ feed on low plants. Yet even the mountain-side, with its shrubs, and the grassy meadow with its abundance of the *most lovely* Alpine plants, nourish no great number of *Tineæ*. We repeat it again, the higher region of the Alps is sparingly peopled with *Micros*!

We believe we must confirm this poverty of the Alps in *Micro-Lepidoptera* as the result of our numerous wanderings; yet we readily admit that we may easily fall here into many errors. Generally our time for seeking larvæ is too short, and in this respect we have hitherto done little; but how very sparingly the mining larvæ occur, I have repeatedly observed. The wind, which almost always prevails up above, renders the capture of *Micros* more difficult; and the best time for collecting, the later evening hours, we can rarely use, since we must then be already on our way down; moreover it soon becomes cold up there.

Yet with energy and perseverance a tolerable number of *Micro-Lepidoptera* may be taken on the higher Alps, the best proof of which has been furnished by Herr Mann of Vienna. These, in contradiction to the *Macros*, are mostly species which also occur in the plains, especially in more northern countries; yet many are new, and peculiar to the Alps. What a pity there are not more of them!

We will now attempt in the following pages to give the results of our investigations respecting the *Tineæ* of the Swiss Alps. For this purpose, some years ago, we stayed

several weeks in the splendid Engadine, in the Grisons, and lived at Samaden, more than 5,000 feet above the level of the sea. We explored the neighbourhood, mountain and valley. Herr Senator von Heyden had previously been twice for the same purpose to the neighbouring St. Moritz. His captures we have since carefully studied at Frankfort. Some species we obtained last year from Herr Pfaffenzeller, at Samaden. Numerous shorter excursions in the nearer Alps have likewise furnished us with some species.

I. Among the first family of the *Tineina*, the *Exapatidæ*, I have hitherto found no species in the Alps of either of the genera *Exapate*, *Dasystema* and *Chimabacche*. Neither does *Semioscopis* appear to be represented. This seems extraordinary; for should even the want of many broad-leaved trees explain the non-occurrence of the *Exapatidæ*, yet one would expect that the Alpine alder (*Alnus viridis*) and the Alpine willows would furnish food for some of the species.

II. On the contrary, in the higher regions of the Alps, the family *Tineidæ* (from which I exclude the genus *Micropteryx*) is rather well represented. The mode of life of larvæ of the *Tineidæ*, on low plants, on lichens, grass, and in wood, must especially fit them for an abode at a considerable elevation, just as many of the species occur in the high latitudes of Europe, whereof we have proof in the works of Zetterstedt, Tengström and Madame Lienig. We have obtained *Talæporia pseudobombycella*, a *Solenobia*, *Xysmatodoma melanella*, *Incurvaria Masculella*, *Capitella* and *Rupella*. There also occurs there one *Adela*, namely, *Fibulella*, and likewise *Nemophora Pilulella*. No species of the genus *Ochsenheimeria* has hitherto been taken. The



genus *Tinea* furnishes us with *Tapetiella*, *Rusticella*, *Grannella*, *Pellionella*, and the beautiful *Fulvimitrella*. The first four accompany the dwellings of man up the high mountains. No species of this family is peculiar to the Alps, since *T. Rupella*, a mountain species, occurs at much lower elevations.

III. The family of the *Micropterygidæ*, containing the single genus *Micropteryx*, has only eight species which occur in Switzerland. The half of these, *i.e.* four, have been noticed on the higher Alps, *viz.* *Calthella*, *Aruncella*, *Alionella* and *Anderschella*, often at considerable elevations. Certainly the larvæ live not only in the wood of trees, but also on low bushes and hard-stemmed plants.

IV. Curiously enough the *Hyponomeutidæ* are almost unrepresented in the higher Alps. The genera *Swammerdamia*, *Scythropia*, *Hyponomeuta*, *Psecadia* and *Prays*, seem *entirely* wanting there. Only the pretty *Symmoca signella* is found on rocks and stones and at rather considerable elevation. How disproportionately then is this family represented, how very different from the *Tineidæ*!

V. The *Plutellidæ* are well represented in the upper Alps. In the genus *Plutella*, *Cruciferarum* and *Geniatella* ascend to a height of 7,000 feet. The latter is a peculiarly Alpine species, not occurring in the lower neighbourhood. In the genus *Cerostoma* we find *Dalella*, *Falcella* and *Xylostella*. The larvæ of the two latter probably feed on *Lonicera alpingena*.

VI. The large family of the *Gelechidæ* is probably, among the *Tineæ*, that which seems best adapted for re-



siding among the higher Alpine regions; it also furnishes us with the greatest number of peculiarly Alpine species. It is true the genera *Harpella*, *Hypercallia*, *Nothris*, *Chelaria*, *Parasia*, *Henicostoma* and *Phibalocera*, do not attain an elevation of 5,000 feet, but *Depressaria*, *Gelechia* and *Anchinia* rise above that level. Of the twenty-three Swiss species of *Depressaria*, no fewer than seven occur in the higher Alps, and amongst these three peculiar to that region, namely, *D. Heydenii* and two new species I have discovered, which I name *D. alpestris* and *D. Rætica*, and which I shortly intend to describe. The four other species, which also occur in the plain are *Costosa*, *Arenella*, *Liturella* and *Badiella*. I doubt not that the number of Alpine *Depressaria* will eventually be much increased. Likewise the genus *Gelechia*, of which I know at present eighty-one Swiss species, has twenty-three representatives in the higher Alps, of which five seem peculiar to that elevation, viz. *G. præclarella*, *holosericeella*, *elatella*, *perpetuella* and *interalbicella*. They are found either on rocks or in grass. The remaining eighteen, which are likewise found partly in the plain, are *Tripunctella*, *Maculosella*, *Galbanella*, *Lentiginosella*, *Tenebrella*, *Ericetella*, *Vicinella* [this can hardly be identical with our coast species of that name, H. T. S.], *Sequax*, *Longicornis*, *Terrella*, *Distinctella*, *Artemisiella*, *Scabidella* [*Diffinis*, Sta.], *Lugubrella*, *Dimidiella*, *Coronillella*, *Anthyllidella* and *Superbella*. The genus *Anchinia*, which only contains four Swiss species, furnishes two peculiar to the higher Alps, *Laureolella* and *Grisescens*; and probably *Daphnella* also ascends above the 5,000 feet line, since Herr Boll met with it last summer nearly at that elevation in the Engelberg valley. Other species of this family occurring in the higher Alps are *Cleodora* *Cytisella*, *Pleurota* *semicostella*, *Sophonria* *Parenthesella* and *Humerella*.

VII. With reference to the *Æcophoridae*, neither *Dasycera*, nor (extraordinary as it may seem) *Endrosis Fenestrella* have occurred. On the other hand both species of the genus *Pancalia*—*Leuwenhoekella* and *Latreillella*—go far up the Alps, and at least two species of *Æcophora*, *Sulphurella* and *Rhætica*; the latter, a very beautiful insect, appears peculiar to this region. The genus *Butalis* has two species peculiar to the higher Alps, *Amphonycella* and another species, probably new. *Scopolella*, *Fallacella* and *Noricella* are found likewise at lower elevations.

VIII. The family of the *Glyphipterygidae* show us *Acrolepia Cariosella*, with its food plant, *Gnaphalium Arenarium*, at very considerable elevations; likewise we see *Glyphipteryx equitella*. *Tinagma perdicellum*, so abundant in many parts of Germany, flies also at great heights. The genera *Æchmia*, *Perittia* and *Heliozela* (*Tinagma*, Sta.) appear to be unrepresented. The latter genus, of which the larva, as Stainton discovered, mines the leaves of trees (*Alnus*), is probably not to be expected. In this family we find no peculiarly Alpine species.

IX. Of the *Argyresthidae*, the genus *Cedestis* is alone unrepresented. The larva of *Argyresthia Sorbiella* feeds on *Cotoneaster*, and a new species, *Lævigatella*,\* was discovered by Von Heyden on *Pinus Larix*. Also a species of *Ocnerostoma* appears peculiar to the Alps, namely, *Copiosella*,\* which is very common mining the leaves of the *Pinus Cembra*. These two species are not found at lower elevations. Of the genus *Zelleria*, *Fasciapennella* has been taken sitting on stones.

\* Entomologist's Annual for 1856, p. 131.

X. In the family *Coleophoridae*, the genus *Coleophora* is well represented on the upper Alps: of ten species which occur there, six seem peculiar; these are *C. Fulvosquamella*, *Albisquamella*, *Nubivagella*, *Valesianella?* *Tractella?* and *Rectilineella*. The four others, which also occur in the plain, are *Ornatipennella*, *Lusciniæpennella* [*Gryphipennella*, Sta.], *Annulatella* and *Solitariella*.

XI. Of the family *Gracilaridae*, the genus *Coriscium* is unrepresented. Of the genus *Ornix*, one very lovely insect, *O. Pfaffenzelleri* (allied to *O. Loganella*), appears peculiar to the higher Alps; the larva feeds probably on *Cotoneaster*. Three species of *Gracilaria* ascend these heights, viz. *Auroguttella*, *Rufipennella* and *Stigmatella*. A peculiarly Alpine *Gracilaria* has not yet been observed.

XII. Of the extensive family of the *Elachistidae* most of the genera seem to be entirely wanting in the higher Alps, as, for instance, *Batrachedra*, *Cosmopteryx*, *Stathmopoda*, *Bedellia*, *Chrysoclista*, *Schreckensteinia*, *Heliodines*, *Stagmatophora*, *Antispila*, and also *Tischeria*. The remaining genera are represented, but none furnish us with peculiarly Alpine species. We meet with *Ochromolopis ictella*, *Laverna miscella* and *Langiella*, likewise *Elachista humilis*, *bifasciella* and *truncatella* [*Bedellella*, Sta.]; certainly other species of *Elachista* should occur there. *Chauliodus scurella*, which we used to consider peculiar to the upper Alps, has been found by Herrich-Schäffer at a much lower elevation, at Reichenhall, near Salzburg.

XIII. Of the *Lyonetidae*, one *Lyonetia*, the beautiful *Frigidariella*,\* discovered by Von Heyden, is peculiar to

\* Entomologist's Annual for 1856, p. 131.

the higher Alps; we also meet with the pretty *Bucculatrix aurimaculella*. The genera *Phyllocnistis*, *Cemiostoma* and *Opostega* seem unrepresented.

XIV. As concerns the beautiful family *Lithocolletidæ*, of the 43 Swiss species only two occur in the upper Alps, namely, *L. Alpina*, which is very common in the Engadine, feeding on *Alnus viridis*, and another, of which I only possess a single specimen, and therefore cannot speak with confidence. It is very singular that I cannot find in the Alps *Lithocolletis Vacciniella* and *Nepticula Weaveri*, though they occur on high ground in England and Scotland, and the food plant is abundant in the Alps.

XV. The family *Nepticulidæ* is likewise but poorly represented in the higher Alps. Last August I found, for the first time, on one of the Glarus Alps, at an elevation of 5,400 feet, *Nepticula Septembrella*, and the mine of a new species on mountain-ash (*Sorbus aucuparia*), mining in a blotch; this latter also occurs near Zürich, but has not yet been reared. Years ago the late Herr Bremi-Wolff collected a species of *Trifurcula* abundantly on the Righi.

### LIST OF SWISS TINEINA.

	Number of Swiss Tineina.	In the Alps, from 5,000 to 7,000 feet.	Proper Alpine Species.
<b>I. EXAPATIDÆ.</b>			
Exapate .....	1	0	0
Dasystema .....	1	0	0
Chimabacche .....	2	0	0
Semioscopis .....	3	0	0
	7	0	0

LIST OF SWISS TINEINA—*continued.*

	Number of Swiss Tineina.	In the Alps, from 5,000 to 7,000 feet.	Proper Alpine Species.
<b>II. TINEIDÆ.</b>			
Talæporia .....	2	1	0
Solenobia .....	2	1	0
Xysmatodoma .....	1	1	0
Ochsenheimeria .....	2	0	0
Euplocamus.....	1	0	0
Scardia .....	1	0	0
Tinea .....	18	5	0
Lampronia .....	3	0	0
Teichobia .....	1	0	0
Incurvaria .....	6	3	0
Nemophora .....	6	1	0
Adela .....	8	1	0
Nemotois.....	5	0	0
	56	13	0
<b>III. MICROPTERYGIDÆ.</b>			
Micropteryx .....	8	4	0
	8	4	0
<b>IV. HYPONOMEUTIDÆ.</b>			
Swammerdammia .....	4	0	0
Scythropia .....	1	0	0
Hyponomeuta .....	5	0	0
Psecadia.....	4	0	0
Symmoca .....	1	1	0
Prays.....	1	0	0
	16	1	0
<b>V. PLUTELLIDÆ.</b>			
Plutella .....	3	2	1
Cerostoma .....	14	3	0
Theristis .....	1	0	0
	18	5	1

LIST OF SWISS TINEINA—*continued.*

	Number of Swiss Tineina.	In the Alps, from 5,000 to 7,000 feet.	Proper Alpine Species.
<b>VI. GELECHIDÆ.</b>			
Phibalocera .....	1	0	0
Depressaria .....	23	7	3
Henicostoma .....	1	0	0
Gelechia .....	81	23	5
Parasia .....	1	0	0
Cleodora .....	1	1	0
Chelaria .....	1	0	0
Hypsolophus .....	4	0	0
Sophronia .....	3	2	0
Nothris .....	1	0	0
Pleurota .....	1	1	0
Hypercallia .....	1	0	0
Anchinia .....	4	2	2
Harpella .....	3	0	0
	126	36	10
<b>VII. CECOPHORIDÆ.</b>			
Dasycera .....	1	0	0
Cecophora .....	12	2	0
Butalis .....	12	5	2
Pancalia .....	2	2	0
Endrosia .....	1	0	0
	28	9	2
<b>VIII. GLYPHIPTERYGIDÆ.</b>			
Acrolepia .....	3	1	0
Glyphipteryx .....	5	1	0
Æchmia .....	1	0	0
Perittia .....	2	0	0
Tinagma .....	1	1	0
Heliozela .....	2	0	0
	14	3	0
<b>IX. ARGYRESTHIDÆ.</b>			
Cedestis .....	2	0	0
Argyresthia .....	20	2	1
Ocnerostoma .....	2	1	1
Zelleria .....	2	1	1
	26	4	3

LIST OF SWISS TINEINA—*continued*.

	Number of Swiss Tineina.	In the Alps, from 5,000 to 7,000 feet.	Proper Alpine Species.
<b>X. COLEOPHORIDÆ.</b>			
Coleophora .....	51	10	6
	51	10	6
<b>XI. GRACILARIDÆ.</b>			
Gracilaria .....	16	3	0
Coriscium .....	3	0	0
Ornix .....	9	1	1
	28	4	1
<b>XII. ELACHISTIDÆ.</b>			
Batrachedra .....	2	0	0
Cosmopteryx .....	2	0	0
Stathmopoda .....	1	0	0
Bedellia .....	1	0	0
Ochromolopis .....	1	1	0
Chauliodus .....	4	1	0
Chrysoclista .....	1	0	0
Schreckensteinia .....	1	0	0
Heliodines .....	1	0	0
Stagmatophora .....	1	0	0
Laverna .....	12	2	0
Antispila .....	2	0	0
Elachista .....	35	3	0
Tischeria .....	3	0	0
	67	7	0
<b>XIII. LYONETIDÆ.</b>			
Lyonetia .....	3	1	1
Phyllocnistis .....	2	0	0
Bucculatrix .....	8	1	0
Cemiostoma .....	3	0	0
Opostega .....	1	0	0
	17	2	1
<b>XIV. LITHOCOLLETIDÆ.</b>			
Lithocolletis .....	43	2	1
	43	2	1

LIST OF SWISS TINEINA.—*continued.*

	Number of Swiss Tineina.	In the Alps, from 5,000 to 7,000 feet.	Proper Alpine Species.
<b>XV. NEPTICULIDÆ.</b>			
Nepticula .....	46	2	0
Trifurcula .....	2	1	0
	48	3	0
<i>a</i> Number of the Swiss Tineina .....	553		
<i>b</i> Number of Tineina which occur in the Alps from 5,000 to 7,000 feet above the level of the sea .....	....	103	
<i>c</i> Number of Tineina which are peculiar to the higher Alps .....	....	....	25



## PARIS VIEWED LEPIDOPTEROLOGICALLY.

(BY THE EDITOR.)



It is always interesting on arriving in a new place to discover other persons with tastes kindred to our own. The Coleopterist who visits Paris has in this respect a great advantage over the Lepidopterist. Almost every Entomologist of any note in Paris is a Coleopterist, and Lepidopterists are rare indeed.

Dr. Boisduval, whose scientific reputation as the author of the "Index Methodicus" needs no indorsement here, has a most extensive Collection of *Lepidoptera*, and some species of great rarity, such, for instance, as *Plusia Dives*.

M. Bellier de la Chavignerie has a *tremendous* Collection; we know of no other word which will so well express it; long series of bred specimens such as we see in few Collections here, and extended to the *Lepidoptera* of Europe. The Lepidopterist who visits Paris, and does not see this Collection, misses the sight which we should fancy he would enjoy more than any other.

M. Berce has also a Collection which would well repay a visit. The series are not as long as with M. Bellier; but he possesses several rarities, which are wanting in the larger Collection.

Dr. Sichel has also a Collection of *Lepidoptera*; but with him it only occupies a subordinate place, as his attention is divided amongst all the orders.

M. Guérin-Ménéville, who does not so much make a Collection as study the habits and economies of the insects he meets with, and from whom we have obtained several valuable suggestions, showed us last spring a small Lepidopterous insect, which was totally new to us. We borrowed it for description, and when at Zürich showed it to Professor Frey, who was no less struck with its singular appearance than we were.

In order to redeem our promise of describing it, we here give a notice of this insect, which is figured on the Frontispiece (fig. 5).

STATHMOPODA? GUERINII, n. sp.

*Alis anticis dilute olivaceis, fascia obliqua albida ante medium, plaga albida pone medium, a venis olivaceis intersecta.*

Exp. al.  $5\frac{1}{2}$  lines.

Head whitish grey; face and palpi white; antennæ grey, slightly pubescent, with long basal joint.

Anterior wings pale olive grey, a little darker posteriorly; before the middle is an oblique whitish fascia, nearest the base of the wing on the inner margin, the whitish colour of this fascia runs along the edge of the costa and inner margin to the middle of the wing; beyond the middle is a whitish blotch not reaching to the costa, and intersected by two dark olive-grey veins; the apex of the wing is whitish, streaked with grey; cilia grey.

Posterior wings pale grey, with greyish cilia.

This singular insect, which was bred by M. Guérin-Ménéville (after whom I have named it) from a large gall of the pistachio tree, September 15th, 1852, does not appear referable to any of our existing genera; the antennæ are only slightly pubescent, whereas in *Stathmopoda pedella* the

male has them sparingly clothed with long hairs, and the female has them utterly naked; the<sup>s</sup> posterior wings are very different in form from those of *S. pedella*, being far broader, and coming rather suddenly to a point, more after the style of *Gelechia subocellea*.

The dark veins intersecting the pale blotch beyond the anterior wings give it a superficial resemblance with *S. pedella*, and on that account, till something more is known of the insect, I prefer referring it doubtfully to that genus.

Colonel Goureau also occupies himself with the education of larvæ of small *Lepidoptera*, and annually adds to his note book the histories of two or three with which he was previously unacquainted. His investigations extend also to their parasites, and to the gall-making *Diptera* and *Chalcididæ*.

We have repeatedly sought in Paris for a *Micro-Lepidopterist*; but our search has hitherto been unsuccessful. We have, of course, expectations that those who have such rich Collections of *Macro-Lepidoptera* as M. Bellier and M. Berce will before long turn their attentions to the *Micros*.

Should other *Lepidopterists* in Paris wish to make our acquaintance, or should any unknown *Micro-Lepidopterists* exist there, we shall be very glad indeed to hear from them.

NEW WORKS ON ENTOMOLOGY.

(BY THE EDITOR.)



THE past season has not been prolific in Entomological publications. We proceed to mention those published in this country.

ON A TRUE PARTHENOGENESIS IN MOTHS AND BEES. BY CARL THEODOR ERNST VON SIEBOLD. TRANSLATED BY W. S. DALLAS, F.L.S., ETC. 8vo. Cloth. Price 5s. LONDON: JOHN VAN VOORST.

The notices in this work on the economy of the Hive Bee are of more than ordinary interest, both to physiologists and bee-keepers. Though of course they have been met by plenty of declarations of "I don't believe it," the cautious student will wish statements so startling to be repeatedly verified by observation, and not that they should be quietly ignored with the self-complacency of *Incredulity*.

A MANUAL OF BRITISH BUTTERFLIES AND MOTHS. BY H. T. STANTON. VOL. I. COMPRISING THE BUTTERFLIES AND STOUT-BODIED MOTHS. Cloth. Price 4s. 6d. LONDON: JOHN VAN VOORST.

This volume contains descriptions of nearly 500 species, and is illustrated with 80 woodcuts.

THE SUBSTITUTE; OR ENTOMOLOGICAL EXCHANGE-FACILITATOR, AND ENTOMOLOGIST'S FIRE-SIDE COMPANION FOR 1856-7. Cloth. Price 5s. LONDON: E. NEWMAN.

This was the representative of the "Entomologist's Weekly Intelligencer" during last winter, and it contains several important

“leading articles,” some delicious “Notices of Summer Rambles,” and a series of extracts from Guenée’s Work on the *Noctuæ*, and the undeveloped embryo of “the Insect Hunters,” hereafter to be noticed.

THE ENTOMOLOGIST’S WEEKLY INTELLIGENCER. VOL. II. 8vo. Cloth. Price 4s.

LONDON: E. NEWMAN.

This periodical continues its career, and is now pursuing a winter “course of lectures;” the third volume being in progress at the present time (price one penny weekly).

The history of “Young Barnes,” “the greedy boy, who never saw anybody else with anything nice, but immediately he wanted to have it himself,” was given in the second volume of the “Intelligencer,” which also contains woodcuts of *Endromis versicolora*, of a shoot of *Stellaria holostea* puckered by the larva of *Gelechia tricolorella*, of *Gastropacha Ilicifolia*, of a holly-leaf mined by a Dipterous larva (*Phytomiza Aquifolii*), &c., &c.

ELEMENTS OF ENTOMOLOGY; AN OUTLINE OF THE NATURAL HISTORY AND CLASSIFICATION OF BRITISH INSECTS. BY W. S. DALLAS, F.L.S. 8vo. Cloth. Price 8s. 6d.

LONDON: JOHN VAN VOORST.

A good elementary work, giving a general view of Entomology, has long been felt a great *desideratum*. The number of applications we have received to recommend some such work, and our utter inability to select one *actually unobjectionable*, has led to the production of the present volume, which we believe will answer the end for which it was designed.

THE NATURAL HISTORY OF THE TINEINÆ. VOL. II. CONTAINING LITHOCOLLETIS, PART I. BY H. T. STANTON, ASSISTED BY PROFESSOR ZELLER AND J. W. DOUGLAS. Eight coloured Plates. 8vo. Cloth. LONDON JOHN VAN VOORST, Paternoster Row; PARIS, DEYROLLE, Rue de la Monnaie, 19; BERLIN, E. S. MITTLER UND SOHN, Zimmerstrasse, 84, 85. Price 12s. 6d.; 15 francs; 4 thlr. 6 sgr.

The real drawback to this work, and one of which we are fully

sensible, is its slow rate of progress. A recent writer observes, "On a former occasion we spoke of the twenty years which would be occupied in its publication; but we really cannot help thinking that thirty or forty will be more likely to be the period during which the annual or biennial volumes must regularly appear before the whole of the species will be described, at the present rate of twenty-four to each." It is such a common thing for people to commence Herculean works, and never to finish them, that we are not surprised that the conclusion of "The Natural History of the *Tineinæ*" is looked on as something hardly to be expected. However, our consolation is, that in the nature of the thing it can never be complete, and it will always be complete as far as it goes. A history of any period brought down to the day when it is written is necessarily incomplete, and needs a continuation ten or twenty years afterwards, and it is no more possible to write a complete and final history of animals than to do the same office for mankind.

That an interval of two years will again elapse before the appearance of the next volume seems hardly probable, as the manuscript of Vol. III., which will contain *Elachista*, Part I., and *Tischeria*, Part I., is already written, and the first portion is in the hands of the printer.

THE INSECT HUNTERS; OR ENTOMOLOGY IN  
VERSE. BY EDWARD NEWMAN, F.L.S. *Foolscap 8vo.*  
*Cloth, gilt edges. Price 1s. 6d.*

LONDON: EDWARD NEWMAN.

An amusing attempt to introduce scientific definitions into the infant mind by means of versification in the "Hiawatha" style, and *undoubtedly* the best and most useful of Mr. Newman's Entomological Works. "Hiawatha," it is true, has been parodied almost *ad nauseam*; first we had "Drop'owatha," then "Milkanwatha," from which, as perhaps some of our readers have not seen it, we give the following extract:—

" But beside him, Milkanwatha  
Loved the very fat man Bee-del;  
He, the fattest human being,  
That you ever laid your eyes on.  
From his very earliest childhood,  
He was round, and fat and lazy;  
Didnt go a squirrel-hunting,  
Didnt skate and didnt nothing—  
Wasnt like the other children;

But they understood the reason,  
 And they all were sorry for him,  
 'Cause he was of such a fatness—  
 'Cause his fatness grew upon him."

Then came "Bugfliwatha," which appeared in the pages of "The Substitute," and following it came some similar poetic attempts, which have now been amplified and consolidated into "The Insect Hunters," from which we quote a few paragraphs.

"And if further you should ask me,  
 Saying, 'Who, then, is this Douglas?  
 Who this great and learned Douglas?  
 Tell us all about this Douglas,'  
 I should answer your inquiries,  
 Straightway in the words which follow:  
     'Very near the Blackheath Station,  
 Station of the North Kent Railway,  
 In a lonely place called Kingswood,  
 Dwells the wise and learned Douglas;  
 There he wrote "The World of Insects;"  
 And before the honoured dwelling  
 Stands a single graceful birch tree,  
 And a somewhat stunted willow.'

\* \* \* \* \*

"First, the Craneflies, TIPULINA,  
 Daddylonglegs, Tipulina;  
 With a head so long and narrow;  
 Thorax thick, and body slender,  
 Never nipped in at the middle;  
 Legs beyond all reason lengthy;  
 Flight both weak and very flagging.  
 Larvæ fat and ugly maggots,  
 Living in the earth, and feeding  
 On the roots of plants and herbage,  
 Also on decaying timber.  
 Pupa without any shell-case,  
 Breathing through two horns porrected."

The above specimens will show both the comic and poetic vein that runs through "The Insect-Hunters," and we fancy most who read it will regret that the "Poem" is not longer.

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Of Foreign Works we have not many to mention:

LINNÆA ENTOMOLOGICA. Vol. XI. Price 6s.

BERLIN: E. S. MITTLER UND SOHN.

The reputation of this Periodical is already so great, that most



Entomologists in this country who can hammer out the meaning of German take in the Linnæa as a matter of course.

The volume before us contains:—

KRAATZ on the *Aleocharini* and the Termitophilous *Coleoptera*;

SUFFRIAN on African *Cryptocephali*;

GERSTÆCKER on Exotic *Sratiomyidæ*, and

FREY on *Nepticulæ*.

## DIE SCHMETTERLINGE DES SÜDWESTLICHEN DEUTSCHLANDS, VON GABRIEL KOCH.

CASSEL: THEODORE FISHER.

An industrious compilation, containing notices of upwards of 1,200 species; generally with remarks on their times of appearance, and food-plants. Dr. Herrich-Schäffer observes of it, "The notices of the occurrence, localities and habits of many species are very serviceable, and partly new, and to every collector (especially those residing in Western Germany) indispensable."

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## P R E F A C E.



HAD any one told us four years ago that in the year 1858 we should have before us a printed list of the names and addresses of 967 British Entomologists, we should certainly have doubted the sanity of our informant. Yet, as our readers will perceive, such a list now exists, and not only so, but that list by no means exhausts the Entomologists resident amongst us. Since it was printed the names of fifteen other Entomologists have reached us—some, no doubt, beginners, but others have been collecting for some time.

One gentleman, of whose existence we were previously unaware, wrote to make some entomological inquiry, and concluded his letter with these words, "As I cannot move out of my room as yet, I amuse myself of an evening by placing my table-lamp in the window, and I have taken some very good things. So, you see, at seventy-four years of age, I am as great an enthusiast as a boy." Hence it is quite possible that many Entomologists who have turned three-score are scattered throughout the country, and their names are not entered in our list.

The Geographical List will no doubt be found highly serviceable; but a considerable drawback is, that these two lists take up so much space (54 pages) that a serious inroad

is made on the space in the Annual available for other purposes.

We have endeavoured to cater for the students of the three best studied orders - LEPIDOPTERA, COLEOPTERA and HYMENOPTERA; but our restricted space has caused all these communications to be rather shorn of their former amplitude.

Dr. Hagen's paper on the British PHRYGANIDÆ is one of so important a nature that we feel no apology is necessary for its length; those who are neither Anglers nor Neuropterists will be glad to see so important a contribution to the elucidation of an interesting, but much neglected, group of insects.

If we have failed to produce as amusing a volume as usual, we hope to be forgiven in consideration of the beauty of the Plate. The central figure, representing an insect quite new to our lists, should do much to impel Entomologists to the south-west of Ireland; but, we trust, those who go will not patronize the steamers, either to Waterford or Cork, as the Dublin Entomologists are looking forward to the arrival in that metropolis of numbers of English Entomologists next year, and are preparing for them that hearty reception so peculiar to the Irish character, and they would feel hurt and disappointed should the English visitors arrive and depart without being welcomed in Dublin.

H. T. STAINTON.

MOUNTSFIELD, LEWISHAM,

*December 4th, 1858.*



## EXPLANATION OF PLATE.



- Fig. 1. *Micra parva*, Hübner, see page 147.  
2. *Harpella bracteella*, L., see page 152.  
3. *Diasemia Ramburialis*, Duponchel, see page 149.  
4. *Notodonta bicolora*, Fabricius, see page 146.  
5. *Cryptocephalus imperialis*, F., see page 143.  
6. *Harpalus servus*, Dufts., see page 122.  
7. *Andrena nitida*, Fourc., see page 116.  
8. *Hallomenus humeralis*, F., see page 142.  
9. *Pentarthrum Huttoni*, Wollaston, Ann. and Mag. Hist. 2nd Ser.  
xiv. 129 (1854); Ent. Annual for 1855, p. 107.



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787. SMITH, HENLEY, 4, Warnford Court, Throgmorton Street, London, E. C.
788. SMITH, H. S., Headingley, near Leeds.
789. SMITH, JOHN, 25, Booth Street, Salford. *British Lepidoptera.*
790. SMITH, JOHN, Turkey Street, Worcester.
791. SMITH, J. W., jun., Beaumont Villa, Northampton.
792. SMITH, R., 19, Albany Villas, Cliftonville, Brighton. *British Lepidoptera.*
793. SMITH, W. H., County Court Office, Nottingham. *British Lepidoptera and Coleoptera.*
794. SMITH, W. P., High Street, Carnarvon, *British Coleoptera.*
795. SMITHSON, T., 5, Brunswick Place, Upper Grange Road, Bermondsey, S. E.
796. SNELLING, G., 25, Gun Street, Union Street, Spitalfields, N. E. *British Lepidoptera.*
797. SOMERVILLE, ALEXANDER (Rev. A. N. Somerville's), 328, Renfrew Street, Glasgow. *British Lepidoptera.*
798. SOMERVILLE, JAMES, E. (Rev. A. N. Somerville's), 328, Renfrew Street, Glasgow. *British Coleoptera.*
799. SPENCE, WILLIAM, F.R.S., F.L.S., 18, Lower Seymour Street, Portman Square, W.
800. SPENCER, W., Park Street, Nottingham. *British Lepidoptera.*
801. SPILSEURY, Rev. F. M., Somershall, Derby. *British Lepidoptera.*
802. SPRAGUE, T. B., B.A., Fellow of St. John's College, Cambridge.
803. SQUIRE, H., 16, Sandwich Street, Burton Crescent, W. C. *British Coleoptera.*
804. STAFFORD, Jos., Coal Pit Lane, Nottingham. *British Lepidoptera.*
805. STAINTON, H. T., Mountsfield, Lewisham, S. E. *European Lepidoptera and the Tineina of the whole world. At home to Entomologists the first Wednesday in each month after 6 p.m.*

806. STAINTON, T. J., 34, Belsize Road, St. John's Wood, N. W.
808. STANDISH, BENJAMIN, 12, Acorn Street, Southampton Street, Camberwell, S. *British Lepidoptera.*
807. STANDISH, F. O., 2, Alfred Cottages, Warner Road, Camberwell, S.
809. STANDISH, JOSEPH, 5, Richmond Terrace, Clapham Road, S. *British Lepidoptera.*
810. STANHOPE, Hon. E., Chevening, Sevenoaks. *British Lepidoptera.*
811. STATHAM, WILLIAM, Greenbank House, Brailsford, Derbyshire.
812. STATHER, T., Spring Bank, Hull. *British Lepidoptera.*
813. STEPHENSON, HENRY, 63, Chorley Street, Little Bolton, Lancashire. *British Lepidoptera.*
814. STEVENS, JOSEPH, Upper Richmond Road, Wandsworth, S. W. *British Lepidoptera.*
815. STEVENS, SAMUEL, F.L.S., 24, Bloomsbury Street, W. C. *British Lepidoptera and Coleoptera.*
816. STEWART, R. M., 3, Park Place, Torquay. *British Lepidoptera.*
817. STOCKDALE, Master ERNEST, Linwood Rectory, Wragby. *British Lepidoptera.*
818. STOCKLEY, GEORGE, 2, Leachdale Place, Old Ford, E. *British Lepidoptera, Diptera and Coleoptera, especially the Carabidæ.*
819. STOKES, JAMES, 1, Thanet Street, Burton Crescent, London, W. C. *British Coleoptera.*
820. STONE, J. B., 89, Lupin Street, Birmingham.
821. STOWELL, Rev. HUGH A., M.A., (Curate of) Luddenham, near Faversham.
822. STRETCH, R. H., Parson's Street, Banbury. *British Lepidoptera.*
823. STUBBS, H. J., Henley-on-Thames. *British Lepidoptera.*
824. STURCESS, W., Kettering. *British Lepidoptera.*
825. STYLE, SIDNEY, 163, North Street, Brighton. *British Lepidoptera and Coleoptera.*
826. SUTCLIFFE, JOSEPH, Warley, Halifax.
827. SWANN, WILLIAM, 9, Everton Garden, Preston.
828. SYME, JOHN T., 12, Gordon Street, Gordon Square, London, W. C. *Coleoptera.*
829. TAGART, Wm. ROBERT, A.B., (Gen. Sec. Dub. Univ. Zoolog. Assoc.), Blenheim, Kingstown, Dublin. *British Lepidoptera.*
830. TALBOT, W., Mount Pleasant, Wakefield. *British Lepidoptera and Coleoptera.*

831. TALES, WILLIAM, 2, Windsor Street, Putney, S. W. *British Lepidoptera and Coleoptera.*
832. TAVERNER, HENRY THOMAS, 7, Saville Row, Mile End Road, E.
833. TAYLOR, A. D., 83, Nelson Square, Bermondsey, S.E.
834. TAYLOR, D. R., 4, Alpha Cottages, New Road, Hammersmith, W. *British Lepidoptera, Coleoptera and Hymenoptera.*
835. TAYLOR, E. W., 75, London Wall, City, E. C.
836. TAYLOR, F., Starston, Harlestone, Norfolk. *British Lepidoptera.*
837. TAYLOR, JAMES, 15, Salop Street, Cavalier Hill, Bank, Leeds.
838. TAYLOR, WATERS, 44, Bridges Street, Southwark, S. E. *British Lepidoptera.*
839. TAYLOR, W. H., Tolson Street, Sunny Bank, Leeds. *British Lepidoptera.*
840. TEARLE, E., Gainsborough. *British Lepidoptera.*
841. TEARLE, REV. F., Grammar School, Kettering. *British Lepidoptera.*
842. TEBBS, H. V., jun., Southwood Hall, Highgate, N. *British Lepidoptera.*
843. THOMAS, JOHN, H., Florist, &c., 16, John Street, Blisset Street, Greenwich, S. E.
844. THOMAS, WILLIAM, Park Gate, near Rotherham.
845. THOMAS, J. P., jun., 7, Montague Place, Islington, N.
846. THOMLINSON, JOHN, Port Road, Carlisle.
847. THOMPSON, C., Foregate Street, Worcester. *British Lepidoptera.*
848. THOMPSON, Miss S., Barn Hill, Stamford.
849. THOMPSON, T., Worcester.
850. THOMPSON, THOS., Welton, near Hull.
851. THOMPSON, WILLIAM, 4, Dutton's Buildings, Mill Street, Crewe, Cheshire. *British Lepidoptera.*
852. THOMPSON, Master CHARLES, Frisby, Leicester. *British Lepidoptera.*
853. THOMSON, R., Bourtreebush, viâ Stonehaven. *British Lepidoptera.*
854. THOMSON, W. BURNS, Kirriemuir, Forfarshire.
855. THOMSON, WILLIAM, F.L.S., 11, Dartmouth Villas, Forest Hill, Sydenham, S. E.
856. THOMSON, Professor WYVILLE, 6, University Terrace, Belfast. *British Lepidoptera.*
857. THORBURN, WILLIAM STEWART, Bank House, Troqueer, near Dumfries. *British Lepidoptera.*

858. THORNCROFT, THOMAS, 87, North Lane, Brighton. *British Lepidoptera.*
859. THORNE, J., 12, Morpeth Street, Green Street, Bethnal Green, N. E. *Insect Cabinet Maker. Dealer and Collector of all Orders.*
860. THURNELL, CHARLES, Newton, Cambridgeshire.
861. THYNNE, J. C., Haynes Park, Bedford.
862. TIDEMORE, T., 15, Northampton Street, Lower Road, Islington, N.
863. TIDY, LEWIS, 16, Crown Gardens, Brighton. *British Lepidoptera.*
864. TILLET, W. H., Norwich. *British Lepidoptera.*
865. TILLY, J. H., 3, Bernard Street, Regent's Park North, London, N. W. *British Lepidoptera.*
866. TINDALL, GEORGE, Grove Street, Huddersfield. *British Lepidoptera.*
867. TINKER, JETHRO, Stalybridge.
868. TISDALL, W. G., Charlesfort, Navan, Ireland.
869. TOMLINSON, J. H., Newark. *British Lepidoptera.*
870. TOMPKINS, H., 44, Guildford Street, Russell Square, W. C. *British Lepidoptera.*
871. TOMPKINS, J. C., 54, Bernard Street, Russell Square, W. C. *British Lepidoptera.*
872. TRAQUAIR, R. H., 30, Clarence Street, Edinburgh. *British Lepidoptera.*
873. TRAVERS, FRANCIS, West Street, Poole.
874. TROTTER, C. T. G., St. Peter's, Marlow. *British Lepidoptera.*
876. TROTTER, JAMES, 308, High Street, Perth. *British Lepidoptera.*
877. TRYE, R. E., Leckhampton Court, near Cheltenham. *British Lepidoptera.*
878. TUDSBURY, R., jun., Edwinstowe, Ollerton, Notts. *British Lepidoptera.*
879. TUGWELL, W. H., 112, Cheapside, E. C.
880. TURNBULL, R. F., Ramsgate. *British Lepidoptera.*
881. TURNER, EDWIN, Lostock Hall, near Bolton-le-Moors, Lancashire.
882. TURNER, J. ASPINALL, M.P., Cross Street, Manchester. *Foreign Coleoptera, especially African species.*
883. TURNER, W. C., 33, Bermondsey Square, Southwark, S. E. *British Lepidoptera.*
884. TUTIN, J. HAZLEDINE, M.R.C.S., A.K.C., Ripon, Yorkshire.

885. TWEED, E. B., The Grammar School, Kettering.
886. TWEEDY, WILLIAM, jun., Truro-Vean, Truro. *British Lepidoptera.*
887. TYRER, JOHN, jun., Melville Hospital, Chatham. *British Lepidoptera.*
888. TYRER, R., jun., Clewer House, Windsor. *British Lepidoptera and Coleoptera.*
889. TYSSEN, AMHURST, Manor House, Hackney, N. E. *British Lepidoptera.*
890. TYSSEN, RIDLEY, Manor House, Hackney, N. E. *British Lepidoptera.*
891. ULYATT, W., House of Correction, Wakefield. *British Lepidoptera.*
892. UNWIN, W. C., St. Anne's, Lewes. *British Hymenoptera—Aculeata.*
893. VALENTINE, W. H., Somerton, Somersetshire. *British Lepidoptera.*
894. VARLEY, J., Almondbury Bank, near Huddersfield. *British Lepidoptera.*
895. VAUGHAN, P. H., Redland, near Bristol. *British Lepidoptera.*
896. VEALE, S. C., 29, Trinity Square, Deptford, S. E.
897. WADHAM, A., 14, High Street, Barnstaple. *British Lepidoptera.*
898. WAGSTAFF, E., Chippenham, Newmarket, Cambridge.
899. WAILES, GEORGE, Newcastle-on-Tyne. *British Insects.*
900. WAITE, JOSIAH, Leslie House, Markinch, Fife. *Coleoptera and Lepidoptera.*
901. WALCOTT, W. H. L., 11, Vyvyan Terrace, Clifton. *British Hymenoptera.*
902. WALKER, E., Harrow. *British Lepidoptera.*
903. WALKER, M., Dewsbury.
904. WALKER, ALFRED, O., Chester.
905. WALKER, FRANCIS, St. Michael's House, Grove, Highgate, N.
906. WALKER, FREDERICK, Southgate, N. *British Lepidoptera.*
907. WALKER, J. D., School House, Rugby.
908. WALLACE, ALEXANDER, M. B., 5, Green Street, Clerkenwell, E. C.

909. WALTON, JOHN, F.L.S., Byard's Lodge, Knaresborough. *British Coleoptera, principally Curculionidæ.*
910. WARD, CHRISTOPHER, Horton Street, Halifax.
911. WARING, S. L., Norwood, S. *British Lepidoptera.*
912. WARRINGTON, JOHN, Tranmere Hall, near Birkenhead. *British Lepidoptera.*
913. WATERHOUSE, G. R., F.Z.S., British Museum, W. C. *Coleoptera.*
914. WATKINS, W., Agincourt Square, Monmouth. *British Lepidoptera. No longer collects.*
915. WATNEY, DANIEL, Reigate. *Coleoptera and Lepidoptera.*
916. WATTSON, MARTIN, 15, Stall Street, Bath. *British Lepidoptera.*
917. WEIR, J. JENNER, 6, Haddo Villas, Blackheath, S. E. *British Lepidoptera.*
918. WERE, ROBERT B., 35, Osborne Terrace, Clapham Road, S. *British Lepidoptera.*
919. WESLEY, JOHN, 2, Canonbury Place, Canonbury, N.
920. WESLEY, J. S., The Close, Winchester. *British Lepidoptera.*
921. WEST, THOMAS, Belmont, Bolton-le-Moors, Lancashire. *British Lepidoptera.*
922. WESTON, WILLIAM, 37, Corn Street, Bristol. *British Lepidoptera.*
923. WESTWOOD, J. O., M.A., F.L.S., Taylor Institute, Oxford. *Economic Entomology of Insects of all Orders from all parts of the globe, especially if of peculiar forms.*
924. WHALL, Rev. W., Thurning, near Oundle. *British Lepidoptera.*
925. WHEELER, E., 1, Promenade Place, Cheltenham. *British Lepidoptera.*
926. WHITE, ADAM, Assist. Zool. Dept., British Museum, W. C.
927. WHITE, F. B. W., Athole Place, Perth.
928. WHITFIELD, EDWIN, Trinity Hall, Cambridge. *British Lepidoptera.*
929. WHITTINGHAM, THOMAS, Leytonstone, Essex, N. E. *British Coleoptera and Lepidoptera.*
930. WIGGLESWORTH, ROBERT, 60, Whalley Road, Accrington, Lancashire. *British Coleoptera.*
931. WIGNALL, JOHN U., Secretary to the Holbeck Entomological Society, Holbeck, Leeds.
932. WIGNALL, SAMUEL, 4, Turk's Head Yard, Briggate, Leeds.
933. WILD, W. J., Herne Hill, Camberwell, S. *British Lepidoptera.*



934. WILDMAN, T., Grove Place, Southampton Street, Camberwell,  
S. *British Lepidoptera.*
935. WILKINSON, J. N., 47, Stanley Street, Chelsea, S. W.
936. WILKINSON, E., Shittlehope Burn, Stanhope, viâ Darlington.
937. WILKINSON, T., 6, Cliff Bridge Terrace, Scarborough. *British  
Lepidoptera.*
938. WILKINSON, Rev. WALTER G., Fellow of Worcester College,  
Oxford.
939. WILKINSON, S. J., 7, Jeffrey's Square, St. Mary Axe, London,  
E. C. *British Lepidoptera.*
940. WILLETTS, HENRY, 63, Edmond Street, Birmingham.
941. WILLIAMS, 37, Old Town Street, Plymouth. *Lepidoptera.*
942. WILLIS, T. W. B., Wick Episcopi, near Worcester. *British Lepi-  
doptera.*
943. WILSON, ANDREW, 18, Young Street, Edinburgh. *Scottish Lepi-  
doptera.*
944. WILSON, C. C., 16, Sussex Place, Rotherfield Street, Islington, N.
945. WILSON, JAMES, Zeta Court, William Street, Botchergate, Car-  
lisle. *British Lepidoptera.*
946. WILSON, JOHN, 43½, Castle Street, Aberdeen.
947. WILSON, JUNIUS, 149, Kirkgate, Wakefield. *British Lepidoptera.*
948. WILTON, E. R., High Street, Ely. *British Lepidoptera.*
949. WINCHESTER, C., Osborne, Isle of Wight. *British Lepidoptera.*
950. WINGFIELD, L., Keston, near Maidstone, Kent.
951. WINTER, JOHN N., Sussex County Hospital, Brighton. *British  
Lepidoptera.*
952. WINTER, WILLIAM, National School, Aldeby, Beccles. *British  
Insects of all Orders, except Hymenoptera.*
953. WOLLASTON, T. V., M.A., F.L.S., 10, Hereford Street, Park Lane,  
W. *Coleoptera.*
954. WOOD, C., Dulwich Common, S. *British Lepidoptera.*
955. WOOD, JOHN, Framwellgate, Gate Bridge, Durham.
956. WOOD, HENRY, Danesfield Gardens, Marlow. *British Lepidoptera.*
957. WOOD, F. W., jun., Hampton House, Luton Road, Chatham.  
*British Lepidoptera.*
958. WOODAGE, ANDREW, 9, East Street, Goldsmith Row, Hackney  
Road, N. E.
959. WOODS, S. E., Westleton, Saxmundham. *British Lepidoptera.*

960. WRIGHT, Dr. E. PERCIVAL, (Hon. Sec. Dub. Univ. Zoolog. and Bot. Assoc.), 5, Trinity College, Floraville, Eglinton Road, Dublin, Ireland. *British Coleoptera and Hymenoptera.*
961. WRIGHT, R. W., 4, Gloucester Terrace, Victoria Park Road, N. E. *British Lepidoptera.*
962. YOUNG, JAMES, 11, Bishop Lane, Hull. *British Lepidoptera.*
963. YOUNG, MORRIS, 7, Old Sneddon Street, Paisley. *British Coleoptera and Lepidoptera.*
964. YOUNG, REGINALD and EDWARD, Hill House, Farnworth, near Warrington.
965. YOUNG, S. W., 12, Portland Street, Cheltenham. *British Coleoptera and Lepidoptera.*
966. YUILL, Rev. JAMES, Peterhead, N. B.
967. ZACHARY, HENRY, jun., Cirencester.

# LIST OF BRITISH ENTOMOLOGISTS,

## ARRANGED GEOGRAPHICALLY.

*Note.*—It has been thought unnecessary to increase the bulk of this List by including those residing within the London District—so that to speak more correctly this is only a “List of *Provincial* British Entomologists.”

The counties and the towns in each county are arranged alphabetically. The nearest town to the Entomologist's residence is that indicated, but by referring to the preceding Alphabetical List the reader will ascertain the precise address and the *spécialité* of any individual.

Wales, Scotland and Ireland are treated as single counties, and placed at the end of this List.

### BEDFORDSHIRE.

#### BEDFORD.

217. Dawson, J. F.  
861. Thynne, J. C.

#### BIGGLESWADE.

493. King, Josiah.

#### LUTON.

82. Boggis, Rev. W. R. T.  
544. Lucas, Alfred.

#### SHARNBROOK.

320. Graham, W. B.

#### WOBURN.

265. Farrow, William.

### BERKSHIRE.

#### MAIDENHEAD.

258. Ellis, Hon. C.

#### NEWBURY.

64. Binning, E.  
275. Fordham, T.  
721. Roake, J. W.

#### READING.

78. Blandy, C. J.  
79. Blandy, J. F.  
661. Philbrick, G.  
662. Philbrick, T.

#### WINDSOR.

888. Tyrer, R., jun.

## BUCKINGHAMSHIRE.

## GREAT MARLOW.

767. Shaw, Wm.  
782. Smith, Rev. Bernard.  
874. Trotter, C. T. G.  
956. Wood, Henry.

## HIGH WYCOMBE.

126. Browne, Rev. T. H.

## SLOUGH.

141. Butterfield, Rev. H.  
268. Fawkes, F. H.  
310. Goldney, George.

## WAVENDON.

138. Burney, Rev. H.

## CAMBRIDGESHIRE.

## CAMBRIDGE.

24. Babington, C. C.  
29. Baker, J.  
37. Barlow, F.  
53. Beadon, C. A.  
123. Brown, Thomas.  
148. Canham, T. J.  
149. Canham, T., jun.  
222. Digby, H. S.  
238. Dunning, J. W.  
253. Egles, E. H.  
266. Farren, W., jun.  
379. Harvey, George.  
563. Manning, John, jun.  
692. Prime, J.  
761. Sealy, A. F.  
802. Sprague, T. B.  
860. Thurnell, Charles.  
928. Whitfield, Edwin.

## ELY.

948. Wilton, E. R.

## NEWMARKET.

263. Fairlie, Evelyn.  
264. Fairlie, John.  
643. Page, F., jun.  
898. Wagstaff, E.

## CAMBRIDGESHIRE—

*continued.*

## WISBEACH.

32. Balding, James.  
329. Green, J.  
565. Marris, Robert  
638. Oliver, George.  
657. Peckover, Alexander.

## CHESHIRE.

## BIRKENHEAD.

12. Almond, G. A.  
117. Brockholes, J. F.  
512. Langcake, T. H.  
912. Warrington, John.

## BOWDON.

243. Edleston, R. S.  
484. Kershaw, John.

## CHESTER.

904. Walker, Alfred O.

## CREWE.

851. Thompson, William.

## LISCARD.

186. Cooke, Nicholas.

## MACCLESFIELD.

311. Goodall, D. G.  
566. Marsh, John.

## CORNWALL.

## LISKEARD.

369. Hare, N., jun.

## TRURO.

886. Tweedy, William, jun.

## CUMBERLAND.

## CARLISLE.

20. Armstrong, T.  
347. Groggins, James.  
414. Hodgkinson, J.  
416. Hodgkinson, Thomas.  
435. Hunter, James.

CUMBERLAND—*continued.*CARLISLE—*continued.*

516. Lattimer, J.  
560. Main, James.  
582. Melville, David.  
846. Thomlinson, John.  
945. Wilson, James.

## COCKERMOUTH.

373. Harris, J. W.

## KESWICK.

335. Greenip, Wm.

## WHITEHAVEN.

627. Nicholson, H. J.

## DERBYSHIRE.

## ASHBORNE.

530. Lighton, Rev. Sir C. R.,  
Bart.

## DERBY.

195. Cox, W.  
242. Eaton, James.  
261. Evans, Henry.  
332. Greene, Rev. J.  
406. Hill, Matthew.  
811. Statham, William.

## UTTOXETER.

801. Spilsbury, Rev. F. M.

## DEVONSHIRE.

## AXMINSTER.

252. Edwards, Rev. Z. J.

## BARNSTAPLE.

575. Mathews, G. F.  
897. Wadham, A.

## BIDEFORD.

94. Bostock, Rev. G. J.  
723. Roberts, L.

DEVONSHIRE—*continued.*

## COLLUMPTON.

764. Selwood, Rev. J. B.

## EXETER.

224. D'Orville, H.  
392. Hellins, Rev. J.  
629. Norcombe, E. S.  
646. Parfitt, Edward.

## PLYMOUTH.

70. Bishop, H. S.  
84. Bolitho, E.  
128. Bryant, F. C.  
271. Fey, G. T.  
298. Gatcomb, John.  
403. Hill, A. J.  
445. Isaac, J. C.  
526. Lethbridge, E.  
703. Randall, J.  
706. Reading, J. J.  
735. Rogers, C.  
744. Ryder, J. B.

## SIDMOUTH.

303. Gibbes, H.  
459. Johnson, E. R.  
460. Johnson, F. P.

## TEIGNMOUTH.

470. Jordan, C. J. R.

## TORQUAY.

49. Battersby, H. W.  
50. Battersby, R.  
491. King, George.  
558. Madden, W.  
586. Metcalfe, W.  
816. Stewart, R. M.

## DORSETSHIRE.

## BLANDFORD.

664. Pickard-Cambridge, O.

## DORCHESTER.

293. Garland, John.

DORSETSHIRE—*continued.*

## POOLE.

21. Atkins, T. W.  
52. Baylie, W. E.  
136. Burnand, W. W.  
164. Churchill, J.  
327. Green, Rev. G. C.  
873. Travers, F.

## SHERBORNE.

210. Dale, J. C.  
466. Jones, G. W.

## WAREHAM.

521. Leatham, James.

## WEYMOUTH.

653. Payne, Mrs.  
689. Pretor, A.

## DURHAM.

## BISHOP WEARMOUTH.

608. Morris, Beverley, R.

## DARLINGTON.

97. Bowman, Jesse.  
241. Eales, Christopher.  
257. Elliott, J.  
517. Law, Thomas.  
562. Malham, George.  
571. Martin, E. J., jun.  
640. Orde, Jonathan.  
644. Page, John.  
751. Sang, John.  
936. Wilkinson, E.

## DURHAM.

35. Banks, E.  
135. Bungey, T. J.  
144. Cairnes, W.  
648. Park, Mungo.  
694. Proctor, W., jun.  
955. Wood, John.

## GATESHEAD.

25. Backhouse, William.

DURHAM—*continued.*

## SEAHAM.

413. Hodge, George.

## ESSEX.

## CHELMSFORD.

273. Flatman, James.  
779. Skeels, S. C.

## COLCHESTER.

151. Carter, J.  
372. Harrington, H. P.  
381. Harwood, W. H.

## EPPING.

226. Doubleday, Henry.  
668. Piffard, B.

## GLOUCESTERSHIRE.

## BRISTOL.

45. Barton, Stephen.  
85. Bolt, Henry.  
86. Belt, John.  
101. Braikenridge, Rev. G. W.  
197. Cracknell, James.  
199. Crawford, J. B.  
215. Davis, Edwin, jun.  
360. Hale, W. W.  
364. Harding, G. jun.  
447. Jacques, F. V.  
621. Naish, Arthur.  
895. Vaughan, P. H.  
901. Walcott, W. H. L.  
922. Weston, William.

## NEWNHAM.

63. Bingham, S.  
150. Carefield, J. G.  
193. Cowmeadow, Jas. jun.

## CHELTENHAM.

14. Andrew, C. H.  
130. Brydges, C. E.  
166. Clark, John.  
181. Comyn, W. H.

## GLOUCESTERSHIRE—

*continued.*CHELTENHAM—*continued.*

205. Crump, T. L.  
 326. Gray, R.  
 479. Kemp, J. E.  
 510. Lambert, Henry.  
 568. Marshall, Rev. T. A.  
 684. Prentice, C.  
 784. Smith, Edwin.  
 877. Trye, R. E.  
 925. Wheeler, E.  
 965. Young, S. W.

## CIRENCESTER.

27. Baily, W. A.  
 967. Zachary, Henry, jun.

## GLOUCESTER.

354. Guise, W. V.  
 583. Merrin, Joseph.

## WOTTON-UNDER-EDGE.

659. Perkins, C. M.

## HAMPSHIRE.

## ALVERSTOKE.

1. Adams, Arthur.  
 2. Adams, Mrs. Arthur.

## BEMBRIDGE, ISLE OF WIGHT.

602. More, A. G.

## EMSWORTH.

131. Buckler, Wm.

## FRESHWATER, ISLE OF WIGHT.

737. Rogers, H.

## GOSPORT.

26. Baikie, W. B.  
 42. Barron, Charles.

## HORNDEN.

384. Hawker, Rev. W. H.

HAMPSHIRE—*continued.*

## NEW FOREST.

30. Baker, Richard.  
 69. Birt, Jacob.

## OSBORNE, ISLE OF WIGHT.

949. Winchester, C.

## PORTSMOUTH.

714. Richards, P. S.

## RYDE, ISLE OF WIGHT.

598. Moon, J. F.

## SELBORNE.

58. Bell, Thomas.

## SOUTHAMPTON.

43. Bartlett, Rev. J. P.  
 356. Gwatkin, R. L.  
 378. Harvey, A. S.  
 380. Harvey, Robert.  
 633. Oakley, A. C. jun.  
 671. Pinnock, J. D.

## VENTNOR, ISLE OF WIGHT.

355. Guyon, G.  
 477. Keet, John.

## WHIPPINGHAM, ISLE OF WIGHT.

693. Pristo, J.

## WINCHESTER.

143. Byrne, W. S.  
 274. Floud, T.  
 590. Midwinter, W. C.  
 920. Wesley, J. S.

## HEREFORDSHIRE.

## LEOMINSTER.

19. Arkwright, H.

## ROSS.

396. Hepburn, Archibald.  
 532. Lingwood, R. M.  
 698. Purchas, A. J.

## HERTFORDSHIRE.

## BARNET.

229. Downie, R.

## HITCHIN.

500. Knapp, J. H.

## ROYSTON.

371. Harradence, Richard.

## HUNTINGDONSHIRE.

## GODMANCHESTER.

433. Hunnybun, W. Martin.

670. Pinder, Rev. George.

## HOLME.

173. Clarke, William.

## ST. NEOTS.

518. Lawson, Rev. E.

719. Rix, Joseph.

## KENT.

## ASHFORD.

743. Russell, A.

## CANTERBURY.

194. Cox, Capt. C. J.

539. Lloyd, W. H.

## CHATHAM.

158. Chaney, W. C.

204. Crozier, Lieut. H. D.

515. Latchmore, F.

527. Lewcock, G.

887. Tyrer, John, jun.

957. Wood, F. W. jun.

## DARTFORD.

366. Hards, H. R.

## DOVER.

269. Fedarb, J.

## FARNBOROUGH.

543. Lubbock, John.

KENT—*continued.*

## FAVERSHAM.

821. Stowell, Rev. H. A.

## GRAVESEND.

370. Hargreaves, Wm.

## MAIDSTONE.

287. Fremlin, R. H.

950. Wingfield, L.

## TENTERDEN.

54. Beale, Rev. S. C. T.

## TUNBRIDGE.

770. Shepherd, R.

## RAMSGATE.

524. Lenny, C. G.

880. Turnbull, R. T.

## SEVENOAKS.

810. Stanhope, Hon. E.

## SITTINGBOURNE.

552. Mackie, W. L.

## LANCASHIRE.

## ACCRINGTON.

92. Boothman, W.

400. Heys, Abraham.

930. Wigglesworth, Robert.

## BLACKBURN.

182. Constantine, W. L.

391. Hearn, Rev. E. M.

## BOLTON.

113. Briars, William.

121. Brown, John.

214. Daniels, J.

260. Entwistle, Henry.

285. Fraser, Finley.

324. Gray, John.

421. Holt, James.

463. Johnson, W.



LANCASHIRE—*continued.*BOLTON—*continued.*

- 641. Owen, James.
- 666. Pickering, William.
- 677. Porter, Thos.
- 741. Rothwell, Richard.
- 813. Stephenson, Henry.
- 881. Turner, Edwin.
- 921. West, Thomas.

## BURY.

- 778. Simpkin, E.

## CHORLEY.

- 759. Scott, Henry.

## LIVERPOOL.

- 17. Archer, F. jun.
- 291. Galliers, Thomas.
- 321. Grainger, John.
- 339. Gregson, C. S.
- 377. Harrison, William.
- 462. Johnson, Serjeant.
- 580. Melly, C. P.

## LYTHAM.

- 340. Gregson, William.

## MANCHESTER.

- 5. Adamson, John.
- 76. Blakeley, John.
- 96. Boulaye, W. G. De la.
- 119. Brown, D. E.
- 145. Campbell, Charles.
- 152. Carter, Samuel.
- 161. Chappell, Joseph.
- 184. Cooke, Benjamin.
- 243. Edleston, R. S.
- 244. Edmondson, James.
- 245. Edmondson, Townley.
- 289. Friar, Charles.
- 359. Hague, Thomas.
- 368. Hardy, John.
- 376. Harrison, Thomas.
- 428. Howarth, Thomas.
- 478. Kelsall, Thomas.
- 480. Kenderdine, Frederic.

LANCASHIRE—*continued.*MANCHESTER—*continued.*

- 505. Labrey, B. B.
- 536. Linton, James.
- 636. O'Brien, C. F.
- 685. Prescott, W.
- 789. Smith, John.
- 867. Tinker, Jethro.
- 882. Turner, J. Aspinall.

## PRESTON.

- 318. Graham, Edmund.
- 415. Hodgkinson, J. B.
- 696. Pugh, Thomas R.
- 728. Robinson, H.
- 731. Robinson, W.
- 766. Sharples, Richard.
- 827. Swann, W.

## ST. HELENS.

- 762. Seddon, George.

## ULVERSTONE.

- 496. Kirby, James.
- 573. Mason, Anthony.

## WARRINGTON.

- 142. Buxton, E. C.
- 189. Cooper, James.
- 276. Forrest, B. G.
- 334. Greening, Noah.
- 481. Kendrick, B.
- 550. M'Keand, John H.
- 551. M'Keand, Robert.
- 964. Young, Reginald and Edward.

## WIGAN.

- 419. Holcroft, William.

## LEICESTERSHIRE.

## LEICESTER.

- 48. Bates, F.
- 567. Marshall, Thomas.
- 672. Plant, Francis.

## LEICESTERSHIRE—

*continued.*

## MARKET HARBOROUGH.

308. Goadby, Rev. J. J.

## MELTON MOWBRAY.

852. Frisby, Charles.

## LINCOLNSHIRE.

## BRIGG.

323. Grantham, Henry.

## GAINSBOROUGH.

277. Forington, Jabez.

840. Tearle, E.

## STAMFORD.

848. Thompson, Miss S.

## WRAGBY.

817. Stockdale, E.

## MIDDLESEX.

## HARROW.

902. Walker, E.

## SHEPPERTON.

520. Lea, J. W.

## MONMOUTHSHIRE.

## MONMOUTH.

504. Kuper, Rev. C.

513. Langley, W.

914. Watkins, W.

## PONTYPOOL.

75. Bladon, J.

## NORFOLK.

## BECCLES.

952. Winter, William.

NORFOLK—*continued.*

## HARLESTON.

281. Fox, W. L.

836. Taylor, F.

## LONG STRATTON.

454. Jerrard, F.

## LYNN.

490. King, E. L.

## NORWICH.

114. Brightwell, Thomas.

207. Cubitt, W. Q.

864. Tillett, W. H.

## SCOLE.

46. Barton, W. H.

742. Ruspini, F. O.

## WYMONDHAM.

553. M'Lachlan, J.

## NORTHAMPTONSHIRE.

## KETTERING.

824. Sturgess, W.

841. Tearle, Rev. F.

885. Tweed, E. B.

## NORTHAMPTON.

395. Hensman, Arthur.

791. Smith, J. W., jun.

## Oundle.

110. Bree, Rev. W.

924. Whall, Rev. W.

## WELLINGBOROUGH.

343. Griesbach, Rev. A. W.

## NORTHUMBERLAND.

## BELFORD.

763. Selby, J. P.

## NORTHUMBERLAND—

*continued.*

## NEWCASTLE-ON-TYNE.

83. Bold, T. J.  
660. Perkins, V. R.  
669. Pigg, Thomas.  
899. Wailes, George.

## NOTTINGHAMSHIRE.

## EDWINSTOWE.

733. Roe, W. J.  
878. Tudsbury, P., jun.

## ILKESTON.

290. Fuller, Rev. A.

## MANSFIELD.

103. Brameld, R. E.  
637. Oldham, F. H.  
712. Reynolds, R. S.

## NEWARK.

297. Gascoyne, G.  
358. Hadfield, W. P.  
437. Huskings, C. E.  
869. Tomlinson, J. H.

## NOTTINGHAM.

8. Allen, C. F.  
9. Allen, William.  
38. Barnes, S. B.  
133. Bull, E.  
170. Clarke, J. and H. B.  
239. Durand, J. L. E.  
280. Fox, J.  
286. Freason, G.  
531. Lineker, S.  
606. Morley, John.  
607. Morley, W.  
628. Nicolls, S.  
717. Riley, S. H.  
718. Riley, T.  
739. Rose, W. B.  
781. Slater, R.  
793. Smith, W. H.  
800. Spencer, W.  
804. Stafford, J.

## OXFORDSHIRE.

## BANBURY.

822. Stretch, R. H.

## CHARLBURY.

753. Saunder, W. J.

## DEDDINGTON.

595. Mitchell, C. B.

## HENLEY.

68. Birks, Rev. H.  
823. Stubbs, H. J.

## OXFORD.

171. Clarke, Mrs. L. L.  
574. Mathews, Murray A.  
594. Minchin, Rev. H. H.  
630. Norman, Rev. A. M.  
665. Pickard, Rev. H. Adair.  
923. Westwood, J. O.  
938. Wilkinson, Rev. W. G.

## TETSWORTH.

651. Partridge, A. W.

## SHROPSHIRE.

## MARKET DRAYTON.

426. Houghton, Rev. W.

## OSWESTRY.

724. Roberts, T. Vaughan.

## SHREWSBURY.

747. Salt, G. M.

## WORTHEN.

223. Done, John.

## SOMERSETSHIRE.

## BATH.

101. Braikenridge, Rev. G. W.  
198. Cranstone, Joseph.  
279. Fowler, W. N.  
453. Jenyns, Rev. L.  
599. Moor, J. H.  
916. Wattson, Martin.

## SOMERSETSHIRE—

*continued.*

## BRIDGEWATER.

39. Barnwell, J. C.  
750. Sanders, John.

## CASTLE CARY.

547. Macdonald, S. R.

## ILMINSTER.

104. Braund, E.  
472. Jordan, W. J.

## SOMERTON.

893. Valentine, W. H.

## TAUNTON.

549. M'Intosh, J.  
704. Rawlinson, W. G.

## WELLINGTON.

592. Miller, E., jun.

## WESTON-SUPER-MARE.

127. Bryant, A. C.  
201. Crotch, G. R.  
202. Crotch, W. D.

## STAFFORDSHIRE.

## BURTON-ON-TRENT.

120. Brown, Edwin.

## LEEK.

700. Putnam, George.

## LICHFIELD.

708. Reeve, G. W.

## RUGELEY.

88. Bonney, E. S.

## STOKE-UPON-TRENT.

294. Garner, Robert.

## WEDNESBURY.

749. Sampson, T. L.

## WEST BROMWICH.

236. Duncalfe, Henry.

## SUFFOLK.

## BOTESDALE.

218. Dawson, S. T.

## BUNGAY.

295. Garneys, C.  
296. Garneys, W.

## BURY ST. EDMONDS.

302. Gedge, J.  
349. Groom, Miss S.

## IPSWICH.

59. Berridge, E. W.  
108. Bree, Rev. H.  
541. Longe, J.

## NEEDHAM MARKET.

177. Clowes, G. A.

## SAXMUNDHAM.

959. Woods, S. E.

## STOWMARKET.

200. Crewe, Rev. H. H.

## WANGFORD.

457. Jodrell, Rev. H.

## SURREY.

## DORKING.

206. Cubitt, C.

## EPSOM.

80. Bockett, Rev. B. B.  
738. Rogers, T.

## FARNHAM.

528. Lewcock, Henry.

## GUILDFORD.

625. Newnham, Rev. P. H.

## LEATHERHEAD.

654. Payne, J. F.

SURREY—*continued.*

## REIGATE.

112. Brewer, J. A.  
533. Linnell, John, jun.  
534. Linnell, Thos.  
755. Saunders, W. W.  
915. Watney, Daniel.

## THAMES DITTON.

382. Hastings, Sidney.

## WALTON-ON-THAMES.

398. Hewitson, W. C.

## WEYBRIDGE.

658. Pennell, A. Francis.

## SUSSEX.

## BRIGHTON.

15. Andrews, Percy.  
174. Clayton, E. G.  
185. Cooke, Henry.  
235. Duke, F.  
253. Egles, E. H.  
254. Egles, G. M.  
288. Fry, Hubert.  
345. Griffith, J. R.  
346. Griffith, Thomas.  
348. Groom, C. O.  
427. House, Samuel.  
440. Image, Rev. J.  
498. Kirby, W. F.  
557. Madden, H. R.  
674. Pocock, Crawford J.  
683. Pratt, John and Henry.  
786. Smith, George.  
792. Smith, R.  
825. Style, Sidney.  
858. Thorncroft, Thomas.  
863. Tidy, Lewis.

## CHICHESTER.

232. Draper, W. H.

## EAST GRINSTEAD.

561. Major, W.  
576. May, W.  
1859.

SUSSEX—*continued.*

## HORSHAM.

313. Gore, Rev. H. J.

## LEWES.

77. Blaker, M. S.  
482. Kenware, J.  
676. Porter, J., jun.  
892. Unwin, W. C.

## MIDHURST.

780. Skeffington, H. C.

## NEWHAVEN.

709. Reeve, J. J.

## UCKFIELD.

386. Hay, A. J.

## WORTH.

251. Edwards, W.  
776. Silvester, E. T.

## WORTHING.

649. Parry, Captain F. J. S.

## WARWICKSHIRE.

## ALLESLEY.

109. Bree, Rev. W. T.

## ATHERSTONE.

494. King, Rev. P. M.

## BIRMINGHAM.

134. Bull, W.  
139. Burns, Henry.  
140. Burns, Robert.  
146. Campbell, Thomas.  
230. Drakeford, John.  
315. Gould, Henry.  
328. Green, John.  
344. Griffin, Isaac.  
417. Hodgson, C. B.  
471. Jordan, Dr.  
503. Knight, F., jun.  
564. Mansfield, Richard.

## WARWICKSHIRE—

*continued.*BIRMINGHAM—*continued.*

587. Meyer, Frederick.  
690. Price, Samuel.  
820. Stone, J. B.  
940. Willetts, Henry.

## LEAMINGTON.

259. Enoch, William.

## RUGBY.

180. Colvin, J. W.  
341. Grenfell, J. G.  
907. Walker, J. D.

## WARWICK.

438. Hyde, Fred. Osman.

## WESTMORELAND.

## APPLEBY.

56. Bedford, T.  
525. Leslie, David.  
616. Moses, Henry.  
720. Rix, J. L.

## KENDAL.

267. Fawcett, J. K.

## WILTSHIRE.

## AMESBURY.

155. Caswall, R. C.  
701. Pyle, G.

## CORSHAM.

418. Hogan, Rev. A. R.  
501. Knapp, William.  
618. Mullens, E. H.

## DEVIZES.

734. Rogers, B.

## MARLBOROUGH.

89. Bonney, F.  
688. Preston, Rev. T. A.

WILTSHIRE—*continued.*

## TROWBRIDGE.

572. Martin, W.

## WORCESTERSHIRE.

## EVESHAM.

389. Head, John D.

## WORCESTER.

424. Horton, Rev. E.  
783. Smith, Edward.  
790. Smith, John.  
847. Thompson, C.  
849. Thompson, T.  
942. Willis, T. W. B.

## YORKSHIRE.

## BOSTON SPA.

655. Pearson, Edward.  
765. Sergeant, Lewis.

## BRADFORD.

577. Meade, R. H.

## DEWSBURY.

903. Walker, M.

## DONCASTER.

167. Clark, S.  
385. Hawley, A.  
710. Reid, Hugh.

## GOOLE.

57. Bell, R. J.

## GUISBOROUGH.

451. Jeffrey, W.

## HALIFAX.

154. Cash, William.  
203. Crowther, James.  
420. Hollenrake, J.  
826. Sutcliffe, Joseph.  
910. Ward, Christopher.

## HUDDERSFIELD.

441. Inchbald, Peter.  
444. Ingle, T. W. B.

YORKSHIRE—*continued.*HUDDERSFIELD—*continued.*

461. Johnson, Rev. J.  
632. North, James.  
866. Tindall, George.  
894. Varley, J.

## HULL.

812. Stather, T.  
850. Thompson, Thomas.  
962. Young, James.

## KEIGHLEY.

322. Grant, Rev. J. B.

## KNARESBOROUGH.

909. Walton, John.

## LEEDS.

36. Barker, William.  
60. Berry, John.  
102. Braim, John.  
105. Bray, Edwin.  
118. Brooke, Jonathan.  
132. Buckton, Frederick.  
196. Coxon, John.  
208. Cundell, Robert.  
220. Denny, Henry.  
431. Hudson, George.  
538. Liversidge, William.  
613. Morris, W. Whytehead.  
634. Oates, F.  
635. Oates, W.  
656. Pearson, John.  
725. Roberts, Williams.  
788. Smith, H. S.  
837. Taylor, James.  
839. Taylor, W. H.  
931. Wignall, J. U.  
932. Wignall, Samuel.

## MIDDLESBOROUGH-ON-TEES.

760. Scott, John.

## POCKLINGTON.

352. Gruggen, A. W.

YORKSHIRE—*continued.*

## RIPON.

11. Almond, F.  
122. Brown, J.  
172. Clarke, Thomas.  
570. Marston, G.  
578. Meldrum, T.  
884. Tutin, J. Hazledine.

## ROTHERHAM.

455. Jessop, John, jun.  
732. Rodgers, William.  
777. Simmons, William.  
844. Thomas, William.

## SCARBOROUGH.

71. Bissill, W. K.  
183. Cook, Robert.  
614. Morton, Edward.  
937. Wilkiuson, T.

## SELBY.

412. Hobson, Richard.  
488. Killingbeck, James.

## SHEFFIELD.

51. Batty, James.  
100. Bradley, Francis.  
270. Fenton, John.  
330. Green, W.  
402. Hicks, W.  
439. Hydes, W.  
519. Laycock, William.  
752. Sanson, Ezra.

## THORNE.

331. Greene, George.

## WAKEFIELD.

317. Grace, Thomas.  
545. Lumb, G.  
722. Roberts, Charles.  
830. Talbot, W.  
891. Ulyatt, W.  
947. Wilson, Junius.

## WATH.

- 589 Middleton, Rev. C. H.

YORKSHIRE—*continued.*

## YARM.

588. Meynell, Thomas.

## YORK.

10. Allis, T. H.

13. Anderson, Robert.

68. Birks, John.

191. Cooper, Walter.

387. Hayden, Rev. F. W.

393. Helstrip, Charles.

399. Hey, Rev. William.

409. Hind, Robert.

600. Moore, B. J.

609. Morris, Rev. F. O.

610. Morris, Marmaduke  
C. F.

611. Morris, Reginald F.

686. Prest, William.

687. Preston, Rev. J. D. J.

705. Read, Rev. G. Rudston.

729. Robinson, J.

## NORTH WALES.

## CARNARVON.

794. Smith, W. P.

## LLANRWST.

74. Blackwall, J.

## MACHYNLLETH.

6. Alington, A. M.

## PONTYPRIDD.

458. John, Evan.

## SOUTH WALES.

## ABERGAVENNY.

31. Baker, William.

## BRECON.

124. Browne, Rev. C.

## BUILTH.

467. Jones, J.

SOUTH WALES—*continued.*

## CARDIFF.

231. Drane, Robert.

639. Ollevant, J.

## LLANDOVERY.

250. Edwards, T. W.

## MERTHYR TYDVIL.

650. Parry, Thomas.

## WELSHPOOL.

465. Jones, Capt. J. M.

## SCOTLAND.

## ABERDEEN.

72. Black, John.

157. Chalmers, J. H.

163. Christie, G. G.

450. Jazdowski, Bronislas.

597. Moir, David.

946. Wilson, John.

## AYRTON.

486. Kidd, R. C.

## BANFF.

247. Edward, Thomas.

336. Gregor, Walter.

## BRECHIN.

663. Philip, Robert.

## CASTLE DOUGLAS.

425. Hosach, W. J. R.

## COCKBURNSPATH.

367. Hardy, James.

## DUMFRIES.

305. Gibson, W. G.

342. Grierson, T. B.

857. Thorburn, W. S.



SCOTLAND—*continued.*

## DUNBAR.

434. Hunter, Miss.  
622. Nelson, C.

## EDINBURGH.

107. Bree, C. R.  
422. Hood, Robert.  
540. Logan, R. F.  
542. Lowe, W. F.  
619. Murray, A.  
872. Traquair, R. H.  
943. Wilson, Andrew.

## ELGIN.

312. Gordon, Rev. Geo.

## FALKIRK.

216. Dawson, John.  
411. Hislop, Robert.  
456. Jobson, Henry.  
593. Millingen, Charles.

## GLASGOW.

159. Chapman, Algernon.  
160. Chapman, Thomas.  
179. Colquhoun, Hugh.  
797. Somerville, Alexander.  
798. Somerville, James, E.

## HAMILTON.

511. Lang, W.

## HAWICK.

620. Murray, J. A. H.

## HUNTLEY.

111. Bremner, Dr. Jas., jun.

## KELSO.

508. Lamb, Rev. William.

## KIRKPATRICK JUXTA.

537. Little, Rev. W.

## KIRKWALL.

446. Iverach, J. G.

SCOTLAND—*continued.*

## KIRRIEMUIR.

854. Thomson, W. Burns.

## LERWICK, SHETLAND.

555. Maclaurin, Rev. Rob.

## MARKINCH, FIFE.

900. Waite, Josiah.

## MONKTON.

237. Duncan, John P.

## NORTH BERWICK.

556. Macmorland, John P.

## PAISLEY.

963. Young, Morris.

## PERTH.

507. Lamb, James.  
559. Mailer, Daniel.  
604. Morison, David P.  
876. Trotter, James.  
927. White, F. B. W.

## PETERHEAD.

702. Ramsay, J.  
966. Yuill, Rev. James.

## STONEHAVEN.

853. Thomson, R.

## IRELAND.

## BALLYMONEY.

61. Bewley, Rev. F.

## BELFAST.

115. Bristow, John.  
856. Thomson, Professor W.

## CAVAN.

363. Halpin, Charles.

IRELAND—*continued.*

## DUBLIN.

44. Barton, Lieut. Robert.  
 65. Birchall, Edwin.  
 66. Birchall, E. H.  
 361. Haliday, A. H.  
 489. Kinahan, J. R.  
 727. Robinson, G. W.  
 829. Tagart, W. Robert.  
 960. Wright, Dr. E. Percival.

## FOYNES.

713. Rice, Edward.

IRELAND—*continued.*

## NAVAN.

868. Tisdall, W. G.

## PARSONSTOWN.

292. Galloway, A.

## TINAHELY.

116. Bristow, Rev. John.

## WESTPORT.

748. Salt, Samuel.

## NEUROPTERA.

## SYNOPSIS OF THE BRITISH PHRYGANIDÆ.

BY DR. HAGEN.

[The first portion only of this Paper is now given, owing to its length and the pressure of other matter.]

## INTRODUCTION.

ENGLAND is the cradle of our present knowledge of the *Phryganidæ*. More than a century and a half ago Willoughby gave (*Raii Hist. Ins.*) a review of the cases of the various species, which shows an accurate acquaintance with the subject. Nearly fifty years ago we find in Dr. Leach's excellent article ENTOMOLOGY (Brewster's *Encycl.* vol. ix. 1815), the first useful classification of the *Phryganidæ*. At p. 136 we read:—"We must refer to a work which Dr. Leach is about to publish, entitled, 'Trichoptera Systematica.'" Unfortunately this work has never appeared. However, the genera established by Leach, from their truth to nature, essentially constitute the foundation of every subsequent work, and at the same time prove how earnestly he had occupied himself with this subject. There can be no doubt that even now the publication of his manuscript investigations upon the *Phryganidæ* (in case they be still in existence) would be of great value to science.

Thus the classification of Stephens rests almost throughout upon the previous works of Leach, and this is sufficiently indicated from the fact that the genera in Stephens' "Illustrations" are for the most part very good, whilst the description attached to the genus often contains very striking errors, as in the number of spurs and joints of the palpi. This circumstance, coupled with the insufficient descriptions, has rendered the determination of his species impossible; their number is very considerable (187), but may be reduced more than a third when the double references to species are deducted. Two years before the appearance of the "Illustrations," Curtis had given the characters of a number of new species in the "Philosophical Magazine" for 1834; these also cannot be determined with certainty from the descriptions, whilst, on the contrary, the species in the "British Entomology" of the same author, the number of which is unfortunately small, are represented in his well known masterly manner. A few species, given by Donovan and others, are hardly to be determined with certainty.

The section of Westwood's "Introduction" relating to the *Phryganidæ* constitutes, as is always the case in this classical work, a rich mine of information. The deficiency referred to, in the descriptive part of the works of Stephens and Curtis, and in Walker's "Catalogue," is the less blameable in those naturalists, as every work upon the *Phryganidæ*, not excluding Pictet's Monograph, are in the same case. This deficiency, therefore, is evidently due to the difficulty of the subject itself, and to the fact that these naturalists have confined themselves entirely to characters of coloration. Rambur and Brauer (*Neuropt. Austr.*) have, therefore, rightly struck into a new course, and employed structural characters in the identification of the species. Unfortunately

the *appendices anales*, which are here of especial importance, cannot be clearly explained without figures, or long detailed descriptions; and I have, consequently, for the most part, left them unnoticed in the "Synopsis," although they have always been carefully examined by me, and indeed the reduction of Stephens's species depends upon their examination.

With regard to the determination of the *Phryganidæ* I have to offer the following hints:—

I. In the first place the palpi, and especially the maxillary palpi, are to be carefully examined, and the number of their joints determined. If there be less than five (always in males) the insect belongs to the HETEROPALPI. It is certainly an unfortunate circumstance that the females of these always bear five joints, but by taking into consideration the other characters, and by the help of a little practice, there will rarely be any doubt. The *Hydropsychidæ*, which are otherwise so difficult to separate, are readily distinguished from all others by the abnormal form of the last joint of the palpi. This is very long, and composed of numerous small joints closely pressed together; this is not to be confounded with the forms in which there is a flexibility [of the last joint] without any division into joints (*e. g.* *Leptocerus*). The relative proportions of the joints of the palpi form very important and easily seized generic characters, especially in the ISOPALPI.

II. Next to the palpi the antennæ must be compared. Their characters are usually distinctly perceptible, and consist in the length and thickness of the antennæ, and in the proportions of the basal joint. At the same time it must not

be forgotten that, in some cases (*Sericostomidæ*, *Leptoceridæ*), the antennæ differ in the sexes.

III. A third important character in the determination of genera consists in the presence or absence of ocelli; however, in species strongly clothed with hair this investigation is not always very easy. When they are present there are always *three* ocelli, by which the *Phryganidæ* are distinguished from the *Lepidoptera*, in which the ocelli are *two* or none.

IV. The fourth character for the distinction of genera, and which, from its intelligibility, is almost the most important, is presented by the spurs of the legs. These differ from the spines, of which several rows are usually present, by their size, and nearly always by their different colour: it is but rarely that they are so small as to leave one in doubt (*Dasysotoma*). The spurs are situated on the tibiæ; there are at the utmost four on each tibia, namely, two at the apex and two more in the middle; the anterior tibiæ never exhibit more than three spurs, two at the apex and one in the middle. Their number is always expressed by figures,—for example, 3, 4, 4, indicates anterior tibiæ with three, intermediate tibiæ with four, and posterior tibiæ with four spurs. The greatest number present is 3, 4, 4,—the smallest 0, 2, 2. In *Hydroptila*, *Chimarra* and some exotic forms, the number differs in the two sexes. On the other hand in some forms (*Hydropsychidæ*, *Agapetus*, &c.) the tibiæ themselves are considerably dilated in the females; the form of the tarsal joints (*Chimarra*) and of the claws of the anterior feet (*Rhyacophilidæ*, &c.) is also sometimes sexually different.

V. In the fifth place the wings furnish important generic

and specific characters. The various combinations of the veins are easily intelligible, if we first investigate the simplest and most regular form of the venation (*Hydropsyche*), and from this derive the other forms. Close to the anterior margin of the wings runs a strong longitudinal vein, the *radius*; a finer longitudinal vein, the *subcosta*, running between the radius and the anterior margin, is of no value in classification. Close to the base two longitudinal veins spring from the radius, the *Ramus discoidalis* and *Ramus thyriifer*, which sustain almost the whole of the anterior wing, and in the posterior wings the anterior portion as far as the folded hinder space. These two branches, almost alone, are of importance in classification; the other veins consist of the *cubitus* with its branches. The *Ramus discoidalis* and *R. thyriifer* soon divide, and the anterior branch of the *R. thyriifer* (the *R. thyriifer* strictly so called, whilst the hinder branch is called the *R. clavalis* by Kolenati) divides again. We thus obtain five longitudinal veins,—two belonging to the *Ramus discoidalis* and three to the *R. thyriifer*. These five longitudinal veins (or a part of them) terminate with a forked cell at the margin of the wing. If, then, transverse veins unite these five cells, the latter with the four intervening spaces constitute nine apical cells. The uniting transverse veins form a straight or broken line, the *anastomosis*. According as the transverse veins unite all the cells, or only some of them, the anastomosis is *complete* or *incomplete*. If a transverse vein unites the two branches of the *R. discoidalis*, an elongated cell, the *discoidal cell*, is thereby produced. The anterior branch of the *R. thyriifer*, a little before its furcation, exhibits a pale perforated spot, the *thyridium*. If we compare the other forms of the venation with this simple representation, they may be easily reduced, es-

pecially the complicated forms of the HETEROPALPI. The variations consist partly in the more or less complete anastomosis, and partly in the presence or absence of the cells of furcation at the ends of the five branches. On the whole the venation furnishes especially generic characters; only the five first apical cells (the four others are called *sub-apicales* by Kolenati) sometimes furnish specific characters in the HETEROPALPI. Not unfrequently the venation presents sexual differences; thus with Stephens the sections B. and C. of *Leptocerus* contain only the different sexes of the same species. The venation is, however, very constant in different individuals of the same species, and only subject to unimportant variations.

VI. The structure of the apex of the abdomen presents, in the sixth place, extremely important specific characters. Its investigation is not yet sufficiently advanced to enable it to be employed throughout in a Synopsis. The genera, or, at all events, the groups, always exhibit a definite type, the details of which are modified in very various ways in the different species. The observation of these parts require some practice and a considerable magnifying power.

In the males there are always a pair of superior and a pair of inferior *appendices*; between the latter lies the penis, which is accompanied above and below by a pair of sheaths; the upper sheaths in the HETEROPALPI probably form the *appendices intermediae*; in the *Leptoceridae* and others the so-called cover of the penis. The form of all these parts is very various,—so that, whilst in one group the *appendices superiores* furnish the specific characters, although the other parts always exhibit a great similarity of structure, in others these characters are derived from the *app. inferiores*, the



sheaths of the penis, or the penis itself. Besides these appendages, the upper and lower margins of the last abdominal segment, and sometimes peculiar appendages on the ventral surface of the penultimate and antepenultimate segments, are also of value as characters.

In the females the apex of the abdomen either forms a telescopic tube or a spine-like ovipositor, or it is obtusely truncated, with the orifice of the oviduct over the penultimate segment. Sometimes, in the females, the same parts may be detected as in the males, especially *app. superiores*, *inferiores* and *intermediæ*; in most cases, however, the parts are too much changed to allow any analogy. In general the specific distinctions of the females are here less distinctly marked.

VII. Lastly, in the seventh place, the coloration of the animals presents specific characters, in the application of which, however, great care must be employed. The coloration and marking of the insects consists principally in the covering of hair, which is very easily rubbed off, and besides the colours fade by long keeping. Moreover, the coloration and marking vary within rather wide limits, and animals newly excluded are pale and nearly colourless, and very old insects are often completely rubbed. The coloration of parts destitute of the hairy covering are also not perfectly stable.

I find the most profitable mode of capturing the insects to consist in beating into the umbrella [or beating-net], especially amongst firs and willows on the margins of woods, even at a considerable distance from water. A convenient place for taking them is also presented by walls or palings by the water side, especially in the forenoon. Some genera (*Leptoceridæ*) swarm in great quantities over the water, and

are then to be taken with the net. If a bright lamp be placed upon a table covered with a white cloth at no great distance from water, species are often taken easily, which may be sought for in vain by day. In order that the insects may not rub themselves by fluttering, they must be killed rapidly; tobacco smoke blown two or three times into the half-opened boxes, which are then quickly closed, soon kills or stupifies even large species. Very small species (*Hydroptila*) are best pinned at home. For the sake of the *appendices anales* it is necessary to set all the species with the wings expanded, but, when possible, also to place by the side of them some unexpanded specimens, as the latter are very different in their appearance, and some writers describe expanded and others unexpanded specimens.

The knowledge of the earlier stages and their cases is still in a very backward state. As a general rule rearing them is not very difficult, if the following rules be observed. Full grown larvæ or pupæ, which have been captured in the open waters, usually die very easily in captivity. But if some glasses with aquatic plants (*Ranunculus aquaticus*, *Stratiotes aloides*, &c.) be kept ready, and the eggs laid by captured females (which is a frequent occurrence) be placed in them, full grown larvæ at any rate may easily be obtained. Gravel, fragments of stone or roots, may be put in to be selected from for the cases; the presence of some Mollusca (*Limnæus*, &c.) is also of use; but there must not be too many of these, as they greedily devour small larvæ of *Phryganidæ*.

So far as we can judge at present Great Britain is very rich in *Phryganidæ*, and the number of species is considerably greater than is here stated. The abundance of water, and the varied nature of the soil, permit us to expect the

presence of nearly all the species of central Europe, and, for Scotland, the Alpine species of Switzerland and Scandinavia. It is very probable that even the remarkable genus *Enoicyla*, with apterous females and the larvæ living out of the water, will occur in Britain. I cannot resist here calling attention to a notice by Doubleday (Ent. Mag. Vol. V. p. 279), which has hitherto been overlooked. The indication of *ISOPALPI* with apterous females in North America renders it not improbable that similar species will occur in Europe.

The materials made use of by me are the following:—The collection of the British Museum, and the Stephensian types preserved there, have been studied by me as carefully as possible. The knowledge of the species is rendered difficult by the circumstance that Stephens ticketed his collection, not in accordance with the “Illustrations,” but with the “Catalogue,” and in some instances has inserted what are evidently different animals. Some species are altogether wanting, or could not be ascertained. The collection of Mr. Curtis I was only able to look through once, notwithstanding the obliging kindness of its celebrated owner. It contains much that is beautiful and deserving of further examination; the species also are well separated. Mr. Newman’s collection furnished me with interesting details and unique specimens (*Apatania*), as did also a small number of species collected by Mr. Walker, which I received through Mr. Stainton. I have obtained some extremely important results from a number of types sent by Pictet to Curtis, and furnished by the latter with his names. I am indebted for the permission to study these carefully (the final conclusion of the investigation, which is completed as far as the *Hydropsychidæ*, has been delayed by circumstances beyond my control), to

the honourable confidence of Dr. Gray, and the self-sacrificing kindness of Mr. Adam White.

I have always preferred giving only those species about which I was certain, and leaving the rest to the amplification and observation of native Entomologists. There is no doubt that they will yet find a rich treasure here. It will also easily be observed that my work is rather unequal. This is owing simply to the circumstance, that for particular genera I had better previous works to start from. With regard to the synonyma I have the following observation to make:—Curtis's work appeared in February and March, Pictet's in July, 1834. Stephens (Illustrations, l. c. p. 147) is of opinion that Pictet's names, as belonging to a comprehensive monograph, deserve the preference. As, however, the majority of the British Entomologists may not share in this opinion, I have placed Curtis's names first. However, the number of names thus brought into collision is but small. With regard to the other synonyma, I have limited myself to the most necessary ones; those adduced almost rest upon the examination of typical specimens. It is a great disadvantage that the above-mentioned types of Pictet's are not compared with those of Stephens, as I could only obtain the former on the very day before my return home. This is the more important, as a number of nearly allied and hitherto confounded species were only rendered distinct to me by these types.

The *Phryganidæ* undoubtedly form the most difficult portion of my work upon the British *Neuroptera*. This work is indebted for its production to British kindness and hospitality. May it be found not unworthy of both! In judging of it, it should not be left out of consideration that the vast impression which London produced upon the mind

and feelings of the investigator perhaps made him stumble in some details. My wishes are fulfilled if, by the following essay, British naturalists should feel themselves impelled to take up and follow the course so brilliantly opened by Leach.

N.B.—The measurements given are average measurements, as the animals sometimes vary considerably in size.

### PHRYGANIDÆ, Latreille, 1803.

*Trichoptera*, Kirby, 1813; Stephens, Curtis, Westwood.

Wings 4, arranged like a roof; the longitudinal veins united by but few transverse veins; prothorax very short; antennæ with numerous joints, long and thin; oral organs rudimentary, only the palpi developed; maxillary palpi five-jointed, or less; labial palpi three-jointed; legs long and thin; tibiæ furnished with movable spurs; tarsi five-jointed.

#### Division I. HETEROPALPI, Kolenati.

Maxillary palpi of the females with five, of the males with *fewer* joints.

#### Sub-Family 1. PHRYGANIDES.

Maxillary palpi of the males *four-jointed*; ocelli *present*; 2, 4, 4 *spurs*; antennæ as long as the wings.

#### Genus PHRYGANEA, Linné, Stephens.

Wings *hairy*, the anterior with an elliptical apex; palpi short, broad, sparingly and shortly hairy; tibiæ *spinose*.

Coloration a monotonous grey, spotted with brown or black; this genus includes the largest indigenous species.

The larval case consists of quadrangular fragments of leaves, 1859.

disposed in a spiral turned towards the left. They live in stagnant or slowly flowing deep water.

† The posterior branch of the *ramus thyriifer* of the anterior wings simple in the male, furcate in the female.

1. PHRYGANEA GRANDIS, L. ; Steph. Ill. 205, 1 ; Curtis, B. E. 592, 1 ; Walk. Cat. 4, 1 ; Hagen, Linnæa, V. 366 ; *P. atomaria*, Steph. Ill. 206, 3, ♂.

Antennæ clay-coloured, annulated with brown ; thorax and abdomen brownish yellow ; legs testaceous, apices of the tarsal joints and the anterior thighs brown ; anterior wings ashy grey, mingled with brown, with two white dots, and in the female *with a broad, bidentate, black, longitudinal band* ; posterior wings grey, *bordered with black along the veins at the apex and hinder margin*. App. anal. sup. ♂ cylindrical, long, with the thickened tips *bent inwards and downwards* (Brauer, Neur. Austr. fig. 37 ; Curtis's B. E., 592, A).

Hab., May to July, Albury in Surrey, Ripley, Hertford, New Forest, Devonshire ; local, sometimes very abundant.

Length, with closed wings, 10 lin. ; exp. 20 lin.

2. P. STRIATA, L. ; Hagen, Linnæa, v. 366 ; *P. grandis*, De Geer, Scopoli ; *P. fulvipes*, Burm. ; *P. Beckwithii*, Steph. Ill. 206, 2 ; Curtis, B. E. 592, 2.

Antennæ brown, annulated with black ; thorax and abdomen dark piceous ; legs brown, the base of the tarsal joints and the posterior legs testaceous ; anterior wings ashy-grey, but little mingled with brown, with two white dots, and in the female *with a short, interrupted, black, longitudinal line* ; posterior wings

*grey*. App. anal. sup. ♂ cylindrical, long; the thickened apices *bent outwards and upwards* (Brauer, N. A. fig. 38).

Hab. England, coll. Steph. (mixed with *P. grandis*); coll. Curtis; coll. Linné (but not the type specimen); coll. Banks.

Length 9 lin.; exp. 18 lin.

3. *P. VARIA*, F.; Steph. Ill. 206, 4; Curtis, B. E. 592; Walk. Cat. 5, 3.

Antennæ testaceous, annulated with black; thorax piceous, above with grey and black hairs; abdomen testaceous; legs testaceous, tibiæ and tarsi of the anterior and intermediate legs strongly annulated with black; anterior wings grey, spotted with brown, with two white dots; posterior wings grey, the margin with a blackish border. App. sup. ♂ *short, foliaceous, horizontal, bordered with long yellow hairs (black beneath)*, the apex beneath black; App. inf. long, cylindrical, curved upwards, with a short tooth before the apex (Brauer, N. A. fig. 36).

Length 7 lin.; exp. 14 lin.

Hab. in June, not rare near London, Norfolk, Cambridge, South Wales, Devonshire, Darenth, Botisham, Cumberland, Parley, Uggmere, and the Trossachs in Scotland.

- †† The posterior branch of the *ramus thyriifer* of the anterior wings simple in both sexes. Sub-genus *Trichostegia*, Kolenati.

4. *P. MINOR*, Curtis, B. E. 592; Steph. Ill. 207, 5; Walk. Cat. 5, 1; *P. mixta*, Burm.; *P. tortriceana*, Ramb.

Antennæ testaceous, annulated with brown, with their base blackish ; thorax and abdomen testaceous ; legs testaceous, the ends of the tibiæ and the tarsi of the anterior and intermediate legs annulated with black ; anterior wings brown, spotted with grey ; *two larger obsolete grey spots on the anterior margin, and three interrupted grey transverse lines on the hinder margin* ; border white, spotted with black ; posterior wings grey, with a darker margin. App. sup. ♂ small, coalescent, bordered with yellow ; App. inf. large, hook-shaped, bent inwards and upwards, thicker at the base.

Length 4 lin. ; exp.  $8\frac{1}{2}$  lin.

Hab., in July, Epping Forest, Parley Heath, South Lambeth, New Forest, Scotland.

#### GENUS NEURONIA, Leach, Stephens.

Wings *not covered with hair*, the anterior with the apices elliptical ; palpi short, broad, scarcely hairy ; legs almost spineless ; *the discoidal cell of the anterior wings is remarkably short and narrow, nearly elliptical*.

Colour of the body black ; legs usually pale, with black tarsi ; wings unicolorous, dusky, with strongly marked veins.

The case of the larvæ is composed of quadrangular fragments of leaves arranged in a spiral *turned towards the right*. They live in stagnant water.

5. NEURONIA RUFICRUS, Scop. ; Walk. Cat. 11, 13 ; *N. fusca*, Steph. Ill. 234, 1 ; *P. striata*, Burm. ; *O. analis*, Kolen.

Shining black ; *wings uniform blackish brown, translucent, with the veins darker and very distinct* ; legs



brownish, with the thighs of the anterior and intermediate legs paler at the knees; posterior tibiæ yellow, with the base brown; tarsi black; posterior tibiæ almost without spines. App. sup. ♂ small, coalescent with a pyramidical process arising from the margin of the last segment; App. inf. oval, foliaceous; at the apex with a long, thin, movable spine, articulated backwards.

Length 7 lin.; exp. 12 lin.

Hab. near London, in the summer, rather rare.

The nearly allied species of *Holostomis*, *H. reticulata*, *clathrata* (in the British Museum without habitat, from Children's collection) and *phalænoides* (indicated by Turton as British) will probably occur in England: even *H. atrata* (*Altaica*, Fischer) might be met with in the north of Scotland. These species are usually local, and often do not appear for a long time. *H. phalænoides* was only re-discovered in Sweden fifty years after Linné's death.

*Holostomis reticulata*, L.: Walk. Cat. 7, 1. Black; wings yellow, the anterior checkered with black, the posterior bordered with black, *with a black curved line in the middle*; legs black; *posterior tibiæ yellow*. Length 5 lin.; exp. 11 lin. Hab. Sweden, Germany, France.

*H. clathrata*, Kolen.; Walk. Cat. 7, 2. Very like the preceding; *posterior wings with diffused black spots from the base to the curved line, and all the tibiæ yellow*. Length 5 lin.; exp. 11 lin. Hab. Sweden, Germany.

*H. phalænoides*, L. ; Walk. Cat. 6, 2. Black ; posterior tibiæ and tarsi yellow ; wings milk-white ; the anterior with numerous dark steel-blue round spots ; the posterior *with a broad border on the outer margin*, and some spots on the anterior margin of the same colour. Length 10 lin. ; exp. 20 lin. Hab. Sweden, Prussia, and, according to Turton, England.

*H. atrata*, Lepechin ; *Altaica*, Fischer ; Walk. Cat. 6, 1. Very like the preceding, but the spots of the anterior wings are less round, and connected together, forming broken bands, *and the border of the posterior wings is indistinct*, essentially only the apices of the veins being bordered with black ; tibiæ yellow. Length 9 lin. ; exp. 17 lin. Hab. Sweden, Russia.

#### Genus AGRYPNIA, Curtis.

Wings *not clothed with hair* ; the anterior narrow, *very obliquely truncated at the extremity* ; palpi short, broad, not hairy ; *legs without spines* ; discoidal cell of the anterior wings *long, narrow, triangular*.

Colour pale, scarcely spotted.

The case of the larvæ consists of fragments of root-fibres of equal length, arranged close together in a spiral *turned to the right*. They live in standing waters.

6. AGRYPNIA PAGETANA, Curt. B. E. 540 ; Steph. Ill. 229, 1 ; Walk. Cat. 11, 1 ; *P. ægrota*, Burm. ; *O. strigosa*, Ramb.

Dull straw-yellow, *the longitudinal veins of the anterior wings brownish towards the margin*, and the membrane between them sometimes rather dark ; abdomen

above greyish brown. App. inf. ♂ bent upwards like a hook, *with a long thin tooth* articulated to the thickened base.

Length  $5\frac{1}{2}$  lin. ; exp. 10 lin.

Hab. near Yarmouth.

The type from which Curtis's description was drawn up appears to have been accidentally pressed flat ; besides this (which is now in the British Museum) I have seen two other specimens in Curtis's collection. In repose the wings lie flatter and in a less tectiform position than in the other genera.

*A. picta*, Kolen. ; Walk. Cat. 12, 2 ; like the preceding in form, greyish brown, with the legs testaceous ; the anterior wings very pale grey, with darker brownish dashes. Length  $5\frac{1}{2}$  lin. ; exp. 10 lin. Hab. Sweden, Germany.

A third species, very similar in colouring to *A. Pagetana*, is found in Iceland.

#### Sub-family 2. LIMNOPHILIDES.

Maxillary palpi of the males *three-jointed* ; ocelli *present* ; spurs variable in number (1, 3, 4 ; 1, 3, 3 ; 1, 2, 4 ; 1, 2, 2), *the anterior leg never with more than one spur* ; antennæ as long as the wings.

#### Genus LIMNOPHILUS, Leach.

Joints of the palpi cylindrical and thin ; wings sparingly clothed with hairs, the anterior narrow, *obliquely truncated at the apex* ; spurs, 1, 3, 4 ; tibiæ spinose.

Case of the larvæ composed of vegetable fragments disposed, like the tiles of a roof, of small shells, sand or small

stones, and even sometimes of the cases of smaller *Phryganidæ* (which are then arranged in the same way as the vegetable fragments). They live in standing or slowly running water.

Sub-genus GLYPHOTÆLIUS, Stephens.

Apical margin of the anterior wings with a rounded emargination. Case formed of imbricated fragments of grass or wood.

7. LIMNOPHILUS PELLUCIDUS, Oliv.; Steph. Ill. 210, 1; Walk. Cat. 18, 2; *L. basalis*, Curtis; *L. emarginatus*, Curt. Phil. Mag. 122, 1 and 2.

Brownish; antennæ, palpi and legs paler; anterior wings yellowish-grey, spotted with brown; a narrow, rhombic fenestrated spot in the centre of the wing; a larger round spot about the anastomosis (which, however, may be entirely wanting, or broken up into a number of small dots); both spots vary much in form and size, and, when they unite, may form a large crescent (*L. basalis*, Curt.); the emarginate apex is bordered with white, with dark spots; on the anterior margin is a blackish pterostigma; posterior wings limpid, *with a brown apex, in which a paler spot not unfrequently occurs*. This species varies considerably; sometimes the anterior wings are almost uniformly pale brown.

Length 7 lin.; exp. 12 lin.

Hab. not rare in the summer around London, New Forest, Devonshire, Norfolk, Suffolk, Dover, Scotland, &c.

*L. binervosus*, Villers; *P. punctato-lineata*, De Geer;

*G. umbraculum*, Kolen.; Walk. Cat. 17, 1; *G. lævis*, Walk. Cat. 18, 3.

Anterior wings clay-coloured; *a fine black line* at the apex of the wing; *two black lines spotted with yellow* along the hinder margin, and an indistinct fenestrated spot in the middle of the wings; posterior wings pale grey, with their apex clay-coloured; body brownish; legs testaceous. This species is also sometimes spotted with brown like the preceding.

Length 10 lin.; exp. 18 lin. Hab. Sweden; Germany. There is a specimen without locality in the British Museum from Children's Collection. This is the largest of the European *Limnophilidæ*.

#### Subgenus COLPOTAULIUS, Kolenati.

The outer margin of the posterior wings is strongly emarginate. Case?

8. *L. INCISUS*, Curt. Phil. Mag. 124, 17; Steph. Ill. 228, 48; Walk. Cat. 23, 16; *L. vulsella*, Walk. Cat. 23, 17; *L. striolata*, Ramb.; *C. excisus*, Kolen.

Head and thorax reddish-yellow, clothed with darker hairs; abdomen greyish-brown; antennæ and legs testaceous; anterior wings narrow, *with a lanceolate apex*, clothed with fine hairs, straw-yellow; *the veins strong and with blackish punctures* (these points are formed essentially only by the black hairs which stand upon the veins at regular distances, but this is only distinct when strongly magnified); posterior wings limpid, slightly yellowish at the apex.

Length  $3\frac{1}{2}$  lin.; exp. 6 lin.

## Subgenus GRAMMOTAULIUS, Kolenati.

Anterior wings pointed; posterior wings with a black longitudinal streak in the apex.

9. *L. NITIDUS*, Müll.; *L. lineola*, Schrank,; Walk. Cat. 19, 4; *L. gracilis*, Burm.

Entirely straw-yellow: prothorax with golden yellow hairs; posterior wings hyaline, with a black longitudinal streak in the apex as far as the anastomosis; the anterior wings *acutely pointed*. App. sup. ♂ foliaceous, oblong, *with the apex slightly notched* (Brauer, N. A. fig. 93).

Sometimes the anterior wings are sprinkled with small brownish spots, especially on the hinder margin.

Length 8 lin.; exp. 14 lin.

Hab. England. Both in Stephens and Curtis's Collections this species is not separated from the following one; by Curtis it is indicated as *L. striola*, Leach.

10. *L. ATOMARIUS*, F.; *L. lineola*, Steph. 213, 2; *L. strigosa*, Curt. Phil. Mag. 122, 3; *L. lineola et atomarius*, Walk. Cat. 19, 4 and 5.

Testaceous; abdomen above greyish-brown; anterior wings *obtusely* pointed, brownish-yellow, thickly sprinkled with small brown spots; the anterior margin, a spot which is often indistinct in the middle, and sometimes the anastomosis, remain unspotted; posterior wings hyaline, with a black longitudinal streak in the apex as far as the anastomosis. App. sup. ♂ foliaceous, oblong, *emarginate nearly to the base* (Brauer, N. A. fig. 95).

The coloration of the anterior wings varies considerably ; either the spots disappear in part or entirely (the wings are then of a uniform dingy brownish-yellow), or the spots coalesce more and more (when the wings are dark brown, sprinkled with pale round spots).

Length 7 lin. ; exp. 13 lin.

Hab. from May to September on marshes near London, in Devonshire, New Forest, and near Carlisle ; in Scotland in July.

#### Subgenus CHÆTOTAULIUS, Kolenati.

Anterior wings narrow, dilated towards the obtusely truncated apex ; a rhombic fenestrated spot in the middle ; posterior wings in the ♂ with a black beard on the first *sector apicalis* ; colour of the anterior wings yellow, with brown spots.

11. *L. VITRATUS*, De Geer ; *P. lunaris*, Pict. ; *L. nebulosus*, Curt. Phil. Mag. 123 ; Steph. Ill. 215, 10 ; *L. apicalis*, Curt. Phil. Mag. 123 ; *L. lunatus*, Curt. Phil. Mag. 123 ; Steph. Ill. 216, 11.

Testaceous ; anterior wings yellow, their hinder half brown ; an oblique but *not interrupted band* in the middle of the wing, a round spot about the anastomosis, and a *semilunar spot on the truncated margin*, white and transparent ; all three stand half in the anterior, yellow, and half in the posterior, brown half of the wing ; *pterostigma pale brown* ; posterior wings hyaline, their apex yellow ; in the ♂ the posterior margin of the last segment of the abdomen is *produced into a lobe* and bent inwards (Brauer, N. A. fig. 86).

Length 5 lin. ; exp. 9 lin.

Hab. Very frequent on marshes round London, in Wales, the North of England, and Scotland.

*L. subcentralis*, Hagen ; Brauer. Extremely similar to the preceding in size, form and coloration, but in the anterior wings the oblique white band is *broken into steps*, and usually united with the round spot about the anastomosis (which here possesses a brown pupil). App. anal. different (Brauer, N. A. fig. 90). Hab. Germany.

The cases of the larvæ of both (?) species consist of vegetable fragments, which are fixed upon them in a longitudinal position.

12. *L. RHOMBICUS*, L. ; Steph. Ill. 214, 6 ; Walk. Cat. 24, 13 ; Pict. ; Burm. ; Kolen., &c.

Ochreous ; the anterior wings greyish yellow, in the middle with a broad, oval, fenestrated spot placed obliquely, *and on each side a triangular, dark brown dash* ; a roundish pale yellow spot, externally bordered with brown about the anastomosis ; the posterior and *outer margin of the wing darker* ; a *pterostigma* is not marked ; posterior wings hyaline, with a yellow apex. The coloration of the wings varies (as also in the preceding species) according as the brown colour is more or less developed. App. anal., Brauer, N. A. figs. 91, 92.

Length 7 lin. ; exp. 15 lin.

Hab. England and Scotland, in the middle of summer.

The case is formed of vegetable fragments, which are arranged transversely around it and closely pressed together,



so that it is sometimes nearly oval; for the pupa the orifices of the case are closed by a very regularly-formed lattice work.

A new English species, like *L. rhombicus*, but still larger, is contained in the British Museum. Another English species (*L. pavidus*, Hagen) in the same collection resembles *L. rhombicus* in form and size, but the app. anal. are different, and similar to those of the species of *Anabolia*.

13. *L. MARMORATUS*, Curt. Phil. Mag. 123; Steph. Ill. 214, 7; *L. discoidalis*, Curt. Phil. Mag. 122; Steph. Ill. 214, 5; *L. binotatus*, Curt. Phil. Mag. 122; Steph. Ill. 215, 8; *L. vitratus*, Walk. Cat. 20, 7; *L. vitrea*, Ramb.; *P. concentrica*, Zett.

Ochreous; the anterior wings greyish-yellow, with a rhombic fenestrated spot in the middle, and about the anastomosis a rather larger, irregular, roundish spot; *the veins of the anastomosis blackish-brown*; the posterior half of the wing brown; around the spots the colour is darker, and surrounds the apex of the wing as far as the *blackish brown pterostigma*; *small white points are more or less abundantly scattered in the brown colour*; posterior wings hyaline, with a yellow apex.

Length  $5\frac{1}{2}$  lin.; exp. 12 lin.

Hab. about London, in Devonshire, &c., in July and August.

14. *L. FLAVICORNIS*, F.; Steph. Ill. 213, 3; Pict. &c.; *L. dorsalis*, Steph. Ill. 213, 4.

Testaceous; abdomen greyish-green; anterior wings pale yellowish-grey, with *numerous scattered small*

*brown spots*, especially on the apical portion and along the posterior margin; a rhombic fenestrated spot in the centre and a round spot about the anastomosis are only marked in reality by the neighbouring spots; venation testaceous, the anastomosis brown; *pterostigma not indicated*; posterior wings hyaline. App. anal., Brauer, N. A. figs. 88, 89.

This species varies considerably according to the strength and abundance of the spots.

Length 6 lin.; exp. 12 lin.

Hab. not rare in summer, in England and Scotland.

In Curtis's collection this species stands as *L. griseus*.

Case cylindrical, usually set regularly round with small shells, but sometimes also constructed of fragments of plants or wood.

*Ch. nobilis*, Kolen., is extremely similar to the preceding species in form, size and coloration; it is distinguished by a distinct blackish-brown pterostigma, and by the longitudinal veins being regularly punctured with brown. Hab. France, Switzerland. Curtis has also ticketed it as *L. griseus*.

15. *L. STIGMA*, Curt. Phil. Mag. 123; Steph. Ill. 216, 12; *L. fulva*, Ramb.

Testaceous; superior wings reddish-ochreous, closely sprinkled *with small red spots* like freckles; these are wanting in the marginal field, in the middle of the wing and around the anastomosis; pterostigma piceous; posterior wings yellowish, with the apex darker; the margin of the last segment in the ♂ produced into a *tongue-shaped process*, with the apex rolled up.

The only specimen before me (Rambur's type, which I have compared with Stephens's types) has no pterostigma. This and the somewhat longer and narrower wings form almost the sole differences between *L. stigma*, Steph., and *L. impura*, Ramb. (*stigmaticus*, Kolen.) The latter species, which is very abundant on the Continent, and variable in colour, was not noticed by me in the English collections. It now appears to me that a further examination must prove whether the two species should not be reduced to one.

Length 6 lin. ; exp.  $11\frac{1}{2}$  lin.

Hab. near London and in the New Forest, in June.

16. *L. AFFINIS*, Steph. Cat. 3700.

Reddish-yellow ; abdomen greyish-brown ; anterior wings of a fine brownish-yellow, with a strong *pitchy-brown pterostigma* ; along the truncated margin of the apex of the wing is a narrow *whitish crescent, internally margined with brown* ; sometimes, especially in the females, faint, reddish, freckle-like spots occur in the posterior half and in the apical portion, where there also appears a rhombic, narrow spot in the middle and a round spot about the arculus ; both these, however, are always indistinct, and but little paler than the ground colour of the wing.

Length 6 lin. ; exp. 11 lin.

Hab. England.

In the British Museum this species is marked as above. Subsequently, in the "Illustrations," p. 215, Stephens has erroneously united it with *L. vitratus (nebulosus)*.

17. *L. ELEGANS*, Curt. Phil. Mag. 123 ; B. E. 488 ; Steph. Ill. 215, 9 ; Walk. Cat. 22, 14.

Yellowish-brown ; palpi and antennæ reddish ; head and thorax brownish ; abdomen ochreous ; anterior wings shining, pale yellowish-brown, *with three long, white, straight longitudinal streaks*, the intermediate one somewhat the shortest, in the discoidal field ; the base of the apical cells white ; in the third and sixth (first sub-apical cell) only one white dot.

Length 6 lin. ; exp. 11 lin.

Hab. New Forest, in June.

Of this strikingly marked species (the figure given by Curtis is very successful), I am only acquainted with females. Whether the posterior wings of the male are furnished with a beard I do not know ; at any rate *L. elegans* differs remarkably from the other species, and perhaps forms a distinct group with the nearly allied *L. designatus*, Walk., from Arctic America.

#### Sub-genus GONIOTAULIUS, Kolenati (partim).

Very similar to the preceding in form and marking ; *the posterior wings of the male destitute of beard* ; colour of the anterior wings whitish-grey, spotted with brown or black ; the rhombic fenestrated spot is smaller, often indistinct ; *the marking and coloration of the anterior wings differs very considerably in the same species*, according as the darker spots coalesce more or less, or even entirely.

Case of the larva cylindrical, straight, with the ends rounded off (pupa), constructed of small stones arranged regularly in mosaic.

18. *L. GRISEUS*, L. ; F. ; Pict. ; *L. fenestralis*, Curt. Phil. Mag. 123 ; Steph. Ill. 218, 17 ; *L. marginalis*, Steph. Ill. 218, 16 ; *L. bipunctatus*, Steph. Ill. 218,

18; *L. obliquus*, Steph. Ill. 219, 20; *L. luniger*, Steph. Ill. 219, 21; *L. variegata*, Ramb.

Reddish-grey; antennæ brown, with paler rings; mesothorax paler in the middle, with the sides blackish; abdomen blackish, with a yellowish longitudinal band below and on the sides; legs testaceous; anterior wings very narrow, whitish-grey, spotted with black and brown, in such a manner that, especially toward the posterior margin and the apex, numerous brown and white spots alternate; the fenestrated spot is milk white; around the anastomosis there is an irregular pale spot, which runs to the anterior margin and there encloses the pterostigma; *venation brown and distinct*. The described coloration is the ordinary form of the female; if the dark spots coalesce entirely, the anterior wings become uniformly black; only the base of the marginal field, the fenestrated spot, and the spot about the anastomosis, remaining white. The males have the anterior wings for the most part uniformly brownish-grey, with a few scattered, small, darker points on the posterior margin and at the apex; the fenestrated spot is narrower, and often indistinct; the spot around the anastomosis is only marked externally or not at all; the pterostigma is smaller, brownish. Between the colourings above described there are innumerable intermediate steps. Posterior wings pale grey, with the apex rather darker. App. sup. ♂ spoon-shaped, yellow; *the margin of the last segment cut off straight, smooth, grey* (vid. Brauer, N. A. fig. 76, 77).

Length 5 lin.; exp. 10 lin.

Hab. England, near London, New Forest, Cambridge, 1859.

Devonshire, Scotland (probably generally distributed); not uncommon from June to August.

19. *L. BIPUNCTATUS*, Curt. Phil. Mag. 123; *L. griseus*, Steph. Ill. 217, 13; *L. obscura*, Ramb.

Rusty grey; antennæ rusty, with paler wings; thorax and abdomen like *L. griseus*; anterior wings rusty, spotted with brown; the fenestrated spot, a stripe about the anastomosis, and a spot within and close to the piceous pterostigma, are yellow; *the brown venation (as well as the membrane) is covered with numerous small paler spots*; a tolerably dense and distinct hairy coat covers the wings. The disposition of the colouring and marking of the wings is the same as in *L. griseus*, and varies in the same way. Posterior wings smoky grey, with a yellowish-brown apex. App. sup. ♂ triangular, bent together inwards, yellow; *the margin of the last segment is bi-emarginate, with a short, thick, black brush* (vid. Brauer, N. A. fig. 78, 79).

Length 6 lin.; exp. 11 lin.

Hab. London, New Forest and Scotland; in July, not very abundant.

20. *L. AURICULA*, Curt. Phil. Mag. 124; Steph. Ill. 220, 22; *L. obscurus*, Curt. Phil. Mag. 124; Steph. Ill. 220, 24; *L. geminus*, Steph. Ill. 220, 23; *L. signatus*, Steph. Ill. 219, 19; *P. nigridorsa*, Pict; *L. guttata*, Ramb.; *G. fenestratus*, Kolen.

Brown; head, antennæ and abdomen above darker; anterior wings dark ochreous, with the pterostigma pale pitchy brown; *the fenestrated spot is formed by two roundish spots lying obliquely one over the other*;

a third, of the same size, is situated upon the thyridium; externally, close to the anastomosis, in the bases of the apical cells, there are six pale spots, two of which are close together in the third apical cell; veins slightly clothed with dark hairs; posterior wings smoky grey, with the apex brownish. *App. sup.* ♂ *finger-like, bent upwards*; between them the posterior margin of the last segment is produced into a roundish process (Brauer, N. A. fig. 81 [♀]). This species also varies considerably; in the males the pale spots of the anterior wings are usually entirely wanting; the females are sometimes very similar in colouring and marking to the males of *L. griseus*, and Stephens has mixed the two species in *L. signatus*.

Length  $3\frac{1}{2}$  lin.; exp. 6 lin.

Hab. London, Carlisle, Devonshire, New Forest, Suffolk, Hertford, Ripley, Scotland (probably everywhere); not rare from June to August.

21. *L. COSTALIS*, Steph. Ill. 217, 14; *L. affinis*, Curt. Phil. Mag. 123; Steph. Ill. 217, 15; *G. anastomosis*, Kolen.

Yellowish grey; body brownish, the antennæ with paler rings; anterior wings ochreous, somewhat brownish, clothed with light yellow hairs; pterostigma pitchy brown; *a brown longitudinal dash, sprinkled with paler points, reaches from the base towards the anastomosis*, but is usually (like the narrow, oblique fenestrated spot) only distinct when the wings are closed; the veins of the anastomosis brown, *the longitudinal veins spotted with brown and yellow*,

along the posterior margin the brown spots stand closer together; posterior wings smoky-grey, with an indistinct yellowish-brown pterostigma. App. sup. ♂ *triangular*, yellow; margin of the last segment straightly truncated. The coloration of the anterior wings varies according to the abundance of the spots.

Length 5 lin.; exp. 9 lin.

Hab. London, Whittlesea Mere, New Forest, Kent, Suffolk, and Scotland in June and July; not common.

Subgenus GONITAULIUS, Kolenati (partim).

Very similar to the preceding in form; *anterior wings without a fenestrated spot*; in the males the beard of the posterior wings is wanting; coloration of the anterior wings yellow, with the posterior half sprinkled with brown.

Case horn-shaped, slightly curved, very regularly constructed of fine grains of sand.

† Fifth apical cell of the anterior wing acute, not reaching the anastomosis.

22. *L. VITTATUS*, F.; Kolen.; Pict.; Ramb.; Steph. Ill. 225, 39; *L. elegans*, Pict.; Ramb.; *L. ochraceus*, Steph. Ill. 223, 34; *L. consobrinus*, Steph. Ill. 224, 35; *L. substrigosus*, Steph. Ill. 224, 37; *L. bipartitus*, Steph. Ill. 225, 38; *L. nigrivittatus*, Steph. Ill. 225, 40.

Ochreous; antennæ with paler rings; head and thorax reddish above; abdomen above brownish-grey; anterior wings brownish-yellow; *from the apex nearly to the base runs a nearly straight, sharply defined brown streak*; the portion of the wing situated behind



this is more or less covered with brown punctures; posterior wings hyaline, with an indistinct yellow pterostigma.

The markings of the anterior wings vary very considerably, according as the brown streak is more or less sharply and broadly marked, interrupted, or even completely broken up into a series of small dots. The coloration of the portion of the wing behind the streak is also very variable; usually there is a triangular brown dash on the apical margin, and the posterior margin is spotless; but the former may also be replaced by numerous points, or disappear entirely. The pterostigma of the anterior wings is brownish, or entirely wanting.

Varieties in which the brown line of the anterior wings is entirely deficient, or partially replaced by points, form the following species:—*G. flavus*, Kolen.; *L. consobrinus*, Curt. Phil. Mag. 124; *L. terminalis*, Curt. Phil. Mag. 124; *L. notatus*, Steph. Ill. 224, 36; *L. præustus*, Steph. Ill. 226, 41; and *L. flavus*, Steph. Ill. 226, 42.

This species may, however, always be easily distinguished from all others by the *acute fifth apical cell not reaching the anastomosis*.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

Hab. London, New Forest, Hertford, Coombe Wood, Dover; not uncommon from June to December.

†† Fifth apical cell of the anterior wing truncated, as long as the others, reaching the anastomosis.

23. *L. CENTRALIS*, Curt. Phil. Mag. 124; Steph. Ill. 227, 43 (♀); *L. punctatus*, Steph. Ill. 227, 44 (♂); *L.*

*elongatus*, Steph. Ill. 227, 45 (♀); *L. fuliginosus*, Steph. Ill. 227, 46 (♂); *L. ustulatus*, Steph. Ill. 228, 47 (var.); *P. flava*, Pict.; *L. nebulosa*, Ramb. Ochreous; antennæ, head and thorax somewhat reddish; the anterior wings have a brown dash from the apex to the anastomosis, and another along the whole posterior margin, the two being sometimes connected at the anastomosis, *but still so that the apical margin of the wing remains free*; pterostigma wanting; posterior wings hyaline, with the anterior margin yellow. App. sup. ♂ *small, triangular*, not projecting beyond the extremity of the abdomen, closely applied upon the App. infer.

On the whole, in form and coloring, this species is very similar to *L. vittatus*, and especially to its variety *L. flavus*, in the colouring of the anterior wings. *L. centralis* is, however, easily distinguished by the *form and length of the fifth apical cell*, and by its more dense clothing of yellow hair upon the anterior wings; in *L. vittatus*, also, *the brown dash on the apical margin is always below, and in L. centralis always above, the brown line.*

Varieties in which the brown dashes break up into numerous larger or smaller, and sometimes much darker spots, which may then also occupy the entire apical margin, are described as *L. nebulosa*, Ramb.; and *L. ustulata*, Steph.

Length  $4\frac{1}{2}$  lin.; exp. 8 lin.

Hab. London; not rare in June and July.

24. *L. FLAVESCENS*, Steph. Ill. 223, 33; *L. ignavus*, Hagen.

Ochreous; antennæ reddish-yellow, with paler rings; abdomen brownish-grey; head and thorax chestnut brown; *anterior wings yellowish-brown*, with a thin covering of hair, usually darker along the apical and hinder margins; pterostigma not marked, or light ash colour; a small spot upon the thyridium and a similar one opposite to it on the hinder margin, white and translucent; posterior wings hyaline, light grey, with the apex brownish. App. sup. ♂ *large, spoon-shaped*, projecting beyond the extremity of the abdomen.

Sometimes the brown coloration of the apical and posterior margins of the wing breaks up into scattered brown points.

Length 5 lin.; exp. 9 lin.

Hab. London and Ripley, in June: not common.

#### Subgenus DESMOTAULIUS, Kolenati.

The species belonging here are very nearly allied to the preceding, and are distinguished essentially only by the *more parabolic* form of the apex of the anterior wings, and by a *longer and denser clothing of hair* upon them, especially on the veins near the posterior margin. Coloration of the anterior wings brown, spotted with yellow, or the reverse.

Case as in *Goniotaulius*.

25. *L. HIRSUTUS*, Pict.; *L. irroratus*, Steph. Ill. 223, 32.

Brownish red; antennæ annulated with yellow; abdomen beneath and legs testaceous; anterior wings *yellowish-grey, closely sprinkled with small brown points*; posterior margin and a streak before it darker; posterior wings hyaline, greyish, with the

apex scarcely darker; the margin of the last segment in the male *deeply emarginate, with a black brush, and on each side with a cylindrical process*, which appertains to the hinder margin and not to the App. anales. The coloration and marking of the anterior wings is remarkably constant in this species.

Length  $5\frac{1}{2}$  lin.; exp. 10 lin.

Hab. London, in June; rare.

26. *L. SPARSUS*, Curt. Phil. Mag. 123; Steph. Ill. 223, 31; *L. tenebricus*, Curt. Phil. Mag. 123; Steph. Ill. 222, 29; *L. vinculum*, Curt. Phil. Mag. 124; Steph. Ill. 222, 28; *L. fuscus*, Steph. Ill. 221, 25; *L. punctatissimus*, Steph. 221, 27; *L. fuscatus*, Steph. 222, 30; Ramb.; *D. Megerlei*, Kolen.

Chestnut brown; antennæ annulated with yellow; abdomen greyish brown; legs dark testaceous, the intermediate tibiæ annulated with black; anterior wings *chestnut brown, closely sprinkled with small light yellow dots*; on the hinder margin and within close to the brown pterostigma there is a large yellow spot; along the hinder margin two darker streaks; posterior wings hyaline, grey, *with the apex dark brown*; the margin of the last segment in the male produced into a *roundish lobe, with a black brush at the apex*.

The coloration of the anterior wings is remarkably variable, according as the yellow dots are more or less numerous and close together; sometimes they are entirely wanting, with the exception of the spot on the hinder margin and near the pterostigma; the wings are then almost of a uniform dark brown, and essentially

alter the appearance of the insect; on the other hand they are sometimes so numerous that the ground colour of the wing appears to be light yellow; the pterostigma also is sometimes wanting.

Length 5 lin.; exp. 9 lin.

Hab. London, Hertford, New Forest, Devonshire, North of England, Battersea, Coombe Wood, Ripley, Dorset, Wiltshire and Suffolk; common in June and July.

27. *L. FUMIGATUS*, Germar; Kolen.; *L. fuscicornis*, Ramb.

Dark brown; thorax clothed with rather long hairs; antennæ rusty red; lower surface rather paler; legs testaceous; *anterior wings uniform smoky brown*, with the hinder margin darker; thyridium whitish; posterior wings grey, hyaline, with the apex yellowish grey; the margin of the last segment in the male rounded.

Length  $6\frac{1}{2}$  lin.; exp.  $12\frac{1}{2}$  lin.

Hab. England; British Museum.

Genus ANABOLIA, Stephens.

*Stathmophorus*, Kolenati.

Joints of the palpi cylindrical, thin; wings *naked, shining*, the anterior with the apex *parabolic*; spurs 1, 3, 4; tibiæ spinose.

Case constructed of small stones, cylindrical, with the head end a little widened; one or two small twigs or fragments of straw are attached longitudinally to the case as balances, to lighten it in swimming and keep it in equilibrium.

As already remarked by Stephens, this genus, which is well marked in its habit, is difficult to distinguish from

*Limnophilus*. To the characters above given may be added (Brauer, N. A.) that the fourth apical cell of the posterior wings is as broad as the second; in *Limnophilus* it is narrower.

The coloration is uniform brown.

28. ANABOLIA NERVOSA, Steph. Ill. 230, 1; *A. lurida*, Steph. 230, 2; *P. fusca*, Pict.; Ramb.

Brown; head reddish yellow; legs testaceous; anterior wings yellowish brown, the marginal vein surrounded by a darker tint; thyridium whitish; posterior wings hyaline, with the apex yellowish grey. App. sup. ♂ *broad triangular, with the apex curved inwards*.

Length  $5\frac{1}{2}$  lin.; exp. 10 lin.

Hab. London, Hertford, Dover, Ramsgate, New Forest, Scotland; common in August and September.

29. A. DESTITUTA, Kolen.; *A. nigricornis*, Steph. Ill. 232, 6.

Testaceous; antennæ piceous; head and thorax reddish brown; anterior wings ochreous, with the thyridium and a spot on the inner margin white; posterior wings hyaline. App. anal. ♂ *spoon-shaped, long, pointed*.

Length 4 lin.; exp.  $6\frac{1}{2}$  lin.

Hab. London in June; not common.

30. A. DUBIA, Steph. Ill. 232, 7.

“Reddish-ochreous; antennæ annulated with brown; anterior wings very pubescent, slightly granulated, ochreous-brown, with a few paler dots; posterior wings hyaline, with the apex distinctly ochreous; legs pale ochreous.”

Length  $5\frac{1}{2}$  lin. ; exp. 12 lin. (Stephens).

Hab. London, in June ; not common.

I have not this species before me. When I examined the type I declared it to be a new *Anabolia*, not described elsewhere, and which had not previously occurred to me. The description is greatly in favour of *A. dubia* being the *Phacopteryx granulata*, Kolen. ; yet I believe that in comparing the types I found differences between them. The species requires further investigation. I have noted that in Curtis's collection the *Phac. granulata*, Kolen., is ticketed as *L. brevipennis* ; it consequently occurs in England.

#### Genus STENOPHYLAX, Kolenati.

*Hallesus*, Stephens (partim).

Joints of the palpi cylindrical, thin ; first joint of the antennæ shorter than the head ; wings pretty thickly clothed with short hairs, the anterior much widened towards the apex and obtusely rounded off ; spurs 1, 3, 4 ; tibiæ with short spines.

Case rather irregularly constructed of small stony fragments, cylindrical, with the head-end rather wider and surrounded by larger stones.

This genus also is very nearly related to *Limnophilus*, and has been re-united therewith by Brauer. Its habit is peculiar, and differs in the broad obtusely rounded anterior wings.

The species belonging here are excessively similar in form and coloration, and are often confounded together. By the app. anal. I now distinguish sixteen European species. When I examined the types of Stephens and Curtis, a portion of these species, especially those described by Pictet, were still

unknown to me. My determination of the English species will therefore require further confirmation to render it perfectly certain.

31. STENOPHYLAX VIBEX, Curt. Phil. Mag. 125; *H. hieroglyphicus*, Steph. Ill. 210, 5; *S. striatus*, Kolen.; Ramb.

Reddish-ochreous; mesothorax above pitchy brown on each side; anterior wings ochreous, closely sprinkled with reddish freckles, with the exception of the anterior and posterior margins; *anterior branch of the ramus thyriifer blackish, as far as the fifth apical cell.* App. anal. ♂ *triangular, large, internally hollowed out like a spoon, with the acute apex curved inwards*; margin of the last segment *straightly truncated* (vide Brauer, N. A. fig. 58, 59).

Length  $7\frac{1}{2}$  lin.; exp. 13 lin.

Hab. London, Ripley, Albury, in August and September.

This species is perfectly certain for England. Perhaps it would be advisable to adopt Stephens's name, as Curtis has ticketed the following species as "*Vibex*, Curt.," in Pictet's types, and his description in the Phil. Mag. is insufficient. In Curtis's collection the above species stands as *H. Vibex*.

32. S. STRIATUS, Pict.; *H. tenebrosus*, Curt. Coll.; *H. Vibex*, Steph. Ill. 209, 3.

Extremely similar to the preceding species in colour and form. App. anal. ♂ *very different, small, spoon-shaped, rounded off*; *the hinder margin of the last segment hangs down in the form of a long broad lobe, with a dense black brush, between the app. anal. sup.*



Length 6 lin. ; exp.  $11\frac{1}{2}$  lin.

Hab. London, Devonshire, Norfolk, New Forest, in autumn. Requires further confirmation for England.

33. *S. LATERALIS*, Steph. Ill. 210, 6; *H. latipennis*, Steph. Ill. 209, 4; *P. pilosa*, Pict.

In coloration and form extremely similar to the preceding, but the freckles are larger and also distributed upon the posterior margin; the anterior branch of the ramus thyriifer not darker than the other veins. App. anal. ♂ *small, spoon-shaped, rounded; the hinder margin of the last segment straightly truncated, with a black brush in the middle.*

Length 6 lin. ; exp.  $11\frac{1}{2}$  lin.

Hab. London, Hertford, Ripley, New Forest, Devonshire, in August and September. Requires further confirmation for England.

34. *S. TESTACEUS*, Pict. ; *H. cingulatus*, Steph. Ill. 209, 2.

Form of the preceding species; colour ochreous; anterior and posterior margins of the anterior wings as dark as the rest; the anterior wings appear of one colour, small spots making their appearance only under a strong magnifying power. App. anal. ♂ *curved like a post-horn, produced above into a sharp point, like a reversed funnel.*

Length  $5\frac{1}{2}$  lin. ; exp. 10 lin.

Hab. Devonshire, in July.

Requires further confirmation. When I examined Stephens's type, Pictet's *Phr. testacea* was still unknown to me; according to my notes, *H. cingulatus* was a *Stenophylax* new to me; with app. anal. like those described. I do not

see in Pictet's species the black colouring of the abdominal segments described by Stephens.

35. *S. PANTHERINUS*, Pict.; *H. latipennis*, Curt. Phil. Mag. 125.

Brown; lower surface and legs testaceous; first joint of the antennæ yellowish-brown; thorax blackish-brown; anterior wings mouse-grey, with yellow longitudinal lines; their apex *parabolic*. App. anal. infer. ♂ *thick, obtuse, running straight upwards and inwards, rounded off at the apex, and clavate* (see Brauer, N. A. fig. 56, 57).

Length 8 lin.; exp. 15 lin.

Hab. England, Coll. Curtis. Requires further confirmation.

36. *S. STELLATUS*, Curt. Phil. Mag. 125; Steph. Ill. 210, 7; *Ph. nigricornis*, Pict.; *S. arcatus*, Kolen., Brauer.

Brown; lower surface and legs testaceous; first joint of the antennæ yellowish-brown; thorax yellowish-brown in the middle, with grey hoariness; anterior wings striped with dull greyish-brown and pale grey, their apex *nearly circular*. App. anal. infer. ♂ *produced into a long, fine point* (vide Brauer, N. A. fig. 52, 53).

Length  $7\frac{1}{2}$  lin.; exp. 14 lin.

Hab. London, Devonshire, Dorsetshire, Isle of Wight; rare.

Genus HALLESUS, Stephens.

*Anabolia*, Stephens (partim).

Joints of the palpi cylindrical, thin; first joint of the an-

tennæ shorter than the head; wings *nearly naked, thinly clothed with very short hairs, the anterior very much dilated towards the apex* and obtusely rounded; spurs 1, 3, 3; tibiæ with few and short spines.

Case constructed of fragments of leaves, cut into a round form by the larva and laid upon each other like tiles, rather irregular; the larvæ live in shallow, rapidly running water.

37. HALLESUS DIGITATUS, Schrk.; Pict.; Steph. Ill. 208, 1; *L. radiatus*, Curt. Phil. Mag. 125; *L. hieroglyphicus*, Curt. Phil. Mag. 125.

Yellowish-brown; thorax darker on each side above; anterior wings *yellowish-grey; all the veins with darker borders; grey, jagged longitudinal streaks in the cells*; posterior wings hyaline, grey, yellowish at the apex (vide Brauer, N. A. fig. 47).

Length 8 lin.; exp. 15 lin.

Hab. Hertford, Ripley, Devonshire, Carlisle, Scotland, Suffolk, New Forest. Very common in autumn.

38. H. FLAVIPENNIS, Steph. Ill. 231, 5.

Ochreous; antennæ yellowish-brown; vertex yellowish-red; anterior wings yellowish-grey, slightly clothed with yellow hairs; *posterior margin of the last segment (♂) straightly truncated, with a black brush, above which is an oval swelling, with a black brush in front.* App. anal. sup. ♂ small, roundish, yellow.

Length  $4\frac{1}{2}$  lin.; exp.  $7\frac{1}{2}$  lin.

Hab. Devonshire, in June; rare.

When I examined Stephens's types I was unable to find in the app. anal. ♂ and ♀ of *A. testacea*, Ill. 231, 3, and

*A. annulata*, ♀, Ill. 231, 4, any difference from *H. flavipennis*; only both are rather larger. I have since become acquainted with two nearly related species, *H. flavipennis*, Pict., and *H. flavipennis*, Kolen., Brauer; consequently this statement with regard to *A. testacea* and *A. annulata* will require further confirmation.

#### Genus CHÆTOPTERYX, Stephens.

Joints of the palpi thin, cylindrical; first joint of the antennæ shorter than the head; anterior wings short, broad, obtusely rounded; *in the separate cells there stand several rows of raised dots; upon each dot and upon the veins there stand single long hairs*; from both these circumstances the wings acquire a peculiar granular appearance; spurs 1, 3, 3; titiæ with few and short spines.

Case cylindrical, with fragments of plants fastened lengthwise round it. The larvæ live in quickly running water.

#### 39. CHÆTOPTERYX VILLOSA, F.; Steph. Ill. 233, 1; Pict.; Kolen.

Reddish yellow; antennæ darker; abdomen and legs testaceous; wings brownish-yellow, covered with long brown hairs; *in the apical cells more than two (3—4) rows of dots*; posterior margin of the last segment in the male straightly truncated. App. anal. sup. large, hollowed out like a boat (vide Brauer, N. A. fig. 42).

Length 6 lin.; exp. 11 lin.

Hab. London, Hertford; not rare in July and August.

#### 40. C. TUBERCULOSA, Pict.; *C. brevipennis*, Steph. Ill. 233, 2; *C. echinata*, Curt. Coll.

Reddish yellow; antennæ and abdomen darker, legs testaceous; wings brownish-yellow, clothed with long brown hairs, *with only two rows of dots in the apical cells*; posterior margin of the last segment in the male produced in the middle into a roundish lobe. App. anal. sup. small, spoon-shaped.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

Hab. London, Hertford, Ripley, Guildford, Suffolk, Cambridgeshire; common.

### Genus ECCLISOPTERYX, Kolenati.

With the same characters and habit as *Hallesus*, but only 1, 2, 3 spurs; *the male has, at the base of the posterior wings, a narrow, long, folded pouch, in which a pencil of hairs is concealed*. However, some species of *Hallesus* exhibit a similar pouch.

Case?

41. ECCLISOPTERYX GUTTATA, Pict.; *E. Dalecarlica*, Kolen.; *L. cœnosus?* Curt. Phil. Mag. 123; Steph. Ill. 221, 26.

Smoky brown; the antennæ darker, with paler rings; thorax reddish in the middle above; anterior wings with a greasy lustre, greyish-brown, with few and short hairs, and with a few paler dots on the hinder margin and in the apical cells; pterostigma darker; posterior wings hyaline, grey; legs testaceous, thighs and tarsi darker (vide Brauer, N. A. fig. 41).

Length 5 lin.; exp.  $8\frac{1}{2}$  lin.

Hab. England.

I have an English specimen before me. This species is wanting in Stephens's Collection. I regarded Curtis's *L.* 1859.

*cœnosus* as a new *Hallesus*, but am now inclined to think that it belongs here.

### Genus ENOICYLA, Rambur.

The same characters as *Chaetopteryx*, but only 1, 2, 2 spurs. *The females are apterous*, and constitute the genus *Dromophila*, von Heyden.

Case cylindrical, constructed of fine sand. The larvæ live out of the water upon the roots of trees.

*Enoicyla pusilla*, Burm.; *E. sylvatica*, Ramb.; *Ptyopteryx Reichenbachii*, Kolen.; *Dromophila montana*, von Heyden (♀).

Black; legs testaceous; thighs as far as towards the knees, the tips of the tibiæ and the tarsi blackish; wings hyaline, with yellow down; the veins strong and covered with longer hair.

Length 3 lin.; exp. 6 lin.

Hab. France, Germany; very probably also in England.

### Genus APATANIA, Kolenati.

The same characters as *Hallesus*, but 1, 2, 4 spurs; wings more closely and strongly hairy; spurs small.

Case? The larvæ probably live in swiftly running streams.

#### 42. APATANIA VESTITA, Kolen.

Black; legs testaceous, with the basal half of the thighs black; wings greyish-brown, the anterior covered with a dense yellow down.

Length 3½ lin.; exp. 6½ lin.

Hab. England; Coll. Newman.

## Sub-Family III. SERICOSTOMIDES.

Maxillary palpi of the males two or three-jointed, strongly hairy, broadly curved upwards; maxillary palpi of the females five-jointed, with the basal joints thick, hairy; *ocelli wanting*; spurs variable in number (2, 2, 4; 2, 4, 4; 2, 3, 3; 2, 2, 2); *the anterior leg always with two spurs*; antennæ usually as long as the wings, strong, the first joint thicker and usually long, hairy; *wings densely and strongly hairy*; legs almost destitute of spines.

Cases constructed of sand, swimming freely; the larvæ probably always live in running water of no great depth.

The *Sericostomides*, by the remarkable variety in their structure, constitute the chamber of curiosities amongst the *Phryganidæ*, as in almost every great family of insects nature has selected one group in which to develop her wealth of forms.

Genus SERICOSTOMA, Latreille; Stephens.

*Potamaria*, Leach.

Maxillary palpi of the males large, spoon-shaped, closing together *and thus covering the face with a mask*, which is clothed externally with distant, and internally with long, curved, closely approximated hairs; labial palpi of the males with a long basal joint; antennæ strong, not so long as the wings, the first joint thick, *shorter than the head*; wings densely clothed with hairs, narrow, the anterior with an elliptical apex; the posterior of equal breadth, but considerably shorter; spurs 2, 2, 4; tibiæ without spines.

Case constructed of fine sand, conical, with the tail-end slightly curved. The larvæ live in rapid brooks.

43. SERICOSTOMA SPENCII, Steph. Ill. 184, 1; *S. Latreillii*, Curt. Phil. Mag. 214; *S. collara*, Pict.; Ramb.; Kolen.; *Potamaria assimilis*, Steph. Ill. 183, 2 (♀); *P. analis*, Steph. Ill. 183, 1, tab. 34, 4 (♀ var. *alis griseo-variegatis*); *P. hyalina*, Steph. Ill. 183, 3 (♀ with the wings deprived of hairs).

Black; antennæ brown, not annulated; vertex and prothorax clothed with golden yellow hairs; legs brownish, tibiæ and tarsi of the four posterior legs testaceous; wings clothed with golden brown hairs, the posterior darker, blackish; in the females the anterior wings are sometimes spotted with grey (vide Brauer, N. A. fig. 35).

Length 5 lin.; exp. 9 lin.

Hab. New Forest, Brockenhurst, West of England, South Wales, Carlisle, Scotland, Devonshire, and near London; in June and July.

I am now acquainted with eight very similar European species, some of which probably occur in England. I have hitherto only been able to distinguish the males with certainty. The best characters are furnished by the colour of the antennæ and legs (especially the anterior) and more particularly by the app. anales. Amongst the latter this applies especially to two narrow sheaths, forked at the apex, situated near the penis; their proportions are very different in the different species, and the English species must be tested by these characters. In *S. Spencii* the points of the fork are of different lengths, the lower being shorter.

Genus NOTIDOBIA, Stephens.

Maxillary palpi of the males three-jointed, spoon-shaped,



bent upwards, *small, not closing together*, only clothed with hair on the outside; labial palpi of the males with a long basal joint; antennæ stout, not so long as the wings, the first joint thick, *shorter than the head*; wings densely clothed with hair, narrow, with an obtusely rounded apex; posterior of the same breadth as the anterior, but considerably shorter; spurs 2, 2, 4; tibiæ without spines.

Case constructed of fine sand, nearly cylindrical, slightly curved. In the anterior wings the first apical cell reaches nearly to the base of the discoidal cell (which is not the case in *Sericostoma*); in the posterior wings the discoidal cell is closed (open in *Sericostoma*).

44. NOTIDOBIA CILIARIS, L.; Kolen.; *N. atrata*, F.; Pict.; Steph. Ill. 186, 1.

Black; strongly hairy; legs testaceous, with the thighs darker.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

Hab. Hertford, New Forest, in June; not very rare.

Genus GOËRA, Hoffmanssegg, Stephens.

*Trichostoma*, Pict.; *Lasiostoma*, Ramb.; *Spathidopteryx*, Kolen.

Maxillary palpi of the male two-(?) jointed, spoon-shaped, bent upwards, *not closing together, densely clothed on the outside with clavate hairs*; labial palpi of the males with a short basal joint; antennæ stout, not so long as the wings, the first joint thick, straight, *longer than the head*; wings densely clothed with hair, broad, obtusely rounded at the apex; the posterior of equal breadth with the anterior, but rather shorter; anterior wings near the hinder margin *with a*

*naked cell circumscribed by a circular vein*; spurs 2, 4, 4; tibiæ without spines.

Case irregularly constructed of small stones, smooth, tubular, nearly uniform in width, with larger stones affixed to the outside on each side. The larva lives in swiftly running brooks.

45. GOËRA CAPILLATA, P.; *G. flavipes*, Steph. Ill. 187, 2 (♂); Curt. Phil. Mag. 215; Ent. Mag. I. 189; *G. pilosa*, Steph. Ill. 187, 1 (♀); *L. fulcrum*, Ramb. Yellowish brown, clothed with golden yellow hairs; antennæ brown, with the basal joint paler; anterior wings pale golden brown; posterior wings ashy grey. Length 5 lin.; exp. 8 lin.  
Hab. London, Hertford, Ripley, from June to September; common.

46. G. FUSCICORNIS, P.; *G. vulgata*, Steph. Ill. 188, 3. Black, clothed with ochreous hairs; antennæ darker; anterior wings pale straw yellow; posterior wings greyish yellow.  
Length  $3\frac{1}{2}$  lin.; exp. 6 lin.  
Hab. London and Devonshire, in June; not common.

I cannot separate the two species by certain structural characters; but as, according to Pictet, the larvæ are different, I have not felt justified in uniting them.

#### Genus SILO, Curtis.

*Trichostoma*, Pict.; *Aspatherium*, Kolen.

The same characters as for *Goëra*, but the naked circular cell is wanting in the anterior wings; the basal joint of the

antennæ is still longer; in the male the hinder wings have a longitudinal pinched fold not far from the anterior margin, traversing the veins and forming a sort of longitudinal pouch, which is beset with coarser, clavate hairs.

Case as in *Goëra*. The larva is remarkable as being the victim of an ichneumon (*Agriotypus armatus*) reared by Dr. Kriechbaumer.

47. SILO PALLIPES, Curt. ; Steph. Ill. 186, 1 ; *S. minutus*, Walk. Cat. 93, 1 ; *T. picicorne*, Pict. ; *Asp. fuscicorne*, Kolen.

Black, densely clothed with hairs; anterior wings brownish black, with a silky lustre; legs testaceous.

Length 3 lin. ; exp.  $5\frac{1}{2}$  lin.

Hab. Hertford, in June and July ; Lewisham, common on hedges at the end of May.

There are about eight species of the genus *Silo* in Europe; they are for the most part undescribed and not easily separated; some of them will probably occur in England. The app. anal. ♂ have hitherto furnished me with the most certain characters.

#### GENUS MORMONIA, Curtis, Stephens.

*Goëra*, Burm., Kolen. ; *Lepidostoma*, Ramb. ;  
*Sericostoma*, Pict.

Maxillary palpi of the males 2- (?) jointed, straight, thick, with their extremity dilated into a club above, verrucose, densely clothed with short hairs; antennæ thin, longer than the wings, *the first joint much longer than the head* (longer in the females than in the males), thick, strongly hairy; wings narrow, with the apex elliptical, *clothed with erect*

*hairs, especially the veins*; the anterior wings of the female have a fork less than those of the males; spurs 2, 4, 4; tibiæ without spines.

Case conical, somewhat curved, constructed of sand.

48. MORMONIA HIRTA, F.; *M. nigromaculata*, Steph. Ill. 189, 1, tab. 32, 2 (♂); *M. hirta*, Steph. Ill. 189, 2 (♀); *M. immaculata*, Steph. Ill. 189, 3 (♀ rubbed); *G. hirta*, Curt. Phil. Mag. 215 (♀); *M. gracilicornis* and *M. immaculicornis*, Curt. Phil. Mag. 215 (♂); *Lep. squamulosum*, Ramb. (♂); *G. hirta*, Kolen.

Ashy grey; antennæ pale yellow, annulated with brown, with the basal joint darker; wings grey, clothed with light brown hairs; legs testaceous; the anterior wings and the basal joint of the antennæ in the male are strongly clothed with black, clavate hairs, so that their covering resembles the scales of the *Lepidoptera*; *the first apical cell in the anterior wings is as long as the others.*

Length  $3\frac{1}{2}$  lin.; exp.  $7\frac{1}{2}$  lin.

Hab. London, Devonshire, Hertford, Ripley, New Forest, Oxford, in June; not uncommon.

49. M. IRRORATA, Curt. Phil. Mag. 215; Steph. Ill. 188, 4; *M. minor*, Steph. Ill. 189, 4.

Greyish-yellow; basal joint of the antennæ darker; anterior wings ochreous, densely clothed with long hairs; legs testaceous; *first apical cell of the anterior wings much longer than the others.*

Length 2 lin.; exp. 4 lin.

Hab. Devonshire, in June.

Genus BRACHYCENTRUS, Curtis, Stephens.

*Pogonostoma*, Ramb.; *Hydronautia*, Kolen.

Maxillary palpi of the males 2- (?) jointed, short, slender, curved, strongly hairy; antennæ as long as the wings, *basal joint as long as the head*; wings elliptical at the apex, densely clothed with hair; spurs 2, 3, 3; tibiæ without spines; spurs very short.

Case conical, straight, composed of sand; the larvæ live in marshes, and even in the brackish water at the mouths of rivers.

50. BRACHYCENTRUS SUBNUBILUS, Curt. Phil. Mag. 215; Steph. Ill. 182, 1 (♀); *B. concolor*, Steph. Ill. 182, 2 (♂); *B. costalis*, Steph. Ill. 182, 3 (♀ rubbed); *Ph. tinctoria*, Zett.; *P. verum*, Ramb.; *H. maculata*, Kolen.

Black, clothed with grey hairs; anterior wings grey, with large yellowish spots; posterior wings brownish-grey; legs yellowish-white, thighs grey.

Length  $3\frac{1}{2}$  lin.; exp.  $6\frac{1}{2}$  lin.

Hab. London, Devonshire and New Forest, in June.

#### Sub-Family IV. HYDROPTILIDES.

Maxillary palpi of the males 4-jointed; *labial palpi with the apical joint thickened*; antennæ shorter than the wings, *thick, moniliform*; wings very narrow, *pointed, lanceolate*, clothed with long hairs; *posterior wings not folded*; anterior legs without spurs; number of spurs variable (0, 2, 4; 0, 3, 4).

The minute species of this genus are still very insufficiently investigated.

Case membranous, compressed laterally; the larvæ live in still water.

Genus AGRAYLEA, Curtis.

*Hydrorchestria*, Kolenati.

Antennæ *not thickened*; ocelli *present*; last joint of the labial palpi large, thick, *conical*; wings narrow, lanceolate; spurs 0; 3, 4.

(?) Case membranous, gelatinous, slender, quadrangular, flat; for the pupa it is fastened to the lower surface of aquatic plants by four finger-like knobs in the four corners (Bremer).

51. AGRAYLEA MULTIPUNCTATA, Curt. Phil. Mag. 217; Steph. Ill. 153, 2; *A. sexpunctata*, Curt.; Steph.

Ochreous; antennæ brownish; anterior wings brown, densely clothed with hair, spotted with yellow; posterior wings grey, with long fringes; legs testaceous; tibiæ hairy.

Length  $1\frac{3}{4}$  lin.; exp. 3 lin.

Hab. England.

I cannot separate the two species described by Curtis.

Genus HYDROPTILA, Dalman; Stephens.

Antennæ *thickened before the apex*; ocelli wanting; last joint of the labial palpi large, thick, *cylindrical*; wings extremely narrow, produced into a long, fine point, clothed with very long hairs; in the male I find 0, 3, 4 spurs, in the female 0, 2, 4.

Case membranous, flat, roundish, of the form of a cucumber seed.

The minute species belonging here have a most deceptive resemblance to the *Micro-Lepidoptera*; but they are separated therefrom without any difficulty by the total want of a scaly covering. The species much require a careful

study. In Stephens's Collection there are only three, namely, *H. tineoides*, *brunneicornis* and *sparsa*. The two former appear to me to be identical and to belong to *H. pulchricornis*, Pict.; the third, *H. sparsa*, I regarded as *tineoides*, Dalm.; whether the latter is not merely the female of the former remains still to be decided. In Curtis's Collection I saw *H. sparsa*, *Vectis* and *costalis*. The two former are identical, but not with Stephens's species; of the *H. costalis* the type was not in sufficiently good condition to allow me to come to a decided opinion.

52. HYDROPTILA PULCHRICORNIS, Pict.; *H. tineoides* and *H. brunneicornis*, Steph. Ill. 152, 1 and 2.

Testaceous, clothed with long hairs; antennæ brown before the apex and in the middle; wings brownish-grey, with very long fringes; anterior wings spotted with white.

Length  $1\frac{1}{2}$  lin.; exp.  $2\frac{1}{4}$  lin.

Hab. London, Hertford, from June to August; common.

53. H. TINEOÏDES, Dalm.; *H. sparsa*, Steph. Ill. 152, 3.

Testaceous, clothed with long hairs; antennæ uniformly testaceous; wings ashy grey, with very long fringes; the anterior wings spotted with white.

Length  $1\frac{1}{2}$  lin.; exp.  $2\frac{1}{4}$  lin.

Hab. Hertford, June; perhaps only the female of the preceding species.

54. H. VECTIS, Curt. Phil. Mag. 217; Steph. Ill. 152, 4; *H. sparsa*, Curt. Phil. Mag. 217.

Testaceous, clothed with long hairs; antennæ brown before the apex and in the middle; anterior wings

brown, brightly spotted with black and white, clothed with very long hairs.

Length  $1\frac{1}{2}$  lin. ; exp.  $2\frac{1}{2}$  lin.

Hab. Hertford and South of England, in June.

55. *H. COSTALIS*, Curt. Phil. Mag. 218 ; Steph. Ill. 153, 5.

“Pale ochreous, shining ; anterior wings variegated, fuscous, with a dot on the disc ; the costal cilia long and black, with a long pale space at the centre” (Curtis).

Length 1— $1\frac{1}{3}$  lin. ; exp. 3 lin.

Hab. London, June ; probably also in Scotland.

Stephens's genus *NARYCIA* belongs to the *Micro-Lepidoptera* ; the only species, *N. elegans*, is his *Xysmatodoma (Tinea) melanella*, to which *X. atrella* also belongs.

*Acentropus niveus*, *A. Garnonsii*, Curt. B. E. 497, the *Zancle Hansoni*, Steph., also belongs to the *Micro-Lepidoptera*, and, according to Zeller, to the *Crambidæ*.

[*To be continued.*]



## HYMENOPTERA.



NOTES ON THE CAPTURE OF RARE SPECIES IN 1858,  
WITH SOME OBSERVATIONS ON THEIR ECONOMY, &c.

By FREDERICK SMITH.

BEING again requested to contribute our annual record of captures, observations and discoveries, it occurs to us that the Annual of the Entomologist is, to the best of our knowledge, the last of a once numerous and flourishing race. We well remember the publication of the first Annual, its novelty, its great success, and consequently the host of competing Souvenirs which soon appeared, dividing public favour; one appealed to the artistic taste, another to the taste poetic, there were also others of a graver character, whilst poor Tom's annual volume of cheerful and innocent mirth, brought joy and gladness to many a winter's hearth and home; all these have passed away, and the Entomologist's Annual is the last of the race. It is true that it bears little resemblance to its predecessors, its size and annual appearance being the only characters which unite it to the *genre*.

The Annual makes its fifth appearance, increasing in health and vigour with each succeeding year, and showing every promise of living many years to come; but whilst penning these observations we must not forget the scientific character of the work, which precludes on our part any

approach to jocularity; we must not forget certain hints which have reached us of our having transgressed in this particular on former occasions; but an Annual does appear to us to give a certain degree of licence, and if a quiet smile or so should escape from us we plead in excuse that it is our annual appearance, and we beg our readers to feel assured that the fault is not ours: if this little work, instead of an Annual, had been called a Register, not a spark of hilarity had escaped from us.

It will be seen that we have this season, as has indeed been the case on former occasions, to depend principally on our own resources, so few are our fellow-labourers, and our own opportunities of out-door research so limited, that the record of novelties must of necessity be brief.

A few months ago we perused a most desponding article on the "decline and fall" of Hymenopterology; we have better heart on this subject, and can assure the writer of the episode that some young and studious hands are at work. To the study of the *Hymenoptera* a large amount of patient application is required, there is no branch of Entomology indeed which can be thoroughly studied without, but that of the *Hymenoptera* is beset with many difficulties from which the student of other orders is comparatively free; one great difficulty in the discrimination of the species arises from their liability to a total change of appearance from exposure, many of the bees are extremely difficult to recognise when bleached and faded in the sun, in fact they frequently bear little resemblance to the beautiful insect which first flitted from flower to flower before us.

The *Tenthredinidæ* and *Ichneumonidæ* both await their monographer; a work on the *Formicidæ*, *Fossores* and *Vespidæ* will shortly appear.

The astonishing increase in the number of individuals who collect insects must eventually, we trustfully hope, include a far greater number who study them, and we look forward confidently to the day when the now neglected orders will have numerous votaries, earnestly and successfully investigating them; a deep and never failing interest attaches to all, but those whose inclinations or occupations only suffer them to look upon the most beautiful of the Insect-World, almost of necessity attach themselves to the *Lepidoptera*; this order has its students, and ardent ones too, but its admirers out-number those attached to all the other orders united. From this amazing increase of collectors, however, many benefits to science arise; the working dealer is sent into remote and unexplored localities, and thus objects new to our Fauna are frequently brought to light. This is consolatory, but we cannot hide from ourselves the fact, that too many exclusively devote their energies to the acquisition of specimens, which once obtained, all their ends and aims are accomplished. Others, possessing rich and valuable collections, earnestly and patiently investigate their treasures, studiously they work out the names of recorded species, and satisfactorily they ascertain which are new to science, but at this point they halt, and no result of their labours falls to the lot of the Entomological public—don't "they manage these things better in France?"

During the past season we have had an opportunity of investigating a portion of the Suffolk coast, at and in the neighbourhood of Lowestoft; this may be appropriately called a sandy region, pre-eminently promising of fossorial *Hymenoptera*; the results of our short campaign will show that we were not wrong in selecting this spot for the purpose of collecting that family.

By changing the field of operations each succeeding year, some hitherto rare or perhaps doubtful species occurs in abundance; we would, however, call particular attention to a capture made during the past season, on ground over which we have collected during the last two-and-twenty years. Shuckard, in his admirable Essay on the *Fossorial Hymenoptera*, says, in the remarks on *Pompilus notatus*, "I am unacquainted with the female of this insect, I took a single specimen in 1833 at Highgate; Mr. Stephens's, I believe, was captured at Ripley in Surrey." Since the year 1836 we have searched annually for that insect without success, but during the past season, at a spot which had been frequently searched before, we found the long looked for *P. notatus*, and captured seven males and one female; therefore let not those, whose occupations will not admit of their extending their researches beyond a limited district, despair of adding novelties to their collections, let them not imagine that in a few seasons they have exhausted any locality. In addition to the above another rarity, *Pompilus variegatus*, was captured within half-a-mile of the spot where the above novelty occurred; the latter we had not met with since the far-famed Colney Hatch Wood was destroyed, and an asylum for lunatics erected in its stead.

About twenty years ago we noticed, in the collection of the late J. F. Stephens, a very beautiful Ichneumon, *Arotes albicinctus*, taken on the trunk of an oak at the entrance to Darenth Wood; on obtaining the knowledge of the locality, we proceeded a few days afterwards to Darenth; no sooner had we arrived at the spot pointed out, than on the identical oak a fine *Arotes* settled before us, and was immediately captured; the following season a second example was taken at Colney Hatch, since which we have not met

with it until the present season, when a third was captured near Lowestoft.

*Myrmosa melanocephala*. Taken, not uncommon, at Lowestoft.

*Tiphia femorata*. In immense profusion at Pakefield, near Lowestoft, also taken near Exeter by Mr. Parfitt.

*Pompilus rufipes*. Taken abundantly at Pakefield.

*Pompilus plumbeus*. We mention this species, which is so generally distributed on our coasts, for the purpose of recording its appearance in numbers far greater than we ever observed any species of fossorial insect; this was at Pakefield, thousands upon thousands were seen on the sandy slopes, running on the leaves of plants and assembling on the heads of the Wild-carrot (*Daucus carrota*).

*Pompilus pectinipes*, found about three miles south of Lowestoft, on the coast.

*Aporus unicolor*. This rare insect was captured in Pakefield Gap: it is the fourth example which at present exists in British Collections; one in the collection at the British Museum, formerly in that of the late J. F. Stephens, two which I captured at Southend, and the above taken this season, in my own.

*Ceropales maculata*. Very plentiful to the south of Lowestoft, settling on the Wild-carrot; we have never been successful in tracing the history of this supposed parasite.

*Ammophila lutaria*. Not at all scarce on Corton Heath, to the north of Lowestoft, in company with the two other species of the genus.

*Astata boops*. Very abundant on Corton Heath at the verge of the ravine. Mr. Parfitt has taken it near Exeter.

*Gorytes Fargeii*. This very local species was taken about five miles south of Lowestoft, near Kessingland.

*Harpactus tumidus*. This scarce species was taken in Pakefield Gap.

*Mellinus sabulosus*. Shuckard says of this insect, "all the specimens I have seen have come from Norfolk or Suffolk, where it appears to be local;" Mr. Hewitson took it, I believe, near Newcastle; Dr. Howitt found it at Nottingham, and Mr. Dossetor captured it at Christ Church Sands, Hampshire: at none of these localities does it appear to have occurred in any numbers; to the south of Pakefield it occurs in the greatest profusion—here, for the first time, we had the pleasure of seeing this pretty species alive.

*Crabro scutatus*. We had not taken this insect for several years; in 1836 we took two males and one female at Birch Wood, Kent, and have always considered it one of the rarest species of the genus to which it belongs. Near Pakefield it occurred in the greatest abundance; they are very fond of settling on the leaves of plants, particularly those of the Coltsfoot, and sunning themselves; the females burrow in hard sandy banks, and provision their nests with a species of *Culex*.

*Cerceris interrupta*. This rare insect was the only species of *Cerceris* which we captured near Lowestoft.

This record of captures of fossorial *Hymenoptera* will, no doubt, induce others to visit Lowestoft, certainly the best locality for that family of insects which we ever discovered; insects of rarity only are enumerated, but a long list of more generally distributed species were equally numerous. We may mention *Crabro dimidiatus* on account of its extreme abundance; we took two or three examples of the rare black variety of the male.

The captures of bees, during the past season, have not been by any means so numerous as in 1857, a season remarkable for the acquisition of several of our rarest species; but

to us the capture of a British bee for the first time is a remarkable event; last year we had that gratification, and this season, for the first time, we took a male of the rare *Prosopis dilatatus*; and, better still, have obtained a perforated stick, containing, we have little doubt, a series of seven cells of that bee, enclosing the larvæ; the cells are lined with the same kind of transparent membrane as those constructed by the species of the genus *Collotes*, but with this difference, there is no space left between the cells, they are separated simply by a division of thin membrane; we hope next year to be able to describe the female of this rare species, which is at present unknown.

*Andrena decorata*. This rare bee was captured by Mr. Parfitt, in Devonshire.

*Andrena nigriceps*. Three or four examples of the female were taken on the flowers of the Rag-wort, to the south of Lowestoft.

*Andrena Coitana*. Taken at the same spot as the preceding, in company with *A. Shavella*, Kirby; thus confirming the correctness of uniting Kirby's species. We have now taken them in company in Yorkshire, at Kingsdowne near Deal, and at Lowestoft.

*Cilissa tricineta* and *Panurgus Banksianus*, both occur near Lowestoft.

*Nomada armata*. This rare species was taken by Mr. Parfitt, near Exeter, on ground where the following species also occurs; it may prove to be its parasite.

*Osmia xanthomelana*. A fine series of this very local bee were taken in the spring by a working collector, J. Truscott of Exeter, of whom we obtained some very fine examples. Mr. Parfitt also took the species in the same locality near Exeter.



*Megachile maritima*. Very abundant on Corton Heath, north of Lowestoft, and also *Cælioxyys quadridentata*, *C. rufescens*, *C. umbrina* and *C. simplex*.

*Ceratina cærulea*. Taken at Folkestone, on the *Echium vulgare*, by Mr. S. Stevens, in June.

*Bombus Smithianus*. Taken by Mr. Henry Squire, in Shetland.

*Bombus nivalis*. From the same locality, by Mr. Squire.

The occurrence of hermaphrodites amongst the Aculeate *Hymenoptera* is of such rare occurrence, or has been so seldom observed, that the capture of a third example, and that in a genus in which it has not, to my knowledge, been previously observed, is worthy of a special notice. Mr. James Stokes captured an hermaphrodite of *Andrena nitida*, and I am indebted to him for the liberal presentation of the specimen to my collection. The right side is male, the mandible being slender and arcuate, the antenna thirteen-jointed, and the side of the face with long white pubescence; the thorax exhibits scarcely any perceptible difference on the upper side, but beneath the difference is very striking, the female side being much swollen, whilst the male side is very much less convex; it is in the legs that the most marked difference is seen, the basal joint of the tarsi of the anterior and intermediate pair are stout, and densely pubescent beneath on the female side, whilst on the male side they are slender, and have only scattered hairs; the posterior legs are, however, the most anomalous: on the female side the trochanter has a long floccus of white hair, the femur has a fringe of a similar colour, and the tibia is densely clothed with short hair, which is dark brown above and silvery beneath; the male leg has none of these appliances, but is very slender, elongate and slightly pubescent; the abdomen has



the rounded form on the female side, with two patches of white pubescence above, the male side being much less rounded, or lanceolate; this would belong to the division of perfect hermaphrodites, according to Burmeister, that is, the external form is perfect male on one side and female on the other.

The above is the fourth instance which has come to my knowledge of hermaphroditism in the Aculeate *Hymenoptera*; the first being the remarkable example figured in my Monograph of the British Bees, and also in the third volume of the Zoologist; Mr. Walcott has also an hermaphrodite of the same bee, *Anthophora acervorum*. The third specimen is of a species of *Nomada*, *N. Baccata*, and the fourth the *Andrena* figured on the frontispiece of this volume (Fig. 7).

As the foregoing list will probably induce others to visit Lowestoft, the pleasure of their capture will be much enhanced by the knowledge that they are exploring ground which the greatest English Hymenopterist traversed in the year 1806. In the life of the Rev. William Kirby it is related, in a letter to Mr. Spence, "between walking and riding I managed to get as far as Lowestoft, from whence at the end of the first week I started." I felt assured from this that the very ground I was hunting over had been previously visited by Kirby, and this conviction, I need scarcely add, not only rendered the spot doubly interesting, but imparted an additional pleasure to my successful investigations.

NOTE.—*The captures at Lowestoft and in its neighbourhood were made during the two last weeks of July and the two first of August.*

## COLEOPTERA.



NEW BRITISH SPECIES NOTICED IN 1858.

BY E. W. JANSON, SEC. ENT. SOC.

IN the following enumeration of the species recorded as new to our list during the year, it is not improbable that some may ultimately prove to be described in the works of the late Mr. Stephens, and to be extant in his Collection; while, on the other hand, I may have inadvertently excluded some which are in reality entitled to a place here, being neither represented in his Collection nor described in his works. I allude more particularly to the *Brachelytra*, in which group, it will be remarked in the following pages, the accession of new species, derived from the "Catalogue of British Coleoptera," of which the first instalment was published by Mr. Waterhouse in the early spring, is this year again somewhat formidable.

The facilities *exclusively* possessed by Mr. Waterhouse of leisurely and thoroughly investigating the Collection of the late Mr. Stephens, purchased by the nation and now deposited in the British Museum, warranted the expectation that on this score at least his catalogue would have afforded

a complete epitome; and that, taking Mr. Wollaston's "Revision of the British Atomariæ"\* as his model, he would have furnished such an analysis of the insects placed by Mr. Stephens in his cabinet to represent his published descriptions as should guide us in forming a correct estimate of the value of those descriptions, and of arriving at a fair and impartial decision as to the extent to which the names employed by Mr. Stephens will *rightfully* supersede those in use on the Continent.

Until such an analysis is laid before the Entomological public, any attempt to establish an uniform nomenclature must prove utterly abortive. It is not to be supposed that the Entomologists of the Continent will consent to the banishment of names "familiar to them as household words," and embalmed in the laborious and conscientious works of Gyllenhal, Erichson, Aubé, Schioedte, Schaum, Mannerheim, Chevrolat, Heer, Kraatz, Fairmaire, and a host of worthies too numerous to mention, unless full and unquestionable evidence is adduced of our *right* to substitute for them names equally cherished by us—precious legacies bequeathed to us in the writings of Kirby, Spence, Marsham, Leach, Stephens, Curtis, Westwood, Denny, Haliday, Wollaston, Walton, and luminaries of minor magnitude.

In Mr. Waterhouse's catalogue the Stephensian synonyms are based upon the examination of a *single individual* only of each species, *selected by him* from the series, however extensive, and *arbitrarily* taken as the *type*, without any reference whatever to the *remaining specimens*, of which *no account* at all is vouchsafed. And as it not unfrequently happens that two, or, in difficult genera, more, species are

\* Trans. Ent. Soc. Lond. New Series, iv. 64 (1857).

mixed up in Mr. Stephens's cabinet under the same specific title, it results, that Mr. Waterhouse's catalogue conveys a very imperfect notion of Mr. Stephens's views and of the species contained in his Collection. The fact that a species is unaccompanied by any reference whatsoever to Stephens does not, as one would surmise, necessarily imply either that it was not known to and described by Mr. Stephens or that it is not to be found in his Collection, *e. g.* *Achenium depressum*, which is well described by Stephens, Illustr., Mand. V., 265, 1, excluding the last paragraph of the description, which refers to *A. humile*, which he considered to be a variety, and with which it will be found mixed up in his cabinet. Again, in the genus *Oligota*, Mr. Waterhouse enumerates *four* species, to none of which does he make the remotest allusion either to the Stephensian works or Collection, and which would naturally induce the belief that the genus was totally unknown to Mr. Stephens and unrepresented in his Collection, an inference scarcely reconcilable with the fact that in the Manual he *describes no fewer than six species under that genus, to not one of which is prefixed the sign that he did not possess it, and of all of which exponents exist, therefore, in his Collection.*

Under these circumstances it is obvious that in my summary of the new species of *Brachelytra* noticed in 1858, faults both of commission and omission are not unlikely to occur.

Furthermore, I have been under the necessity of passing over two Lists published by Mr. Waterhouse, Proc. Ent. Soc. Lond. 7 Dec. 1857, 96, of the genera *Rhizophagus* and

*Monotoma*, no authors' names being appended to the species nor any reference given to Stephens.

1. *NOTIOPHILUS SUBSTRIATUS*, Waterhouse, Cat. Brit. Col. 4 (1858).

*Notiophilus substriatus*, Waterhouse, Ent. Mag. i. 211, 17 (1833).

*Notiophilus punctulatus*, Wesmael, Bullet. de l'Acad. de Bruxell. ii. 22 (1835); Fairm. et Laboulb. Faune Ent. Franç. i. 9, 3 (1854); Schaum, Naturg. d. Ins. Deutschl. i. 65, 4 (1856).

*Notiophilus semipunctatus*, var.  $\gamma$ , Dawson, Geod. Brit. 55, 4 (1854), excluding *N. nitidus* and *biguttatus*, Waterhouse, which, judging from the original descriptions, cannot be synonymous with the insect now under consideration.

Distinguished from *N. biguttatus*, F. (*semipunctatus*, F., Dawson, but with regard to which it is perhaps most advisable to adopt the course pursued by Dr. Schaum and followed by Mr. Waterhouse, and to reinstate the specific title *biguttatus*, F., since the description thereunto appended suits the ordinary phase of the species, whilst that given under *semipunctatus* applies to a form of comparatively rare occurrence) by the parallel frontal sulci, the fine striæ on the posterior part of the head immediately behind the eyes; by the longer, narrower, and more parallel elytra; by the interstices between the suture and the first, and between the second and seventh striæ, being exceedingly finely chagrined, imparting an opaqueness to those parts, which contrasts strongly with the broad glabrous space between the first and second striæ; moreover in *semistriatus* the spaces between

the second and third and the third and fourth striæ are distinctly wider than those comprised between the striæ beyond them; the sculpture throughout is much finer, and the colour invariably more brassy, than in *biguttatus*.

On referring to M. Wesmael's description, *l. c.*, and comparing it with that of Mr. Waterhouse above cited, I find that the diagnostics (the fine sculpture and the inequality of the spaces between the dorsal striæ of the elytra) are the same in both; there is therefore no plea for adopting the name proposed by M. Wesmael in preference to that imposed by Mr. Waterhouse, and which is two years anterior in date of publication.

It is much to be regretted that Mr. Waterhouse, in his recently published Catalogue, has not given us a full resumé of the synonymy of the British *Notiophili*; a statement at his own hands of the views he now entertains would have set the matter at rest for ever, whereas the fact that he does *not* coincide in the conclusions arrived at in respect to them by Mr. Dawson, and that he cites *four* only of the *eighteen* species given in his "*Monographia Notiophilon Angliæ*" as synonymous with the recognized British species, admits of the inference that he considers the remaining *fourteen* distinct.

*N. substriatus* appears to be very generally distributed throughout the southern portion of our island; I have met with it in single specimens at various points of the London district, more frequently in the vicinity of Croydon than elsewhere.

2. *HARPALUS SERVUS*, Dufts.; E. W. Janson, Proc. Ent. Soc. 5 April, 1858, Zool. 6072 (1858).

*Carabus servus*, Dufts. Faun. Austr. ii. 101, 97 (1812).

*Harpalus servus*, Gyll. Ins. Suec. iv. 437 (1827);

Dej. Spec. gen. iv. 377, 151 (1829), Icon. iv. 229, 108, tab. 197, f. 3 (1834); Erich. Kaef. d. Mark Brand. i. 56, 21 (1837); Redtenb. Faun. Aust. 101, 32 (1849), 2nd ed. 60, 35 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 138, 61 (1854).

*Harpalus complanatus*, Sturm, Deutsch. Faun. Ins. iv. 64, 36, Tab. 88, f. a A (1818).

*Harpalus coracinus*, Steph. Illustr. Mand. i. 145, 12 (1828), Man. Brit. Col. 41, 299 (1839), *nec* Sturm.

*Harpalus maritimus* (Kirby), Steph. *l. c.*, and of the Kirbyan and Leachian Cabinets.

*Harpalus anxius*, var., immature, Dawson, Geod. Brit. 151, 28 (1854)?

Distinguished from its near ally *H. anxius*, and which it should precede in our collections, by its invariably larger size and broad depressed form, bright ferruginous antennæ, the greater comparative width of the thorax behind, which gives it the appearance of being much more narrowed in front, its more acute posterior angles, and by its relatively short broad elytra. In colour it varies from pitchy black to bright red-brown; in the darkest specimens the lateral and posterior margins of the thorax are narrowly red-brown, in lighter coloured individuals the posterior angles are broadly red; the extremities appear not to vary in hue.

Detected by Mr. H. Squire among a number of unset and unexamined *Coleoptera* collected by Mr. F. Smith near Deal in the autumn of last year, in which locality he has subsequently taken it very sparingly in March and July.

Fig. 6.

3. ANISOTOMA BRUNNEA, Sturm; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

I may here remark that *Anisotoma obesa*, Schmidt, given

by Mr. Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858), as a distinct species, has been satisfactorily shown by Dr. Kraatz, Ent. Zeit. Stettin, xiii. 379 (1852), to be synonymous with *A. brunnea*, Sturm: in this view Dr. Schaum concurs; *conf.* Cat. Col. Eur. 4th ed. (1852).

4. *ANISOTOMA CILIARIS*, Schmidt; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

5. *CYRTUSA MINUTA*, Ahrens; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

6. *AGARICOPHAGUS CEPHALOTES*, Schmidt; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

7. *LEIODES ORBICULARIS*, Herbst; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

8. *EUTHEIA PLICATA*, Gyll.; Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

Taken by Mr. Pelerin, from whom I obtained a specimen, identified by me at the time, upwards of four years since; found by Mr. Whittingham at Leytonstone and by Mr. Waterhouse at the Crystal Palace. Mr. Wollaston met with it at Whittlesea in September last, and kindly presented me with a pair.

9. *BOLITOCARA LUNULATA*, Payk. (*nec* Steph.); Waterhouse, Cat. Brit. Col. 15 (1858).

10. *CALODERA RIPARIA*, Erich.; Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6073 (1858).

A single specimen taken by Dr. Power in the autumn of 1857 at Holme Bush, near Brighton.

11. *ISCHNOPODA RUBICUNDA*, Erich.; Waterhouse, Cat. Brit. Col. 17 (1858).

12. *HOMALOTA IMBECILLA*, Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6074 (1858) (described).



Taken by Mr. Waterhouse under *rejectamenta* at the mouth of the Orwell, in September, 1855.

13. HOMALOTA PLUMBEA, Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6074 (1858) (described).

Found by Dr. Power at Seaford, near Newhaven; by Mr. H. Squire at Brighton; and by Mr. F. Bond in the Isle of Wight—beneath seaweed on the beach.

14. HOMALOTA ÆGRA, Heer; Waterhouse, Cat. Brit. Col. 18 (1858).

*Homalota luctuosa*, Mulsant, Opusc. Ent. ii. 35, 1 (1853), appears to differ but little from this, and will probably sink as a synonyme; *conf.* Kraatz, Naturg. d. Ins. Deutschl. ii. 249, 52 (1858).

15. HOMALOTA MARCIDA, Eric.; Waterhouse, Cat. Brit. Col. 19 (1858).

I have taken this in moss near Highgate.

16. HOMALOTA ORBATA, Eric.; Waterhouse, Cat. Brit. Col. 19 (1858); Proc. Ent. Soc. 3 May, 1858, Zool. 6115 (1858).

Found by Dr. Power at Merton; taken also by Mr. Constantine in Lancashire.

17. HOMALOTA PULCHRA, Kraatz; Waterhouse, Cat. Brit. Col. 19 (1858).

Taken by Dr. Power in a marsh near Red Hill early in May, 1856, and again in the same month on the banks of the Thames near Charlton.

18. OCYUSA RUFICORNIS, Kraatz; E. W. Janson, Proc. Ent. Soc. 5 April, 1858, Zool. 6072 (1858).

*Oxypoda fulvicornis*, Fairm. et Laboulb.

Found in the early spring amongst dead rushes at the sides of a ditch within the London district; apparently so local and scarce that to publish the precise locality in which it

occurs would, beyond a doubt, ensure its speedy and utter extirpation.

19. *OXYPODA RUFULA*, Mulsant ; Waterhouse, Cat. Brit. Col. 17 (1858).

Of this elegant little species I have met with a single specimen only ; it was taken near Hampstead, on the underside of a piece of decayed wood which I had laid on the declivity of a large nest of *Formica rufa* as a trap for myrmecophilous insects.

20. *OXYPODA NIGRINA*, Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6073 (1858) (described).

Taken at Erith in July, 1855, at Charlton in June, 1855, and in other places near London ; found by Mr. M. Young near Paisley, and by Dr. Power at Kilburn, Darenth and Cowley.

21. *OXYPODA NIGROFUSCA*, Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6073 (1858) (described).

Hampstead.

22. *OXYPODA? ATERRIMA*, Waterhouse, Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858) (described).

Taken by Mr. M. Young near Paisley.

23. *ALEOCHARA BISIGNATA*, Eric. ; Waterhouse, Cat. Brit. Col. 16 (1858).

24. *OLIGOTA GRANARIA*, Eric. ; Waterhouse, Cat. Brit. Col. 19 (1858) ; Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

*Oligota granaria*, Eric. Kaef. d. Mark Brand. i. 364, 4 (1837).

*Oligota casei*, Steph. Man. Brit. Col. 366, 2868 (1839) ? Stephens's description of *Al. pumila*, Illustr. Mand. v. 131, 67 (1832), cannot possibly refer to this insect, which is known to me by description only.

Taken by Dr. Power at the Holt, Hampshire.

25. *OLIGOTA FLAVICORNIS*, Lacord. ; Waterhouse, Cat. Brit. Col. 19 (1858).

Mr. Waterhouse has referred this species to Erichson ; it was, however, long previously described under the name of *Hypocyptus flavicornis* in Boisduval and Lacordaire's Faune Ent. des Envir. de Paris, i. 521, 4 (1835), as cited both by Erichson and Kraatz.

Nearly allied to the preceding species, resembling it in form and the pale colour of the antennæ, but in the present insect these organs have the club consisting of *three* joints only, while in *O. granaria* it is *quadri*-articulate. I found a pair of this insect beneath dead leaves at the roots of trees at Waustead, Essex, on the 21st October, 1851 ; it was taken in some numbers by beating lime trees, at Kennington, in July, 1857.

26. *GYROPHÆNA GENTILIS*, Eric. ; Waterhouse, Cat. Brit. Col. 19 (1858).

I have met with this species in fungi near Hampstead in July ; it is apparently very rare.

27. *GYROPHÆNA STRICTULA*, Eric. ; Waterhouse, Cat. Brit. Col. 19 (1858).

28. *AGARICOCCHARA LÆVICOLLIS*, Kraatz ; Waterhouse, Cat. Brit. Col. 19 (1858) ; Proc. Ent. Soc. 3 May, 1858, Zool. 6115 (1858).

Taken by Dr. Power at the Holt, Hampshire. I have met with it in boleti at Colney Hatch.

29. *PLACUSA PUMILIO*, Grav. ; Waterhouse, Cat. Brit. Col. 19 (1858).

Found by Mr. M. Young, near Paisley.

30. *EURYUSA LATICOLLIS*, Heer ; Waterhouse, Cat. Brit. Col. 15 (1858).

First taken by me beneath bark of Elm trees near High-

gate, and subsequently found by Mr. Waterhouse at Henhault Forest.

I am by no means satisfied that this is the insect to which Heer applied the name of *laticollis*. My specimens were taken on three occasions, and were certainly not accompanied by any ant, nor was an ant of any description to be seen in the vicinity.

31. *HYPOCYPTUS PULICARIUS*, Eric.; Waterhouse, Cat. Brit. Col. 20 (1858).

32. *HYPOCYPTUS PYGMÆUS*, Kraatz (?); Waterhouse, Cat. Brit. Col. 20 (1858).

33. *CONURUS BIPUNCTATUS*, Eric.; Waterhouse, Cat. Brit. Col. 21 (1858).

34. *TACHYPORUS TERSUS*, Eric.; Waterhouse, Cat. Brit. Col. 21 (1858).

Appears more partial to swampy places than most of its congeners, and to be rare. I have taken it near Croydon and at Hammersmith marshes early in the Spring.

35. *TACHYPORUS TRANSVERSALIS*, Grav.; Waterhouse, Cat. Brit. Col. 21 (1858).

Hampstead and near Finchley, rare.

36. *LAMPRIINUS SAGINATUS*, Grav.; Waterhouse, Cat. Brit. Col. 21 (1858).

Given me by Mr. E. Sheppard, of Notting Hill, by whom it was captured in that neighbourhood. A specimen was taken about two years back by Mr. Edwin Shepherd, near Wickham, Surrey.

37. *TACHINUS RUFIPENNIS*, Gyll.; Waterhouse, Cat. Brit. Col. 20 (1858).

A single example found by Mr. Wollaston in North Wales.

38. *TACHINUS BIPUSTULATUS*, Grav.; Waterhouse, Cat. Brit. Col. 20 (1858).

A rare species which I have on several occasions met with near Highgate, Hampstead and Charlton, Kent, amongst the fermenting comminuted wood ejected from their burrows by the larvæ of *Cossus ligniperda*: my colleague, Mr. Edwin Shepherd, has found it under similar circumstances near Putney.

39. *MYCETOPORUS LUCIDUS*, Eric.; Waterhouse, Cat. Brit. Col. 22 (1858).

This insect occurs in moss in humid places. The only specimen I possess was taken by Mr. G. Guyon, near Ventnor, in the Isle of Wight; and in Mr. Wollaston's Collection, I find a single individual captured by that gentleman near Norwich.

40. *MYCETOPORUS PUNCTUS*, Grav., Eric., Kraatz.

*Mycetoporus punctatus*, Waterhouse, Cat. Brit. Col. 22 (1858).

41. *XANTHOLINUS LONGIVENTRIS*, Heer; Waterhouse, Cat. Brit. Col. 26 (1858).

A not uncommon insect in the vicinity of London. Nearly allied to *X. linearis*, and confounded with it by the older Entomologists; it may be readily distinguished by its usually larger size, by the linear series of punctures on each side of the thorax, rarely exceeding twelve in number, being larger and deeper, by its brassy black elytra and their more delicate and sparser puncturing.

42. *PHILONTHUS LUCENS*, Mannerh.; Waterhouse, Cat. Brit. Col. 24 (1858).

In cow-dung near Hampstead, rare.

43. *PHILONTHUS LEPIDUS*, Grav.; Waterhouse, Cat. Brit. Col. 24 (1858).

In a letter, dated 30th September, 1848, Mr. J. Hardy writes me that he had received a specimen of this insect from Deal, and that Stephens's description of *Quedius lepidulus* (Kirby) appears to refer to it.

Dr. Power has met with it in the above-mentioned locality; and there are several specimens in Mr. Wollaston's Collection taken at the same place by that gentleman. I am not aware that it has occurred elsewhere in Britain.

44. *PHILONTHUS SPLENDIDULUS*, Grav.; Waterhouse, Cat. Brit. Col. 25 (1858).

This curious insect is apparently rare; it is to be sought for on the muddy margins of ponds and streams: I first met with it near Kingsbury on the 11th of September, 1848.

45. *PHILONTHUS THERMARUM*, Aubé; Waterhouse, Cat. Brit. Col. 25 (1858).

*Philonthus exilis*, Kraatz olim.

Frequents manure heaps and hot-beds. I have met with it near Croydon, and Mr. Squire secured two or three specimens near Hampstead in July last.

46. *PHILONTHUS FUMARIUS*, Grav.; Waterhouse, Cat. Brit. Col. 25 (1858).

The first specimens which came under my notice I obtained at the sale of the collections of the late Mr. Hemmings, of Brighton, where he probably captured them. Dr. Power has met with it in the same locality; and Mr. Squire found it there sparingly in December last.

47. *PHILONTHUS NIGRITA*, Nordm.; Waterhouse, Cat. Brit. Col. 25 (1858).

Taken by Dr. Power at Eltham, Kent, in January last.

48. *PHILONTHUS PULLUS*, Nordm.; Waterhouse, Cat. Brit. Col. 25 (1858).

Discovered by Dr. Power at Portsea in August, 1857.

49. *PHILONTHUS CINERASCENS*, Grav.; Waterhouse, Cat. Brit. Col. 26 (1858).

An abundant species near London, occurring on the margins of ponds and ditches; I have met with it in profusion at Hammersmith marshes and similar localities.

I have great hesitation in including this in the list of new species, but it appears from Mr. Waterhouse's Catalogue to have been unknown to Stephens, who erroneously applied the name to *Phil. procerulus*, Grav.

50. *PHILONTHUS SIGNATICORNIS*, Mulsant et Rey; Waterhouse, Cat. Brit. Col. 26 (1858); Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858).

Taken by Dr. Power at Eastcot, Merton and Barnes. I have met with it at Hammersmith and Southend.

51. *HETEROHOPS DISSIMILIS*, Grav.; Waterhouse, Cat. Brit. Col. 22 (1858).

In haystack refuse near Finchley and Highgate; rare. Dr. Power has taken it near Waterford and in the neighbourhood of Brighton.

52. *HETEROHOPS QUADRIPUNCTULUS*, Grav.; Waterhouse, Cat. Brit. Col. 22 (1858).

In decaying vegetables, and among haystack rubbish, near Croydon and Finchley; very rare. Dr. Power has met with it at Hammersmith and Darenth, Kent.

53. *QUEDIUS XANTHOPUS*, Eric.; Waterhouse, Cat. Brit. Col. 22 (1858).

54. *QUEDIUS SCITUS*, Grav. Waterhouse, Cat. Brit. Col. 23 (1858).

Mr. Waterhouse refers this species to Erichson; but that author cites *Staph. scitus*, Grav. Mon. Col. Micr. 50, 13 (1806), and Gyll. Ins. Suec. ii. 306, 22 (1810). Kraatz

quotes Gyllenhal, but omits all reference to Gravenhorst, to whom, however, the species has been universally attributed.

Kraatz considers *Quedius atriceps*, Steph., as the variety with the thorax and elytra destitute of black markings—“*rufo-testaceus capite solo piceo*;” it is, Mr. Waterhouse states, a variety of *Q. fulgidus*, F.

This insect is certainly partial to the society of *Formica fuliginosa*; but is, nevertheless, not a myrmecophilous species in the strict sense of the term. I have taken it with the ant, and beneath bark, far removed from any ant's nest; it appears to be a rare and exceedingly local species.

55. *QUEDIUS LÆVIGATUS*, Gyll.; Hardy in Murray's Catalogue of Scotch Coleoptera, 122 (1853); Waterhouse, Cat. Brit. Col. 23 (1858).

Apparently confined to the northernmost portions of our island; the first specimen which I had seen was sent me nearly ten years since by Mr. R. Hislop; it was subsequently brought up to London in some numbers by Mr. Foxcroft, by whom it was taken beneath the bark of firs at Rannoch, Perthshire.

I find that, through some unaccountable oversight, I neglected to include this species in my summary of new species in the Annual for 1855.

56. *LATHROBIUM RUFIPENNE*, Gyll.; E. W. Janson, Proc. Ent. Soc. 6 July, 1857; Waterhouse, Cat. Brit. Col. 26 (1858).

Mr. Stephens's descriptions, Illustr. Mand. v. 268, 6; Man. Brit. Col. 405, 3229, refer indubitably to this insect, being copied, the diagnosis verbatim, from Gyllenhal; but in his cabinet a male individual of the common *L. elongatum* has served to represent it: taken near Bristol by Mr. S. Barton; at Clapham, near London, by Mr. Waterhouse; near Graves-



end by myself; and, about a month since, by Mr. Squire at Horning, in Norfolk. It frequents turfy bogs, and appears to be everywhere scarce.

57. *LATHROBIUM PALLIDUM*, Nordm.; Waterhouse, Cat. Brit. Col. 27 (1858).

I captured a single example of this insect amongst rubbish brought down during a flood, at Tottenham, Middlesex, on the 29th October, 1848.

58. *SCOPEUS LEVIGATUS*, Gyll.; Waterhouse, Cat. Brit. Col. 27 (1858).

Discovered by Mr. Wollaston in North Wales.

59. *LITHOCHARIS BRUNNEA*, Eric.; Waterhouse, Cat. Brit. Col. 27 (1858).

The first specimen which came under my notice was found by Mr. G. Guyon at Ventnor, in the Isle of Wight, about six years back; I have since taken it near London; it appears to be rare.

60. *LITHOCHARIS APICALIS*, Kraatz; Waterhouse, Cat. Brit. Col. 27 (1858).

61. *STILICUS SUBTILIS*, Eric.; Waterhouse, Cat. Brit. Col. 27 (1858).

I have taken this species near Croydon on several occasions in the spring, and secured a single example at Hurst, near Brighton, on the 7th October, 1857; it occurs in moss and among decaying vegetable matter, and appears partial to the chalk.

62. *STILICUS SIMILIS*, Eric.; Waterhouse, Cat. Brit. Col. 27 (1858).

63. *STILICUS GENICULATUS*, Eric.; Waterhouse, Cat. Brit. Col. 27 (1858).

Taken by Dr. Power near Uxbridge, and at Woking, and to his liberality I am indebted for a specimen.

*Rugilus punctipennis*, Steph., has, according to the published descriptions [Illustr. Mand. v. 278, 3 (1833), Man. Brit. Col. 408, 3252 (1839)], the "*elytra brassy black, spotless*," and can scarcely be referred to the present species, in which the *elytra* are *pitchy*, with the *apex testaceous*.

64. *PÆDERUS CALIGATUS*, Eric.; Waterhouse, Cat. Brit. Col. 27 (1858).

Found by Mr. Waterhouse, near Alverstoke, Hants.

65. *STENUS SOLUTUS*, Eric.; Waterhouse, Cat. Brit. Col. 29 (1858), Proc. Ent. Soc. 3 May, 1858, Zool. 6116 (1858); E. Shepherd, Proc. Ent. Soc. 3 May, 1858, Zool. 6114 (1858).

Taken at Cowley, near Uxbridge, and at Lee, Kent, by Dr. Power, and within the London district by Mr. E. Shepherd and myself. Mr. Squire has likewise met with it at Whittlesea, and at Horning, Norfolk. Although widely distributed it appears to be very scarce.

66. *STENUS PICIPENNIS*, Eric.; E. W. Janson, Proc. Ent. Soc. 5 April, 1858, Zool. 6072 (1858); Waterhouse, Cat. Brit. Col. 28 (1858).

First identified as a distinct unrecorded British species by Mr. Edwin Shepherd, who captured it in the autumn of 1857, at which period he presented me with specimens and pointed out to me its characteristics. Found by Dr. Power in Hampshire, and by myself at Hampstead, Highgate and Southend.

67. *STENUS RUGOSUS*, von Kiesenwetter; T. V. Wollaston, Zool. 5928 (1858).

*Stenus Guynemeri*, Jacq. Duval; Waterhouse, Cat. Brit. Col. 28 (1858).

“Caernavon, amongst wet earth and shingle at the edges of a small trickling stream, which finds its way into the

river which flows down from the Snowdon range through the Llanberis Pass. Extremely rare." *Wollaston, l. c.*

Mr. Edwin Shepherd has received it from Mr. M. Young, by whom it has been taken, in some numbers I believe, in the vicinity of Paisley.

68. *EVÆSTHETUS LÆVIUSCULUS*, Mannerh.; Waterhouse, Cat. Brit. Col. 27 (1858).

Discovered by Mr. Wollaston at Holyhead.

69. *EVÆSTHETUS RUFICAPILLUS*, Lacord.; Waterhouse, Cat. Brit. Col. 27 (1858).

Abundant at Hammersmith marshes in the early spring; found also, but I believe very sparingly, at Horning, Norfolk, by Mr. Squire.

70. *BLEDIUS PALLIPES*, Grav.; Waterhouse, Cat. Brit. Col. 29 (1858).

71. *BLEDIUS FEMORALIS*, Gyll.; Waterhouse, Cat. Brit. Col. 29 (1858).

72. *PLATYSTHETUS NODIFRONS*, Sahlb.; Waterhouse, Cat. Brit. Col. 29 (1858).

Taken by Mr. Wollaston at Whittlesea.

73. *PLATYSTHETUS CAPITO*, Heer; T. J. Bold, Zool. 5928 (1858) (described).

First taken, in May, 1856, by my colleague, Mr. Edwin Shepherd, near Croydon, and subsequently in the same locality by myself; I have likewise met with it near Reigate, and have recently seen a specimen in Dr. Power's Collection, secured by that gentlemen near Dover.

Not having had an opportunity of narrowly examining Mr. Bold's insect, I am unable to state anything positive with respect to it; but his description appears to me not to agree with the true *capito*, Heer, Kraatz; the conformation of the sixth and seventh abdominal segments given by

Mr. Bold being at variance with my insect and with Dr. Kraatz's description (Naturgesch. der Ins. Deutschl. ii. 844 (1858)).

74. OXYTELUS PICEUS, L.; Grav.; Gyll.; Eric.; Waterhouse, Cat. Brit. Coll. 30 (1858).

Mr. Waterhouse cites the *Staph. piceus* of the Linnæan Collection as synonymous with the *O. sculptus*, Grav.; Eric. Dr. Erichson considered it identical with the insect described by Gyllenhal under the specific title of *piceus*, which was confirmed by Mr. Westwood, Proc. Ent. Soc. 5 Oct. 1840, p. 13, Ann. and Mag. Nat. Hist. vii. 149 (1840), Trans. Ent. Soc. Lond. iv. 54, 25 (1845), where he says, "I believe the *Oxyt. piceus* of the English collections is a distinct species." Now the *O. piceus* of the English collections is doubtless the insect so denominated by Stephens in *his* Collection (the fountain-head of Entomological information of that day, at all events as far as nomenclature was concerned), and which Mr. Waterhouse correctly assigns as a synonym to *O. sculptus*, Grav. I am willing to believe that the insect now standing in the Linnean Collection as *Staph. piceus*, L., coincides with *O. sculptus*, Grav.; but it is manifest that some transposition or substitution must have taken place during the eighteen years which have elapsed since Mr. Westwood critically examined it: moreover Linnæus, Syst. Nat. i. 686, 25, remarks of his *S. piceus*, "*Habitat Upsaliæ*," but the *O. sculptus* has not, I believe, to this day been detected in Sweden.

75. ANCYROPHORUS OMALINUS, Eric.; Kraatz; Waterhouse, Cat. Brit. Col. 30 (1858).

Taken by Dr. Power near Sawley, Lancashire.

76. TROGOPHLOEUS FOVEOLATUS, Sahlb.; Eric.; Waterhouse, Cat. Brit. Col. 30 (1858).

77. THINOBIUS BRUNNEIPENNIS, Kraatz? Waterhouse, Cat. Brit. Col. 30 (1858).

Scotland. In the Rev. W. Little's Collection. *Mr. Waterhouse.*

78. ACROGNATHUS MANDIBULARIS, Gyll.; J. W. Douglas, Proc. Ent. Soc. 7 June, 1858, Zool. 6152 (1858).

"Taken at Darenth about three years ago."

79. ANTHOPHAGUS CARABOIDES, Grav., Eric. (*nec* Steph.); Waterhouse, Cat. Brit. Col. 30 (1858).

80. LESTEVA PUBESCENS, Mannerh., Eric.; Waterhouse, Cat. Brit. Col. 31 (1858).

Captured in North Wales by the Rev. H. Clark; near Paisley by Mr. M. Young; and in the Isle of Wight by Mr. F. Bates, to whom I have much pleasure in acknowledging myself indebted for a beautiful specimen.

81. OMALIUM MONILICORNE, Gyll.; Waterhouse, Cat. Brit. Col. 31 (1858).

Stephens's description of *S. monilicorne*, Illust. Mand. v. 347, 5 (1834); Man. Brit. Col. 428, 3419 (1839), appears to have been compiled from Gyllenhal, Ins. Suec. ii. 219, 18 (1810), his diagnosis being copied verbatim, save that in lieu of "*elytris longioribus fuscis, confertissime punctulatis*," he has simply "*elytris piceis*." In his collection, however, he has placed a specimen of *O. concinnum*, Marsham, to represent it.

Taken by Mr. Foxcroft at Rannoch, Perthshire, in the summer of 1855.

82. OMALIUM PLANUM, Payk.; Waterhouse, Cat. Brit. Col. 31 (1858).

Stephens's description of *O. planum*, Illust. Mand. v. 346 (1834); Man. Brit. Col. 427, 3415 (1839), appears to apply to the insect under consideration, and could certainly

not have been drawn up from the specimen of *O. concinnum* which now stands as the exponent of the species in his cabinet. The first example of this species which came under my notice was taken by Mr. Wollaston at Penheale, Cornwall; I subsequently met with it at Colney Hatch, Hampstead, Darenth and Shirley, and Mr. Edwin Shepherd has captured it near Putney. It occurs, but very sparingly, beneath the bark of decaying trees.

83. *OMALIUM EXIGUUM*, Gyll.; Waterhouse, Cat. Brit. Col. 31 (1858).

The descriptions of *O. exiguum*, Steph. Mand. v. 350, 13 (1834); Man. Brit. Col. 428, 3427 (1839), are abridged from Gyllenhal, Ins. Suec. ii. 218, 17 (1810); the insect, however, so designated by the Swedish Entomologist, appears to have been unknown to Stephens. Mr. Wollaston captured it at Killarney, and I have taken it on several occasions in the neighbourhood of London.

84. *OMALIUM PYGMÆUM*, Payk., Eric.; Waterhouse, Cat. Brit. Col. 32 (1858).

This species appears to be unrepresented in Mr. Stephens's Collection: his descriptions, Illust. Mand. v. 356, 30 (1834); Man. Brit. Col. 430, 3444 (1839), are evidently copied from Gyllenhal, Ins. Suec. ii. 223, 22 (1810), and therefore apply to the insect before us, which occurs, but very rarely, in boleti and beneath bark of decaying trees. The first specimen which came under my observation was captured near Norwich by Mr. Wollaston. I have taken solitary examples at Colney Hatch and near Croydon, and Dr. Power has secured an individual near Alverstoke, Hants.

85. *OMALIUM INFLATUM*, Gyll.; Waterhouse, Cat. Brit. Col. 32 (1858).

86. *MEGARTHURUS SINUATOCOLLIS*, Lacord., Eric.; Hardy, in Murray's Cat. Scot. Col. 134 (1853); Waterhouse, Cat. Brit. Col. 32 (1858).

Mr. Hardy considered that this insect was probably identical with *M. depressus*, Steph., but as it proves not to be so, according to Mr. Waterhouse, and to be totally unrepresented in his cabinet, the merit of first identifying it as an inhabitant of Britain is due to Mr. Hardy.

“Berwickshire, Dalmeny, Aberdeenshire;” common in garden rubbish at Finchley and Highgate, and occasionally in putrid fungi at Hampstead.

87. *MEGARTHURUS HEMIPTERUS*, Illig.; Hardy in Murray's Cat. Scot. Col. 134 (1853); Waterhouse, Cat. Brit. Col. 32 (1858).

*M. rufescens*, Steph., turns out to be a pale variety of *M. denticollis*, Beck, and not, as Mr. Hardy conjectured, synonymous with the present species. Appears to be of very rare occurrence in Britain; it is found in putrid fungi, and has been taken by Mr. Wollaston at Scawby, Lincolnshire, by Mr. T. P. Dossetor and myself at Mereworth, Kent, and I have met with single examples near Highgate and Mickleham.

88. *HISTER MARGINATUS*, Eric.; Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6072 (1858).

Distinguished from *H. carbonarius*, Ent. Hefte, with which it is not improbably mixed up in many collections, by its uniformly smaller size, sub-orbicular outline, and by the anteriorly abbreviated second striæ, which reach the middle only of the elytra, while the first and third are entire, or very nearly so.

89. *SAPRINUS IMMUNDUS*, Gyll.; Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6072 (1858).



Taken at the mouth of the Orwell, in September, by Mr. Waterhouse, and at Deal by Dr. Power and Mr. F. Smith.

90. *SAPRINUS METALLICUS*, F. (*nec* Steph.); Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6073 (1858).

Discovered at Deal by Mr. F. Smith.

Distinguished from *S. rugifrons*, Payk. (*metallicus*, Payk., Gyll., Steph.), by its smaller size, more convex ovate form, and by the anterior tibiæ having five denticulations only on their outer edge.

91. *ACRITUS NIGRICORNIS*, Ent. Hefte; Waterhouse, Proc. Ent. Soc. 5 April, 1858, Zool. 6073 (1858).

Taken by Mr. Wollaston at Spridlington, Lincolnshire, and by Mr. Waterhouse in the corridor of the Crystal Palace; indicated as a native of Britain by De Marseul in his Mon. Hist. Ann. de la Soc. Ent. de France, 3ième Ser. iv. 613, 12 (1857).

This species is distinguished from *A. minutus*, Hbst., by the sub-quadrate form of the mesosternum, its marginal stria dividing at each anterior angle, and by the more elongate prosternum. The colour of the antennæ appears scarcely to differ in the two species, and the fine striæ on the elytra, on which Mr. Waterhouse laid great stress as a diagnostic, though not alluded to in his written and published communication, are certainly not a distinguishing character of *nigricornis*, being not unfrequently conspicuous in *minutus*. Found in company with *minutus* in dung-heaps, hot beds, and vegetable and animal refuse.

In *Hister nigricornis*, Ent. Hefte, and *H. minutus*, Hbst., the posterior tarsi consist of four articulations only, a structural peculiarity noticed by Redtenbacher, Faun. Austr. 242 (1849), and on which, and the perpendicularly deflexed



pygidium, Leconte founded the genus *Acritus*, Proc. Acad. Nat. Sc. Philadelph. vi. 287 (1853).

92. TRICHOPTERYX CONVEXA, Matthews, Zool. 6107 (1858) (described).

“Oxfordshire.”

93. TRICHOPTERYX THORACICA, Gillm.; Matthews, Zool. 6109 (1858).

94. TRICHOPTERYX BREVIPENNIS, Eric.; Matthews, Zool. 6109 (1858).

95. TRICHOPTERYX SIMILIS, Gillm.; Matthews, Zool. 6109 (1858).

96. PTERYX MUTABILIS, Matthews, Zool. 6106 (1858) (described).

97. PTINELLA BRITANNICA, Matthews, Zool. 6032 (1858) (described).

“Oxfordshire.”

98. MICRUS FILICORNIS, Fairm. and Laboulb.; Matthews, Zool. 6109 (1858).

99. MICRUS PULCHELLUS (Alib.), Gillm.; Matthews, Zool. 6109 (1858).

100. PTILIUM FUSCUM (Waltl.), Eric.; Matthews, Zool. 6110 (1858).

101. PTILIUM CANALICULATUM (Maerk.) Eric.; Matthews, Zool. 6110 (1858).

102. SPHÆRIUS ACAROIDES, Waltl.; Matthews, Zool. 6032 (1858).

Found in June, 1854, on a wall in a garden in Oxfordshire.

103. BLAPS MORTISAGA, L., Gyll., Mulsant, *nec* Steph.; T. J. Bold, Zool. 5974 (1858) (described).

“Near Elgin, Morayshire.”

## 104. HALLOMENUS HUMERALIS, F.

*Hallomenus humeralis*, Panzer, Faun. Ins. Germ. xvi. 17 (1794); Gyll. Ins. Suec. ii. 527, 1 (1810); Redtenb. Faun. Austr. 610, 2 (1849); 2nd ed. 628, 2 (1858).

*Dircæa humeralis*, F., Syst. El. ii. 91, 10 (1801).

Two specimens taken by Mr. Pelerin, in July last, near Hornsey, Middlesex, in a rotten willow.

M. E. Perris, in his admirable Essay on the insects which infest *Pinus maritimus*, Annales de la Soc. Ent. de France, 3ième Ser. v. (1857), has elaborately described and figured the metamorphoses both of this species\* and of *H. flexuosus*, Payk., † and directed attention to the striking and important differences which exist, especially in the larvæ of the two species, in the number and disposition of the ocelli, the structure of the maxillæ, mentum and mandibles, and the conformation of the terminal abdominal segment; discrepancies, he remarks, to which we are unaccustomed in larvæ of the same genus, and which give rise to grave doubts as to the propriety of so intimate an association of the two species.

Fig. 8.

## 105. TOMICUS SAXESENII, Ratzeb.? E. C. Rye, Entom. Weekly Intelligencer, 28 Nov. 1857, 70.

Found by Mr. Rye on the 11th of October in a decayed elm on Wandsworth Common.

## 106. LEMA ERICHSONII, Suffrian; Waterhouse, Proc. Ent. Soc. 7 Sept. 1857.

Found by Dr. Power, in Ireland, early in the autumn of 1857. A specimen is extant in the cabinet of the late

\* Page 382, tab. 9, figs. 481—490.

† Page 378, tab. 9, figs. 473—480.

Mr. Stephens, who had evidently recognized it as a distinct species, having set it apart, but without a label.

This insect resembles on a cursory inspection the common *L. (Crioceris) cyanella*, L., so nearly that it may possibly be found mixed up with it in some of our collections. It differs in being a trifle larger, in the thorax being widest a little before the middle, its disc exceedingly finely punctate, with three irregular longitudinal rows of larger punctures; the elytra are more finely punctate-striate, the interstices transversely wrinkled.

107. *CRYPTOCEPHALUS IMPERIALIS*, F.; Waterhouse, Proc. Ent. Soc. 7 Sept. 1857.

Found by Dr. Power some years since on the Gogmagog Hills, Cambridgeshire. Identified by Mr. Edward Shepard.

Fig. 5.

108. *CRYPTOCEPHALUS VARIABILIS*, Schneider; Waterhouse, Proc. Ent. Soc. 7 Sept. 1857.

Confounded by Dr. Leach and Mr. Stephens with its nearly ally *C. sexpunctatus*, L., a single specimen having been detected in each of their cabinets mixed up with that species; no clue exists, it would appear, to the localities in which these specimens were taken.

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The following require further investigation ere they can be admitted as species new to our list.

*NEBRIA NIVALIS*, Payk.; E. W. Janson, Proc. Ent. Soc. 6 Sept. 1858, Zool. 6252 (1858).

I have only recently had an opportunity of examining the two specimens referred by Mr. Squire to this species, and which certainly present the characters attributed by Drs.

Kraatz and Schaum to the variety of *N. nivalis* with pitchy black femora; but among the *Nebriæ* collected by Mr. Squire in the Shetland Isles I find an individual, which, as regards the proportions of the thorax and the depth of the elytral striæ, is intermediate between the two specimens called by him *nivalis* and the insect now denominated *Gyllenhalii* (*nivalis*, Dawson); it has, moreover, the legs entirely rufous; hence the twofold doubt arises, whether the specimens supposed by Mr. Squire to pertain to *N. nivalis*, Payk., Kraatz, Schaum, are in reality referrible thereto; and, if they be so, whether it can be maintained as a species.

PATROBUS LAPPONICUS, Chaudoir? E. W. Janson, Proc. Ent. Soc. 6 Sept. 1858, Zool. 6253 (1858).

Clova Mountains, Mr. Murray; Shetlands, near Lerwick, Mr. H. Squire; North Wales, Rev. H. Clark; Northumberland, Dr. Power. Specifically distinct, I believe, from the *P. excavatus*, Payk., Dawson, from which its short broad and convex thorax, the coarse sculpture of that segment and of the head, together with its deep black hue, serve readily to distinguish it. Dr. Schaum informs us, Naturgesch. d. Ins. Deutschl. i. 376 (1858), that *Patrobus Lapponicus*, Chaudoir, is described from an unique specimen, and requires further confirmation.

2, ALMA ROAD, UPPER HOLLOWAY,  
November 10th, 1858.

## LEPIDOPTERA.



NEW BRITISH SPECIES IN 1858.

(BY THE EDITOR.)

THE almost unprecedented heat of last June, coming so closely on the heels of the unusually hot summer of 1857, has had a most extraordinary effect on insect life.

Many species that are usually rare have been taken in some plenty; species that are generally limited to a few of our southern counties have wandered far further north this year; *Colias Edusa* has gladdened the eyes of many a north country Entomologist, and some South European species, not previously added to our lists, have now found a place there.

*How* the heat of the weather produces these effects is a problem which we are not prepared to solve, and which will probably long serve to puzzle the rising generation of Entomologists.

That *Micra Ostrina*, not taken here since 1826, should occur simultaneously in different parts of the country, is certainly startling—though from all accounts the habit of the insect is so retired that it seems but natural, even if the insect were about, that it should escape observation.

Our list of novelties is far better than usual, and the occurrence of *Notodonta bicolora* in the south-west of Ireland will certainly tempt many next summer to visit that part of the country, where we are told it is not improbable that *Charaxes Jasius* may occur.

Entomologists should bear in mind that amongst the best early captures next spring will be hybernated specimens of *Vanessa Antiopa*.

The following is the list of New British Species in 1858:—

BOMBYCINA.	TINEINA.
Notodonta bicolora.	Swammerdamia Pruni.
NOCTUINA.	Gelechia leucomelanella.
Xanthia ocellaris.	„ ocellatella.
Hadena peregrina.	„ subdecurtella.
Micra parva.	Harpella Bracteella.
Catephia alchymista.	Glyphipteryx Cladiella.
GEOMETRINA.	„ Schœnicolella.
Eupithecia viminata.	Coleophora Salinella.
PYRALIDINA.	Elachista stabilella.
Diasemia Ramburialis.	„ perplexella.
Nola Centonalis.	„ Cingillella.
Acrobasis rubrotibiella.	„ Caricis.
TORTRICINA.	Cemiostoma Lotella.
Catoptria parvulana.	„ Wailesella.
	Nepticula Pomella.

NOTODONTA BICOLORA, Fabricius.

(Fig. 4.)

A specimen of this conspicuous and pretty species was taken near Killarney, last July, by Mr. Bouchard, in an extensive birch wood. The specimen is in Mr. Waring's collection.

On the Continent the perfect insect appears in May and June, and the larva (figured by Freyer, N. B. iii. Pl. 212), feeds on birch in July.

## XANTHIA OCELLARIS, Borkhausen.

The capture of this species at Brighton has been recorded; see "Intelligencer," vol. v. p. 36.

## HADENA PEREGRINA, Treitschke.

Not very closely allied to any of our known species. In September, 1857, Mr. Bond took a specimen at Freshwater, in the Isle of Wight; the insect is a native of Southern Europe and attached to low coasts.

## MICRA PARVA, Hübner.

(Fig. 1.)

Of this insect, execrably figured by Hübner, a passable likeness is given by Duponchel (under the name of *Minuta*); his description, however, is far more satisfactory than his figure.

Several years ago Mr. Doubleday saw a specimen which had been taken at Teignmouth by Mr. Jordan, but it was so mutilated as to be unrecognizable.

In the past summer Dr. Battersby of Torquay has been fortunate in obtaining two specimens, of which he has, at my request, sent the following notice.

"My daughter having found a specimen of *Micra Ostrina* in June, I was induced to go with my children the two following mornings and make a close search along the coast wherever the cliffs are accessible, and, having a good many little eyes at work, we were fortunate enough to meet with five more; they occurred at three places in an extent of about three miles, and were met with from half-way down the cliffs to the water's edge. We found *Micra parva* only in one place, and saw but two specimens, both of which were

captured; they, as well as an *Ostrina*, lay very close among the grass and brambles, and when disturbed did not fly more than a yard or two, *Ostrina* settling on the ground and *Parva* on plants: this was the only difference I observed in their habits; indeed, until I was able to examine both carefully at home, I considered that I had merely taken the two sexes of *Ostrina*. We searched the cliffs with great care for nearly a week after, but without seeing a trace of more."

Dr. Staudinger informs us that the larva of *M. Ostrina* feeds in the shoots of thistles; that of *M. parva* may have a similar habit.

#### CATEPHIA ALCHYMISTA, W. V.

Of this most conspicuous and striking species, of which we hope to give a figure next year, a single specimen was taken in September this year at sugar by Dr. Wallace in the Isle of Wight.

The larva feeds on oak in July and August, the perfect insect appearing naturally in June of the following year; hence its capture in September must be considered exceptional.

This is not the *Leucomelas* of Haworth, of which he says, "Mr. Francillon possesses an English specimen;" the Francillonian specimen may still be seen amongst the doubtful British species in the possession of Mr. Shepherd.

#### EUPITHECIA VIMINATA, Doubleday.

This obscure species, described by Mr. Doubleday in the "Zoologist" last summer, p. 6103, appears to frequent the osier: it has occurred in several localities, but its want of distinctness has perhaps caused it to be overlooked.



## DIASEMIA RAMBURIALIS, Duponchel.

(Fig. 3.)

A specimen of this insect, which had previously only been recorded as occurring at Vienna and Corsica, was taken at Probus in Cornwall by Mr. Boyd, on the 16th of June," a single specimen flying in a swamp at dusk" (Int. vol. iv. p. 151). Duponchel states that it occurs in marshy places in the Isle of Corsica, in April and August.

## NOLA CENTONALIS, Hübner.

A specimen of this species, which may readily be distinguished from *Cristulalis* by the more stumpy anterior wings and the different form of the elbowed line, was taken at light on the 1st of July, at Bembridge in the Isle of Wight, and was exhibited by Dr. Wallace at the August meeting of the Entomological Society of London.

Herrich-Schäffer has figured this species in his second volume, figures 141 and 142.

## ACROBASIS RUBROTIBIELLA, Mann.

Two specimens of this novelty were taken by Mr. McLachlan flying round an oak tree near Forest Hill, and were exhibited at the September meeting of the Entomological Society.

The species is closely allied to *A. tumidella*, but differs from it in the following respects:—

1°. The basal portion of the wing, instead of being orange, is a pale grey, with a red streak along the costa; 2°. instead of the broad orange band beyond the black first line there is only a slender red band; and 3°. the hind margin of the wing is straighter and less oblique.

## CATOPTRIA PARVULANA, Wilkinson, MS.

This little species reminds one somewhat of a dwarf *Cæcimaculana*, but is darker and has the markings more shining. It was taken by Mr. Bond in the summer of 1857, in the Isle of Wight, amongst dwarf thistles.

## SWAMMERDAMIA PRUNI, Stainton (Int. iv. p. 91.)

The larva of this species, found by Mr. Parfitt of Exeter on plum, is so strikingly different from the other larvæ which we know of the genus, that there can be little doubt of the distinctness of the species; although the only specimen yet bred of the perfect insect so closely resembles *S. griseocapitella*, that a series will be necessary in order to ascertain its distinctive characters.

## GELECHIA LEUCOMELANELLA, Zeller.

*Alis anticis nigris, fascia obliqua ad dorsum latiore ante medium, nebulaque in medio indistincte albidis, maculis duabus posticis albis, costali majore ac posteriore.*

Exp. al. 6 lin.

Head and face blackish. Second joint of the palpi greyish-ochreous, terminal joint black. Antennæ blackish, with very slender paler annulations. Anterior wings black, with some scattered whitish scales; not far from the base is an obliquely placed whitish fascia, broadest on the inner margin, and nearly on the middle of the disc is an indistinct whitish cloud; beyond are two distinct white marginal spots, of which that on the costa is the larger and placed nearer to the apex of the wing; cilia grey.

This is another species added to our lists by the untiring energy of Mr. Boyd, who found the larva mining the shoots

of *Silene maritima* at the Lizard in Cornwall, May 18th, 1858. The insect is referable to the *Tricolorella* group, but it is easily recognized by the clear black and white markings.

GELECHIA OCELLATELLA, Stainton.

*Alis anticis griseis, ochraceo-suffusis, dorso dilutiore, punctis tribus nigris ochraceo-circumcinctis, fascia postica, parum angulata, dilute ochracea; margine postico ochraceo-punctata.*

Exp. al. 6 lin.

Head and face greyish-ochreous, sometimes with a reddish tinge. Palpi greyish; terminal joint pale ochreous, with a black spot externally at the base and a black ring before the apex. Antennæ dark grey. Anterior wings dark grey, much dusted with ochreous, especially along the inner margin, which hence appears paler; in the middle of the wing are three black spots, one on the fold and two beyond it on the disc, the second of which is generally itself composed of two small spots; all are surrounded with ochreous rings, giving the insect an ocellated appearance; towards the hind margin is a pale, ochreous, angulated fascia, divided in the middle by a dark grey dash; an indistinct row of pale ochreous spots precedes the hind margin; cilia pale grey, with a faint ochreous tinge. Posterior wings pale grey, with pale greyish-ochreous cilia. Abdomen dark grey.

This species is allied to *G. instabilella* and *obsoletella*, but the anterior wings are much shorter than in *Instabilella*, and in form much more nearly resemble *G. obsoletella*, yet in that species the upper half of the sub-apical fascia is more perpendicular, and the basal half of the abdomen is ochreous-grey. These are differences which preclude the possibility of *Ocellatella* being a form of either of those species.

Except a few specimens taken by Mr. Wollaston at Porto

Sancto, this species was entirely unknown, till Mr. Boyd met with it in Cornwall at the Lizard last May. Mr. Boyd also met with the larva at the same time feeding in the flower-heads of *Beta maritima*.

GELECHIA SUBDECURTELLA, n. sp.

*Alis anticis costam versus cæruleo-griseis, dorsum versus ochraceis strigulis duabus obliquis fuscis abbreviatis ante medium, altera recta integra pone medium, fascia postica subargentea, punctis duobus disci nigris.*

Exp. al. 6 lin.

Allied to *Subericinella*, *Decurtella* and *Ericinella*, but abundantly distinct. I have seen but two specimens (and therefore abstain for the present from a more detailed description), which were taken in the Cambridge Fens by Mr. Bond last June.

HARPELLA BRACTEELLA, Linn.

(Fig. 2.)

*Alis anticis basim versus luteis, postice brunneis cæruleo-fasciatis, macula costali lutea apicem versus; ciliis apicis albis.*

Exp. 8 lin.

Head and face yellow. Palpi brown, the second joint yellow beneath, and the base and extreme tip of the terminal joint yellow. Antennæ dark brown, spotted with white along the back. Anterior wings bright yellow at the base, with a short dark blue streak along the costa; from before the middle the ground colour of the wings is dark brown, traversed by a narrow blue fascia nearly in the middle, an oblique transverse blue streak beyond the middle, and another parallel to the hind margin; between these last two

blue streaks is a large yellow spot on the costa; cilia dark brown, but the tips of the apical cilia white.

This conspicuous and pretty species has long held a place among the reputed British insects, and is figured in Wood's Index: its recurrence was recorded in the "Intelligencer," vol. iii. p. 179, Mr. Backhouse having sent me for examination a specimen, "which was taken near Gateshead, along with two or three more, by a young collector in a garden, flying about some old tree stumps, in the summer of 1857." Mr. Backhouse has very liberally enriched my Collection by the addition of this species.

The larva is a rotten-wood feeder, and I had no doubt fed on the old tree stumps. I have received it from Herr Grabow, of Berlin, feeding in the bark of mulberry trees.

#### GLYPHIPTERYX CLADIELLA, n. sp.

*Alis anticis saturate viride æneis, strigulis nullis, pone medium nigro-striatis, angulum analem et apicem versus nigro-squamato.*

Exp. al. 6—6½ lin.

Allied to *G. Thrasonella*, but with no silvery streaks.

This species has been collected during the two past seasons by Mr. Bond, in Wicken Fen, near Cambridge; the specimens do not vary, so that it does not appear to be a form of *Thrasonella*. It was taken flying singly over the tall sedge; and, as that fen abounds with *Cladium mariscus*, I should not be surprised to find that the larva feeds on the seeds of that plant.

#### GLYPHIPTERYX SCHÆNICOLELLA, Boyd.

*Alis anticis angustulis saturate æneo-griseis, strigula angusta curvata ex medio dorsi, strigulis posticis quinque costæ,*

*una dorsi albis, apicibus argenteis, macula violacea supra angulum analem, puncto apicis atro.*

Exp. al.  $4\frac{1}{2}$  lin.

In size this resembles *G. equitella* and *G. ocellatella*, but the anterior wings are much narrower, and the first dorsal streak is much more slender; besides the anterior wings have not the base pale as in *Equitella*, nor has the apical black spot a silvery pupil as in *Ocellatella*.

For the discovery of this species we are indebted to Mr. Boyd, who met with it in Cornwall, at the Lizard. "A species of *Glyphypteryx* was swarming amongst *Schœnus nigricans*, and on examination I found the seed-heads eaten, and an empty cocoon in the centre of many. The next day I collected a number of the heads, and had the pleasure of rearing several." Int. vol. iv. p. 144.

#### COLEOPHORA SALINELLA, n. sp.

*Alis anticis latiusculis, breviusculis dilute ochreis, griseo-irroratis, ciliis dilutioribus; palporum fasciculo nullo articuloque tertio brevissimo.*

Exp. al. 6— $6\frac{1}{2}$  lin.

Closely allied to *C. annulatella*, but the anterior wings shorter and broader; the cilia at the anal angle much paler, and the structure of the palpi very different, the second joint being unprovided with a tuft, and the third joint being so remarkably short.

Several specimens were taken by Mr. Douglas last August at Seaford, amongst *Atriplex portulacoides*.

#### ELACHISTA STABILELLA, Stainton.

Hitherto confounded with *Consortella*, but distinguished

by the whiteness of the head and the obliqueness of the fascia.

It occurs at Headley Lane, near Mickleham, in June and July (see Trans. Ent. Soc. vol. iv. N. S. (Part 8), p. 303).

#### ELACHISTA PERPLEXELLA, Stainton.

This species had hitherto been confounded with *Subnigrella*, from which it differs by the anterior wings being blacker, and the spots more nearly opposite.

The larva feeds in the leaves of *Aira cæspitosa*, and it has occurred at Beckenham, Scarborough and near Edinburgh (see Trans. Ent. Soc. vol. iv. N. S. (Part 8), p. 303).

#### ELACHISTA CINGILLELLA, Fischer.

Among the species which have only a single pale fascia on the anterior wings and have the head dark, this is especially distinguished by the slenderness and whiteness of the fascia.

Mr. Allis has a specimen taken in the North of England some years ago (see Trans. Ent. Soc. vol. iv. N. S. (Part 8), p. 312).

#### ELACHISTA CARICIS, n. sp.

Closely allied to *E. Rhynchosporella*, but darker; the hinder margin of the anterior wings more truncate, and the sub-apical costal spot placed more perpendicularly.

I bred several of this insect from larvæ collected by Mr. Winter and myself at Ramworth at the end of April; they were mining the leaves both of *Carex paniculata* and *Carex paludosa*, simultaneously with the larvæ of *Elachista Gleichenella*. The specimens thus obtained, when placed beside a series of *Rhynchosporella* and *Eleochariella*, ap-

pear quite distinct; future investigation must prove the correctness of this assumption.

CEMIOSTOMA LOTELLA, Stainton.

*Alis anticis angustulis plumbeis, postice cupreis, apice nigro, maculis duabus costæ albis, macula atra violaceo-pupillata ad angulum analem, ciliis albidis cum striis quatuor radiantibus nigris.*

Exp. al.  $2\frac{1}{2}$  lin.

Very closely allied to *C. scitella*, but the anterior wings are narrower; the apical portion of the wing, whence the radiating lines in the cilia start, is black instead of coppery; besides, the radiating lines are darker than in *C. scitella*, and the position of the two lower ones is quite different; in *C. scitella* one of these projects straight out at the end of the wing (or even droops a little), and the other droops considerably; in *C. Lotella* the one points slightly upwards and the other slightly downwards.

This species was detected by Mr. T. Wilkinson, who bred it from larvæ collected near Scarborough, mining in the leaves of *Lotus major*, and which at the time were supposed merely to have been larvæ of *Nepticula Cryptella*. Mr. Wilkinson again met with the larvæ this summer (see Int. vol. iv. p. 117).

CEMIOSTOMA WAILESELLA, Stainton.

Allied to *C. Laburnella* and *Spartifoliella*, but smaller, and with a faint bluish tint (see Int. vol. iv. p. 44).

In order to describe this species satisfactorily, it will be necessary to wait till we can examine an extensive series of bred specimens.



The insect is widely distributed, having occurred at Tunbridge Wells, near Newcastle-on-Tyne and at Mottram.

NEPTICULA POMELLA, Vaughan.

Allied to *Pygmæella*, but the anterior wings rather broader and more purple. A detailed notice of the larva, mine and cocoon has been given by Mr. Vaughan (see Int. v. p. 44). It is a garden insect, frequenting apple trees, in the leaves of which the larva mines.

## OBSERVATIONS ON BRITISH TINEINA.

(SUPPLEMENTARY to the INSECTA BRITANNICA—LEPIDOPTERA, TINEINA; and the ENTOMOLOGIST'S COMPANION, 2nd Edition.)



*Adela Fibulella*, I. B., p. 49. The larva has been found by Herr O. Hofmann feeding on the seeds and leaves of *Veronica Chamædrys* (Int. vol. iv. p. 185).

*Laverna propinquella*, I. B., p. 236. I have bred this from larvæ sent me in February by Mr. Wilkinson; the larvæ were mining the young leaves of *Epilobium hirsutum*.

*Laverna phragmitella*, I. B., p. 238 (E. A. 1858, p. 110). The larva feeds in the heads of the *Typha*, secreting itself in the woolly down, where it is about as easy to find "as a needle in a bottle of hay."

*Elachista magnificella*, I. B., p. 251. The larva mines the leaves of *Luzula pilosa*, in April and May. The habit was discovered in three different localities by three Entomologists, each unaware of the researches of the others.

*Elachista trapeziella*, I. B., p. 254. This larva was discovered by Mr. Scott in the leaves of the *Luzula pilosa*, and subsequently collected freely by Mr. T. Wilkinson (see Zoologist, 1858, p. 6146).

*Elachista Rhynchosporella* and *Eleochariella*, I. B., p. 259 and 260. Both these species? have been bred from larvæ in *Eriophorum angustifolium* (Cotton-grass), and both from larvæ in a *Carex*. Yet I am still unwilling to view them as identical.

*Trifurcula pulverosella*, I. B., p. 307. This species has been bred from the "*Nep.* larva making blotches in the apple leaves" (see Ent. Comp. p. 127, and Int. iv. p. 14).

ANSWERS TO ENIGMAS.

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ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1855, 1st Edition, p. 63; 2nd Edition, p. 81.

11. Not yet solved.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1856, p. 63.

18. From information I have received from Professor Frey there seems no doubt but that the *Lithocolletis* larva mining the *upper* side of birch leaves is truly the *L. Betulæ* of Zeller.

20. Not yet solved.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1857, p. 13.

26. Not yet solved.

27. Not yet solved.

28. *Coleophora limosipennella*.

29. *Coleophora Siccifolia*.

31. Not yet solved.

32. *Coleophora Albicans*.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1858, p. 115.

33. Not yet solved.

34. *Cemiostoma Wailesella*.

35. *Coleophora Therinella*.
36. *Tischeria Dodonæa*, Stainton, n. s.
37. Not yet solved.
38. Not yet solved.
39. *Coleophora albicostella*, Duponchel.
40. *Coleophora*, n. s., near *Vulnerariæ*, bred by Professor Frey.
41. Not yet solved.
42. *Butalis torquatella*.
43. *Coleophora Cornuta*, Frey, n. s.
44. *Nepticula Agrimonæ*, Frey, n. s. (Int. iv. p. 43).
45. *Nepticula Freyella*, Heyden, n. s. (Int. iv. p. 175).

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## ENIGMAS STILL UNANSWERED.

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11. "An *Elachista* larva, found by Mr. Scott at the end of April, mining the leaves of *Scirpus lacustris*." No one appears to have again found this.

20. "A *Depressaria* larva, found by Mr. Boyd, May 2nd, 1855 (it was then young), feeding on a leaf of parsnip (*Pastinaca sativa*) under a turned-down corner; this was expected to be *Depressaria Douglasella*." This has not again been met with.

26. "A *Nepticula* larva, mining the leaves of birch; the mine has some resemblance to that of *Nep. luteella*, but the central track of excrement is broader, not so mathematically linear."

27. "A *Gelechia?* larva, feeding in the heads of yarrow (*Achillea millefolium*)."

31. "A *Coleophora* larva, feeding on *Vaccinium Myrtillus* in a longish slender case, somewhat like that of *Viminetella*." Professor Zeller thinks that this should be *C. orbitella*.

33. "A brown *Gelechia*-like larva, found amongst moss by Mr. Douglas in March, 1857."

37. "A *Coleophora* larva, found on birch at West Wickham, October 31st, 1857, in a case which had much the appearance of a birch bud."

38. "A *Lithocolletis*, mining the *upperside* of beech leaves."

41. "A *Gelechia?* larva, long and thin, of a pale dull yellowish; feeding on thyme, eating the leaves half through from the underside, and concealing itself in tubes of sand, spun together with silk." Professor Zeller has this year bred *Butalis siccella*, and he believes from the above-mentioned larvæ.

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## NEW ENIGMAS FOR SOLUTION.

46. A pretty red-spotted yellow larva mining a leaf of *Carex riparia*, found at Hackney, March 29th. Is there any possibility of this being *Cosmopteryx Lienigiella?* Only one larva was found, and that escaped when half figured; *Cosmopteryx* larvæ are excessively apt to crawl away.

47. A *Gelechia?* larva mining down the stems (near the root) of *Carex paludosa*, collected at Wicken Fen, near Cambridge, April 30th. These were very young, and all died. Some local Entomologists may be more successful in rearing this species.

48. A larva mining in the stems of the shoots of *Rhamnus frangula*, near Guildford, causing the leaves to droop; collected May 21st, 1858. It was imagined that this would have produced *Laverna Rhamniella*, but the larvæ all escaped or died.

49. A grotesquely minute, pistol-form *Coleophora* case, collected by Mr. Gregson, on *Salix fusca*, at the end of May. These only produced ichneumons.

50. A *Tortrix?* larva mining down the stems of *Centaurea nigra*, and ejecting its "frass" from a hole in the side of the stem; collected by Mr. Boyd at Probus, in Cornwall, June 19th (see Int. iv. p. 151).

56. A *Lithocolletis* larva mining the underside of the leaves of *Helianthemum vulgare*, collected near Ratisbon, Bavaria, by Herr F. Hofmann, at the end of June. I only reared one miserable cripple, which was unrecognizable; it appears to be new.

57. A *Gelechia?* larva feeding inside the flowers of *Campanula persicifolia* was collected by Herr O. Hofmann (then at Erlangen) at the end of June. None were reared.

58. A *Cosmopteryx?* larva, found by Mr. Scott, near Middlesboro' on Tees, July 12th, mining down the midribs of the leaves of *Centaurea Scabiosa*, making a small blotch on the upper side, and ejecting its black excrement. I succeeded in getting one larva into pupa, which subsequently presented me with an ichneumon!

59. A *Gelechia?* larva feeding in the fruit of the barberry

(*Berberis vulgaris*) was collected by Herr F. Hofmann, at Ratisbon, at the end of August.

60. A *Coleophora* larva was found by Herr F. Hofmann at the same time feeding on lime; the case was cylindrical, and rather wrinkly, like the case of *Vitisella*, with the mouth turned downwards.

61. A small larva, feeding gregariously in sloe leaves, was found by Herr F. Hofmann at the same time, but this may perhaps only be the young of *Scythropia Cratægella*.

62. A *Nepticula* larva in lime, distinct from *N. Tiliæ*, collected by Mr. Vaughan, near Bristol, September 14th, along with larvæ of *N. Tiliæ*. The mine of the new species is visceriform.

63. A *Coleophora* larva, supposed to be that of *Binotapennella*, was collected at the beginning of October, on the seeds of *Atriplex portulacoides*, by Mr. Bond, in the Isle of Wight.

64. A larva mining the leaves and boring the stems of *Chenopodium maritimum*, collected by Mr. Bond at the same time, is probably that of *Gelechia obsoletella*.

65. A *Nepticula* larva mining the leaves of *Helianthemum vulgare* was collected by Herr F. Hofmann early in October.

66. A *Nepticula* larva (supposed to be that of *N. Argyropeza*), mining close to the foot-stalk of the leaves of *Populus alba*, was collected in October by Senator von Heyden, near Wiesbaden, and by Mr. Vaughan, near Bristol.

67. An *Ornix?* larva collected by Herr Schmid, at Frankfort-on-the-Maine, in apple leaves. This differs in habit and appearance considerably from the larva of *O. guttea*.

68. A *Coleophora?* larva, discovered by Mr. Scott at Brighton, October 14th; it bores the stems and shoots of

*Salicornia*, throwing out much ochreous-white "frass," and using a piece of bored stem for a portable case. To change to pupa, Mr. Scott observes that it quits this case and enters the ground. Can this be a true *Coleophora*?

69. *Gelechia marmorea* has been bred from sand-cocoons, collected on Dawlish Warren by the Rev. J. Hellins. The habit of the larva yet remains to be detected.



## NATURAL HISTORY OF THE TINEINA.

DURING the past year sixty-one larvæ have been described, seventy have been figured, and the mines of nine others, which had died in transit, have also been figured.

Material has thus been accumulated within the year for nearly three volumes of the "Natural History of the Tineina," but it must be anticipated, that, as we penetrate deeper in our researches, the result will be less productive.

Our main chance lies in developing *new observers in new localities*.

It will be seen that one Entomologist has attained the promised distinction, and several others are following closely in his wake. This should serve as an encouragement to those who are still at the bottom of the ladder.

I annex, as in the two preceding Annuals, a Table, showing the amount of assistance I have received during the past twelve months.

		Discovered.	Sent.	Bred.	Known before.
Adela Fibulella .....	Hofmann.....	·50	·25	·25	
*Swammerdamia Pruni.....	Parfitt .....	·50	·25	25	
*Cerostoma antennella .....	Mühlig .....	..	..	..	·25
* costella .....	Mühlig .....	..	..	..	·25
Depressaria Hofmanni .....	Hofmann.....	·50	·25	·25	
Libanotidella .....	Hofmann.....	..	..	..	·25
	Frey.....	..	..	..	·25
Dictamnella .....	Hofmann.....	..	..	..	·25

		Discovered.	Sent.	Bred.	Known before.
<i>Gelechia scintillella</i> . . . . .	Mühlig . . . . .	·50	·25	·25	
<i>leucomelanella</i> . . . . .	Boyd . . . . .	·50	·25	·25	
* <i>ocellatella</i> . . . . .	Boyd . . . . .	·50	·25	·25	
<i>leucatella</i> . . . . .	Mühlig . . . . .	..	..	..	·25
<i>Farinosæ</i> . . . . .	Frey . . . . .	·50	·25	·25	
* <i>Cecophora minutella</i> . . . . .	Edleston . . . . .	..	..	..	·25
<i>Butalis torquatella</i> . . . . .	Mühlig . . . . .	·50	·25	·25	
<i>Glyphipteryx Haworthana</i> . . . . .	Chappell . . . . .	..	..	..	·25
<i>Argyresthia glaucinella</i> . . . . .	Edleston . . . . .	..	..	..	·25
* <i>Gracilaria Limosella</i> . . . . .	Frey . . . . .	·50	·25	·25	
<i>Ononidis</i> . . . . .	Frey . . . . .	..	..	..	·25
	Zeller . . . . .	..	..	..	·25
<i>Coleophora ditella</i> . . . . .	Hofmann . . . . .	..	..	..	·25
<i>Vibicella</i> . . . . .	Fletcher . . . . .	..	..	..	·25
<i>Lugduniella</i> . . . . .	Millière . . . . .	·50	·25	·25	
<i>conspicuellæ</i> . . . . .	Hofmann . . . . .	..	..	..	·25
<i>n. sp. near Vulnerariæ</i>	Schmid . . . . .	..	·25	..	
	Frey . . . . .	..	..	·25	
<i>albidella</i> . . . . .	Winter . . . . .	..	..	..	·25
	Gregson . . . . .	..	..	..	·25
<i>palliatella</i> . . . . .	Bond . . . . .	..	..	..	·25
<i>auricella</i> . . . . .	Hofmann . . . . .	..	..	..	·25
<i>Chamædryella</i> . . . . .	Bruand . . . . .	·50	·25	·25	
<i>virgatella</i> . . . . .	Hofmann . . . . .	..	..	..	·25
<i>leucapennella</i> . . . . .	Mühlig . . . . .	·50	·25	·25	
<i>murinipennella</i> ..	Wilkinson . . . . .	..	..	..	·25
* <i>fuscocuprella</i> . . . . .	Hofmann . . . . .	..	..	..	·25
<i>Vitisella</i> . . . . .	Edleston . . . . .	..	..	..	·25
* <i>Cornuta</i> . . . . .	Mühlig . . . . .	·50	·25	·28	
<i>Chauliodus Illigerellus</i> . . . . .	Mühlig . . . . .	..	..	..	·25
<i>Oinophila V-flava</i> . . . . .	Mühlig . . . . .	..	..	..	·25
<i>Laverna propinquella</i> . . . . .	Wilkinson . . . . .	·50	·25	·25	
<i>Phragmitella</i> . . . . .	Brown . . . . .	·50	·25	·25	
<i>Elachista Trapeziella</i> . . . . .	Scott . . . . .	·50	·25	·25	
<i>Rhynchosprella</i> . . . . .	Wilkinson . . . . .	·50	·25	·25	
<i>Caricis</i> . . . . .	Winter . . . . .	·50	·25	·25	
<i>Pollinariella</i> . . . . .	Frey . . . . .	·50	·25	·25	
<i>Cemiostoma Lotella</i> . . . . .	Wilkinson . . . . .	·50	·25	·25	
* <i>Wailesella</i> . . . . .	Wailes . . . . .	·50	·25	·25	
<i>Bucculatrix maritima</i> . . . . .	Vaughan . . . . .	..	..	..	·25

		Discovered.	Sent.	Bred.	Known before.
Bucculatrix artemisiella	Hofmann	..	..	..	·25
Cristatella	Wilkinson	..	..	..	·25
* Nepticula splendidissima	Hofmann	..	..	..	·25
** Potentillæ	Hofmann	..	..	..	·25
** Aceris	Hofmann	..	..	..	·25
Agrimonix	Hofmann	·5 0	·25	·25	
Freyella	Hofmann	..	..	..	·25
minusculella	Hofmann	..	..	..	·25
Tiliæ	Vaughan	..	..	..	·25
Pomella	Vaughan	..	..	·25	·25

Of the species marked thus \* I shall be glad of a further supply of larvæ.

The summary of this Table yields the following results:—

Hofmann	6·25	Scott	} 1·
Mühlig	5·25	Vaughan	
Frey	3·75	Wailes	
Wilkinson	3·50	Edleston	·75
Boyd	2·	Bond	} ·25
Winter, W.	1·25	Chappell	
Bruand	} 1·	Fletcher	
Brown		Gregson	
Millière		Schmid	
Parfitt		Zeller	

The total awards to this time being:—

FREY	20·50	Parfitt	2·75
		Edleston	2·50
		Zeller	2·25
Mühlig	18·	Grabow	} 2·
Hofmann	13·25	Millière	
Wilkinson	11·50	Wailes	
Schmid	11·	Bond	1·75
Scott	8·50	Harding	1·50
Boyd	7·25	Brockholes	} 1·25
Douglas	4·50	Brown, T.	
Gregson	3·	Law	

Logan .....	}	1·25
Winter, W.....		
Bruand .....	}	1·
Machin .....		
Vaughan .....		
Boll .....		
Miller .....	}	·75
Simmons.....		

Crump .....	}	·50
Beaumont .....		
Chappell.....	}	·25
Drane .....		
Fletcher .....		
Newnham .....		
Shield .....		
Wildman .....		

## NEW WORKS ON ENTOMOLOGY.



THE number of new Entomological publications during the past season has not been oppressively great.

The first in order of appearance was an instalment of a  
**CATALOGUE OF BRITISH COLEOPTERA.**  
 By G. R. WATERHOUSE, F.Z.S., &c.

The first part of which (price 2s., or, if printed only on one side for labelling collections, 2s. 6d.), containing the *Geodephaga*, *Hydradephaga* and *Brachelytra*, was published in April.

The importance of this work can scarcely be overrated, and we are glad to hear there is a prospect of the speedy appearance of a further portion of it. When the Catalogue is complete, probably some Coleopterist will take courage and undertake to supply that other great want, a work describing all our British Beetles.

When the year was further advanced another Catalogue reached us,—

**A CATALOGUE OF THE LEPIDOPTERA OF NORTHUMBERLAND AND DURHAM.** By GEORGE WAILES, Member of the Entomological Societies of London, France and Stettin.

This Catalogue extends to 46 pages, and only reaches to the end of the *Sphingina*, thus showing clearly that it is not a mere list of names; and truly it contains much valuable local information, whilst the critical remarks at pp. 24—35, establishing the specific identity of *Artaxerxes* and *Agestis*, will be read with interest by all who have studied the range of variation of species.

Mr. Gregson's Catalogue of *The Lepidopterous Insects*

of the District round Liverpool, which has formed a series of Papers in the "Transactions of the Historic Society of Lancashire and Cheshire," has this year been brought to a conclusion.

In September there appeared *the Third Volume of THE NATURAL HISTORY OF THE TINEINA, CONTAINING ELACHISTA, PART I., AND TISCHERIA, PART I.* BY H. T. STANTON, ASSISTED BY PROFESSOR ZELLER, J. W. DOUGLAS AND PROFESSOR FREY. *Eight coloured Plates, 8vo. Cloth.* LONDON, JOHN VAN VOORST, PATERNOSTER ROW; PARIS, DEYROLLE, Rue de la Monnaie, 19; BERLIN, E. S. MITTLER UND SOHN, Zimmerstrasse, 84, 85. *Price 12s. 6d.; 15 francs; 4thlr. 6 sgr.*

The appearance of this volume within twelve months of its predecessor is a good omen for the steady and regular publication of the following volumes, and Volume IV., which will contain 24 species of the genus *Coleophora*, is already in a forward state.

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## P R E F A C E .



WE have again the pleasure of addressing an increased number of British Entomologists, the list being now swollen to upwards of 1,200 names; yet daily we receive letters from new correspondents, one of whom lately expressed surprise that we had not known of his existence previously, as he had for two years been a constant reader of the "Entomologist's Weekly Intelligencer."

Unfortunately, we are not sufficiently proficient in the art of Mesmerism to be able to hold sympathetic communion with our unknown readers.

The students of the order NEUROPTERA will be glad to find another portion of the results of the investigations made by Dr. Hagen, when in this country, on the identity of the various species of *Phryganidæ* dispersed in our collections. We confidently anticipate that on our next appearance we shall be able to furnish the concluding portion of this "Synopsis of the British Phryganidæ."

Mr. Smith has again contributed some useful notes on his

favourite order, the HYMENOPTERA, and has called the attention of our readers to the singular physiological law which has been stated to occur in the common wasp.

Mr. Janson's usual critical acumen has been devoted to the enumeration of the new British COLEOPTERA which have occurred in the past season, and has enriched our pages with positive and comparative descriptions of several novelties of more than ordinary interest.

Through the kindness of Mr. Wollaston we received, just in time for press, some interesting observations by Dr. Schaum, of Berlin, on the nomenclature of the British *Carabidæ*. Unfortunately, the striving for infinite perfection is so intense amongst many of our German contemporaries, that they discard useful stepping-stones in the vain attempt to arrive at some firmer and more solid foundation which shall endure *for ever!*

A German writer will gravely tell you that he prefers B.'s name for a species to A.'s, because, though not so old, the description is better. No doubt in a few years' time C. might write a description which would eclipse B.'s, and, if there is any ground for his previous decision, he must repeat the process and adopt the name which C. may have applied to the species. Let this rule be generally adopted and constantly acted on, and in the progress of science every one of

our existing specific names will be found, a thousand years hence, in a fossil state!

The novelties amongst the British LEPIDOPTERA during the past season have been mostly confined to the larger groups; hence our Plate appears more showy than usual. In consequence of the numerous demands made upon us since last year to devote a few pages at least to the record of *Rarities*, we have acceded to a wish so generally expressed.

The question of *species, their variation, and the limits of that variation*, being now likely to enjoy an unusual degree of prominence in the attention of Naturalists, we have devoted a few pages to setting before our readers some thoughts by an American Entomologist, Dr. Clemens, on that subject.

H. T. STANTON.

MOUNTSFIELD, LEWISHAM,

December 7th, 1859.



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## EXPLANATION OF PLATE.



- Fig. 1. *Clostera Anachoreta*, Fabricius, see page 129.  
2. *Leucania extranea*, Guenée, see page 130.  
3. *Catephia Alchymista*, W. V., see page 127.  
4. *Margarodes Unionalis*, Hübner, see page 133.  
5. *Acontia Solaris*, W. V., see page 131.  
6. *Acrognathus mandibularis*, Gyllenhal, see Ent. Annual for 1859,  
p. 139.  
7. *Symbiotes latus*, Redtenbacher, see page 117.  
8. *Tropideres sepicola*, Herbst, see Ent. Annual for 1857, p. 84.

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*British Lepidoptera.*
424. GRAINGER, JOHN, A. B., T.C.D., Palatine Club, Liverpool. *British  
Lepidoptera and Coleoptera.*
425. GRANT, Rev. JOS. B., Oxenhope, near Keighley, Yorkshire.
426. GRANTHAM, HENRY, Scawley, near Brigg, Lincolnshire. *British  
Insects.*
427. GRAY, G. R., F.L.S., F.Z.S., &c., British Museum, W. C.
428. GRAY, JOHN, Wheatfield House, near Bolton-le-Moors.
429. GRAY, J. E., Ph. D., F.R.S., V.P.Z.S. &c., British Museum, W.C.
430. GRAY, P., 9, St. James' Square, Wolverhampton.
431. GRAY, R., 3, Oriel Place, Cheltenham.
432. GREEN, Rev. G. C., Parsonage, Hamworthy, near Poole, Dorsets.
433. GREEN, JOHN, Messrs. John Hardman, 43, Newhall Hill, Bir-  
mingham. *British Lepidoptera.*
434. GREEN, J., Market Place, Wisbeach.
435. GREEN, T. H., Saffron Walden.
436. GREEN, W., Eccleshall New Road, Sheffield. *British Lepi-  
doptera.*
437. GREENE, GEORGE, Painter, Thorne, Yorkshire. *British Lepi-  
doptera.*
438. GREENE, Rev. JOSEPH, Cubley Rectory, Doveridge Rectory,  
Derby. *British Lepidoptera.*
439. GREENFIELD, J. T., Royal Military Academy, Woolwich. *British  
Lepidoptera.*
440. GREENING, NOAH, Trafalgar Place, Warrington. *British Lepi-  
doptera.*
441. GREENIP, WILLIAM, Plosh, Keswick, Cumberland.
442. GREGOR, WALTER, Parochial Schoolmaster, Gowkstanes, Macduff,  
Banff.
443. GREGORY, WILLIAM, Sen., 24, Clandon Street, near South Street,  
Walworth, S.
444. GREGORY, WILLIAM, Jun., 24, Clandon Street, near South Street,  
Walworth, S.
445. GREGSON, C. S., Fletcher Grove, Stanley, near Liverpool. *British  
Lepidoptera and Coleoptera.*
446. GREGSON, WILLIAM, Lytham. *British Lepidoptera.*
447. GRENFELL, J. G. *British Lepidoptera.*

448. GRIERSON, T. B., Surgeon, Thornhill, Dumfriesshire.
449. GRIESBACH, Rev. A. W., Wollaston, Wellingborough.
450. GRIFFIN, ISAAC, 261, Aston Road, Birmingham.
451. GRIFFITH, J. R., Brighton College, Brighton. *British Lepidoptera.*
452. GRIFFITH, THOMAS, 4, St. Peter's Place, Brighton.
453. GRIDALE, T., Dockray, Penrith, Cumberland.
454. GROGGINS, JAMES, Port Road, Caldergate, Carlisle. *British Lepidoptera.*
455. GROOM, CHARLES OTTLEY, 13, Nova Villas, Cliftonville, Brighton.  
*British Insects, Arachnida and Crustacea.*
456. GROOM, Miss S., at G. P. Clay, Esq., Bury St. Edmonds.
457. GROSVENOR, R., 11, Skinner Street, Clerkenwell, E. C.
458. GROVES, W., 1, Lee Place, Lee, S. E. *British Lepidoptera and Coleoptera.*
459. GRUGGEN, ARTHUR, W., Pocklington, Yorkshire. *British Lepidoptera.*
460. GRUT, F., 9, King Street, Southwark, S.E. *British Coleoptera and Lepidoptera.*
461. GUISE, W. V., F.L.S., Elmore Court, Gloucester.
462. GUNNER, GEORGE, St. Peter's Street, Colchester. *British Lepidoptera.*
463. GUNNER, SAMUEL, Factory Yard, Colchester. *British Lepidoptera.*
464. GUYON, G., Richmond, Surrey, S.W., and Ventnor, Isle of Wight.  
*British Coleoptera.*
465. GWATKIN, R. L., The Park, Milbrooke, near Southampton.  
*British Lepidoptera and Coleoptera.*
466. GWYNNE, H. A., Richmond Villa, St. John's Wood, London.  
N. W. *British Lepidoptera.*
467. HADFIELD, W. P., Newark, Notts. *British Coleoptera.*
468. HAGUE, THOMAS, Dog and Partridge Inn, Stalybridge.
469. HALE, WILLIAM, W., Ascension House, Montpelier, Bristol.
470. HALIDAY, A. H., 23, Harcourt Street, Dublin. *British Insects, except Lepidoptera.*
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473. HALLIDAY, EDWARD, Beaumont Town, Halifax.
474. HALPIN, CHARLES, M.D., Cavan, Ireland.



475. HAMMOND, W. O., St. Alban's Court, near Wingham.
476. HANSON, SAMUEL, Epsom.
477. HARDING, GEO., Jun., Stapleton, near Bristol. *British Lepidoptera.*
478. HARDING, H. J., York Street, Church Street, Shoreditch, N. E.  
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480. HARDY, JAMES, Penmanshiel, near Cockburnspath. *British Dip-  
tera, Coleoptera, Hemiptera, Homoptera and Hymenoptera.*
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483. HARGREAVES, WILLIAM, 9, John Street, Gravesend.
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486. HARRINGTON, H. P., 16, Top of High Street, Colchester. *British  
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488. HARRIS, JOS. WILLIAM, Cockermouth.
489. HARRISON, E., 5, Ebenezer Terrace, Plumstead Common, S. E.
490. HARRISON, HUGH, 59, George Street, Manchester.
491. HARRISON, J., 5, Ebenezer Terrace, Plumstead Common, S. E.
492. HARRISON, R., 1, South Place, Upper Grange Road, Bermondsey,  
S. E. *British Lepidoptera.*
493. HARRISON, THOMAS, 48, Rochester Road, Manchester. *British  
Lepidoptera.*
494. HARRISON, WILLIAM, Gardener, Borough Gaol, Walton, near  
Liverpool. *British Lepidoptera.*
495. HARVEY, A. S., 4, Sussex Place, Southampton. *British Lepidop-  
tera.*
496. HARVEY, GEORGE, Baitsbite Sluice, near Cambridge.
497. HARVEY, ROBERT, 5, Portland Terrace, Southampton. *British  
Lepidoptera.*
498. HARWOOD, W. H., St. Peter's Street, Colchester. *British Lepi-  
doptera.*
499. HASTINGS, SIDNEY, Weston Grove, Thames Ditton, Surrey, and  
14, Albemarle Street, London, W. *British Lepidoptera.*

500. HATHWAY, L., 3, London Terrace, London Fields, N. E.
501. HAWARD, ALFRED, Eagle Cottage, Gloucester Road, Croydon Common, S. *British Coleoptera.*
502. HAWKER, REV. W. H., Horndean, Hants. *British Lepidoptera.*
503. HAWLEY, A., 55, Hall Gate, Doncaster.
504. HAWLEY, H. J. T., Twickenham, S. W.
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507. HAYDEN, REV. F. W., Skelton Rectory, York.
508. HAYNES, —, 13, Powell Street, East, King's Square, E. C.
509. HAYWARD, CHARLES, Water Lane, Colchester. *Collects for sale.*
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511. HAYWARD, W. R., Addington Place, Norwood, S.
512. HEAD, JOHN D., care of H. Burlingham & Co., Evesham.
513. HEALY, CHAS., 74, Napier Street, Hoxton, N. *British Lepidoptera.*
514. HEAP, W. E., Sandback, Cheshire.
515. HEFFORD, JNO., 6, Middle Walk, George Gardens, Bethnal Green, N. E. *British Lepidoptera.*
516. HELLINS, REV. J., St. David's Hill, Exeter. *British Lepidoptera.*
517. HELSTRIP, CHARLES, 5, Apollo Street, Heslington Road, near York. *British Lepidoptera.*
518. HEMMINGS, THOMAS, 11, Ann Street, James Street, Globe Fields, N. E.
519. HENSMAN, ARTHUR, Spring Hill, Northampton. *British Lepidoptera.*
520. HEPBURN, ARCHIBALD, Ross, Herefordshire. *British Lepidoptera and Coleoptera.*
521. HERTSLET, J. G., 19, Grove Place, Brompton, S. W. *British Lepidoptera.*
522. HEWITSON, W. C., Oatlands, Walton-on-Thames, Surrey. *Diurnal Lepidoptera, Exotic and European.*
523. HEY, REV. WILLIAM, York. *British Coleoptera.*
524. HEYS, ABRAHAM, Grange Road, Accrington.
525. HICKS, J. B., M.D., F.L.S., Tottenham. *British Lepidoptera.*
526. HICKS, W., Cricket Inn, near Sheffield. *British Lepidoptera.*
527. HIGGINSON, W., 2, Gloucester Place, Swansea.

528. HILL, G. N., Jun., 2, James Street, Penton Street, Islington, N.
529. HILL, H. W., Jun., 8½ William Street, Margaret Street, New River Head, N.
530. HILL, MATTHEW, Little Eaton, near Derby. *British Lepidoptera.*
531. HILL, SAMUEL, 2, Anne's Place, Margaret Street, Clerkenwell, E. C. *British Insects of all Orders for sale or exchange.*
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533. HIND, ROBERT, 24, Gillygate, York. *British Lepidoptera.*
534. HINDLEY, WILLIAM, 3, Kirk's Row, Rhodeswell Road, Limehouse, E. *British Lepidoptera, especially Tortricina.*
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536. HISLOP, ROBERT, Blair Lodge, by Falkirk, N.B. *British and Foreign Coleoptera.*
537. HOBSON, RICHARD, Selby, Yorkshire.
538. HODGE, GEORGE, Seaham Harbour. *British Coleoptera and Lepidoptera.*
539. HODGKINSON, J., Harraby, near Carlisle. *British Lepidoptera.*
540. HODGKINSON, J. B., 11, Bispham Street, Preston. *British Lepidoptera.*
541. HODGKINSON, THOMAS, Graystone, off London Road, Carlisle.
542. HODGSON, C. B., Hockley Hill, Birmingham. *British Lepidoptera.*
543. HOGAN, Rev. A. R., A.B., T.C.D., Corsham, Wilts. *British Lepidoptera and Coleoptera.*
544. HOLCROFT, WILLIAM, Upholland, Wigan, Lancashire.
545. HOLDHAM, WILLIAM, Lower Beach, Macclesfield. *British Lepidoptera.*
546. HOLLENRAKE, J., care of T. Mellor, Skircoat Green, near Halifax.
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549. HOOD, ROBERT, M.D., Newington, Edinburgh.
550. HORTON, Rev. E., Littleton House, Lower Wick, Worcester.
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553. HOUGHTON, Rev. W., Child's Ercall, Market Drayton, Shropshire. *British Coleoptera.*

554. HOUSE, SAMUEL, 82, St. James Street, Brighton. *British Lepidoptera.*
555. HOWARTH, THOMAS, Mottram Road, near Manchester.
556. HUCKETT, THOMAS, 26, Britannia Row, Lower Road, Islington, N.
557. HUDD, F., 20, West Street, Bristol.
558. HUDSON, GEORGE, 27, Stansfield Row, Burley, near Leeds.
559. HUDSON, J. C., Crescent, Salford.
560. HUME, W., 20, Victoria Road, Kentish Town, N.W.
561. HUNNYBUN, W. MARTIN, Chadleigh House, Godmanchester, Huntingdon.
562. HUNTER, Miss, of Thurston, Dunbar, N. B.
563. HUNTER, JAMES, West Walls, Carlisle. *British Coleoptera and Lepidoptera.*
564. HUNTER, JOHN, 16, Robert Street, Hampstead Road, N.W. *British Lepidoptera.*
565. HUSKINGS, C. E., Cromwell Rectory, near Newark, Notts.
566. HUTCHINGS, J., Hewarth Road, York.
567. HUTHWAITE, T. W., Bath. *British Lepidoptera.*
568. HYDE, FRED. OSMAN, Warwick. *Lepidoptera.*
569. HYDES, WILLIAM, Bagshaw's Buildings, Park Spring, Sheffield.
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571. INCHBALD, PETER, Storthes Hall, Huddersfield.
572. INGALL, THOMAS, Park Road, Stockwell, S. *British Insects.*
573. INGALL, W., 4, Albany Road, Camberwell, S. *British Insects.*
574. IRVINE, Rev. AIKEN, Five Mile Town, County Tyrone, Ireland.
575. IVERACH, J. G., Kirkwall. *British Coleoptera and Crustacea.*
576. JACKSON, GEO., Hurdsfield Road, Macclesfield. *British Lepidoptera.*
577. JACKSON, W., 17, Percy Street, Preston. *British Lepidoptera.*
578. JACQUES, F. V., Myrtle Villa, Ashley Down, Horfield, near Bristol. *British Coleoptera.*
579. JAMES, G. J., 14, Norfolk Place, Swan Lane, Rotherhithe, S. E.
580. JAMES, W. C., Gascoyn Terrace, Plymouth. *British Lepidoptera.*
581. JANSON, E. W., 61, Gracechurch Street, London, E. C. *Coleoptera.*
582. JAZDOWSKI, BRONISLAS, 120, Crown Street, Aberdeen. *British Lepidoptera.*

583. JEAKES, W., 22, Camden Road Villas, Camden Town, N. W.
584. JEFFREY, W., 22, Newborough Street, Scarborough.
585. JEKEL, H., 71, Dean Street, Soho, W.
586. JENNER, EDWARD, 2, West Street, Lewes.
587. JENNER, HERBERT, Jun., The Limes, Carshalton, Surrey, S. *British Lepidoptera.*
588. JENYNS, Rev. L., M.A., F.L.S., F.G.S., Upper Swainswick, near Bath.
589. JERRARD, F., Long Stratton, Norfolk.
590. JESSOP, JOHN, Jun., 82, Sorby Street, Sheffield.
591. JODRELL, Rev. H., Gisleham Rectory, near Wangford, Suffolk.
592. JOHN, EVAN, Llantrissant, near Pontypridd.
593. JOHNSON, E. R., Woodlands, Sidmouth, Devon. *British Lepidoptera.*
594. JOHNSON, F. P., Woodlands, Sidmouth, Devon. *British Lepidoptera.*
595. JOHNSON, Rev. J., Denby, near Huddersfield. *British Lepidoptera.*
596. JOHNSON, L., 8, Payne Street, Islington, N.
597. JOHNSON, Serjeant, Police Station, Old Swan, Liverpool.
598. JOHNSON, W., 12, Prospect Place, Upper Mann Street, Liverpool. *British Lepidoptera.*
599. JONES, A., 16, York Place, Fulham Road, Brompton, S.W.
600. JONES, A. H., 11, Victoria Road, Old Charlton, S. E.
601. JONES, Capt. J. M., Dolarddyn Hall, near Welchpool, Montgomeryshire. *Coleoptera.*
602. JONES, G. W., King's School, Sherborne, Dorsetshire. *British Lepidoptera.*
603. JONES, J. (Gardener), New Hall, Builth, Breconshire.
604. JONES, THEOPHILUS R., 11, Victoria Road, Old Charlton, S.E.
605. JONES, W., 19, Stafford Street, Peckham, S.E.
606. JONES, W., 3, Barford Terrace, Liverpool Road, Islington, N.
607. JORDAN, C. J. R., Teignmouth, Devon. *British Lepidoptera.*
608. JORDAN, Dr., Spring Grove Terrace, Edgbaston, Birmingham. *British Lepidoptera.*
609. JORDAN, WM. JAS., Bullen School, St. Helen's, Isle of Wight.
610. JOSLING, JAMES, Jun., 8, Nottingham Place, Charlotte Street, Whitechapel, E.

611. KEARLEY, GEORGE, South Grove, Walthamstow, Essex, N.E.
612. KEELEY, R. G., 11, Sidney Terrace, Marlborough Road, Chelsea, S.W.
613. KEENE, G., 1, Manor Place, Walworth Road, Surrey, S. *British Lepidoptera.*
614. KEET, JOHN, High Street, Ventnor, Isle of Wight. *British Lepidoptera.*
615. KELSALL, THOS., 21, Franchise Terrace, Pendleton, near Manchester. *British Lepidoptera and Coleoptera.*
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624. KEY, EDWARD B., Esq., 3, Arundel Square, Barnsbury Park, Islington, N. *British Coleophora and Lepidoptera.*
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626. KILLINGBACK, H. W., 10, Oldham Place, Bagnigge Wells Road, W. C.
627. KILLINGBECK, JAMES, Wesleyan Schools, Selby. *British Lepidoptera.*
628. KINAHAN, J. R., M.B., T.C.D., Seaview, Donnybrook, Dublin. *British Crustacea to the end of the Decapoda.*
629. KING, EDWARD L., 17, London Road, Lynn.
630. KING, GEORGE, 85, Lower Union Street, Torquay. *British Coleoptera and Lepidoptera.*
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632. KING, JOSIAH, Lankford Road, Biggleswade.
633. KING, REV. P. MEADE, Norton Rectory, Atherstone.
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635. KIRBY, WILLIAM. *British Lepidoptera.*

636. KIRBY, W. F., St. Peter's House, Brighton. *British Insects and Foreign Sphinges.*
637. KNAGGS, H. G., M.D., 1, Maldon Place, Prince of Wales Road, Kentish Town, N.W. *British Lepidoptera.*
638. KNAPP, J. H., Letchforth Rectory, Hitchin. *British Lepidoptera.*
639. KNAPP, WILLIAM, The Lodge, near Corsham, Wilts. *British Lepidoptera; only the Macros.*
640. KNAPP, W. H., 21, Lampeter Street, Islington, N. *British Coleoptera.*
641. KNIGHT, F., Jun., Melbourne Place, Aston, near Birmingham.
642. KUPER, Rev. C., Trelleck, Monmouth. *British and Exotic Coleoptera.*
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644. LACY, G. H., 2, Chester Place, Gosport.
645. LAING, JAMES ARTHUR, Paragon Road, Blackheath, S. E. *British Lepidoptera.*
646. LAMB, JAMES, 7, King Street, Perth. *British Lepidoptera.*
647. LAMB, Rev. WILLIAM, Ednam, by Kelso.
648. LAMB, W. & G., 2, Portsdown Mews, Kilburn Gate, Middlesex, W. *British Lepidoptera.*
649. LAMBERT, HENRY, M.R.C.P., Grammar School, Cheltenham. *British Insects generally.*
650. LANG, W., John Street, Hamilton, Scotland.
651. LANGCAKE, T. H., Oxtou, near Birkenhead. *British Lepidoptera.*
652. LANGLEY, W., B.A., Ganarew, Monmouth (Bishop Cosins' Hall, Durham, during Term time). *British Lepidoptera.*
653. LANKESTER, EDWIN RAY, 8, Savile Row, Regent Street, W.
654. LATCHFORD, W. H., 12, New Charles Street, City Road, E. C. *British Lepidoptera.*
655. LATCHMORE, F., 75, High Street, Strood, Kent. *British Lepidoptera.*
656. LATTIMER, J., Corporation Road, Carlisle. *British Lepidoptera.*
657. LAW, THOMAS, 9, Regent Street, Darlington. *British Lepidoptera.*
658. LAWSON, Rev. E., Little Barford Rectory, St. Neots.
659. LAYCGCK, WILLIAM, 34, Bath Street, Sheffield. *British Lepidoptera.*
660. LEA, JAMES, Stone Bridge Gate, Ripon. *Insects of all Orders.*

661. LEA, JOHN WALTER, Shepperton, near Chertsey. *British Lepidoptera.*
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663. LEGG, HENRY J., 100, Lambeth Walk, Lambeth, S.
664. LEGG, THOMAS, 100, Lambeth Walk, Lambeth, S.
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666. LENNY, C. G., 4, Chatham Place, Ramsgate. *British Lepidoptera.*
667. LESLIE, DAVID (Gardener), Appleby Castle, Westmoreland.
668. LETHBRIDGE, E., Exeter College, Oxford. *British Lepidoptera.*
669. LEWCOCK, G., 69, High Street, Chatham. *British Lepidoptera.*
670. LEWCOCK, HENRY, Castle Street, Farnham, Surrey.
671. LEWIS, Rev. EVAN, Rothwell, Northamptonshire.
672. LEWIS, GEORGE, 14, Woodlands Terrace, Blackheath, S. E. *British Coleoptera.*
673. LEWIS, W. A., 1, Kensington Square, South, W. *British Lepidoptera.*
674. LIGHTON, Rev. Sir C. R., Bart., Ellastone, Ashborne, Derbyshire. *British Lepidoptera.*
675. LINEKER, S., Pierrepont Street, Nottingham. *British Lepidoptera.*
676. LINGWOOD, R. M., M.A., F.L.S., F.G.S., Lyston, near Ross, Herefordshire.
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683. LIVERSIDGE, WILLIAM, 35, Stansfield Row, Burley, Leeds.
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685. LLOYD, A., Belsize, Hampstead, N. W. *British Lepidoptera and Coleoptera.*



686. LLOYD, W. H., 12, Chapel Street, Grosvenor Square, and Barham, near Canterbury.
687. LOAT, WILLIAM, Furze Hill Lodge, Redhill, Reigate.
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693. LUMB, G., Kirkgate, Wakefield. *British Lepidoptera.*
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695. LYNCH, JOSIAH B., 2, Maldon Place, Prince of Wales Road, Haverstock Hill, London, N. W.
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697. M'GILL, H. J., Grove House, Tonbridge.
698. MACHIN, WILLIAM, 35, William Street, Globe Fields, Mile End, E.  
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699. M'KEAND, JOHN H., The Grove, Lowton, near Warrington.  
*British Lepidoptera.*
700. M'KEAND, ROBERT, The Grove, Lowton, near Warrington.  
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702. M'LACHLAN, J., Hethersett, near Wymondham, Norfolk.
703. M'LACHLAN, ROBERT, 1, Park Road Terrace, Forrest Hill, S. E.  
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708. MAIN, JAMES, Port Road, Carlisle. *British Lepidoptera.*
709. MAJOR, W., East Grinstead. *British Lepidoptera.*
710. MALHAM, GEORGE, Lear's Yard, Horse Market, Darlington.
711. MALLETT, C. S., 397, City Road, E. C.

712. MANNING, JOHN, JUN., Market Hill, Cambridge.
713. MANSFIELD, RICHARD, 15, Bradford Street, Birmingham.
714. MARRIS, ROBERT, Lynn Road, Wisbeach.
715. MARSH, JOHN, Macclesfield.
716. MARSHALL, THOMAS, Trinity Cottage, Leicester. *British Insects of all Orders.*
717. MARSHALL, REV. T. A., The College, Cheltenham. *Insects of all Orders.*
718. MARSHALL, W., Springfield, Upper Clapton, N. E.
719. MARSTON, G., Bedern Bank, Ripon, Yorkshire. *British Lepidoptera.*
720. MARTIN, E. J., JUN., 79, Skinnergate, Darlington. *British Lepidoptera.*
721. MARTIN, W., Market Place, Trowbridge, Wilts.
722. MASON, A., 7, Wellington Road, Holloway, N.
723. MASON, ANTHONY, Grange, Newton in Cartmel. *British Lepidoptera.*
724. MATHEWS, REV. A., Gumley, Market Harborough.
725. MATHEWS, MURRAY A., Merton College, Oxford. *British Lepidoptera.*
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1034. SWANN, WILLIAM, 28, Berry Street, Preston.
1035. SWINDEN, ISAAC, 236, South Street, Park, Sheffield.
1036. SYKES, HENRY, Honley, near Huddersfield.
1037. SYME, PROFESSOR JOHN T., 12, Gordon Street, Gordon Square,  
London, W. C. *Coleoptera.*
1038. TAGART, WM. ROBERT, A.B., (Gen. Sec. Dub. Univ. Zoolog.  
Assoc.), Blenheim, Kingstown, Dublin. *British Lepidoptera.*
1039. TAGG, S., Park Street, Congleton.
1040. TALBOT, W., Mount Pleasant, Wakefield. *British Lepidoptera  
and Coleoptera.*

1041. TALES, WILLIAM, 2, Windsor Street, Putney, S. W. *British Lepidoptera and Coleoptera.*
1142. TAVERNER, HENRY THOMAS, 1, Adelaide Place, Stepney Green.
1043. TAYLOR, A. D., 83, Nelson Square, Bermondsey, S. E.
1044. TAYLOR, D. R., 4, Alpha Cottages, New Road, Hammersmith, W. *British Lepidoptera, Coleoptera and Hymenoptera.*
1045. TAYLOR, F., Starston, Harlestone, Norfolk. *British Lepidoptera.*
1046. TAYLOR, F., Hone House, Brighton.
1047. TAYLOR, JAMES, 15, Salop Street, Cavalier Hill, Bank, Leeds.
1048. TAYLOR, W. H., Tolson Street, Sunny Bank, Leeds. *British Lepidoptera.*
1049. TEARLE, E., Gainsborough. *British Lepidoptera.*
1050. TEARLE, Rev. F., Grammar School, Kettering. *British Lepidoptera.*
1051. TEBBS, H. V., Jun., Southwood Hall, Highgate, N. *British Lepidoptera.*
1052. TEGETMEIER, W. B., Muswell Hill, N. *Observer of Bees.*
1053. THOMAS, JOHN, H., Florist, &c., 16, John Street, Blisset Street, Greenwich, S. E.
1054. THOMAS, WILLIAM, Park Gate, near Rotherham.
1055. THOMAS, J. P., Jun., 7, Montague Place, Islington, N.
1056. THOMLINSON, JOHN, Port Road, Carlisle.
1057. THOMPSON, C., Foregate Street, Worcester. *British Lepidoptera.*
1058. THOMPSON, Miss S., Barn Hill, Stamford.
1059. THOMPSON, T., Worcester.
1060. THOMPSON, THOS., Welton, near Hull.
1061. THOMPSON, WILLIAM, 4, Dutton's Buildings, Mill Street, Crewe, Cheshire. *British Lepidoptera.*
1062. THOMPSON, Master CHARLES, Frisby, Leicester. *British Lepidoptera.*
1063. THOMSON, R., Viewhill, Cawdor, viâ Nairn. *British Lepidoptera.*
1064. THOMSON, W. BURNS, Kirriemuir, Forfarshire.
1065. THOMSON, WILLIAM, F.L.S., 11, Dartmouth Villas, Forest Hill, Sydenham, S. E.
1066. THOMSON, Professor WYVILLE, 6, University Terrace, Belfast. *British Lepidoptera.*
1067. THORBURN, WILLIAM STEWART, Bank House, Troqueer, near Dumfries. *British Lepidoptera.*

1068. THORNCROFT, THOMAS, 87, North Lane, Brighton. *British Lepidoptera.*
1069. THORNE, J., 12, Morpeth Street, Green Street, Bethnal Green, N.E. *Insect Cabinet Maker. Dealer and Collector of all Orders.*
1070. THORNLEY, J. J., Market Place, Preston. *Lepidoptera.*
1071. THURNELL, CHARLES, Newton, Cambridgeshire.
1072. THYNNE, J. C., Haynes Park, Bedford.
1073. TIBBS, S., JUN., 9, Finsbury Place South, E.C.
1074. TIDEMORE, T., 15, Northampton Street, Lower Road, Islington, N.
1075. TIDY, LEWIS, 16, Crown Gardens, Brighton. *British Lepidoptera.*
1076. TILLET, W. H., Norwich. *British Lepidoptera.*
1077. TILLY, J. H., 9, Judd Street, Brunswick Square, London, N.W. *British Lepidoptera.*
1078. TILTMAN, I. H., 43, Queen Street, Whitehaven. *British Lepidoptera.*
1079. TIMINS, DOUGLAS, 35, Oxford Terrace, Hyde Park, W.
1080. TINDALL, GEORGE, Grove Street, Huddersfield. *British Lepidoptera.*
1081. TINKER, JETHRO, Stalybridge.
1082. TISDALL, W. G., Charlesfort, Navan, Ireland.
1083. TOMLINSOM, J. H., Newark. *British Lepidoptera.*
1084. TOMPKINS, H., 44, Guildford Street, Russell Square, W.C. *British Lepidoptera.*
1085. TOMPKINS, J. C., 54, Bernard Street, Russell Square, W.C. *British Lepidoptera.*
1086. TOOVEY, WILLIAM, 9, Higginbotham Street, Macclesfield. *British Lepidoptera.*
1087. TOULMIN, W. C., Laura Place, Lower Clapton, N.E. *British Lepidoptera and Coleoptera.*
1088. TRAQUAIR, R. H., 30, Clarence Street, Edinburgh. *British Lepidoptera.*
1089. TRAVERS, FRANCIS, West Street, Poole.
1090. TRIMEN, ROLAND, 71, Guildford Street, Russell Square, W.C. *British and South African Lepidoptera.*
1091. TROTTER, C. T. G., St. Peter's, Marlow. *British Lepidoptera.*
1092. TROTTER, JAMES, 308, High Street, Perth. *British Lepidoptera.*
1093. TRUSCOTT, T., 30, North Street, Exeter. *British Insects.*
1094. TRYE, R. E., Leckhampton Court, near Cheltenham. *British Lepidoptera.*

1095. TUDSBURY, R., Jun., Edwinstowe, Ollerton, Notts. *British Lepidoptera.*
1096. TUGWELL, W. H., 112, Cheapside, E.C.
1097. TURNBULL, R. F., Ramsgate. *British Lepidoptera.*
1098. TURNER, EDWIN, Lostock Hall, near Bolton-le-Moors, Lancashire.
1099. TURNER, J. ASPINALL, M.P., Cross Street, Manchester. *Foreign Coleoptera, especially African species.*
1100. TURNER, W. C., 33, Bermondsey Square, Southwark, S.E. *British Lepidoptera.*
1101. TUTIN, J. HAZLEDINE, M.R.C.S., A.K.C., Westgate, Ripon, Yorkshire. *British Lepidoptera.*
1102. TWEED, E. B., The Grammar School, Kettering.
1103. TWEEDY, J. NEWMAN, 47, Montague Square, W.
1104. TWEEDY, WILLIAM, Jun., Truro-Vean, Truro. *British Lepidoptera.*
1105. TYRER, JOHN, Melville Hospital, Chatham. *British Lepidoptera.*
1106. TYRER, R., Jun., Hill House, Eye. *Coleoptera and Lepidoptera.*
1107. TYSSEN, AMHURST, Manor House, Hackney, N. E. *British Lepidoptera.*
1108. TYSSEN, RIDLEY, Manor House, Hackney, N. E. *British Lepidoptera.*
1109. ULYATT, W., House of Correction, Wakefield. *British Lepidoptera.*
1110. UNWIN, W. C., St. Anne's, Lewes. *British Hymenoptera—Aculeata.*
1111. VALENTINE, W. H., Somerton, Somersetshire. *British Lepidoptera.*
1112. VARLEY, J., Almondbury Bank, near Huddersfield. *British Lepidoptera.*
1113. VAUGHAN, P. H., Redland, near Bristol. *British Lepidoptera.*
1114. VEALE, S. C., 29, Trinity Square, Deptford, S. E.
1115. WADE, F. J., 4, Coney Street, York.
1116. WADHAM, A., 14, High Street, Barnstaple. *British Lepidoptera.*
1117. WAGSTAFF, E., Chippenham, Newmarket, Cambridge.



1118. WAILES, GEORGE, Newcastle-on-Tyne. *British Insects.*
1119. WAITE, JOSIAH, Leslie House, Markinch, Fife. *Coleoptera and Lepidoptera.*
1120. WAITES, BENJAMIN, Ulverston.
1121. WALCOTT, W. H. L., 11, Vyvyan Terrace, Clifton. *British Hymenoptera.*
1122. WALKER, E., Harrow. *British Lepidoptera.*
1123. WALKER, M., Dewsbury.
1124. WALKER, ALFRED O., Chester.
1125. WALKER, FRANCIS, St. Michael's House, Grove, Highgate, N.
1126. WALKER, FREDERICK, Southgate, N. *British Lepidoptera.*
1127. WALKER, J. D., School House, Rugby.
1128. WALLACE, ALEXANDER, M.B., 23, Bedford Place, Bloomsbury, W. C.
1129. WALLIS, THOS. WILKINSON, Louth, Lincolnshire.
1130. WALTON, JOHN, F.L.S., Byard's Lodge, Knaresborough. *British Coleoptera, principally Curculionidæ.*
1131. WARD, CHRISTOPHER, Horton Street, Halifax.
1132. WARD, J., Temple Court, Preston. *British Lepidoptera.*
1133. WARING, S. L., Norwood, S. *British Lepidoptera.*
1134. WARRINGTON, JOHN, Tranmere Hall, near Birkenhead. *British Lepidoptera.*
1135. WATERHOUSE, G. R., F.Z.S., British Museum, W. C. *Coleoptera.*
1136. WATKINS, W., Agincourt Square, Monmouth. *British Lepidoptera.*  
*No longer collects.*
1137. WATNEY, DANIEL, Reigate. *Coleoptera and Lepidoptera.*
1138. WATSON, ALEXANDER, Camperdown Gardens, by Dundee, Scotland.
1139. WATTSON, MARTIN, 15, Stall Street, Bath. *British Lepidoptera.*
1140. WEIR, J. JENNER, 6, Haddo Villas, Blackheath, S. E. *British Lepidoptera.*
1141. WEIR, JOHN, The Garden, Hatfield House, Hatfield, Herts.
1142. WELLMAN, J. R., 12, Courland Grove, Wandsworth Road, S.
1143. WERE, ROBERT B., 35, Osborne Terrace, Clapham Road, S. *British Lepidoptera.*
1144. WESLEY, JOHN, 2, Canonbury Place, Canonbury, N.
1145. WESLEY, J. S., The Close, Winchester. *British Lepidoptera.*
1146. WEST, THOMAS, Belmont, Bolton-le-Moors, Lancashire. *British Lepidoptera.*

1147. WESTON, WILLIAM, 37, Corn Street, Bristol. *British Lepidoptera.*
1148. WESTWOOD, J. O., M.A., F.L.S., Taylor Institute, Oxford. *Economic Entomology and Insects of all Orders from all parts of the globe, especially if of peculiar forms.*
1149. WHALL, Rev. W., Thurning, near Oundle. *British Lepidoptera.*
1150. WHEELER, E., 1, Promenade Place, Cheltenham. *British Lepidoptera.*
1151. WHITE, ADAM, Assist. Zool. Dept., British Museum, W. C.
1152. WHITE, F. B. W., St. Mary's Parsonage, Kirriemuir, Forfarshire.
1153. WHITE, J. B., Box, 34, Wakefield.
1154. WHITE, J. H., Middleton Rectory, near Yoxford, Suffolk.
1155. WHITEHEAD, Rev. J. T., Altrincham, Cheshire.
1156. WHITFIELD, EDWIN, Trinity Hall, Cambridge. *British Lepidoptera.*
1157. WHITTINGHAM, THOMAS, Leytonstone, Essex, N. E. *British Coleoptera and Lepidoptera.*
1158. WIGGLESWORTH, ROBERT, 60, Whalley Road, Accrington, Lancashire. *British Coleoptera.*
1159. WIGNALL, JOHN U., Secretary to the Holbeck Entomological Society, Holbeck, Leeds.
1160. WIGNALL, SAMUEL, 4, Turk's Head Yard, Briggate, Leeds.
1161. WILD, W. J., Herne Hill, Camberwell, S. *British Lepidoptera.*
1162. WILDMAN, T., Grove Place, Southampton Street, Camberwell, S. *British Lepidoptera.*
1163. WILKINSON, J. N., 47, Stanley Street, Chelsea, S. W.
1164. WILKINSON, E., Shittlehope Burn, Stanhope, viâ Darlington.
1165. WILKINSON, G. H., Old Swan, near Liverpool.
1166. WILKINSON, T., 6, Cliff Bridge Terrace, Scarborough. *British Lepidoptera.*
1167. WILKINSON, Rev. WALTER G., Fellow of Worcester College, Oxford.
1168. WILKINSON, S. J., 7, Jeffrey's Square, St. Mary Axe, London, E. C. *British Lepidoptera.*
1169. WILLCOCK, S., 10, High Street Preston. *British Coleoptera and Lepidoptera.*
1170. WILLETTS, HENRY, 63, Edmond Street, Birmingham.
1171. WILLIAMS, D., 56, Ward Street, Swansea.

1172. WILLIAMS, J. M., Lewesfell, Clevedon, near Bristol.
1173. WILLIAMS, W., Somerset House, Redland, Bristol.
1174. WILLIS, CHARLES, Guisborough, Yorkshire.
1175. WILLIS, T. W. B., Wick Episcopi, near Worcester. *British Lepidoptera.*
1176. WILLIS, W. & J., 6, Bath Row, Birmingham.
1177. WILSON, ANDREW, 18, Young Street, Edinburgh. *Scottish Lepidoptera.*
1178. WILSON, C. C., 16, Sussex Place, Rotherfield Street, Islington, N.
1179. WILSON, MASTER H., Charlotte Street, Ballymoney, County Antrim.
1180. WILSON, JAMES, Zeta Court, William Street, Botchergate, Carlisle. *British Lepidoptera.*
1181. WILSON, JOHN, 43½, Castle Street, Aberdeen.
1182. WILSON, JOHN, JUN., Coulson's Buildings, Hallgarth Street, Durham.
1183. WILSON, JUNIUS, 149, Kirkgate, Wakefield. *British Lepidoptera.*
1184. WILSON, REV. STEPHEN, Lea, Prestbury, near Macclesfield. *British Lepidoptera.*
1185. WILTON, E. R., High Street, Ely. *British Lepidoptera.*
1186. WINCHESTER, C., Osborne, Isle of Wight. *British Lepidoptera.*
1187. WINGATE, J., Dunallan Cottage, Bridge of Allan, N. B.
1188. WINGATE, JAMES, 4, Royal Exchange Buildings, Glasgow.
1189. WINGFIELD, L., Keston, near Maidstone, Kent.
1190. WINTER, JOHN N., Sussex County Hospital, Brighton. *British Lepidoptera.*
1191. WINTER, WILLIAM, National School, Aldeby, Beccles. *British Insects of all Orders, except Hymenoptera.*
1192. WINTLE, G. S., Gloucester.
1193. WOLLASTON, T. V., M.A., F.L.S., Southernhay, King's Kerswell, by Newton Abbot, Devon. *Coleoptera.*
1194. WOOD, C., Dulwich Common, S. *British Lepidoptera.*
1195. WOOD, JOHN, Framwellgate, Gate Bridge, Durham.
1196. WOOD, HENRY, Danesfield Gardens, Marlow. *British Lepidoptera.*
1197. WOOD, F. W., JUN., Hampton House, Luton Road, Chatham. *British Lepidoptera.*
1198. WOODAGE, ANDREW, 9, East Street, Goldsmith Row, Hackney Road, N. E.

1199. WOODS, S. E., Westleton, Saxmundham. *British Lepidoptera.*  
 1200. WORMALD, A. W., 10, Priory Road, Kilburn, N. W.  
 1201. WRAGG, J., 7, Spring Gardens, Doncaster.  
 1202. WRATISLAW, A. H., School Hall, Bury St. Edmunds.  
 1203. WRIGHT, DR. E. PERCIVAL (Hon. Sec. Dub. Univ. Zoolog. and Bot. Assoc.), 5, Trinity College, Floraville, Eglinton Road, Dublin, Ireland. *British Coleoptera and Hymenoptera.*  
 1204. WRIGHT, R. W., 4, Gloucester Terrace, Victoria Park Road, N.E. *British Lepidoptera.*  
 1205. WYATT, C. W., North Lodge, Worthing.  
 1206. YOUNG, JAMES, 11, Bishop Lane, Hull. *British Lepidoptera.*  
 1207. YOUNG, MORRIS, 7, Old Sneddon Street, Paisley. *British Coleoptera and Lepidoptera.*  
 1208. YOUNG, REGINALD and EDWARD, Hill House, Farnworth, near Warrington.  
 1209. YOUNG, S. W., 12, Portland Street, Cheltenham. *British Coleoptera and Lepidoptera.*  
 1210. YOUNG, W., Milverton, near Taunton.  
 1211. YUILL, Rev. JAMES, Peterhead, N.B.  
 1212. ZACHARY, HENRY, Jun., Cirencester.

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*Supplementary Names.*

1213. CALVERT, W. SIDNEY, East Bergholt, near Colchester.  
 1214. CARRINGTON, J. T., Clifton, York.  
 1215. GERVIS, F., at G. Pollard, Esq., Taunton.  
 1216. GOURD, J., Bishop's Hull, near Taunton.  
 1217. HIND, JAMES, Sunderland Bridge, near Durham.  
 1218. JAMES, E. H., Lewisford House, Hitchin, Herts.  
 1219. LOWES, Rev. J. C., South Street, Durham.  
 1220. M'ARTHUR, NIEL, 32, Guildford Street, Brighton.  
 1221. MAUGHAM, S., Howard Terrace, Morpeth.  
 1222. MEYNELL, E. J., Old Elvet, Durham.  
 1223. SEYMOUR, L. T., Sherburne Hill, near Durham.  
 1224. STEDMAN, WILLIAM, Ashford, Kent.

# LIST OF BRITISH ENTOMOLOGISTS,

## ARRANGED GEOGRAPHICALLY.



*Note.*—It has been thought unnecessary to increase the bulk of this List by including those residing within the London District—so that to speak more correctly this is only a “List of *Provincial* British Entomologists.”

The counties and the towns in each county are arranged alphabetically. The nearest town to the Entomologist’s residence is that indicated, but by referring to the preceding Alphabetical List the reader will ascertain the precise address and the *spécialité* of any individual.

Wales, Scotland and Ireland are treated as single counties, and placed at the end of this List.

### BEDFORDSHIRE.

#### BEDFORD.

- 290. Dawson, J. F.
- 1072. Thynne, J. C.

#### BIGGLESWADE.

- 632. King, Josiah.

#### LUTON.

- 106. Boggis, Rev. W. R. T.
- 692. Lucas, Alfred.

#### SHARNBROOK.

- 423. Graham, W. B.

#### WOBURN.

- 353. Farrow, William.

### BERKSHIRE.

#### HUNGERFORD.

- 29. Bacon, Rev. J.

#### NEWBURY.

- 85. Binning, E.
- 365. Fordham, T.
- 902. Roake, J. W.

#### READING.

- 102. Blandy, C. J.
- 103. Blandy, J. F.

#### SANDHURST.

- 150. Brown, N. W.

#### WALLINGFORD.

- 358. Fenn, J.

## BUCKINGHAMSHIRE.

## GREAT MARLOW.

962. Shaw, Wm.  
983. Smith, Rev. Bernard.  
1091. Trotter, C. T. G.  
1196. Wood, Henry.

## HIGH WYCOMBE.

160. Browne, Rev. T. H.

## SLOUGH.

179. Butterfield, Rev. H.  
356. Fawkes, F. H.  
413. Goldney, George.

## WAVENDON.

174. Burney, Rev. H.

## CAMBRIDGESHIRE.

## CAMBRIDGE.

26. Babington, C. C.  
34. Baker, J.  
45. Barlow, F.  
66. Beadon, C. A.  
153. Brown, Thomas.  
187. Canham, T. J.  
188. Canham, T., Jun.  
278. Cumming, L.  
297. Digby, H. S.  
337. Egles, E. H.  
354. Farren, W., Jun.  
496. Harvey, George.  
712. Manning, John, Jun.  
868. Prime, J.  
952. Sealey, A. F.  
978. Skeels, S. C.  
1006. Sprague, T. B.  
1071. Thurnell, Charles.  
1156. Whitfield, Edwin.

## CHATTERIS.

385. Fryer, John, Jun.

## ELY.

1185. Wilton, E. R.

## CAMBRIDGESHIRE—

*continued.*

## NEWMARKET.

351. Farebrother, —.  
547. Holland, H., Jun.  
730. Mead, G.  
920. Rogers, Arthur.  
1117. Wagstaff, E.

## WISBEACH.

40. Balding, James.  
434. Green, J.  
714. Marris, Robert.  
813. Oliver, George.  
834. Peckover, Alexander.

## CHESHIRE.

## BIRKENHEAD.

12. Almond, G. A.  
145. Brockoles, J. F.  
235. Cook, J. C.  
408. Gleave, E.  
651. Langcake, T. H.  
1134. Warrington, J.

## BOWDON.

324. Edleston, R. S.  
623. Kershaw, John.

## CHESTER.

1124. Walker, Alfred O.

## CONGLETON.

1016. Steele, J.  
1039. Tagg, S.

## CREWE.

514. Heap, W. E.  
1061. Thompson, William.

## LISCARD.

239. Cooke, Nicholas.

CHESHIRE—*continued.*

## MACCLESFIELD.

46. Barlow, Samuel.  
 59. Bates, Eli.  
 144. Broadhurst, G.  
 305. Dow, James.  
 311. Draper, John.  
 406. Gill, William.  
 414. Goodall, D. G.  
 545. Holdham, William.  
 552. Houghton, Samuel.  
 576. Jackson, George.  
 715. Marsh, John.  
 754. Milward, Richard.  
 1086. Toovey, William.  
 1184. Wilson, Rev. Stephen  
 Lea.

## CORNWALL.

## LISKEARD.

482. Hare, N., Jun.

## PENZANCE.

510. Hayward, W. H.

## TRURO.

1104. Tweedy, William, Jun.

## CUMBERLAND.

## CARLISLE.

21. Armstrong, T.  
 454. Groggins, James.  
 539. Hodgkinson, J.  
 541. Hodgkinson, Thomas.  
 563. Hunter, James.  
 656. Lattimer, J.  
 708. Main, James.  
 739. Melville, David.  
 1056. Thomlinson, John.  
 1180. Wilson, James.

## COCKERMOUTH.

488. Harris, J. W.  
 728. Mawson, G.

1860.

CUMBERLAND—*continued.*

## KESWICK.

441. Greenip, Wm.

## PENRITH.

453. Grisdale, T. D.

## WHITEHAVEN.

798. Nicholson, H. J.  
 1078. Tiltman, J. H.

## DERBYSHIRE.

## ASHBORNE.

674. Lighton, Rev. Sir C. R.,  
 Bart.

## DERBY.

257. Cox, W.  
 263. Crewe, Rev. H. H.  
 264. Crewe, Rev. H. R.  
 323. Eaton, James.  
 347. Evans, Henry.  
 438. Greene, Rev. J.  
 530. Hill, Matthew.  
 1014. Statham, William.

## UTTOXETER.

1005. Spilsbury, Rev. F. M.

## DEVONSHIRE.

## AXMINSTER.

335. Edwards, Rev. Z. J.

## BARNSTAPLE.

726. Mathews, G. F.  
 1116. Wadham, A.

## BIDEFORD.

905. Roberts, L.

## CHUDLEIGH.

811. Oldham, Arthur.

## COLLUMPTON.

119. Bowerman, R. J.  
 956. Selwood, Rev. J. B.

DEVONSHIRE—*continued.*

## EXETER.

300. D'Orville, H.  
391. Galton, J. C.  
516. Hellins, Rev. J.  
801. Norcombe, E. S.  
855. Potter, Jos., Jun.  
1093. Truscott, T.

## PLYMOUTH.

92. Bishop, H. S.  
108. Bolitho, E.  
162. Bryant, F. C.  
294. Dell, J. S.  
580. James, W. C.  
881. Reading, J. J.  
922. Rogers, C.  
928. Rogers, W. H.  
935. Ryder, J. B.

## SIDMOUTH.

402. Gibbes, H.  
593. Johnson, E. R.  
594. Johnson, F. P.

## TEIGNMOUTH.

607. Jordan, C. J. R.

## TORQUAY.

61. Battersby, N. W.  
62. Battersby, R.  
630. King, George.  
744. Metcalfe, W.  
1020. Stewart, R. M.

## DORSETSHIRE.

## POOLE.

23. Atkins, T. W.  
64. Baylie, W. E.  
172. Burnand, W. W.  
210. Churchill, J.  
432. Green, Rev. G. C.  
1089. Travers, F.

## SHERBORNE.

281. Dale, J. C.  
330. Edwards, G.

DORSETSHIRE—*continued.*SHERBORNE—*continued.*

602. Jones, G. W.  
758. Moggridge, J. T.

## WEYMOUTH.

865. Pretor, A.

## DURHAM.

## BISHOP WEARMOUTH.

772. Morris, Beverley, R.

## DARLINGTON.

27. Backhouse, T.  
28. Backhouse, W.  
120. Bowman, Jesse.  
322. Eales, Christopher.  
341. Elliott, J.  
657. Law, Thomas.  
710. Malham, George.  
720. Martin, E. J., Jun.  
815. Orde, Jonathan.  
819. Page, John.  
942. Sang, John.  
1164. Wilkinson, E.

## DURHAM.

42. Banks, E.  
170. Bungey, T. J.  
183. Cairnes, W.  
1217. Hind, James.  
1219. Lowes, Rev. J. C.  
1222. Meynell, E. J.  
768. Morison, D. P.  
802. Norman, Rev. A. M.  
806. Noyes, F.  
823. Park, Mungo.  
870. Proctor, W., Jun.  
1223. Seymour, L. T.  
1182. Wilson, John, Jun.  
1195. Wood, John.

## HARTLEPOOL.

916. Robson, J. E.

## SEAHAM.

538. Hodge, George.



## ESSEX.

## CHELMSFORD.

363. Flatman, James.

## COLCHESTER.

1213. Calvert, W. S.  
193. Carter, J.  
462. Gunner, George.  
463. Gunner, Samuel.  
486. Harrington, H. P.  
498. Harwood, W. H.  
509. Haywood, Chas.  
751. Miller, Thomas.

## EPPING.

302. Doubleday, Henry.  
843. Piffard, B.

## SAFFRON WALDEN.

435. Green, T. H.

## GLOUCESTERSHIRE.

## BRISTOL.

57. Barton, Stephen.  
77. Bernard, R. M.  
109. Bolt, Henry.  
127. Braikenridge, Rev. G.W.  
259. Cracknell, James.  
262. Crawford, J. B.  
469. Hale, W. W.  
477. Harding, G., Jun.  
557. Hudd, F.  
578. Jacques, F. V.  
789. Naish, Arthur.  
1113. Vaughan, P. H.  
1121. Walcott, W. H. L.  
1147. Weston, William.  
1172. Williams, J. M.  
1173. Williams, W.

## NEWNHAM.

84. Bingham, S.  
189. Carefield, J. G.

## CHELTENHAM.

14. Andrew, C. H.  
165. Brydges, C. E.

## GLOUCESTERSHIRE—

*continued.*

CHELTENHAM—*continued.*

212. Clark, John.  
233. Comyn, W. H.  
273. Crump, T. L.  
431. Gray, R.  
616. Kemp, J. E.  
649. Lambart, Henry.  
717. Marshall, Rev. T. A.  
795. Newman, Col. H. W.  
860. Prentice, C.  
985. Smith, Edwin.  
1094. Trye, R. E.  
1150. Wheeler, E.  
1209. Young, S. W.

## CIRENCESTER.

31. Baily, W. A.  
249. Cotton, J. W.  
1212. Zachary, Henry, Jun.

## GLOUCESTER.

461. Guise, W. V.  
743. Merrin, Joseph.  
882. Reed, R. B.  
1192. Wintle, G. S.

## WOTTON-UNDER-EDGE.

836. Perkins, C. M.

## HAMPSHIRE.

## ALTON.

961. Shaw, J. W.

## ALVERSTOKE.

1. Adams, Arthur.  
2. Adams, Mrs. Arthur.

## BEMBRIDGE, ISLE OF WIGHT.

766. More, A. G.

## EMSWORTH.

166. Buckler, Wm.

HAMPSHIRE—*continued.*

## FORDINGBRIDGE.

791. Neave, S. R.

## FRESHWATER, ISLE OF WIGHT.

925. Rogers, H.

## GOSPORT.

30. Baikie, W. B.

52. Barron, Charles.

644. Lacy, G. H.

## HAVANT.

891. Richards, A. J.

## HORNDKAN.

502. Hawker, Rev. W. H.

## NEW FOREST.

36. Baker, Richard.

91. Birt, Jacob.

## OSBORNE, ISLE OF WIGHT.

1186. Winchester, C.

## PORTSMOUTH.

892. Richards, P. S.

## RYDE, ISLE OF WIGHT.

760. Moon, J. F.

## ST. HELEN'S, ISLE OF WIGHT.

609. Jordan, W. J.

## SELBORNE.

73. Bell, Thomas.

## SOUTHAMPTON.

55. Bartlett, Rev. J. P.

465. Gwatkin, R. L.

495. Harvey, A. S.

497. Harvey, Robert.

807. Oakley, A. C., Jun.

846. Pinnock, J. D.

HAMPSHIRE—*continued.*

## VENTNOR, ISLE OF WIGHT.

464. Guyon, G.

614. Keet, John.

## WHIPPINGHAM, ISLE OF WIGHT.

869. Pisto, J.

## WINCHESTER.

182. Byrne, W. S.

364. Floud, T.

748. Midwinter, W. C.

1145. Wesley, J. S.

## HEREFORDSHIRE.

## LEOMINSTER.

20. Arkwright, H.

## ROSS.

520. Hepburn, Archibald.

676. Lingwood, R. M.

874. Purchas, A. J.

## HERTFORDSHIRE.

## BARNET.

306. Downie, R.

## HATFIELD.

1141. Weir, John.

## HITCHIN.

1218. James, E. H.

638. Knapp, J. H.

## ROYSTON.

485. Harradence, Richard.

## HUNTINGDONSHIRE.

## GODMANCHESTER.

561. Hunnybun, W. Martin.

845. Pinder, Rev. George.

## HUNTINGDONSHIRE—

*continued.*

## HOLME.

220. Clarke, William.

## ST. NEOTS.

658. Lawson, Rev. E.

901. Rix, Joseph.

## KENT.

## ASHFORD.

934. Russell, A.

1224. Stedman, W.

## CANTERBURY.

255. Cox, Capt. C. J.

475. Hammond, W. O.

686. Lloyd, W. H.

## CHATHAM.

200. Chaney, W. C.

272. Crozier, Lieut. H. D.

655. Latchmore, F.

669. Lewcock, G.

1105. Tyrer, John.

1187. Wood, F. W., Jun.

## DARTFORD.

479. Hards, H. R.

## FARNBOROUGH.

691. Lubbock, John.

## GRAVESEND.

483. Hargreaves, Wm.

## MAIDSTONE.

381. Fremlin, R. H.

1189. Wingfield, L.

## RAMSGATE.

666. Lenny, C. G.

1097. Turnbull, R. F.

KENT—*continued.*

## SEVENOAKS.

1013. Stanhope, Hon. E.

## SITTINGBOURNE.

702. Mackie, W. L.

## TENTERDEN.

67. Beale, Rev. S. C. T.

## TUNBRIDGE.

697. M'Gill, H. J.

964. Shepherd, E. B.

965. Shepherd, F.

967. Shepherd, R.

## LANCASHIRE.

## ACCRINGTON.

115. Boothman, W.

524. Heys, Abraham.

1158. Wigglesworth, Robert.

## BLACKBURN.

234. Constantine, W. L.

## BOLTON.

140. Briars, William.

151. Brown, John.

285. Daniels, J.

345. Entwistle, Henry.

379. Fraser, Finley.

428. Gray, John.

548. Holt, James.

817. Owen, James.

841. Pickering, William.

852. Porter, Thos.

930. Rothwell, Richard.

1098. Turner, Edwin.

1146. West, Thomas.

## BURY.

977. Simpkin, E.

LANCASHIRE—*continued.*

## CHORLEY.

950. Scott, Henry.

## LIVERPOOL.

18. Archer, F., Jun.

388. Galliers, Thomas.

424. Grainger, John.

445. Gregson, C. S.

494. Harrison, William.

597. Johnson, Serjeant.

598. Johnson, W.

737. Melly, C. P.

993. Smith, J. P. G.

1017. Stephenson, Henry.

1165. Wilkinson, G. H.

## LYTHAM.

446. Gregson, William.

## MANCHESTER.

5. Adamson, John.

96. Blackburn, T. and J. B.

100. Blakeley, John.

118. Boulaye, W. G. De la.

148. Brown, D. E.

184. Campbell, Charles.

194. Carter, Samuel.

205. Chappell, Joseph.

237. Cooke, Benjamin.

324. Edleston, R. S.

325. Edmondson, James.

326. Edmondson, Townley.

384. Fryer, Charles.

468. Hague, Thomas.

481. Hardy, John.

490. Harrison, Hugh.

493. Harrison, Thomas.

555. Howarth, Thomas.

559. Hudson, J. C.

615. Kelsall, Thomas.

617. Kenderdine, Frederic.

643. Labrey, B. B.

680. Linton, James.

810. O'Brien, C. F.

1081. Tinker, Jethro.

1099. Turner, J. Aspinall.

1155. Whitehead, Rev. J. T.

LANCASHIRE—*continued.*

## PRESTON.

126. Bradley, J.

254. Cowperthwaite, W.

268. Cross, W.

346. Etchels, A.

421. Graham, Edmund.

540. Hodgkinson, J. B.

577. Jackson, W.

800. Nixon, G.

872. Pugh, Thomas R.

911. Robinson, H.

913. Robinson, J.

915. Robinson, W.

960. Sharples, Richard.

972. Sherrington, A.

992. Smith, J.

1024. Stocks, G.

1034. Swann, W.

1070. Thornley, J. J.

1132. Ward, J.

1169. Willcock, S.

## ST. HELENS.

954. Seddon, George.

## SOUTHPORT.

147. Brown, C. H.

287. Davis, G.

839. Pickard, Cambridge,  
Rev. O.

## ULVERSTONE.

32. Baines, E.

68. Beardsley, Amos.

634. Kirby, James.

723. Mason, Anthony.

774. Morris, James.

1120. Waites, Benjamin.

## WARRINGTON.

181. Buxton, E. C.

244. Cooper, James.

366. Forrest, B. G.

440. Greening, Noah.

618. Kendrick, B.

LANCASHIRE—*continued.*WARRINGTON—*continued.*

694. Lund, Samuel.  
 700. M'Keand, John H.  
 701. M'Keand, Robert.  
 1029. Stretch, R. H.  
 1208. Young, Reginald and  
 Edward.

## WIGAN.

544. Holcroft, William.

## LEICESTERSHIRE.

## LEICESTER.

60. Bates, F.  
 716. Marshall, Thomas.  
 847. Plant, Francis.

## MARKET HARBOROUGH.

411. Goadby, Rev. J. J.  
 725. Mathews, Rev. A.

## MELTON MOWBRAY.

1062. Thompson, Charles.

## LINCOLNSHIRE.

## BOURNE.

348. Evans, John.

## BRIGG.

426. Grantham, Henry.

## GAINSBOROUGH.

367. Forington, Jabez.  
 1049. Tearle, E.

## KIRTON IN LINDSAY.

387. Fyles, Thomas.

## LOUTH.

223. Clayton, F.  
 1129. Wallis, T. Wilkinson.

LINCOLNSHIRE—*continued.*

## STAMFORD.

1008. Thompson, Miss S.

## WRAGBY.

1022. Stockdale, E.

## MIDDLESEX.

## HARROW.

1122. Walker, E.

## SHEPPERTON.

661. Lea, J. W.

## MONMOUTHSHIRE.

## MONMOUTH.

642. Kuper, Rev. C.  
 652. Langley, W.  
 1136. Watkins, W.

## PONTYPOOL.

99. Bladon, J.

## NORFOLK.

## HARLESTON.

374. Fox, W. L.  
 1045. Taylor, F.

## LONG STRATTON.

589. Jerrard, F.

## LYNN.

629. King, E. L.

## NORWICH.

141. Brightwell, Thomas.  
 275. Cubitt, W. Q.  
 1076. Tillett, W. H.

## WYMONDHAM.

702. M'Lachlan, J.

## NORTHAMPTONSHIRE.

## KETTERING.

671. Lewis, Rev. Evan.  
1031. Sturgis, W.  
1050. Tearle, Rev. F.  
1102. Tweed, E. B.

## NORTHAMPTON.

519. Hensman, Arthur.  
994. Smith, J. W., Jun.

## Oundle.

136. Bree, Rev. W.  
1149. Whall, Rev. W.

## WELLINGBOROUGH.

449. Griesbach, Rev. A. W.

## NORTHUMBERLAND.

## BELFORD.

955. Selby, J. P.

## MORPETH.

1221. Maugham, S.  
933. Ruspini, F. O.

## NEWCASTLE-ON-TYNE.

107. Bold, T. J.  
837. Perkins, V. R.  
844. Pigg, Thomas.  
1118. Wailes, George.

## NOTTINGHAMSHIRE.

## EDWINSTOWE.

919. Roe, W. J.  
1095. Tudsbury, P., Jun.

## ILKESTON.

386. Fuller, Rev. A.

## MANSFIELD.

129. Brameld, R. E.  
622. Ker, H.  
812. Oldham, F. H.  
889. Reynolds, R. S.

## NOTTINGHAMSHIRE—

*continued.*

## NEWARK.

397. Gascoyne, G.  
467. Hadfield, W. P.  
565. Huskings, C. E.  
1083. Tomlinson, J. H.

## NOTTINGHAM.

8. Allen, C. F.  
9. Allen, William.  
47. Barnes, S. B.  
168. Bull, E.  
216. Clarke, J. and H. B.  
320. Durrand, J. L. E.  
373. Fox, J.  
380. Freason, G.  
675. Lineker, S.  
770. Morley, John.  
771. Morley, W.  
799. Nicolls, S.  
898. Riley, S. H.  
899. Riley, T.  
929. Rose, W. B.  
981. Slater, R.  
996. Smith, W. H.  
1004. Spencer, W.  
1007. Stafford, J.

## OXFORDSHIRE.

## CHARLBURY.

944. Saunder, W. J.

## DEDDINGTON.

756. Mitchell, C. B.

## HENLEY.

89. Birks, Rev. H.  
1030. Stubbs, H. J.

## OXFORD.

217. Clarke, Mrs. L. L.  
343. Ellis, Hon. Charles.  
668. Lethbridge, E.  
725. Mathews, Murray A.

OXFORDSHIRE—*continued.*OXFORD—*continued.*

755. Minchin, Rev. H. H.  
 840. Pickard, Rev. H. Adair.  
 1148. Westwood, J. O.  
 1167. Wilkinson, Rev. W. G.

## TETSWORTH.

827. Partridge, A. W.

## RUTLANDSHIRE.

## UPPINGHAM.

74. Bell, W.

## SHROPSHIRE.

## MARKET DRAYTON.

553. Houghton, Rev. W.

## OSWESTRY.

906. Roberts, T. Vaughan.

## SHREWSBURY.

938. Salt, G. M.

## WORTHEN.

299. Done, John.

## SOMERSETSHIRE.

## BATH.

127. Braikenridge, Rev. G. W.  
 190. Carrington, S. B.  
 261. Cranstone, Joseph.  
 370. Fowler, J. B.  
 371. Fowler, W. N.  
 407. Gillo, R.  
 567. Huthwaite, T. W.  
 588. Jenyns, Rev. L.  
 761. Moor, J. H.  
 1139. Wattson, Martin.

SOMERSETSHIRE—*continued.*

## BRIDGEWATER.

48. Barnwell, J. C.  
 941. Sanders, John.

## CHEWTON MENDIP.

308. Drakeford, Rev. D. J.

## FROME.

971. Sheppard, T. W. B.

## ILMINSTER.

130. Braund, E.

## SOMERTON.

1111. Valentine, W. H.

## TAUNTON.

1215. Gervis, F.  
 1216. Gourd, I.  
 821. Parfitt, E.  
 879. Rawlinson, W. G.  
 1210. Young, W.

## WELLINGTON.

750. Miller, E., Jun.

## WESTON-SUPER-MARE.

269. Crotch, G. R.  
 270. Crotch, W. D.  
 893. Richardson, J. E.

## STAFFORDSHIRE.

## BURTON-ON-TRENT.

149. Brown, Edwin.

## LEEK.

876. Putnam, George.

## LICHFIELD.

884. Reeve, G. W.

## RUGELEY.

111. Bonney, E. S.

STAFFORDSHIRE—*continued.*

## STOKE-UPON-TRENT.

393. Garner, Robert.

## WALSALL.

788. Myers, E.

## WEDNESBURY.

940. Sampson, T. L.

## WEST BROMICH.

316. Duncalfe, Henry.

## WOLVERHAMPTON.

430. Gray, P.

## SUFFOLK.

## ALDBURGH.

396. Garrett, Edmund.

## BECCLES.

352. Farr, Rev. John.  
1191. Winter, W.

## BOTESDALE.

291. Dawson, S. T.

## BUNGAY.

394. Garneys, C.  
395. Garneys, W.

## BURY ST. EDMUNDS.

401. Gedge, J.  
456. Groom, Miss S.  
1202. Wratislaw, A. H.

## EYE.

1106. Tyrer, R., Jun.

## IPSWICH.

78. Berridge, E. W.  
134. Bree, Rev. H.  
362. Fison, J. and E.  
689. Longe, J.SUFFOLK—*continued.*

## NEEDHAM MARKET.

226. Clowes, G. A.

## SAXMUNDHAM.

1199. Woods, S. E.

## WANGFORD.

591. Jodrell, Rev. H.

## YOXFORD.

1154. White, J. H.

## SURREY.

## BAGSHOT.

796. Newnham, Rev. P. H.

## DORKING.

274. Cubitt, C.

## EPSOM.

104. Bockett, Rev. B. B.  
476. Hanson, S.  
926. Rogers, T.  
927. Rogers, W.

## FARNHAM.

670. Lewcock, Henry.

## LEATHERHEAD.

831. Payne, J. F.

## MERSTHAM.

842. Pickersgill, J. C.

## REIGATE.

139. Brewer, J. A.  
677. Linnell, John, Jun.  
678. Linnell, Thos.  
687. Loat, W.  
946. Saunders, W. W.  
1137. Watney, Daniel.



SURREY—*continued.*

## THAMES DITTON.

499. Hastings, Sidney.

## WALTON-ON-THAMES.

522. Hewitson, W. C.

## WEYBRIDGE.

835. Pennell, A. Francis.

## SUSSEX.

## BRIGHTON.

15. Andrews, Percy.  
 222. Clayton, E. G.  
 238. Cooke, Henry.  
 251. Courtauld, J.  
 315. Duke, F.  
 337. Egles, E. H.  
 338. Egles, G. M.  
 383. Fry, Hubert.  
 451. Griffith, J. R.  
 452. Griffith, Thomas.  
 455. Groom, C. O.  
 554. House, Samuel.  
 570. Image, Rev. J.  
 636. Kirby, W. F.  
 1220. M'Arthur, Niel.  
 706. Madden, H. R.  
 734. Meiklam, J.  
 816. Ormerod, E. L.  
 849. Pocock, Crawford J.  
 859. Pratt, John and Henry.  
 988. Smith, George.  
 995. Smith, R.  
 1032. Style, Sidney.  
 1046. Taylor, F.  
 1068. Thorncroft, Thomas.  
 1075. Tidy, Lewis.

## CHICHESTER.

312. Draper, W. H.

## EAST GRINSTEAD.

710. Major, W.  
 729. May, W.

SUSSEX—*continued.*

## HORSHAM.

416. Gore, Rev. H. J.

## HURSTPERPOINT.

471. Hall, J. E.

## LEWES.

101. Blaker, M. S.  
 586. Jenner, Edward.  
 620. Kenware, J.  
 851. Porter, J., Jun.  
 1110. Unwin, W. C.

## MIDHURST.

979. Skeffington, H. C.

## NEWHAVEN.

885. Reeve, J. J.

## UCKFIELD.

505. Hay, A. J.

## WORTH.

334. Edwards, W.  
 975. Silvester, E. T.

## WORTHING.

825. Parry, Captain F. J. S.  
 1205. Wyatt, C. W.

## WARWICKSHIRE.

## ALLESLEY.

135. Bree, Rev. W. T.

## ATHERSTONE.

633. King, Rev. P. M.

## BIRMINGHAM.

43. Barclay, Hanbury.  
 65. Bayliss, W. H.  
 169. Bull, W.  
 175. Burns, Henry.

## WARWICKSHIRE—

*continued.*BIRMINGHAM—*continued.*

176. Burns, Robert.  
 185. Campbell, Thomas.  
 218. Clarke, L. W.  
 221. Claypole, E. W.  
 309. Drakeford, John.  
 418. Gould, Henry.  
 433. Green, John.  
 450. Griffin, Isaac.  
 542. Hodgson, C. B.  
 608. Jordan, Dr.  
 641. Knight, F., Jun.  
 713. Mansfield, Richard.  
 745. Meyer, Frederick.  
 866. Price, Samuel.  
 1027. Stone, J. B.  
 1170. Willetts, Henry.  
 1176. Willis, W. and J.

## LEAMINGTON.

344. Enoch, William.

## RUGBY.

232. Colvin, J. W.  
 1127. Walker, J. D.

## WARWICK.

568. Hyde, Fred. Osman.

## WESTMORELAND.

## APPLEBY.

71. Bedford, T.  
 667. Leslie, David.  
 782. Moses, Henry.  
 902. Rix, J. L.

## KENDAL.

355. Fawcett, J. K.

## WILTSHIRE.

## AMESBURY.

197. Caswall, R. C.  
 877. Pyle, G.

WILTSHIRE—*continued.*

## CORSHAM.

543. Hogan, Rev. A. R.  
 639. Knapp, William.  
 785. Mullens, E. H.

## DEVIZES.

921. Rogers, B.

## MARLBOROUGH.

112. Bonney, F.  
 863. Preston, Rev. T. A.

## PEWSEY.

986. Smith, Rev. E. W.

## TROWBRIDGE.

722. Martin, W.

## WORCESTERSHIRE.

## EVESHAM.

171. Burlingham, R.  
 512. Head, John D.

## WORCESTER.

82. Bibbs, W. H.  
 327. Edmunds, Abraham.  
 550. Horton, Rev. E.  
 984. Smith, Edward.  
 991. Smith, John.  
 1057. Thompson, C.  
 1059. Thompson, T.  
 1175. Willis, T. W. B.

## YORKSHIRE.

## BEDALE.

277. Culverwell, W.

## BEVERLEY.

93. Bishoprick, I. S.  
 696. McEnnes, K. I.  
 894. Richardson, R.

YORKSHIRE—*continued.*

## BINGLEY.

824. Parke, G. H.

## BOSTON SPA.

832. Pearson, Edward.

958. Sergeant, Lewis.

## BRADFORD.

731. Meade, R. H.

## DEWSBURY.

1123. Walker, M.

## DONCASTER.

213. Clark, S.

503. Hawley, A.

836. Reid, Hugh.

1201. Wragg, J.

## GOOLE.

72. Bell, R. J.

## GUISBOROUGH.

1174. Willis, Charles.

## HALIFAX.

196. Cash, William.

271. Crowther, James.

473. Halliday, E.

546. Hollenbrake, J.

1033. Sutcliffe, Joseph.

1131. Ward, Christopher.

## HUDDERSFIELD.

69. Beaumont, Alfred.

125. Bradley, Herbert.

191. Carter, E.

207. Charlesworth, Henry.

229. Collins, Rev. J.

342. Ellis, Charles.

571. Inchbald, Peter.

595. Johnson, Rev. J.

682. Liversidge, G.

805. North, James.

YORKSHIRE—*continued.*HUDDERSFIELD—*continued.*

908. Robinson, D.

1036. Sykes, Henry.

1080. Tindall, George.

1112. Varley, J.

## HULL.

1015. Stather, T.

1060. Thompson, Thomas.

1206. Young, James.

## KEIGHLEY.

425. Grant, Rev. J. B.

## KNARESBOROUGH.

1130. Walton, John.

## LEEDS.

44. Barker, William.

75. Benson, Charles.

79. Berry, John.

128. Brain, John.

131. Bray, Edwin.

146. Brook, Jonathan.

167. Buckton, Frederick.

258. Coxon, John.

279. Cundall, Robert.

295. Denny, Henry.

558. Hudson, George.

683. Liversidge, William.

779. Morris, W. Whytehead.

808. Oates, F.

809. Oates, W.

833. Pearson, John.

907. Roberts, William.

990. Smith, H. S.

1047. Taylor, James.

1048. Taylor, W. H.

1159. Wignall, J. U.

1160. Wignall, Samuel.

## MALTON.

780. Mortimer, R.

YORKSHIRE—*continued.*

## MIDDLESBOROUGH-ON-TEES.

951. Scott, John.

## POCKLINGTON.

459. Gruggen, A. W.

## RIPON.

11. Almond, F.

95. Blackburn, R.

152. Brown, J.

203. Chapman, Christopher.

219. Clarke, Thomas.

619. Kennedy, Owen.

660. Lea, James.

719. Marston, G.

735. Meldrum, T.

790. Nash, George.

896. Richmond, R.

1101. Tutin, J. Hazeldine.

## ROTHERAM.

917. Rodgers, Thomas.

918. Rodgers, William.

976. Simmons, William.

1054. Thomas, William.

## SCARBOROUGH.

236. Cook, Robert.

584. Jeffrey, W.

781. Morton, Edward.

1166. Wilkinson, T.

## SELBY.

537. Hobson, Richard.

627. Killingbeck, James.

## SHEFFIELD.

33. Baker, G.

37. Baker, W.

63. Batty, James.

121. Boyd, R.

124. Bradley, Francis.

359. Fenton, John.

456. Green, W.

526. Hicks, W.

569. Hydes, W.

YORKSHIRE—*continued.*SHEFFIELD—*continued.*

590. Jessop, John, Jun.

659. Laycock, William.

943. Sanson, Ezra.

997. Smith, W. H.

1035. Swinden, Isaac.

## THORNE.

437. Greene, George.

## WAKEFIELD.

420. Grace, Thomas.

693. Lumb, G.

904. Roberts, Charles.

931. Roxby, H. S.

1040. Talbot, W.

1109. Ulyatt, W.

1153. White, J. B.

1183. Wilson, Junius.

## WATH.

747. Middleton, Rev. C. H.

## YARM.

746. Meynell, Thomas.

## YORK.

10. Allis, F. H.

13. Anderson, Robert.

90. Berks, John.

1214. Carrington, J. T.

242. Cooper, C.

246. Cooper, Walter.

283. Dallas, W. S.

506. Hayden, C. J.

507. Hayden, Rev. F. W.

517. Helstrip, Charles.

523. Hey, Rev. William.

533. Hind, Robert.

566. Hutchings, J.

763. Moore, B. J.

765. Moore, O. A.

773. Morris, Rev. F. O.

775. Morris, Marmaduke  
C. F.

YORKSHIRE—*continued.*YORK—*continued.*

776. Morris, Reginald F.  
 861. Prest, William.  
 862. Preston, Rev. J. D. J.  
 880. Read, Rev. G. Rudston.  
 912. Robinson, J.  
 1115. Wade, F. J.

## NORTH WALES.

## LLANRWST.

98. Blackwall, J.

## MACHYNLLETH.

6. Alington, A. M.

## PONTYPRIDD.

592. John, Evan.

## SOUTH WALES.

## ABERGAVENNY.

38. Baker, William.

## BRECON.

155. Browne, Rev. C.

## BUILTH.

603. Jones, J.

## CARDIFF.

310. Drane, Robert.  
 814. Ollevant, J.

## LLANDOVERY.

333. Edwards, T. W.

## MERTHYR TYDVIL.

826. Parry, Thomas.

## SWANSEA.

527. Higginson, W. D.  
 684. Llewelyn, J. T. Dillwyn.  
 1171. Williams, David.

SOUTH WALES—*continued.*

## WELSHPOOL.

601. Jones, Capt. J. M.

## SCOTLAND.

## ABERDEEN.

199. Chalmers, J. H.  
 209. Christie, G. G.  
 582. Jazdowski, Bronislas.  
 759. Moir, David.  
 1181. Wilson, John.

## AYRTON.

625. Kidd, R. C.

## BANFF.

329. Edward, Thomas.  
 442. Gregor, Walter.

## BRECHIN.

838. Philip, Robert.

## BRIDGE OF ALLAN.

276. Cueto, Gabriel.  
 829. Paterson, W. D.  
 1187. Wingate, J.

## CASTLE DOUGLAS.

551. Hosach, W. J. R.

## COCKBURNSPATH.

480. Hardy, James.

## DUMFRIES.

156. Browne, H. V. de P.  
 158. Browne, J. B.  
 161. Browne, W. A. F.  
 404. Gibson, W. G.  
 448. Grierson, T. B.  
 665. Lennon, W.  
 1067. Thorburn, W. S.

## DUNBAR.

562. Hunter, Miss.  
 792. Nelson, C.

SCOTLAND—*continued.*

## DUNDEE.

1138. Watson, Alexander.

## EDINBURGH.

159. Browne, J. C.

549. Hood, Robert.

688. Logan, R. F.

690. Lowe, W. F.

786. Murray, A.

1088. Traquair, R. H.

1177. Wilson, Andrew.

## ELGIN.

415. Gordon, Rev. George.

## FALKIRK.

289. Dawson, John.

536. Hislop, Robert.

752. Millingen, Charles.

## GLASGOW.

202. Chapman, Algernon.

204. Chapman, Thomas.

231. Colquhoun, Hugh.

1001. Somerville, Alexander.

1002. Somerville, James, E.

1188. Wingate, J.

## HAMILTON.

650. Lang, W.

## HAWICK.

787. Murray, J. A. H.

## HUNTLEY.

137. Bremner, Dr. Jas., Jun.

## KELSO.

647. Lamb, Rev. William.

## KIRKPATRICK JUXTA.

681. Little, Rev. W.

SCOTLAND—*continued.*

## KIRKWALL.

575. Iverach, J. G.

## KIRRIEMUIR.

1064. Thomson, W. Burns.

1152. White, F. W. B.

## LERWICK, SHETLAND.

704. Maclaurin, Rev. Rob.

## MARKINCH, FIFE.

1119. Waite, Josiah.

## MONKTON.

317. Duncan, John P.

## NAIRN.

1063. Thompson, R.

## NORTH BERWICK.

705. Macmorland, John P.

## PAISLEY.

1207. Young, Morris.

## PERTH.

646. Lamb, James.

707. Mailer, Daniel.

1092. Trotter, James.

1021. Stewart, W.

## PETERHEAD.

878. Ramsay, J.

1211. Yuill, Rev. James.

## IRELAND.

## BALLYMONEY.

80. Bewley, Rev. F.

1179. Wilson, H.

IRELAND—*continued.*

## BELFAST.

142. Bristow, John.  
662. Leatham, James.  
1066. Thomson, Professor W.

## CAVAN.

474. Halpin, Charles.

## DUBLIN.

56. Barton, Lieut. Robert.  
86. Birchall, Edwin.  
87. Birchall, E. H.  
318. Dunlop, A. A.  
470. Haliday, A. H.  
628. Kinahan, J. R.  
910. Robinson, G. W.  
1038. Tagart, W. Robert.  
1203. Wright, Dr. E. Percival.

## FIVE-MILE-TOWN, CO. TYRONE.

574. Irvine, Rev. A.

IRELAND—*continued.*

## FOYNES.

890. Rice, Edward.

## GALWAY.

740. Melville, Prof. A. W.

## LONDONDERRY.

390. Galt, Walter.

## NAVAN.

1082. Tisdall, W. G.

## PARSONSTOWN.

389. Galloway, A.

## TINAHELY.

143. Bristow, Rev. John.

## WESTPORT.

939. Salt, Samuel.

## NEUROPTERA.

## SYNOPSIS OF THE BRITISH PHRYGANIDÆ.

BY DR. HAGEN.

[Continued from the Annual for 1859, p. 109.]

## Division II. ISOPALPI, Kolenati.

MAXILLARY palpi of the males and females with five joints.

## Sub-Family 5. LEPTOCERIDES.

Maxillary palpi *long, hairy*, with the last joint *cylindrical*; *ocelli wanting*; spurs variable in number (2, 4, 4; 2, 2, 4; 2, 2, 2; 0, 2, 2; 1, 2, 2); *antennæ usually thin and longer than the wings*; anterior wings narrow.

Case composed of fine sand, conical, straight or somewhat curved, swimming freely; the larvæ live in running and standing waters.

## Genus ODONTOCERUS, Leach.

*Antennæ somewhat longer* than the wings, *rather stout, serrated internally*, the basal joint thicker, as long as the head; maxillary palpi densely clothed with long hairs; long, *the first three joints thicker*, the first short; anterior wings *much dilated* towards the elliptical apex, anterior margin curved; posterior wings folded; the anterior branch of the



*Ramus thyrifer* forked in all the wings only in the females; spurs 2, 4, 4.

Case conical, slightly curved, composed of small stones.

55. ODONTOCERUS ALBICORNIS, Scop.; Steph. Ill. 192, 1; *O. maculipennis*, Curt. Phil. Mag. 214; Steph. Ill. 193, 2.

Brown; head and thorax clothed with whitish hairs; antennæ testaceous; wings grey, the anterior clothed with yellowish-white hairs, with a silky lustre; veins margined with brown.

Length 7 lin.; exp. 11 lin.

*Hab.* London, Cheltenham, Devonshire, Carlisle, Scotland, Killarney, Norfolk and New Forest, in June and July; common.

### Genus MOLANNA, Curtis.

#### *Nais*, Rambur.

Antennæ as long as the wings, rather stout, the basal joint thickest, shorter than the head; maxillary palpi densely clothed with long hair, the joints of equal thickness, the first two short; anterior wings narrow, scarcely dilated towards the rounded apex, anterior margin straight; posterior wings folded; spurs 2, 4, 4. In the closed state the wings curl into a tube round the body, like the *Nemouræ*.

Case very peculiar, composed of fine sand, cylindrical, straight, with a broad, flat wing attached to it on each side. These have essentially the form of a thin oval shield, to the lower surface of which a cylinder is affixed. "Theca plana utrinque in tenuem marginem seu limbrum procurrente, velut alas quasdam, theca planiore et compressiore quam in superiore." (Willughby.)

56. MOLANNA ANGUSTATA, Curt. Phil. Mag. 214; B. E. 716; Steph. Ill. 203, 2; *M. nigripalpis*, Steph. Ill. 203, 1, pl. 32, fig. 3; *N. plicata*, Ramb.

Brown; antennæ and legs testaceous; anterior wings clay-coloured, clothed with silky hairs; the veins brownish; posterior wings grey.

Length 5 lin.; exp. 9 lin.

*Hab.* London, Hertford, Devonshire and New Forest, from May to August.

Genus LEPTOCERUS, Leach, Stephens, Curtis.

Antennæ *much longer than the wings*; much longer in the males than in the females, *very thin*, basal joint thickened in a flask-like form, as long as the head; maxillary palpi densely clothed with long hairs, *the first joint short, the two following very long*; anterior wings narrow, *scarcely dilated* towards the elliptical apex, anterior margin straight, posterior margin slightly emarginate; posterior wings considerably shorter, nearly triangular, folded; spurs 2, 2, 2.

Case trumpet-shaped, pointed, constructed of vegetable matters worked up into a paste, or (?) of fine sand.

Here belongs *Ceraclea*, Stephens (the statement that the two basal joints of the maxillary palpi are short, is incorrect), and of *Leptocerus*, the § B. (♂) and § C. (♀). In the females the anterior branch of the *Ramus thyrisifer* is forked, in the males simple.

57. LEPTOCERUS NERVOSUS, F.; Lat.; *C. nervosa*, Steph. Ill. 194, 1; *M. vinosa*, Ramb.; *L. Fennicus*, Hag.

Coal-black, strongly clothed with *whitish-grey hairs* on the head and maxillary palpi; antennæ black, annulated with snow-white below to beyond the middle; anterior wings ash-coloured, hyaline; *the veins*

*dark-brown*, strongly marked; the membrane with a greasy lustre, slightly clothed with short clay-coloured hairs; in the anal angle there is a clay-coloured spot, which is often indistinct; posterior wings ash-coloured, hyaline, with the veins weaker; legs clay-coloured, the thighs densely clothed with grey hairs (especially in the ♂); tarsal joints of the posterior feet darker at the apex.

Length  $4\frac{1}{2}$ —5 lin.; exp. 9—10 lin.

*Hab.* Battersea Fields, Hammersmith, Putney, along the Thames; Killarney, Reeks Mountains, at the end of May and beginning of July; abundant.

58. *L. CINEREUS*, Curt. Phil. Mag. 214; Steph. Ill. 199, 17; *L. notatus*, Hag.

Head reddish-brown, *densely clothed with light clay-coloured* hairs; palpi with greyish-brown hairs; antennæ very long, yellowish-white, annulated with brownish up to the apex; thorax reddish-brown, densely clothed with light clay-coloured hairs; abdomen above brown, with broad whitish bands on the sides, beneath reddish; anterior wings long, with the apex much dilated, very obliquely truncated, *pale brown, sparingly clothed with reddish hairs; the veins brown, distinct, but not prominent*; anterior margin and a spot in the anal angle light yellow; a small spot in the middle of the hinder margin, and two in the wing, are usually scarcely visible (especially in dead specimens); posterior wings hyaline, pale yellowish-grey; legs clay-coloured, joints of the four anterior tarsi with their apices brownish.

Length 5—6 lin.; exp. 9—11 lin.

*Hab.* London and New Forest, in July.

59. *L. BIMACULATUS*, Steph. Ill. 197, 11; *L. alboguttatus*, Hag.

Pitchy brown, *clothed with grey hairs*; antennæ dark brown, annulated with snow-white to the apex; abdomen above pitchy-brown, with white bands on the sides, below dingy-greenish; anterior wings shorter, broader and more acute than in *L. cinereus*, brown, *distantly sprinkled with short, white hairs*, with a large snow-white spot in the anal angle; veins not very distinct; posterior wings hyaline, blackish-grey, bordered with grey behind; legs whitish-grey, with the apices of the tarsi and the anterior tibiæ brownish.

Length 4—5 lin.; exp. 7—8 lin.

*Hab.* London, in July; rare.

60. *L. ANNULICORNIS*, Steph. Ill. 199, 15; *M. fulva*, Ramb.

Brown, densely clothed with clay-coloured hairs; antennæ pale clay-yellow, slightly annulated with brown to beyond the middle; abdomen pitchy-brown, with white lateral bands; anterior wings long, slender, but little broader at the apex, *densely clothed with clay-coloured hairs*; veins indistinct; a lighter spot in the anal angle; posterior wings much shorter than the anterior, hyaline, blackish-grey; legs clay-coloured, the tarsi scarcely perceptibly annulated with brown.

Length 4—5 lin.; exp. 9 lin.

*Hab.* London, in June; not very common.

61. *L. ANNULATUS*, Steph. Ill. 197, 9.

Pitchy-brown, *clothed with silver-white hairs*; antennæ brown, the basal half white, annulated with brown; abdomen pitchy-brown, with white lateral bands; an-

terior wings narrow, long, broader at the apex, *rather densely clothed with greyish-brown hairs*, with a light yellow spot in the anal angle; *apex of the wings fringed with white*; veins indistinct; posterior wings yellowish-grey, fringed with white behind; legs silver-white.

Length  $4\frac{1}{2}$  lin.; exp.  $8\frac{1}{2}$  lin.

*Hab.* England.

62. *L. FILOSUS*, L.; Pict.; Steph. Ill. 199, 18.

Black, *clothed with clay-coloured hairs*; antennæ black, annulated with white in the basal half; abdomen black, with white lateral bands; anterior wings narrow, not dilated at the apex, *clothed with brown hairs and fringed with brown*; veins distinctly prominent; a small, paler anal spot is scarcely visible in dead specimens; posterior wings dark blackish-grey, with fringes of the same colour; legs whitish-yellow, tarsi annulated with brown, anterior legs darker.

Length  $4\frac{1}{2}$  lin.; exp.  $8\frac{1}{2}$  lin.

*Hab.* London, in June.

63. *L. PERFUSCUS*, Steph. Ill. 196, 7; *M. rufina*, Ramb.

Black, *clothed with reddish-brown hairs*; antennæ black, with the basal half annulated with white; abdomen black, with white lateral bands; wings narrow, with the apex not dilated, elliptical, *clothed with reddish-brown hairs and with reddish-brown fringes*; no anal spot; posterior wings black, with black fringes; legs testaceous; tarsi with dark rings; intermediate legs paler.

Length 4 lin.; exp. 7 lin.

*Hab.* London, in June.

64. *L. DISSIMILIS*, Steph. Ill. 197, 11 (♂); *L. assimilis*, Steph. Ill. 198, 14 (♀); *L. vetula*, Ramb.

Pale brown; *head clothed with silver-white hairs*; antennæ black, annulated with white to the apex; palpi clothed with brown hairs; abdomen brown, with white lateral bands; wings narrow, dilated at the apex, obtusely and obliquely cut off, *yellowish-brown, paler towards the base, fringed with brown*, with a large yellow spot in the anal angle; posterior wings yellowish-grey; legs whitish; tarsi with dark rings.

Length 4 lin.; exp. 7 lin.

*Hab.* London and Hertford, in June; common.

65. *L. AUREUS*, Steph.; Ill. 197, 8 (♂); *L. seminiger*, Steph. Ill. 199, 15 (♀).

Pitchy-brown, *with ochreous hairs*; palpi brown; antennæ pitchy-brown, annulated with yellowish-white to the apex; abdomen pitchy-brown, with white lateral bands; wings narrow, the apex not dilated, elliptical, *ochreous, with ochreous fringes*; posterior wings deep brown; legs pale yellow; the tarsi with rather darker rings.

Length  $4\frac{1}{2}$  lin.; exp. 8 lin.

*Hab.* London, Hertford and New Forest, in June and July.

66. *L. TINEOIDES*, Scop.; *L. rufogriseus*, Steph. Ill. 201, 24.

Brown, *clothed with ochreous hairs*; palpi of the same colour; antennæ yellowish-white, annulated with black to the apex; abdomen brown, with white lateral bands; anterior wings narrow, not dilated at the

apex, elliptical, *reddish-grey*; posterior wings blackish-grey; legs testaceous.

Length  $3\frac{1}{2}$  lin.; exp. 6 lin.

*Hab.* London and Devonshire, in July, not common.

Stephens' types do not altogether agree with his description ("wings with numerous fainter atoms").

67. *L. BICOLOR*, Curt. Phil. Mag. 214; Steph. Ill. 201, 25.

Testaceous, *clothed with pale ochreous-yellow hairs*; palpi blackish-brown; antennæ blackish, annulated with white; anterior wings *pale ochreous, somewhat orange*; posterior wings blackish-grey; legs testaceous.

Length  $3\frac{1}{2}$  lin.; exp. 6 lin.

*Hab.* London, Devonshire and New Forest, in July; not uncommon.

68. *L. ALBIFRONS*, Ramb.; *L. interruptus*, Steph. Ill. 198, 12 (♂); *L. bilineatus*, Steph. Ill. 200, 21 (♀).

Black; *forehead and basal joint of the antennæ clothed with snow-white hairs*; antennæ black, annulated with white; anterior wings blackish-brown, *with three or four interrupted, white, transverse lines*; legs brownish; tarsi with pale rings; intermediate legs white; tarsi annulated with brown.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

*Hab.* North of England, Scotland and Devonshire, in June and July; common.

69. *L. BIFASCIATUS*, Pict.; *L. affinis*, Steph. Ill. 198, 13.

Black; *forehead and basal joint of the antennæ black*, the remainder annulated with white; anterior wings

black, *with three or four interrupted, white, transverse lines*; legs testaceous; intermediate legs snow-white, tarsi annulated with black; posterior legs brownish, tarsi with paler rings.

Length  $3\frac{1}{2}$  lin.; exp. 7 lin.

*Hab.* North of England, Carlisle, in June.

70. *L. PILOSUS*, Müll.; *L. ochraceus*, Curt. B. E. pl. 17; Steph. Ill. 195, 1; *M. obsoleta*, Ramb.

*Pale ochreous*; the articulations of the antennæ rather darker; anterior wings long and narrow, obtusely rounded at the apex; the *veins somewhat prominent*, ochreous, with the fringe rather darker; posterior wings yellowish white; legs pale yellow.

This species is anomalous; the anterior branch of the *Ramus thyrifer* is simple in the female also, and the anastomosis of the anterior wings is straight (as in *Setodes*), and yet the anterior legs are spurred.

Length  $5\frac{1}{2}$ —6 lin.; exp. 10 lin.

*Hab.* Regent's Park, and Benacre in Suffolk, at the end of August; rare.

### Genus MYSTACIDES, Latreille.

#### *Leptocerus*, Stephens (partim).

The same characters as *Leptocerus*, but 0, 2, 2 spurs; *Ramus thyrifer* of the anterior wings simple in both sexes; *when the wings are laid together their apex curves inwards*; posterior wings folded; anastomosis of the anterior wings oblique.

Case thin, trumpet-shaped, slightly curved, composed of fine sand.



71. MYSTACIDES ATRA, Pict.; Steph. Ill. 196, 5 (♂); *L. obtusus*, Steph.; *L. nigricans*, Steph.; and *L. niger*, Steph. l. c. 3, 4, 6 (♂); *L. caliginosus*, Steph.; and *L. aterrimus*, Steph. Ill. 200, 19 and 20 (♀).

Coal-black; antennæ annulated with white as far as the middle; anterior wings with a steel-blue lustre and a grey fringe; *legs blackish, intermediate tarsi silver-white externally*; the articulations darker.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

*Hab.* London, Devonshire and Scotland, in June and July; very common.

*L. caliginosus* is wanting in Stephens' Collection.

72. M. NIGRA, Pict.; Steph. (partim).

Very similar to the preceding, but smaller and more slender; the anterior wings entirely of a fine steel-blue colour, with black fringes; *legs silver-white, with the tarsi annulated with black.*

Length  $3\frac{1}{2}$  lin.; exp. 6 lin.

*Hab.* London, in June.

73. M. QUADRI-FASCIATA, F.; Steph. Ill. 200, 22.

Black; antennæ yellowish-white, finely annulated with black; *anterior wings golden-yellow, with four broad black bands*; posterior wings grey; legs yellowish-white.

Length 5 lin.; exp. 8 lin.

*Hab.* London, Devonshire and Scotland; not common.

#### Genus SETODES, Rambur.

The same characters as *Leptocerus*, but 1, 2, 2 spurs; *Rapus thyrifer* of the anterior wings simple in both sexes;

*posterior wings not folded*; anastomosis of the anterior wings *straight*; wings very narrow, acute.

Case like that of *Mystacides*, according to Kolenati.

This genus requires further examination. The first two species might perhaps better be referred to *Leptocerus*, especially as the last three species of that genus appear to me to have only 1, 2, 2 spurs; the posterior wings are somewhat folded. The last two species certainly belong to *Setodes*.

74. SETODES CONSPERSA, Ramb.; *L. longicornis*, Steph. Ill. 201, 23.

Pale brownish, densely clothed with long ash-coloured hair; antennæ white, much annulated with brown; legs pale ash-grey, tibiæ brown externally, tarsi with darker rings; anterior wings *narrow, yellowish-grey, densely irrorated with black*; fringe broad, *grey, yellowish* close to the margin of the wing; posterior wings blackish-grey, with rather lighter fringes.

Length 4 lin.; exp.  $7\frac{1}{2}$  lin.

*Hab.* near London, in June; rare.

75. S. ELONGATUS, Steph. Ill. 201, 26.

Pale yellowish-red; antennæ pale grey, annulated with white; legs pale; anterior\* wings very narrow, *yellowish-red, with small black points on the veins*, especially towards the apex of the wing; fringe *pale*; posterior wings somewhat brownish.

Length 3 lin.; exp.  $5\frac{1}{2}$  lin.

*Hab.* near London, in June.

This species is not now before me; according to my notes it is very like the preceding in form and colour, but smaller and more slender, and the wings less punctured, but with the punctures more arranged in rows.

Under the name *L. tineiformis*, Steph. Ill. 202, 27, there were three species, namely, a specimen of *S. elongatus*, one of *L. pilosus* (*ochraceus*) and *L. bicolor*. According to the description only the first can belong here. I could detect no difference between it and the type of *S. elongatus*.

76. *S. FILICORNIS*, Pict.; *L. attenuatus*, Steph. Ill. 202, 28.

Brownish, densely clothed with clay-yellow hairs; antennæ pale yellow, finely annulated with brown in the basal third; legs yellowish; base of the thighs brownish; wings narrow, *pointed, clothed with dark clay-coloured hairs and fringed with the same colour*; posterior wings grey.

Length 3 lin.; exp. 4½ lin.

*Hab.* Ripley at the end of June.

77. *S. TESTACEUS*, Curt. Phil. Mag. 214; Steph. Ill. 195, 2; *M. lacustris*, Pict.

Pale yellowish-brown; antennæ whitish, finely annulated with brown; legs yellowish; anterior wings *narrow, pointed, yellow, with indistinct brown spots upon the anastomosis and along the margin*; fringe brownish; posterior wings grey, with long fringes.

Length 3½ lin.; exp. 6 lin.

*Hab.* England.

N.B.—There is no doubt that a considerably greater number of *Leptocerides* than is here given will occur in England.

#### Sub-Family 6. RHYACOPHILIDES.

Maxillary palpi short, not hairy (except in *Beraea*); the

last joint short, cylindrical, sometimes flexible (as also in *Leptocerides*), but never multiarticulate; ocelli generally present (only wanting in *Beraea*); spurs variable in number (3, 4, 4; 2, 4, 4; 1, 4, 4; 0, 4, 4; 2, 2, 4), the four hinder legs with four long spurs (except in *Beraea*); antennæ moderately stout, as long as, or shorter than, the wings; anterior and posterior wings nearly of equal size and form; the clothing of hair is usually thin and short.

The cases are immovably fastened to stones, and are irregularly constructed of small stones, lined internally with silk; into these the larvæ, which live free in the water, retract themselves, and spin, for the pupa, a completely closed longish oval case of a gelatinous substance; this lies free in the stony case. The larvæ are particularly fond of rapid mountain streams.

I refer to the *Rhyacophilides*, all the species in which the last joint of the palpi is not multiarticulate, and have, therefore, united *Chimarrha* with them, but transferred *Tinodes* and *Anticyra* to the *Hydropsychides*.

#### Genus RHYACOPHILA, Pictet.

Antennæ somewhat shorter than the wings; maxillary palpi short, *the first two joints very short*, nearly globular, the remainder thinner, cylindrical, long, of uniform size; ocelli present; wings nearly similar in size and form; *discoidal cell open*; veins strong; clothing of hairs *very slight*; spurs 3, 4, 4; intermediate legs of the female not dilated; abdomen of the female obtusely conical.

Case as above described.

The section B. of Stephens, in which the females have dilated intermediate legs, does not belong to *Rhyacophila*; the only species (*R. nebulosus*) is a *Hydropsyche*.

78. *RHYACOPHILA DORSALIS*, Curt. Phil. Mag. 213 (♂);  
*R. vulgaris*, Steph. Ill. 165, 1 (♂); *R. stigma*,  
 Steph. Ill. 166, 2 (♂); *R. opaca*, Steph. Ill.  
 166, 3 (♂); *Phil. longipennis*, Curt. 213 (♀);  
*Hydrops. angustata*, Steph. Ill. 174, 9; *R. vulgaris*,  
 Ramb.

Ochreous, head darker; antennæ with pale rings; legs testaceous; anterior wings dingy-brown, thickly set with small yellow spots; a larger, rhombic, whitish spot lies like a saddle upon the wings when they are closed; posterior wings spotless, rather paler.

Length  $5\frac{1}{2}$  lin.; exp. 10 lin.

*Hab.* near London, Devonshire, New Forest and Scotland in June and July.

In the northern and central parts of Europe there are at least seven species belonging to the group of *R. vulgaris*, and of these only four are described, namely, *R. vulgaris*, Pict.; *R. dorsalis*, Curt.; *R. aurata*, Brauer; and *R. torrentium*, Pict. All are exceedingly similar in form and colour, and very variable in the distribution of the spots, which may even be entirely wanting. The males I can distinguish with certainty by the different form of the app. anales; with the females this has not succeeded in all the species. When I examined Stephens' type, I was not acquainted with the type of *R. dorsalis*, and regarded Stephens' species as *R. vulgaris*, Pict. It is not impossible that this species may occur in England; at any rate it appeared to me safer to refer these species provisionally to *R. dorsalis*.

The app. anal. sup. are two short, horizontal, closely approximated laminæ; close above these there is a narrow band-like lobe, projecting, with its dilated but depressed apex, beyond the app. sup.; this lobe is attached to the last

segment and indeed in the middle of its margin. The app. infer. are large, two-jointed, spoon-shaped and opposite. Between them lies the penis, furnished above and below with a covering valve; on each side, close to the penis, are its long spear-shaped sheaths. The latter present a very easily comprehensible character for the distinction of *R. dorsalis* and *R. vulgaris*; as in the former species they are always strongly curved downwards, and in the latter upwards. Amongst Pictet's types ticketed by Curtis, *R. dorsalis* is marked as a variety of *R. vulgaris*.

#### Genus AGAPETUS, Curtis.

Antennæ somewhat shorter than the wings, stout, with the basal joint rather thicker and stronger than the rest; maxillary palpi *with two short roundish basal joints*; the three following longer and cylindrical; ocelli milk-white, very distinct; wings nearly similar in size and form; veins distinct; *in the anterior wings the discoidal cell is as long as the apical cells*; hairy covering moderately strong; on the vertex a thick tuft of longer hairs; spurs 2, 4, 4; *intermediate legs of the females dilated*; abdomen of the females obtusely conical.

Case as in *Rhyacophila*.

The males have, on the antepenultimate ventral segment, a long, narrow, horny lobe, which is directed towards the apex of the abdomen (an indication of this occurs even in *Rhyacophila*); on the penultimate segment there is sometimes a long pencil of hair; app. superiores small, cylindrical; app. infer. large, long, oblong, spoon-shaped; between them projects a long cleft cover of the penis, the form and proportions of which vary according to the species.

79. AGAPETUS FUNEREUS, Steph. Ill. 156, 1 (♀); *A. fuscipes*, Curt. Phil. Mag. 217 (♂); Steph. Ill. 156, 2 (♀); *A. ochripes*, Curt. Phil. Mag. 217 (♀); *A. comatus*, Steph. Ill. 157, 4; *R. ciliata*, P.; *R. tomentosa*, Pict.

Blackish-brown; vertex clothed with testaceous hairs; wings brown; legs rather paler; in the male the narrow horny lobe projects beyond the apex of the abdomen; the pencil of hairs is wanting; the cover of the penis ends in two thin, sharp, brown, horny points, the extremity of which is bent upwards like a hook, and does not project beyond the app. inf.

Length  $2\frac{1}{2}$  lin.; exp. 4 lin.

*Hab.* London, Devonshire, New Forest and Ripley, in June; not rare.

80. *A. CILIATUS*, Pict.; *A. laniger*, Steph. Ill. 156, 3.

Ochreous; vertex clothed with yellowish-grey hair; antennæ brownish; wings ochreous; legs yellowish; in the male the narrow horny lobe does not reach the apex of the abdomen; on the penultimate segment of the abdomen there is a long pencil of hair; the cover of the penis ends in two thin, straight, horny points, which do not project beyond the lower appendices.

Length  $2\frac{1}{2}$  lin.; exp. 4 lin.

*Hab.* Ripley and Hertford, in June; common.

The type of *A. setiferus*, Steph. Ill. 157, 5, is wanting; the species of the same name in Pictet, from whom the description is borrowed, is a *Sericostomide*.

#### Genus GLOSSOSOMA, Curtis.

Antennæ rather shorter than the wings, *slender, thin*, the basal joint rather thicker and stronger than the rest; maxil-  
1860.

lary palpi *with two short, roundish basal joints*; the three following joints long, thin and cylindrical; ocelli present; wings similar in form, the posterior shorter; veins distinct; *the discoidal cell in all the wings is shorter than the apical cells* and placed obliquely; in the males there is at the base of the anterior wings a drum-like hairy lobe, which is only attached on the outer margin and can be erected; hairy covering thin; spurs 2, 4, 4; *intermediate legs of the females dilated*; abdomen of the females obtusely conical.

Case as in *Rhyacophila*.

The males have, on the antepenultimate ventral segment, a broad, short, horny lobe, and upon the penultimate only an indication of the same. The app. sup. are long, two-jointed, foliaceous, with a fine tooth bent upwards at their apex; the app. infer. appear to be wanting, but there is a small boat-shaped lobe, produced into a long point, in the middle of the ventral side of the last segment. The penis is thick, cylindrical, and furnished with a brush of hairs at the tip.

81. GLOSSOSOMA BOLTONI, Curt. Phil. Mag. 216; Steph. Ill. 161, 1; *R. vernalis*, Pict.

Chestnut-brown, with the apex of the abdomen and the legs ochreous; wings pale brown, the anterior with dark spots towards the apex.

Length 4 lin.; exp. 10 lin.

*Hab.* England (?).

82. G. FIMBRIATA, Steph. Ill. 161, 2, pl. 32, 1; *Tinodes obscurus*, Steph. Ill. 164, 8 (♀).

Pitchy-brown; head, apex of abdomen and legs ochreous; wings pale brown, spotless.

Length 3 lin.; exp. 6—7 lin.

*Hab.* London, Scotland.



I cannot separate the two species with certainty, and have therefore reproduced Stephens' diagnoses. The difference of size makes me think they may be distinct.

Genus BERAEA, Stephens.

Antennæ rather shorter than the wings, *stout, the basal joint very strongly clothed with hair, much longer and thicker than the rest*, furnished with a sharp tooth internally in the male; maxillary palpi very strongly clothed with hair, *the first joint short*, the four following long, cylindrical, of equal length; *ocelli wanting*; wings similar in form, the posterior rather shorter; hairy covering long and thick; venation fine and indistinct, more simple in the males than in the females, but the base of the anterior wing has a hairy drum, as in *Glossosoma*, but much smaller; spurs 2, 2, 4; intermediate feet of the females not dilated; abdomen of the females obtuse at the apex.

Case?

The males have on the antepenultimate ventral segment a short, narrow, horny lobe, and upon the penultimate a fringe of hair; app. sup. short, cylindrical; app. infer. long, thin, semicircular, bent inwards; app. intermed. two thin, diverging points; the last ventral segment is produced in the middle like a tongue; in the female the last ventral segment turns upwards, so as to form a receptacle for the brood.

I cannot separate the small, black, densely hairy species with certainty, and have therefore restricted myself to Stephens' diagnoses.

83. BERAEA ALBIPES, Steph. Ill. 158, 1 (the type is wanting; unknown to me). Black; wings blackish-brown; the anterior somewhat iridescent, with some white atoms; legs brown, tarsi white.

Length 2 lin. ; exp.  $5\frac{1}{2}$ —6 lin.

*Hab.* London, Hertford, in June.

84. *B. PYGMÆA*. Steph. Ill. 158, 2.

Black ; wings brown, spotless ; legs brown, knees white.

Length 2 lin. ; exp. 4 lin.

*Hab.* London, Devonshire, in June.

85. *B. MARSHAMELLA*, Steph. Ill. 158, 3 ; *Thya Maurus*, Curt. Phil. Mag. 216.

Black ; anterior wings narrower, nearly brownish-ochreous, spotless ; legs brown, knees and tarsi ochreous.

Length 2 lin. ; exp. 4 lin.

*Hab.* England (?).

#### Genus CHIMARRA, Leach.

Antennæ shorter than the wings, thin, the first joint not stronger than the rest ; maxillary palpi long, *the first joint very short, the two following long and cylindrical, the second with a pencil of hairs at the apex*, fourth joint short, fifth a little shorter than the third ; ocelli present ; wings narrow, the posterior shorter [than the anterior] ; hairy covering dense ; venation indistinct ; spurs in the male 0, 4, 4, in the female 1, 4, 4 ; in the male the claws of the anterior feet are different in structure ; intermediate legs of the females somewhat dilated ; arolia of the tarsi bifid in the male, simple in the female ; abdomen in the female obtusely conical.

Case ?

86. *CHIMARRA MARGINATA*, L. ; Curt. B. E. 561 ; Steph. Ill. 191, 1, pl. 33, 4.

Blackish-brown; anterior wings with a golden-yellow margin, and an oblique longitudinal streak of the same colour.

Length  $2\frac{1}{2}$ —4 lin.; exp. 5—7 lin.

*Hab.* England; Ireland amongst waterfalls; Scotland; sometimes abundant. This remarkable species cannot be confounded with any other.

### Sub-Family 7. HYDROPSYCHIDES.

Maxillary palpi long, not clothed with hair; *the last joint longer than the preceding, flexible, multiarticulate*; in the labial palpi the same structure occurs; ocelli rarely present (*Philopotamus*); spurs variable in number (3, 4, 4; 2, 4, 4), the four hinder legs always with four long spurs; antennæ either thin and longer than the wings, or thick and shorter; posterior wings usually shorter than and differently formed to the anterior; hairy covering variable, sometimes very dense and long.

Case immovably attached to stones, constructed of small irregular stones, sometimes twisted, tubular. The larvæ live principally in rapid streams.

The species, which are very difficult to separate, have usually a very uniform coloration, and are still greatly in want of further investigation.

I divide the missing genera as follows:—

I. Spurs 3, 4, 4. POLYCENTROPUS, PLECTROCNEMIA,  
CYRNU.

II. Spurs 2, 4, 4. PHILOPOTAMUS, HYDROPSYCHE,  
APHELOCHEIRA, ANTICYRA, TI-  
NODES.

(with 25 species).

Königsberg, 14 September, 1858.

## HYMENOPTERA.



OBSERVATIONS ON HYMENOPTEROUS PAPERS WHICH HAVE APPEARED DURING THE YEAR 1859, WITH NOTES ON THE CAPTURE OF RARE SPECIES WHICH HAVE OCCURRED DURING THE SAME PERIOD.

By FREDERICK SMITH.

THE year 1859 will be characterized in my calendar, as having been remarkable for the scarcity of Hymenopterous insects. I do not recollect any season parallel with it in that particular; whether this has been the case generally I am not prepared to say, since in this country, the number of Entomologists who take an interest in the *Hymenoptera* is so small, that it is quite an impossibility to obtain the requisite information.

Were I to limit my observations to a record of the capture of new species, a single paragraph would suffice for that purpose; but, estimating the capture of rarities, although undoubtedly important and interesting, as belonging to a class of facts of minor importance, I naturally seek to ascertain what more solid advantages have accrued in elucidation of the natural history of the order *Hymenoptera*. If a tithe of the ardour, perseverance and enthusiasm, brought to bear in the search after novelties, were applied to the investigation of the habits of the insect world, and to imparting the results

to our common stock of knowledge, what interesting yearly records would enrich the pages of the Annual!

The most interesting paper on British *Hymenoptera*, which has appeared during the past season, is probably that on the habits of the *Vespidæ* by Dr. Ormerod, published in the Zoologist. Several conclusions arrived at by the author are exceedingly striking, if not in fact quite new; how far subsequent observations will tend to confirm them, time alone can determine; but feeling perfectly assured that they are the offspring of no previously conceived theory, and that the paper is a record of the conscientious opinions of an unbiassed naturalist, and that they are based upon carefully followed-out observations, and of well-digested facts, the conclusions demand, on our part, an equally conscientious and deliberate consideration.

That every colony of wasps is founded by a single female, that has passed the winter in a state of torpidity, has long been a generally received opinion; as also, that she is the sole architect of the nest, until such time as worker wasps are developed, and ready to take upon themselves the future enlargement of the nest and the nursing of the young brood.

Dr. Ormerod is inclined to a different opinion, at least as far as regards the *Vespa Britannica*; this wasp builds its nest on trees or low bushes, from the latter situation a nest was procured; on its removal, four stragglers from the original nest immediately set about the building of a second; this was also subsequently removed, and again a number of stragglers constructed a new one; in neither of these cases was any individual wasp seen so much larger than the rest as to be considered the queen *par excellence*; the second and third nests both contained eggs and larvæ. Had a queen or mother wasp existed amongst either set of stragglers,

her conspicuously larger size, must, one would think, have instantly been observed. Dr. Ormerod did observe several wasps rather larger than the rest, but no single wasp so much so as to be considered the *queen par excellence*; these he considers to be small *queens* of a former year, and joint founders of the nest; this is at variance with all my observations on the other species of the genus *Vespa*.

The original nest it appears *was* tenanted by an individual *evidently larger* than the rest, and was the only *queen* contained in the first nest, and she died on the journey from Gloucestershire to Brighton.

The fact of the second and third nests being found to contain fertile eggs and grubs, which developed additional *workers*, is the most remarkable circumstance connected with Dr. Ormerod's observations, and certainly requires much further investigation; that the eggs deposited by workers should produce males we are quite prepared to believe; the observations of Dzierzon, which were subsequently fully corroborated by Dr. Siebold, in the case of the hive-bee, have placed the fact of worker bees depositing eggs which produce *males only*, beyond doubt; but that *worker* wasps lay eggs which develop *workers* and also *males*, as we have previously observed, requires confirmation. Huber, on the authority of M. Perrot, says, the small queens (workers) lay only male eggs. In fact, if the internal organization of the worker wasp is the same as that of the worker hive-bee, such cannot possibly be the case, as is clearly shown by Siebold, in his remarkable work on "A true Parthenogenesis."

Again, were we to admit at once as a fact, that *worker* wasps deposit eggs which produce *workers*, are we not admitting the position, that females are not absolutely necessary

to the perpetuation of the species? nothing but the capacity on the part of the workers to hybernate, appears to be wanting, and the race might be continued without *queens* at all.

The correctness of the generally received opinion, that the nest is always commenced by a single individual wasp, and that a female, is doubted by Dr. Ormerod; this doubt is based upon the fact of the original nest having been twice replaced, and of eggs being laid which produced living grubs, at a season too early for new queens to be developed or impregnated. This circumstance, in connection with the fact of failing to find any workers with developed ovaries, apparently supports the opinion; no *queen* was ever seen in either of the nests constructed after the removal of the original nest, nor was any queen ever observed in the parent nest, except the one which died on the journey to Brighton, and still the business of the nest went on as usual, only failing to produce, in the autumn, *queens* as well as *workers* and *males*.

The subject, I am aware, is one requiring much further observation and research; but Entomologists are greatly indebted to Dr. Ormerod for having published the results of his observations, which are full of interest, and will, I trust, awaken a desire in others to unite with him in the further prosecution of this highly interesting subject.

To the opinion, that the nature of the materials, which a species makes use of, being so undeviatingly the same as to become characteristic of it, and that *V. Britannica*, *V. sylvestris*, and *V. Germanica*, always use herbaceous filaments, we cannot subscribe, having frequently seen all these species collecting materials from sound timber; the first species was seen in great numbers, scraping or rasping off its materials

from the trunks of barked oaks, which had dried, and were scorching in a July sun. The materials used by insects in building are, we believe, generally influenced by circumstances; as an illustration of which, I may quote the fact, recorded in my observations on the habits of humble-bees; *Bombus muscorum*, that usually constructs her nest of moss, on one occasion constructed it entirely of short horse-hair, which was accumulated in a stable window, close at hand, from the currying of horses.

I may be permitted to mention the publication, during the past season, of my second Monograph on the British *Aculeata*, it contains descriptions of all the known species of *Formicidæ*, *Fossores* and *Vespidæ*. It is now twenty-three years since Shuckard's excellent Essay on the *Fossores* appeared, and during that period, nine new species have been discovered, three in the Essay proved to be of foreign origin, and the opposite sex has been discovered of twelve species of which previously only one sex was known. An ample amount of facts and observations on the insects described is added, and every endeavour has been made to render the volume as complete as possible; the portion treating on the *Formicidæ* has been rendered far more correct than it otherwise could have been, by an interchange of specimens of the species with the authors of recent Monographs on that family, Dr. Nylander, Dr. Myer, Foerster and Dr. Roger; the Fossorial group have had the advantage, in many cases of difficulty, of the opinion of M. Wesmael, who has had opportunities of consulting the typical specimens described by Van d. Linden.

The subject of arrested development in the larva of *Hymenoptera* has frequently attracted attention, but the cause remains, as far as I am aware, an impenetrable mystery;



I obtained a large number of the larvæ of *Anthophora acervorum*, two-thirds quickly changed to pupæ, and shortly afterwards arrived at the perfect condition of the insect; the remaining third continued in the larva state until the autumn, when they underwent their changes, becoming imago, in which state they passed the winter. Mr. Walcott has communicated a similar fact in connection with *Osmia aurulenta*. "I found," says my correspondent, "on the sand-hills near Burnham, on the 23rd of August, broken snail shells, from which several bees had left their cocoons; but in most of the shells there still remained two or three unopened cocoons. On opening twelve, I found the bees were perfect, and quite ready to come out; yet from the time of their usual appearance being long passed, the beginning of April, it appeared quite clear that they would not do so, but would be covered over by the drifting sand, together with those shells that had been filled with cells of eggs and pollen during the present season, and carefully stopped at the mouths to prevent the intrusion of the sand." I have no doubt of the bees in the broken shells having passed the previous winter in the larva state, or of their having changed to pupæ and imago during last autumn.

The saw-fly, *Athalia spinarum*, infested the turnip fields along the coast of Suffolk in perfect swarms about the middle of July last. When first seen hovering over the fields, at a little distance, they were mistaken for the shimmering heat which every one must have observed in extremely hot weather. A month later the turnips were in most instances entirely stripped of their leaves, the ribs only remaining. I have always found it utterly useless, to attempt to impress on the mind of a farmer, the possibility of mitigating the evil.

The following rarities have occurred during the past season :—

*Cleptes semiaurata* (Fam. *Chrysididæ*), at Pakefield, Suffolk. Mr. Curtis mentions Norfolk and Suffolk as habitats; it also occurs in the north of England.

*Myrmica lobicornis* (Fam. *Formicidæ*). Four females taken at Pakefield, on the cliffs. Mr. Curtis captured males and workers in Scotland in 1825, since which it has not occurred until the past season, being the first time the female has been taken in this country.

*Myrmica lippula*. I took this rare ant twice in the nest of *Formica fuliginosa*, but I do not think it has any connexion with that species; Nylander does not mention it.

*Myrmecina Latreillii*. I took a female, in August, near Southwold; it is strange that no one finds its worker.

*Methoca ichneumonides*. After a lapse of about fourteen years I again took this rare fossorial insect on Hampstead Heath.

*Tiphia minuta* (Fam. *Scoliadæ*). This insect again occurred on Hampstead Heath, where I had long considered it to be quite exterminated.

*Oxybelus bipunctatus* (Fam. *Crabronidæ*). This is the *O. nigro-æneus* of Shuckard, and is one of five species described in Shuckard's Essay, on which he remarks, "I do not know the locality of these insects; I have seen them only in the British Museum." This being the case, they were classed, together with numerous unique species of different orders, amongst what have been called the Leachian species, that is, doubtful natives. Of the doubtful species of *Hymenoptera*, three-fourths have been taken during the last twenty years. We are indebted to Mr. Dale for having

rescued the *Oxybelus bipunctatus* from the suspicion which has so long hung over it; Mr. Dale took it at Bourne-mouth, Hants.

*Eumenes coarctata* (Fam. *Vespidæ*). Mr. E. Shepherd took this very local insect at Addington Wood, the nearest locality to London with which I am acquainted.

*Prosopis dilatata* (Fam. *Andrenidæ*). I again captured this little bee at Pakefield, near Lowestoft, in July last, and also succeeded in rearing the species from a perforated stick, which I obtained at the same locality in 1848, the female not being previously known; that sex proves to be the *P. annularis* of Kirby; the male, which that author united with the latter, being the male of my species *P. hyalinatus*.

*Andrena eximia* (Fam. *Andrenidæ*). This beautiful species was taken in the spring, near Exeter, by Mr. J. Truscott.

*Stelis aterrima* (Fam. *Cuculinæ*). This rare species was observed in great abundance by Mr. B. Newcome, in his own garden, at Sutton Cottage, near Dartford, Kent; not being aware of its rarity, he only captured two or three specimens.

*Osmia xanthomelana* (Fam. *Dasygastræ*). Taken by Mr. B. Newcome at the above locality. I have once or twice taken it near Birch Wood; it also occurs at Shanklin, Isle of Wight, and near Exeter.

As the last notable capture, I may mention a new species of *Hemiteles*, belonging to the family *Ichneumonidæ*; it has been lately described by Mr. Desvignes, and named *Hemiteles formosus*. This insect is parasitic upon a species of spider, *Agelena brunnea*; this little *Arachnide* constructs a nest of snow-white silk, which it afterwards overlays with

a coating of mud. In addition to the new parasite, I also obtained from nests of the same spider a number of *Pezomachus fasciatus*. Out of sixty nests not more than one-third have developed spiders or parasites; at the end of October I examined the greater portion of the remainder, and ascertained that they contain living larvæ of one of the parasites; not one containing spiders or spiders' eggs.

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Since the preceding remarks were forwarded for the press, a paper by Mr. S. Stone has been read at a meeting of the Entomological Society, in which the deposition of eggs by worker-wasps is apparently proved; but only workers were developed, not a single male; the observations, therefore, of Mr. Stone and Dr. Ormerod do not coincide in their results. It becomes consequently evident, that although a new phase in the history of the wasp appears to present itself, much further, and still more careful observations must be made, before it can possibly be expected to meet with even a favourable reception. Many will doubtless at once reject the theory as absurd, without subjecting it to the test of personally endeavouring to arrive at more satisfactory results; probably, every one must receive it with some degree of doubt; this however will not quench the desire of the true naturalist, to use every means in his power to arrive at the truth; for my own part, I shall use every exertion to obtain, by personal observation, such evidence as may enable me to clear away the difficulties which at present surround the subject; and, if possible, to prove the accuracy of previous

observation. The subject, in its present state, borders too nearly upon the marvellous—is too much opposed to our present knowledge of the history of the wasp, to make any converts to the theory. Let it be however remembered, that some of the greatest wonders are now in daily operation around us, and that they have ceased to excite our astonishment, solely because we are become familiarized with them.

## COLEOPTERA.

NEW BRITISH SPECIES NOTICED IN 1859.

BY E. W. JANSON, SEC. ENT. SOC.

- I. ANCHOMENUS GRACILIPES, Duft., Schaum, Naturgesch. d. Ins. Deutschl. i. 416, 17 (1858).  
*Carabus gracilipes*, Duft. Faun. Austr. ii. 144, 189 (1812).  
*Agonum elongatum* (Dej.), Fischer, Entom. d. l. Russie, ii. 126, 2, tab. xix. f. 3 (1823-1824); Dej. Spec. gen. iii. 146, 13 (1828), Icon. ii. 364, 8, tab. 119, f. 2 (1830); J. F. Dawson, Entom. Annual for 1857, 62 (1856).  
*Anchomenus elongatus*, Eric. Kaef. d. Mark Brand. i. 112, 10 (1837); Heer, Faun. Col. Helv. i. 61, 13 (1838); Redtenb. Faun. Austr. Ed. i. 86 (1849), Ed. ii. 36 (1857); W. K. Bissill, Zool. 6698 (1859); E. W. Janson, Proc. Ent. Soc. 3 Oct. 1859, Zool. 6775 (1859).  
*A. niger*, supra *æneo-cupreus*, *prothorace subquadrato*, *angulis posticis obtusiusculis*, *coleopteris elongato-ovatis*, *subtiliter striatis*, *interstitiis planis*, *punctis quinque impressis*, *antennarum basi pedibusque rufopiceis*.—Long.  $4\frac{1}{4}$  ln.  
*A. black*, above brassy, with a coppery hue, *prothorax*

*subquadrate, posterior angles obtuse, elytra elongate-ovate, delicately striate, interstices flat, with five impressed points, base of antennæ and legs pitchy red. Length  $4\frac{1}{4}$  lines.*

Antennæ distinctly longer than the head and prothorax, about half the length of the entire insect, pitchy, the basal joint rusty red; mandibles and palpi pitchy. Head narrow, triangular, with the usual pair of punctures on the margin of each eye, and two longitudinal shallow foveæ in front, between the antennæ; with these exceptions, smooth, brassy, with a greenish tint anteriorly and a faint coppery hue posteriorly. Prothorax subquadrate, its width slightly exceeding its length, scarcely narrower behind than in front, its sides slightly rounded, rather deeply emarginate in front, very slightly so behind, posterior angles distinct but obtuse, lateral margins reflexed, especially posteriorly, basal foveæ broad, deep and well defined, finely transversely rugose, with a few indistinct punctures, dorsal channel distinct, disc with faint transverse undulated strigæ, brassy, with a faint coppery hue, the sides with a brassy tint. Elytra elongate-ovate, thrice as long as the prothorax, rather depressed, very delicately but distinctly striate, interstices flat, the third with five punctures, of which the three anterior are contiguous to the third stria, the two posterior to the second stria, brassy, with a faint coppery tint. Thighs pitchy black, tibiæ rufous, tarsi pitchy red.

At once distinguished from its nearest ally, *A. parumpunctatus* (*lævis*, Daws.), by its more slender form, its longer depressed elytra, and the obtuse (not rounded) posterior angles of its prothorax.

I have drawn up the above description from a specimen (♀) taken by Mr. Brewer in the spring of this year, near 1860.

Southwold, Suffolk; kindly lent me for that purpose by W. Jeakes, Esq., its present owner.

Mr. Bissill's description of an insect found by him at Hornsea, Yorkshire, in June last, but unfortunately lost, appears to me to apply to the present species, of which, however, the first discovery in Britain must be accorded to the Rev. C. F. Kuper, who, as we are informed by the Rev. J. F. Dawson, captured an example, in the year 1831, on the banks of the Wisbeach Canal, near Lowestoft.

2. *ANCHOMENUS VERSUTUS*, Sturm, Gyll.; E. C. Rye, Entom. Weekly Intelligencer, vi. 83 (11 June, 1859); J. A. Power, Proc. Ent. Soc. 5 Sept. 1859, Zool. 6771 (1859).

*Agonum versutum*, Sturm, Deutschl. Faun. Ins. v. 191, 7, Tab. 132, f. a A (1824); Steph. Illustr. Brit. Ent. Mand. i. 88, 7 (1828), Man. Brit. Col. 26, 162 (1839), but *not* of his *Collection*.

*Harpalus versutus*, Gyll. Ins. Succ. iv. 451, 61—62, excluding var. *c*\* (1827).

*Agonum læve*, Dej. Spec. gen. iii. 151, 18 (1828), Icon. ii. 370, 13, Tab. 120, f. 1 (1830); Steph. Illustr. Brit. Ent. Mand. i. 88, 8 (1828), Man. Brit. Col. 26, 163 (1839), but *not* of his *Collection*.

*Anchomenus versutus*, Eric. Kaef. d. Mark Brand. i. 114, 15 (1837); Heer, Faun. Col. Helv. i. 62, 18 (1838); Redtenb. Faun. Austr. Ed. i. 86 (1849), Ed. ii. 35 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 77, 17 (1854); Schaum, Naturgesch. d. Ins. Deutschl. i. 421, 21 (1858).

*A. niger*, *supra* *obscuræ viridi-æneus*, *prothoracæ trans-*

\* *H. versutus*, var. *C*. Gyll. = *Anchomenus dolens*, Sahlb., Redtenb., Schaum.



*verso, angulis posticis rotundatis, elytris breviter-oratis subtiliter punctato-striatis, interstitiis planis, punctis tribus impressis, antennis palpis pedibusque nigris.*—Long.  $3\frac{1}{4}$ —4 lin.

*A. black, obscurely greenish brass above, prothorax transverse, posterior angles rounded, elytra short-ovate, faintly punctate-striate, interstices flat, with three impressed points, antennæ, palpi and legs black.*  
—Length  $3\frac{1}{4}$  to 4 lines.

Nearly related to *A. viduus*, but readily distinguished by its usually smaller size, wider prothorax, and the flat interstices between the striæ of the elytra; in other respects similar to it.

Taken by Dr. Power, on Wimbledon Common, in July, 1858; found also in the same locality, in the spring of the present year, by Messrs. E. C. Rye and H. S. Gorham. A remarkably large female, which I captured in Yaxley Fen, at the beginning of May last, is entirely black, and presents the raised shoulders and depression in the region of the scutellum often observable in marsh-frequenting *Carabidæ*.

I sent one of two specimens kindly given me by Mr. Rye, and which had been previously submitted to the Rev. J. F. Dawson, and named by him "*A. viduus var. versutus*, Gyll.," to Dr. Schaum, who writes me that it is "*A. versutus*, Sturm."

Dr. Schaum, *l. c.*, gives, without any expression of doubt, *Carabus lugubris*, Dufts. Faun. Austr. ii. 137, 176 (1812), as a synonym of this species, adding in a note, "I found, in Megerle's Collection, as *Car. lugubris*, Dufts., a black example of the present species, without brassy tint, and Duftschmidt's remark that the shallow striæ distinguish *C. lugubris* from *C. viduus*, and that the tibiæ and tarsi are

dark-pitch colour, confirm the accuracy of this determination." Now I would observe that if *Carabus lugubris* of Duftschmidt is really specifically identical with *Agonum versutum* of Sturm, it appears to me that Duftschmidt's trivial appellation must be adopted in preference to Sturm's, it being twelve years antecedent in publication; but I am inclined to think that Duftschmidt's indication, "*Die flügeldecken sind einfach gestreift*" (the elytra are *simply striate*), and the characters assigned by him to the prothorax of his *C. lugubris*, render its identity with *versutus*, Sturm, somewhat doubtful; moreover, Dr. Schaum does not assert that the insect labelled in Megerle's Collection *Car. lugubris*, Duft., had been in any way authenticated by this author.

3. *HELOPHORUS INTERMEDIUS*, Mulsant; J. A. Power, Proc. Ent. Soc. 5 Sept. 1859, Zool. 6771 (1859).

*Helophorus intermedius* (Dej.), Mulsant, Hist. nat. des Coléopt. de France, Palpicornes, 32, 3, Tab. f. 1 (1844).

*Helophorus griseus*, Brullé, Hist. nat. des Ins. Coléopt. ii. 305 (1835), *nec* Herbst.

Allied to *H. nubilus*, but usually larger, narrower, the raised longitudinal ridges on the thorax more prominent, the elytra more parallel, the interstices between the striæ of punctures less raised, pilose.

A single example taken by Dr. Power, at Merton, in Surrey, in July, 1859.

4. *HYDROCHUS CARINATUS*, Germar; E. W. Janson, Proc. Ent. Soc. 7 Nov. 1859.

*Hydrochus carinatus*, Germar, Ins. nov. Spec. i. 89, 153 (1824); Eric. Kaef. d. Mark Brand. i. 198, 3 (1837); Heer, Faun. Col. Helv. i. 477, 3 (1841); Mulsant, Hist. nat. des Coléopt. de France, Palpi-

cornes, 45, 2 (1844); Redtenb. Faun. Austr. Ed. i. 128 (1849), Ed. ii. 110 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 238, 2 (1855).

*H. niger*, prothorace foveolato, coleopteris oblongis, striato-punctatis, sutura interstitiisque alternis elevatis.—Long.  $1\frac{1}{4}$  lin.

*H. black*, prothorax foveolated, elytra oblong, striate-punctate, the suture and alternate interstices raised.—Length  $1\frac{1}{4}$  lin.

Similar to *H. brevis* in colour and the integrity of the raised alternate interstices of the elytra, but smaller and narrower, the elytra oblong about twice as long as broad; whereas in *H. brevis* they are ovate, and their length exceeds their width by about one-fourth only.

Two specimens of this insect were taken by my esteemed friend Mr. T. P. Dossetor, in Holme Fen, Huntingdonshire, during our stay there at the beginning of May last, one of which he, with his wonted liberality, presented to me.

5. HAPLOGLOSSA GENTILIS, Luenemann; E. W. Janson, Proc. Ent. Soc. 6 June, 1859, Zool. 6619 (1859).

*Aleochara gentilis*, Luenemann in Germar's Zeitschr. f. d. Entom. v. 222, 66 (1844); Redtenb. Faun. Austr. Ed. i. 670 (1849).

*Haploglossa gentilis*, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 80, 1 (1856); Redtenb. Faun. Austr. Ed. ii. 158 (1857).

Readily distinguished from its congeners by its larger size and thickly-punctured abdomen.

Found by Mr. F. Smith, at Hampstead, in company with *Formica fuliginosa*.

This species appears to be strictly myrmecophilous, and, although usually of rare occurrence on the continent, is occa-

sionally met with in considerable numbers in the nests of the ant above named. Mr. Smith, however, informs me that despite frequent and assiduous search he succeeded in finding two or three examples only, one of which he kindly ceded to me.

6. *TACHYUSA CONCOLOR*, Eric., Kraatz; Waterhouse, Proc. Ent. Soc. 3 January, 1859, Zool. 6390 (1859); H. S. Gorham, Proc. Ent. Soc. 7 March, 1859, Zool. 6545 (1859).

*Homalota concolor*, Eric. Gen. et Spec. Staph. 126, 100 (1839); Redtenb. Faun. Austr. Ed. i. 821 (1849).

*Tachyusa lata*, Kiesenw. Stett. Ent. Zeit. v. 315 (1844); Redtenb. Faun. Austr. Ed. i. 656 (1849).

*Tachyusa concolor*, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 155, 11 (1856); Fairm. et Laboulb. Faune Ent. Franç. i. 376, 10 (1856); Redtenb. Faun. Austr. Ed. ii. 124 (1857).

Compared with its nearest ally, *T. atra*, the present insect will be distinguished from it at once by its smaller size, greater relative width, and its abdomen narrowed from the base to the apex; the male is especially conspicuous by the broad longitudinal channel which traverses the thorax.

A series of this insect was secured by Dr. Power and Mr. H. Adams in October, 1858, near Barnes, Surrey, and I received a pair at the hands of the former gentleman a few days subsequent to its capture. Mr. Waterhouse met with a specimen at Highgate in May, 1855, but, possessing only a single male, he attributed the broad thoracic channel to a freak of nature or mere accident, and passed it over as a deformed *Homalota* until an inspection of Dr. Power's examples of both sexes made him aware of the actual state of affairs, and hence it was not included in the first part of his Catalogue published on the 1st of April, 1858.

7. *OXYPODA SPECTABILIS*, Maerkel; E. W. Janson, Proc. Ent. Soc. 3 January, 1859, Zool. 6391 (1859).

*Oxypoda spectabilis*, Maerkel, in Germar's Zeitschr. f. d. Entom. v. 217, 47 (1844); Redtenb. Faun. Austr. Ed. i. 664 (1849), Ed. ii. 142 (1857); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 162, 2 (1856).

*Oxypoda ruficornis*, var., Fairm. et Laboulb. Faune Ent. Franç. i. 431, 1 (1856).

Differs from *O. ruficornis*, Gyll., Eric., in having the antennæ (except the three basal joints, which are red), the thorax and the elytra pitchy black, the humeral angles alone of the latter rufous; differences which scarcely warrant its separation as a distinct species.

Found by Mr. R. Hislop, near Falkirk, amongst grass. It occurs on the Continent, associated with *Formica fuliginosa*, but likewise among dead leaves, &c., unaccompanied by ants.

8. *OLIGOTA ATOMARIA*, Eric.; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6613 (1859).

*Oligota atomaria*, Eric. Kaef. d. Mark Brand. i. 363, 2 (1837); Gen. et Spec. Staph. 180, 2 (1839); Redentb. Faun. Austr. Ed. i. 671 (1849), Ed. ii. 153 (1857); Kraatz, Naturg. d. Ins. Deutschl. ii. 348, 2 (1856); Fairm. et Laboulb. Faune Ent. Franç. i. 453, 2 (1856).

Very similar to *O. pusillima*, but broader, the elytra rather longer, and the legs and antennæ darker.

Rare. Colney-hatch, in moss, in December.

9. *CONOSOMA PEDICULARIUM*, Grav.; E. W. Janson, Proc. Ent. Soc. 4 July, 1859, Zool. 6656 (1859).

*Tachyporus pedicularius*, Grav. Col. Micr. 133, 14 (1802); Mon. Col. Micr. 4, 2 (1806); Gyll. Ins.

Suec. ii. 246, 11 (1810); Mannerh. Précis d'un nouv. Arrangem. d. l. Fam. d. Brachel. 60, 13 [Mem. d. l'Acad. imp. des Sciences de St. Petersb. i. Livr. 5, 474] (1831); Eric. Kaef. d. Mark Brand. i. 392, 5 (1839); Heer, Faun. Col. Helv. i. 291, 15 (1839).

*Conurus pedicularius*, Eric. Gen. et Spec. Staph. 230, 18 (1839); Redtenb. Faun. Austr. Ed. i. 679 (1849), Ed. ii. 168 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 476, 7 (1856).

*Conosoma pedicularium*, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 436, 4 (1857).

Smaller and darker than *C. fusculum*, the elytra somewhat shorter than the thorax (in *C. fusculum* they are conspicuously longer); the antennæ more robust and testaceous throughout (in *C. fusculum* the intermediate joints are fuscous).

The first specimen which came under my notice, I found, without a locality ticket, in Mr. Wollaston's Collection; Mr. H. Squire met with several specimens at Whittlesea Mere, Hunts, and at Horning, Norfolk, in the autumn of 1858; and at the beginning of May last, I secured seven or eight examples at the roots of grass at the edges of the dykes in Holme Fen, Hunts.

10. *TACHINUS LATICOLLIS*, Grav.; J. A. Power, Proc. Ent. Soc. 7 November, 1859.

*Tachinus laticollis*, Grav. Col. Micr. 141, 10 (1802); Mulsant et Rey, Opusc. Ent. ii. 67 (1853); Kraatz, Stett. Ent. Zeit. xvi. 26 (1855); Naturgesch. d. Ins. Deutschl. ii. 413, 14 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 484, 9 (1856).

*Tachyporus laticollis*, Grav. Mon. Col. Micr. 15, 29 (1806).

The present species, which Erichson, Redtenbacher and Heer confounded with *T. marginellus*, F., may be recognized by its usually larger size and comparatively greater breadth; its elytra are appreciably shorter and more convex, and their margins and those of the prothorax are ferruginous, not testaceous, as in *marginellus*. The space between the two intermediate processes at the apex of the seventh inferior segment of the abdomen of the male is twice as wide as in *marginellus*, and the processes themselves are distinctly longer; the same differences obtain, but in a less degree, in the female.

Found by Mr. Constantine, near Blackburn.

11. *ACYLOPHORUS GLABRICOLLIS*, Lac., Eric.; J. A. Power, Proc. Ent. Soc. 5 Sept. 1859, Zool. 6771 (1859).

*Staphylinus glabricollis*, Boisd. et Lacord. Faune Ent. des Envir. de Paris, 396, 20 (1835).

*Acylophorus Ahrensii*, Nordm. Symb. ad Mon. Staph. 127, 1 (1837).

*Staphylinus rufilabris*, Zetterst. Ins. Lappon. 65, 42 (1840).

*Acylophorus glabricollis*, Eric. Kaef. d. Mark Brand. i. 482, 1 (1839), Gen. et Spec. Staph. 519, 1 (1840; Heer, Faun. Col. Helv. i. 584, 1 (1841); Redtenb. Faun. Austr. Ed. i. 826 (1849), Ed. ii. 199 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 534, 1 (1856); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 480, 1 (1857).

Greatly resembling, and of our ascertained indigenous species, most nearly allied to *Euryporus picipes*, Payk., but having the antennæ elbowed almost as in *Cryptobium*, the basal joint fully as long as the four succeeding joints taken together, slightly curved.



Two examples were captured by Dr. Power, near Merton, Surrey, on the 26th July, 1859.

Although, as will be seen by the references above given, this species is distributed throughout Europe, (I have an example from the Ionian Islands,) it appears to be everywhere rare, and is to be sought for amongst rubbish, especially the debris of reeds, on the edges of marshes and lakes, and in damp moss in woods.

12. *PHILONTHUS FUSCUS*, Grav., J. A. Power, Proc. Ent. Soc. 7 Nov., 1859.

*Staphylinus fuscus*, Grav. Col. Micr. 29, 41 (1802), Mon. Col. Micr. 59, 26 (1806); Gyll. Ins. Suec. ii. 329, 45 (1810); Mannerh. Précis d'un nouv. Arrangem. d. l. Fam. des Brachel. 29, 59 [Mem. de l'Acad. imp. des Sciences de St. Petersb. i. Livr. 5, 443] (1831).

*Staphylinus subuliformis*, Grav. Col. Micr. 29, 42 (1802), Mon. Col. Micr. 61, 30 (1806).

*Staphylinus terminatus*, Grav. Col. Micr. 30, 43 (1802).

*Staphylinus fragilis*, Grav. Col. Micr. 30, 44 (1802).

*Philonthus fuscus*, Nordm. Symb. ad Mon. Staph. 90, 54 (1837); Eric. Kaef. d. Mark Brand. i. 461, 22 (1839), Gen. et Spec. Staph. 457, 48 (1840); Heer, Faun. Col. Helv. i. 264, 21 (1839); Redtenb. Faun. Austr. Ed. i. 702 (1849), Ed. ii. 191 (1857); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 593, 28 (1857).

Thorax with the dorsal series consisting of four punctures. About the size of *P. cephalotes*.

Readily recognized by its dark brown hue, head and scutellum usually black, the antennæ, palpi, elytra and posterior margins of the abdominal segments reddish brown, the intermediate joints of the antennæ pitchy. The thorax is occasionally reddish-brown, with an anterior black patch.



Taken by Dr. Power at Shirley, near Croydon, and at Merton, Surrey, and by Mr. Waterhouse, at Southend, Essex.

13. *STENUS PRODITOR*, Eric.; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6613 (1859).

*Stenus proditor*, Eric. Kaef. d. Mark Brand. i. 550, 24 (1839), Gen. et Spec. Staph. 713, 44 (1840); Heer, Faun. Col. Helv. i. 220, 22 (1839); Redtenb. Faun. Austr. Ed. i. 727 (1849), Ed. ii. 222 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 585, 40 (1856); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 768, 33 (1857).

Very similar to *S. Argus*, but narrower, the head wider, the tarsi more slender, and the abdomen conspicuously margined throughout, rather more thickly punctured, the base of each segment with a short longitudinal ridge.

I captured a single example, early in December, 1858, at roots of grass in a swamp in a wood near Finchley, Middlesex.

14. *STENUS OPTICUS*, Grav.; E. W. Janson, Proc. Ent. Soc. 4 July, 1859, Zool. 6656 (1859).

*Stenus opticus*, Grav. Mon. Col. Micr. 231, 12 (1806); Eric. Kaef. d. Mark Brand. i. 560, 36 (1839), Gen. et Spec. Staph. 720, 57 (1840); Heer, Faun. Col. Helv. i. 222, 31 (1839); Redtenb. Faun. Austr. Ed. i. 728 (1849), Ed. ii. 223 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 587, 48 (1856); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 778, 47 (1858).

*Stenus femorellus*, Zetterst. Ins. Lappon. 71, 13 (1840), sec. Eric. l. c.

Pertaining to Group I. (fourth joint of the tarsi simple),

§ B. (abdomen cylindrical, not margined). Its small size, scarcely exceeding one line, will suffice to distinguish it from the species belonging to the same group and section hitherto ascertained to be indigenous.

I have seen a single native specimen only of this species, which was captured by Mr. H. Squire in Horning Fen, in the autumn of 1858; it is in the collection of Mr. Jeakes.

15. *STENUS PALUSTRIS*, Eric.; E. Shepherd, Proc. Ent. Soc. 3 January, 1859, Zool. 6391 (1859).

*Stenus palustris*, Eric. Kaef. d. Mark Brand. i. 565, 43 (1839), Gen. et Spec. Staph. 729, 75 (1840); Redtenb. Faun. Austr. Ed. i. 729 (1849), Ed. ii. 224 (1857); Fairm. et Laboulb. Faune Ent. Franç. i. 586, 45 (1856); Kraatz, Naturgesch. d. Ins. Deutschl. ii. 790, 62 (1858).

*Pæderus proboscideus*, Olivier, Entom. 3, 44, 6, 5, tab. i. f. 5, a. b. (1795)??.

*Stenus proboscideus*, Gyll. Ins. Suec. ii. 476, 11 (1810); Sahlb. Ins. Fenn. i. 429, 14 (?\*); Zetterst. Ins. Lappon. 70, 7 (1840); Heer, Faun. Col. Helv. i. 225, 38 (1839).

From the above references it might be deduced that the specific title of *proboscideus* should be adopted for the present species; but no authentic type of Olivier's insect being now extant, it is impossible to determine the species he had in view, his description and figure apply equally well to several pale-legged species; moreover, he describes, and the name itself implies that he looked upon, the exerted ali-

\* Sahlberg's work was published at intervals from 1817 to 1834, and ultimately in a collected form, whereof the title page bears the latter date.

mentary canal, bearing at its apex the ligula paraglossæ and labial palpi, as a specific peculiarity, and he would probably have designated *proboscideus* any pale-legged unspotted *Stenus* in which these organs were similarly protruded; it is, however, now known that *all* the *Steni* are occasionally subject to this disjunction of the ligula from the mentum. Under these circumstances Erichson considered it desirable entirely to discard from the list the trivial name of *proboscideus*, a step in which all subsequent writers have concurred.

The present species, although very closely allied to *S. flavipes*, may be at once distinguished by the dark apical joint of its palpi, the pitchy brown colour of the tips of *all* its thighs and base of its tibiæ, the brown basal joint and club of its antennæ, its more elongate prothorax and more parallel elytra.

Diffused throughout Europe from Lapland to France and Greece, but everywhere scarce.

Three or four specimens were taken by Mr. F. Bond in the Fens near Cambridge, in the autumn of 1858, and presented by him to Mr. E. Shepherd; and I secured a single example in May last on the muddy margin of an old dyke in Holme Fen, Hunts.

16. *PLATYSTETHUS NITENS*, Sahlb., Kraatz; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6613 (1859).

*Oxytelus nitens*, Sahlb. Ins. Fenn. 413, 9 (1834?).

♂ *Platystethus striatulus*, Heer, Faun. Col. Helv. i. 208, 4 (1839).

♀? *Platystethus splendens*, Heer, Faun. Col. Helv. i. 208, 5 (1839).

*Platystethus nitens*, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 845, 5 (1858).

Allied to *P. nodifrons*, with which it was considered identical by Erichson and others, but distinguished by its

usually smaller size, the sparser puncturing of the head, prothorax and elytra, and by the structure of the seventh abdominal segment of the male, which is produced beneath on each side into a small acute spine.

In marshes amongst vegetable debris, at the roots of grass, and hibernating beneath loose bark of willows. I have met with it in the months of October and April near Highgate, and in the vicinity of Croydon. Apparently very rare.

17. *ANISOTOMA NIGRITA*, Schmidt; Waterhouse, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

*Anisotoma nigrita*, Schmidt, Germar's Zeitschr. f. d. Entom. iii. 160, 10 (1841); Eric. Naturgesch. d. Ins. Deutschl. iii. 68, 14 (1845).

♀ *Anisotoma rubiginosa*, Waterhouse, Cat. Brit. Col. (7 March, 1859), nec Schmidt.

Mr. Waterhouse, not having had an opportunity of carefully comparing Dr. Power's specimen with a single example of an insect, which he, Mr. Waterhouse, referred to the *A. rubiginosa*, Schmidt, Eric., considered it identical therewith. A subsequent comparison of the two specimens has convinced him that they are both referrible to the *A. nigrita*. *A. rubiginosa* is, therefore, to be cancelled from the Catalogue of indigenous species, and *A. nigrita* inserted in its place.

"Taken by Dr. Power at Addington, near Croydon."

18. *PTILIUM CÆSUM*, Eric. Naturgesch. d. Ins. Deutschl. iii. 26, 4 (May, 1845); Fairm. et Laboulb. Faune Ent. Franç. i. 335, 3 (1855).

*Trichopteryx lata*, Gillm. in Sturm's Deutschl. Fauna, Ins. xvii. 72, 3, Tab. 6, f. 3 (August, 1845).

*Ptilium latum*, Redtenb. Faun. Austr. Ed. ii. 304 (1857); C. S. Gregson, Entom. Weekly Intell. vi. 165 (20 Aug. 1859)??

In the *débris* of nests of *Formica rufa* from Perthshire.

19. *PTINELLA RATISBONENSIS*, Gillm., Matthews; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

*Trichopteryx Ratisbonensis*, Gillm. in Sturm's Deutschl. Fauna, Ins. xvii. 61, 2, Tab. 5, f. 2 (1845).

*Ptilium Ratisbonense*, Redtenb. Faun. Austr. Ed. i. 150 (1849), Ed. ii. 302 (1857).

*Ptinella Ratisbonensis*, Matthews, *in litteris*.

I found this insect beneath bark of felled pine, within the London district, in January; taken also by my friend Mr. T. P. Dossetor about the same period, and under similar circumstances.

As we expect very shortly, from the pen of the Rev. A. Matthews, a supplementary paper on the British *Trichopterygidæ*, which will comprise descriptions of this and the two following species, besides several other novelties in this genus, I need not here touch on their distinctive characters.

20. *PTINELLA TENELLA*, Eric., Matthews; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

*Ptilium tenellum*, Eric. Naturgesch. d. Ins. Deutschl. iii. 33, 15 (May, 1845); Redtenb. Faun. Austr. Ed. ii. 302 (1857).

*Trichopteryx microscopica*, Gillm. in Sturm's Deutschl. Fauna, Ins. xvii. 65, 5, Tab. 5, f. 5 (August, 1845).

*Ptilium microscopicum*, Redtenb. Faun. Austr. Ed. i. 150 (1849).

*Ptinella tenella*, Matthews, *in litteris*.

I captured a single example of this species, near Hampstead, beneath the bark of a felled pine, at the latter end of February.

21. *PTINELLA ANGUSTULA*, Gillm., Matthews; E. W.

Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

*Trichopteryx angustula*, Gillm. in Sturm's Deutschl. Fauna, Ins. xvii. 66, 6, Tab. 5, f. 5 (1845).

*Ptilium angustulum*, Redtenb. Faun. Austr. Ed. ii. 303 (1857).

*Ptinella angustula*, Matthews, *in litteris*.

Taken by Mr. T. P. Dossetor and myself, within the London district, in the middle of April, beneath the bark of a dead lime tree.

22. *ABRÆUS GRANULUM*, Eric.; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6613 (1859).

*Abræus granulum*, Eric. Kaef. d. Mark Brand. i. 686 3 (1839); Fairm. et Laboulb. Faune Ent. Franç. i. 287, 3 (1855); Redtenb. Faun. Austr. Ed. i. 241 (1849), Ed. ii. 319 (1857); de Mars. Ann. d. l. Soc. Ent. d. France, Ser. iii. iv. 589, 7, T. 14, f. 7 (1857).

Smaller than *A. globosus*, more strongly and closely punctate, the anterior tibiæ slender at the base, suddenly dilated outwardly from about the middle to the apex.

I captured four examples of this rare insect, in a rotten stump, near Walthamstow, Essex, in May.

23. *EPURÆA NEGLECTA*, Heer; E. W. Janson, Ent. Annual for 1858, 72, 70 (1857); Waterhouse, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

Mr. Waterhouse, considering Dr. Power's specimens referrible to *E. parvula*, Sturm., and not to *E. neglecta*, Heer, Sturm, discarded the present species from his Catalogue; subsequent investigation has, however, satisfied him that the insect attributed by Mr. Murray, Dr. Power and myself to the *E. neglecta* is in reality that species, and distinct from *E. parvula*.

The broader form, dark colour and coarse sculpture readily distinguish this species. Sturm's figure is not altogether satisfactory; the thorax there appears widest at the base; but in my specimen its greatest width is at about one-sixth from the base.

Having on a former occasion given the bibliographical references, I need not here repeat them. I will merely add: Redtenb. Faun. Austr. Ed. ii. 325 (1857).

24. *OLIBRUS OBLONGUS*, Eric.; Waterhouse, Proc. Ent. Soc. 4 April, 1859, Zool. 6614 (1859).

*Olibrus oblongus*, Eric. Naturgesch. d. Ins. Deutschl. iii. 121, 10 (1845); Redtenb. Faun. Austr. Ed. ii. 322 (1857).

Very closely allied to *O. piceus*, but smaller and relatively narrower; the elytra with the deep sutural stria shorter, and each interstice with a row of very minute shallow punctures.

Found by Mr. H. Squire, in the spring and autumn, at Whittlesea Mere and Horning. I secured several specimens in Holme Fen, early in May last.

25. *RHIZOPHAGUS POLITUS*, Hellw.; J. W. Douglas, Proc. Ent. Soc. 7 March, 1859, Zool. 6544 (1859).

*Synchita polita*, Hellw. Schneider's Mag. 404, 4 (1791?); Duft. Faun. Austr. iii. 150, 1 (1825).

*Lyctus politus*, Fab. Ent. Syst. I. ii. 502, 1 (1792), Syst. Eleut. 560, 1 (1801).

*Rhizophagus politus*, Gyll. Ins. Suec. iii. 423, 3 (1813); Eric. Naturgesch. d. Ins. Deutschl. iii. 235, 10 (1845); Redtenb. Faun. Austr. Ed. i. 174 (1849), Ed. ii. 339 (1857); Sturm, Deutschl. Fauna, Ins. xxii. 21, 10, T. 396, f. a A (1853).

Larger than the largest specimens of *R. bipustulatus*; above of an uniform black colour, relatively much wider, 1860.

the thorax shorter, the elytra more parallel, the punctate striæ obsolete at the apex and sides. Found on the continent under bark of fir trees.

“Sweeping in a ditch near Lee, Kent, in June.”

26. *LÆMOPHLÆUS DUPLICATUS*, Waltl.; E. W. Janson, Proc. Ent. Soc. 4 April, 1859, Zool. 6613 (1859).

*Læmophlæus duplicatus*, Waltl. Isis, 1839, 225, 39; Eric. Naturgesch. d. Ins. Deutschl. iii. 321, 6 (1846); Redtenb. Faun. Austr. Ed. i. 185 (1849), Ed. ii. 354 (1857); Sturm, Deutschl. Fauna, Ins. xxi. 48, 6, T. 383, f. c C, d D (1851).

The *two* impressed longitudinal lines on each side of the thorax, and the truncate elytra of the male, at once distinguish this species from its congeners.

I secured a pair of this insect from beneath the bark of a felled oak, in a wood near Highgate, at the end of March last. A third specimen was carried away by the high wind before I could transfer it to my bottle.

27. *CORTICARIA SERRATA*, Payk.; Waterhouse, Trans. Ent. Soc. Lond. Ser. ii. v. 138, 5 (1859): *described*.

“Weybridge.”

28. *CORTICARIA FULVA*, Villa; Waterhouse, Trans. Ent. Soc. Lond. Ser. ii. v. 137, 4 (1859): *described*.

*Corticaria elongata* of Stephens' Collection, but not of his descriptions.

29. *CORTICARIA WOLLASTONI*, Waterhouse, Trans. Ent. Soc. Lond. Ser. ii. v. 143, 10 (1859): *described*.

Taken by Mr. Wollaston, at Mablethorpe.

30. *CORTICARIA FUSCULA*, Gyll.; Waterhouse, Trans. Ent. Soc. Lond. Ser. ii. v. 144, 11 (1854): *described*.

31. *BYTURUS FUMATUS*, F.; Waterhouse, Proc. Ent. Soc. 7 November, 1859.



*Dermestes fumatus*, Fab. Ent. Syst. I. i. 231, 23 (1792),  
Syst. El. i. 316, 21 (1801)??

*Byturus tomentosus*, var., B.? Latr. Gen. Crust. et  
Ins. ii. 18, 1 (1807).

*Dermestes tomentosus*, Gyll. Ins. Suec. i. 157, 14  
(1808)?

*Byturus fumatus*, Redtenb. Faun. Austr. Ed. i. 216  
(1849), Ed. ii. 395 (1857).

I will not here attempt to unravel the entangled synonymy of the two nearly allied species: the references to Fabricius above given are exceedingly doubtful, for he cites Linnæus, whose *Dermestes fumatus* we know to be a *Typhæa* of Stephens; and moreover, he says, "*Habitat in Europæ quisquiliis.*"

The present species, which is not unlikely mixed up in many of our collections with *B. tomentosus*, may be distinguished by its usually larger size, darker hue, more prominent labrum, larger eyes, and somewhat coarser sculpture.

### 32. TOMOXIA BIGUTTATA (Ziegler), Gyll.

*Mordella biguttata*, Gyll. Ins. Suec. iv. 520, 3 (1827);  
Lap. de Casteln. Hist. nat. d. Ins. Coléopt. ii. 265,  
3 (1840); Redtenb. Faun. Austr. Ed. i. 614 (1849),  
Ed. ii. 643 (1858).

*Mordella fasciata*, Payk. Ins. Suec. iii. 455, 1—2  
(1800); Gyll. Ins. Suec. ii. 606, 3 (1810), *nec* Fab.

*Tomoxia bucephala*, Achille Costa, Faun. del Regn.  
d. Napol. Mordell. 8, 1, T. 20, f. 1 (1855); Mulsant,  
Hist. nat. des Coléopt. d. France, Longipèdes,  
19, 1 (1856); Waterhouse, Proc. Ent. Soc. 7 No-  
vember, 1859.

*Tomoxia* is distinguished from *Mordella* by its transverse,

subquadrate, emarginate scutellum; by the long abrupt notch or emargination on the inner edge of the apical joint of the antennæ; and by the intermediate tibiæ being shorter than the four basal joints, taken together, of the intermediate tarsi.

*Mordella* has the scutellum narrow, almost semicircular; the apical joint of the antennæ entire; and the intermediate tibiæ very nearly as long as their tarsi.

Probably very generally mixed up in our collections with *Mordella fasciata*, Fab., to which it bears a very close resemblance; the superior size, however, of the species now under consideration, and the differences above pointed out, will at once lead to its recognition.

Found with *Mord. fasciata* in the New Forest, Hampshire, and, as it is not rare in Sweden, it may be expected to occur throughout Britain.

33. *SCOLYTUS PRUNI*, Ratzeb.; E. W. Janson, Proc. Ent. Soc. 4. July, 1859, Zool. 6656 (1859).

*Scolytus Pruni*, Ratzeb. Forst. Ins. i. 186, tab. x. f. 5 (1837); Redtenb. Faun. Austr. Ed. i. 361 (1849), Ed. ii. 838 (1858).

Abdomen beneath without tubercles or teeth. Readily distinguished by the exceedingly fine and sparse puncturing of the prothorax, and the broad interstices of the elytra, on each of which a single row of fine punctures is barely perceptible even under a strong lens.\*

I found this insect, in the month of June, in the bark of the trunk and limbs of a dead apple tree, near Highgate: *S. rugulosus* occurred in the smaller branches of the same tree.

34. *DONACIA OBSCURA*, Gyll; Waterhouse, Proc. Ent. Soc. 7 Nov. 1859.

*Donacia obscura*, Gyll. Ins. Suec. iii. 654, 6 (1853);

Lacord. Monog. des Coléopt. subpentam. d. l. Fam. des Phytophages, i. 138, 24 (1845); Steph. Illustr. Brit. Ent. Mand. iv. 272, 10 (1831), Man. Brit. Col. 282, 2205 (1839), but not of his collection; Redtenb. Faun. Austr. Ed. ii. 881 (1858).

Very nearly allied to *D. Lemnæ*, from which it differs in its more sombre colouring, in having the prothorax transverse, the anterior angles more pronounced and slightly reflexed and without tubercles, and the base of the elytra, from the humerus to within a short distance of the suture, thickly strewn with punctures.

Taken near Glasgow by Mr. Constantine.

35. SYMBIOTES LATUS, Redtenb.; Waterhouse, Proc. Ent. Soc. 3 January, 1859, Zool. 6391 (1859); E. W. Janson, *ibid.* and Proc. Ent. Soc. 7 February, 1859, Zool. 6470 (1859).

*Symbiotes latus*, Redtenb. Faun. Austr. Ed. i. 198 (1849, Ed. ii. 371 (1857); Gerstaeck, Mon. Endom. 400, 1. (1858).

The most obvious difference between the genera *Symbiotes* and *Mycetæa* is in the proportions of the ninth joint, or first articulation of the club, of the antennæ, which in *Symbiotes*, is fully thrice the width of the preceding (8th), whereas in *Mycetæa*, it exceeds it by one-half only; more recondite distinctions exist in the form of the labrum, maxillæ and terminal joints of the palpi, on which, having already elsewhere pointed them out, I will not here again enter.

The present insect, when viewed cursorily, bears so great a resemblance to *Mycetæa hirta*, that it may possibly be confounded with it in some of our collections; its superior size and more parallel elytra, however, could scarcely escape notice, and lead to its detection.

Mr. Waterhouse captured an example of this species "in sweeping the herbage in a wood, near Ryde, in the Isle of Wight, in the summer of 1854."

The partiality of this insect to the society of ants has been noticed by Redtenbacher, who says "*Die Arten leben unter Ameisen*" (The species live among ants), and I met with it on two occasions (June the 30th and July the 14th, 1858), near Highgate, associated with *Formica flava*. Subsequently, however, (August the 8th and 29th,) I took it far distant from the spot in which I first found it, amongst a species of mould growing on a rotten elm stump, and unaccompanied by ants, of which I could find no trace in the vicinity.

2, ALMA ROAD, UPPER HOLLOWAY, N.

November 11th, 1859.

## COLEOPTERA.

—◆—

OBSERVATIONS ON THE NOMENCLATURE OF BRITISH  
CARABIDÆ, AS ESTABLISHED IN THE CATALOGUE OF  
BRITISH COLEOPTERA BY G. R. WATERHOUSE.

By DR. H. SCHAUM.

*Cicindela hybrida*, Linn.—If *Cic. maritima* be considered a distinct species (an opinion which I do not share, in spite of Mr. Dawson's latest notice), the *Cic. hybrida* cannot be assigned to Linné, who most probably confounded both, for while the specimen actually in the Linnean cabinet is a *maritima*, Linné says in his description "*habitat in sylvis*," where *maritima* does not occur.

*Drypta emarginata*, Fab.—I think Rossi's name *dentata* is to be preferred, because Rossi's description is older, better, accompanied by a figure, and was known to Fabricius, who altered the name without reason.

*Polystichus fasciolatus*.—As Rossi first described and figured the *P. discoideus*, Dej., under the name of *fasciolatus*, and Olivier evidently confounded both species under the latter, I think the name *vittatus* ought to be preferred for the English insect.

*Dromius agilis*.—Mr. Dawson confounds two species under this name; the true *agilis* with dark brown elytra and two series of punctures on each of them, and a second species (*meridionalis* et *fenestratus*, Steph.) with testaceous and

more parallel elytra, and one series of punctures only on each. The last species is both *Dr. meridionalis*, Dej., and *Dr. angustatus*, Brullé (= *testaceus*, Er.) I formerly, having seen but a few French specimens of *Drom. meridionalis*, Dej., considered both as distinct, the German examples of *testaceus*, Er., being of a narrower form, but a series of English specimens communicated to me by Mr. Janson, which are intermediate in form between the German *testaceus* and the French *meridionalis*, have satisfied me of their specific identity.

*Dyschirius impunctipennis*.—To the synonyms of this species is to be added *Dysch. inermis*, Dawson. Mr. Dawson, by describing the type under the name of *inermis*, Curtis, and a reddish variety under that of *impunctipennis*, led me, but erroneously, to believe that it was really *inermis* of Curtis, the type of which I had never seen.

*Dyschirius elongatulus*, Dawson, and *D. jejunus*, Dawson, are both very suspicious to me; the latter I believe to be *angustatus*, Ahrens, the former = *politus*, Dej. Mr. Dawson has not pointed out the differences from these species; in so difficult a genus, where a species should never be established on a single or two specimens, it is not sufficient to give a description, however long it may be, but the differences from the others should be pointed out.

*Notiophilus substriatus*, Waterh. (*punctulatus*, Wesm.)—I object to Mr. Waterhouse's name being preferred. Mr. Waterhouse published his paper on *Notiophilus* when he was very young, and now himself admits that, with one exception, all his new species of *Notiophilus* (11 or 12) rest on imaginary differences. In such a case the whole paper ought to be consigned to oblivion, and the name of the single species, which by chance happens to be really distinct, but which no

one has ever been able to recognize from the description, has no greater claim to priority than a manuscript-name.

*Calathus nubigena*, Haliday.—I consider it a black variety of *melanocephalus*. It is very common in Iceland, where intermediate shades are not wanting.

*Anchomenus junceus*, Scop. (*angusticollis*, Fab.); *dorsalis*, Müll. (*prasinus*, Fab.); *lævis*, Müll. (*parumpunctatus*, Fab.); *Amara orichalcica*, Müll. (*bifrons*, Gyll.); *Zabrus piger*, Fourcr. (*gibbus*, Fab.)—I am much opposed to the adoption of these obsolete names, which Mr. Dawson has substituted for the well known and generally adopted appellations in parenthesi, in right of priority. Such a right can be admitted only when it can be proved *to evidence*, that the species in question were indeed those described by the old authors (Scopoli, Müller, Fourcroy); this, however, cannot be done either by their descriptions, or by types actually existing (except perhaps as regards *Anch. dorsalis*, Müll.): the determination of them is based solely on Schönherr's "Synonymia Insectorum," which in such cases is by no means a sufficient warrant; they *may* refer to the supposed species, but *Car. junceus*, Scop., may be equally well *Nebria Gyllenhalii*,—*Buprestis pigra*, Fourc., equally well a black *Harpalus*. *Car. lævis*, Müll., is even *positively not A. parumpunctatus*, for Müller described the latter under the name of *Car. 6-punctatus* (*vide* Schiödte Danm. Eleuth.). Fourcroy's book, in which the author does not even adopt the Linnean genera (he calls *Carabus Buprestis*), is a very poor pamphlet, written without pretension and exclusively intended for tyros and boys. Such a book has no scientific claim whatever; no greater claim than a mere catalogue, for it does not *describe* insects, but merely gives a notice of them in three or four words. If we cultivate Entomology

for the sake of knowledge and not for the sake of nomenclature, I can see no benefit arising from an inquiry into the data of the synonyms compiled (and very often erroneously compiled) by Schönherr, but on the contrary a waste of time which can be better employed in exact observations. What we want for the sake of knowledge is *stability* and *uniformity* of nomenclature, not an upsetting of it by the substitution of old forgotten and *very doubtful* names published in works without, or with little, scientific merit. The practice of seeking for such names in Schönherr's Synonymia, leads to the greatest instability and diversity of nomenclature. Dawson calls *Anchom. angusticollis junceus* in right of priority; Fairmaire, for the same reason, calls it *assimilis*, so that we have now three names instead of the one familiar to all Entomologists.

If, however, we consider it necessary, for the salvation of science, to extend the right of priority to all third and fourth-rate trashy publications, we are at least bound, when we overthrow a universally adopted name, to furnish evident proofs, from the *descriptions* of the authors, that they had *really* the species in question, and *only that*, before them; we must not dare to rely on tradition alone, which is always subject to doubt and criticism.

*Anchomenus pallipes* must bear the name of *albipes*, Fab. Mr. Dawson is wrong in referring to this species the *Car. pallipes* of the Mantissa of Fabricius, which is an American insect belonging to *Cymindis*. The present insect first appears in the Entom. System., where it bears, by a typographical error, the name of *Car. oblongus*, the same as that of the species which precedes it. In the Emendanda of the Entom. Syst., Fabricius corrected this error and substituted the name of *albipes*, the oldest published, and adopted by



Illiger and others. At a later period, in the Syst. Eleuth., Fabricius calls it, by a *lapsus calami* or *memoriæ*, *Car. pallipes*, a name preoccupied by him for the above-mentioned American insect.

*Anchomenus atratus*.—The British species is *atratus*, Fairm., but not the true *Car. atratus*, Dufts., which has been re-described by Fairmaire under the name of *A. lucidus*. In my German *Carabidæ* I have distinguished the *atratus*, Daws., Fairm., from the true *atratus*, Dufts., under the name of *A. pusillus*. *Agonum nigrum*, Dej., is a mixture of both *atratus*, Dufts., and *pusillus*.

*Pæcilus versicolor*.—A variety of *cupreus*.

*Argutor vernalis*, "Gyll."—*Lege vernalis*, "Panz."

*Arg. erythropus*, Marsh., is the true *strenuus*, Panz., as is evidently shewn by Panzer's figure. Erichson was misled by some supposed typical specimen to refer it to *pullus*, Gyll., to which must now be restored its oldest name, *diligens*, "Sturm."

*Amara vulgaris*, Linn.—*Car. vulgaris* of Linné is a *Pterostichus (melanarius)*, as is proved by his description and his cabinet. The insect known on the Continent as *A. vulgaris*, Panz., Dej., Eric., is not *contrusa*, Schiödte, as stated in the Catalogue, but *lunicollis*, Schiödte, which name I have adopted to avoid the confusion connected with the name *vulgaris*, for *Car. vulgaris*, Fab. = *acuminata*, and *Harp. vulgaris*, Gyll. = *A. erratica*. *Amara vulgaris* of Dawson can, however, not be referred to *vulgaris*, Dej., Eric. (*lunicollis*, Schiödte), as he says that three joints of the antennæ are red; it must be referred to *communis*.

*A. communis*, "Gyll."—*Lege* "Panz."

*Curtonotus spinipes*, Linn.—It can be positively proved by Linné's description ("linea media thoracis 'excavata' manibus 'spinosis'"), which rather refers to a *Scarites*, that

this is not the *Car. spinipes*, Linné. To the present species its old name, *aulicus*, Ill., must therefore be restored.

*Harpalus obscurus* of the English Entomologists is not *obscurus*, Fab. (= *monticola*, Dej.), but *rotundicollis*, Fairm, (*obscurus*, Dej.)

*Harp. cribellum*.—This name of Stephens is not entitled to priority, as Stephens evidently confounded in his description both *puncticollis* and *brevicollis*; the diagnosis refers to one, the description to the other, as is shown by the different expressions with respect to the punctuation of the thorax, in which the difference of the species resides.

*Harpalus cuniculinus*.—I do not know what Dawson understands by that name. The true *cuniculinus*, Dufts., established on a single specimen, is nothing but a small *honestus*.

*Harpalus atricornis*, Steph., Daws.—Mr. Janson informs me that this species is founded on a few small specimens of *Anisodactylus binotatus*, actually existing in the British Museum.

*Harp. litigiosus*.—The *H. Wollastoni*, Daws., is erroneously stated to be *litigiosus*, Dej.; it is in reality *tenebrosus*, Dej.

*Harp. fulvipes*, Fab.—Is *Carabus latus*, Linné, both of his description and his cabinet.

*Harp. depressus*, Dufts.—As none of the numerous names given to this species has been universally adopted, I have restored to it the oldest, *Caspius*, under which Steven has well described it.

*Harp. tardus*.—The *H. lentus*, Sturm, does not belong to this species, but to *flavicornis*, Dej., which does not occur in England.

*Harp. vernalis*, Fab.—I prefer the name of *picipennis*,

Dufts., as Fabricius erroneously applied to it the name of *Car. vernalis*, Panz.

*Acupalpus derelictus*, Daws.—A single authenticated specimen of the insect on which this species is founded, obligingly communicated to me by Mr. Janson, is but a dark variety of *dorsalis*.

*Acup. exiguus*.—I consider a variety of *luridus*, Dej.

*Bradycellus fulvus*.—The species described by Mr. Dawson under that name is not *harpalinus*, Dej., as is erroneously stated, but a mixture of *Acup. rufulus*, Dej., and *distinctus*, Dej.; the reddish specimens with nearly right angles to the thorax are *rufulus*, the dark ones with sharp angles *distinctus*, Dej. Marsham's name *C. fulvus* has no claim to priority, as his description is utterly valueless, and he also probably confounded both insects.

*Trechus incilis*, Dawson, is *rivularis*, Gyll.

Of the *Bembidia* I will say nothing at present, and merely remark that the *B. punctulatum*, Drapiez, *chlorophanum*, Sturm, cannot be, as Dawson states, the *Carab. velox* of Linné, as that species does not occur in Sweden.

## LEPIDOPTERA.



## NEW BRITISH SPECIES IN 1859.

(BY THE EDITOR.)

ANOTHER hot summer, in immediate succession to the two previous unusually hot summers, has again tended to swell our lists with species usually confined to the South of Europe.

Yet on the whole we do not hear that the season has been generally a good one for insects; sugaring has rarely been found as profitable as on many a former occasion, and from many parts of the country we have received continual complaints of the scarcity of insects.

The occurrence of a specimen of *Polyommatus Bætica*, on the chalk downs in Sussex, has naturally created a considerable sensation. We, however, see nothing very alarming in this descent of a foreigner on our own coasts, and we fortunately had an opportunity of anticipating the probability of such an occurrence. A correspondent, located almost within sight of Cherbourg, had written to narrate the appearance in 1859 of a butterfly not seen in Guernsey for about twenty years; and this insect, which showed a partiality for a bed of parsnips, proved to be *Polyommatus Bætica*. Subsequently, a correspondent in Madeira gave the interesting information that the larva feeds in the pods of

peas; probably the parsnip bed at Guernsey bordered a row of peas.

The specimen captured in Sussex may not be the sole individual which landed, and if any female came over at the same time, she will infallibly be impelled by instinct to deposit her eggs. Peas are no rarity with us, and therefore the necessary food is forthcoming for the larvæ.

Who would, therefore, be surprised should *Polyommatus Baetica* be common on the southern coast next summer?

We have heard of the occurrence of a specimen of *Callimorpha Hera* near Torquay, but the period for its regulated introduction into our list of British species has not yet arrived.

The re-addition of *Acontia Solaris* will of course direct attention to the circumstance that we are continually erasing species from our lists, in order in a few years to have the pleasure of adding them again. Indeed, our Annual would have been greatly shorn of its apparent utility, had not a number of species been arbitrarily struck off the British list.

*Catephia Alchymista*, taken by Dr. Wallace, in the autumn of 1858, occupies a prominent place on the frontispiece of our present volume (see fig. 3), but, no doubt, twenty years hence, if it has not again occurred in the interval, the leading Lepidopterists of that day will expunge it from their lists, and serious qualms will then be entertained, whether the insect in question was ever taken in this country at all.

Those who do not possess specimens of a rarity are exceedingly apt to doubt its occurrence, and possibly we should be more ready to acknowledge the claims of *Pieris Daplidice* as *indigenous*, did we possess a British specimen. It

is impossible to foresee how insiduously the presence or absence of an insect in a collection may operate on the intellect of an Entomologist.

The following is the list of New British Species in 1859:—

## BOMBYCINA.

*Clostera anachoreta*.

## NOCTUINA.

*Bryophila Algæ*.

*Leucania extranea*.

„ *putrescens*.

*Noctua flammata*.

*Acontia Solaris*.

## PYRALIDINA.

*Sophronia Emortualis*.

*Margarodes Unionalis*.

## TINEINA.

*Tinea dubiella*.

„ *fuscescentella*.

*Depressaria Rhodochrella*.

*Opostega Spatulella*.

*Nepticula Castanella*.

„ *Tiliæ*.

Our list, it will be seen, though rich in NOCTUINA, is comparatively poor in the other groups; and even in the TINEINA, the falling off is great compared with previous years. Amongst the GEOMETRINA we may mention that we believe the Rev. H. Harpur Crewe has a new species in the genus *Eupithecia*, but we do not feel competent at present to announce the fact more in detail.

## CLOSTERA ANACHORETA, Fabricius.

(Fig. 1.)

At the September Meeting of the Entomological Society of London, Dr. Knaggs exhibited some specimens of this insect, bred from larvæ which he had found in the neighbourhood of London.

This insect occupies a position intermediate between our other two chocolate-tips, *C. curtula* and *reclusa*; the most distinctive character is the dark dash which runs into the

middle of the hind margin; besides its larger size will separate it from *Reclusa*; and *Curtula* is well distinguished by the entire tip of the anterior wings being chocolate.

The larva (according to Treitschke) feeds on willow and poplar from June to October; it is yellowish-grey or flesh-coloured, with interrupted, blackish, longitudinal lines, and with alternating black and yellow spots on each side; on the twelfth segment is a small reddish hump, and on the fifth segment a larger one, with a white spot on each side.

#### BRYOPHILA ALGÆ, Fabricius.

Mr. Edleston sent in September last the following communication to the *Intelligencer* (Int. vii. p. 11):—"Two specimens of this pretty species (*B. Algæ*) were taken in this district last July."

This species is rather smaller than *B. perla*, and is varied with green and brown, only the inner and elbowed lines appearing white towards the inner margin; from its dark colour and its habit of reposing on the trunks of lichen-covered trees it is difficult to detect. It is not rare in the neighbourhood of Paris, and is a species one might have anticipated would at least have occurred in the southern counties of England. The Lancashire collectors have, however, been beforehand with us.

#### LEUCANIA EXTRANEA, Guenée.

(Fig. 2.)

At the October meeting of the Entomological Society of London, Mr. Bond exhibited a specimen of this insect from the Isle of Wight, and Dr. Allchin exhibited a specimen taken near Lewes on the 9th of September. The insect had not previously been recorded as European, though occur-

ring in most other parts of the globe. Guenée states that it is very common, and he cites as localities, North America, Columbia, Brazil, East Indies, Java, New Holland.

Now whence came the specimens which were found on the Southern Coast of England? and have other specimens appeared simultaneously in other parts of Europe? our continental readers must help us to reply to this latter inquiry. A specimen has occurred at Madeira this summer, and, curiously enough, was forwarded to this country to be named, arriving just before the October meeting of the Entomological Society. This certainly tends to confirm the idea that the unusual flight hitherwards of this *extraneous Noctua* has not been confined to our own shores.

The insect has a vague resemblance to *L. lithargyria*, but the more pointed anterior wings, more defined apical streak, readily distinguish it. Its proper position seems to be between *Lithargyria* and *Obsoleta*.

#### LEUCANIA PUTRESCENS, Hübner.

Early in July, Mr. Stewart captured three specimens of this insect, hovering over bramble blossoms, near Torquay; subsequently a specimen or two were taken in the same locality by a son of Dr. Battersby.

The species to which it seems most nearly allied is *L. obsoleta*, but the hind wings of the male are quite white, almost as in *Littoralis*, and there is a thick black streak from the base of the anterior wings as in *Comma*, and some short blackish streaks from the hind margin; the elbowed line is distinctly composed of black dots as in *L. obsoleta*.

The larva is unknown.

On the Continent the only localities known for this species are the South and West of France; hence it seems confined to the West of Europe.



## NOCTUA FLAMMATRA, Fabricius.

The capture of this insect was recorded in the *Intelligencer* (vol. vi. p. 164), by Mr. W. D. Crotch, as follows.—“Mr. Rogers, of Freshwater, was the fortunate captor of *Noctua flammatra*, a *Noctua* new to England, but which has a wide range over Europe and India; this insect resembles in some degree *N. triangulum*, but is immediately distinguished by a black collar, even more distinct than that of *T. Pastinum*; it has a black basal streak on the fore-wings.” This specimen was exhibited by Mr. Bond at the October meeting of the Entomological Society of London.

The costa and stigmata of the anterior wings are lighter than the ground colour, and the black streak from the base of the wing contrasts strongly with them.

Guenée places the insect between *Plecta* and *C. nigrum*, but remarks, it has at first sight the appearance of an *Agrotis*; Herrich-Schäffer places it in the latter genus, next to *Agathina*.

According to Treitschke, the larva, which is full fed in April, is green, with paler lateral stripes, and feeds on various low plants.

## ACONTIA SOLARIS, W. V.

(Fig. 5.)

The capture of a specimen of this insect by Mr. Percy Andrews is recorded in the *Intelligencer* (vol. vi. p. 187).

“I took it in a clover field, near Brighton, on the 25th of August, flying in the sunshine, like others of the genus.” Mr. Andrews announced it under the name of *Albicollis*, on the authority of Mr. Doubleday.

*Acontia Solaris* is a variable insect; and pale specimens have been reputed distinct under the name of *Albicollis*.

Guenée observes, "This *Acontia* is, in my opinion, a perfectly distinct species from *Solaris*, of which all modern authors have considered it a variety; and I have no doubt the larva, which is at present unfortunately unknown, will confirm its distinctness. No doubt it occurs in the same localities as *Solaris*; however, it becomes commoner as we advance southwards, whilst the contrary is the case with its congener."

In singular antithesis to the last sentence, the pale variety, and *that only*, has occurred in Britain.

Stephens remarks, "A single specimen of this insect was in the late Mr. Marsham's collection, but of the locality I am not aware; two examples were, however, taken within the metropolitan range about ten years since, and four others near Dover above six years ago; all but the first were rescued from oblivion through the zeal of Mr. Stone."

Herrich-Schäffer observes of *Solaris*—less generally diffused than *Luctuosa*, but occurring further north.

#### SOPHRONIA EMORTUALIS, W. V.

In the *Intelligencer* (vol. v. p. 123), we find a notice from the pen of Mr. Henry Cooke, of Brighton, of the capture of a specimen of this insect; it was taken on the 18th of June, 1858, by Mr. Pocock. The specimen unfortunately is not in good condition.

The insect occurs in many parts of Central and Northern Europe, and is therefore likely to occur with us; but, like many of this group, it is local, and, as Guenée observes, "it only inhabits certain woods."

The generic name of *Sophronia* was proposed for this species by Guenée in Duponchel's Catalogue in 1844; but this name cannot be retained. Hübner had in 1816 pro-

posed this name for a genus of *TINEINA*; and Zeller in the *Isis* of 1839 had adopted it for the genus which now includes the only species placed by Hübner in *his Sophronia*. If we do not consider the name as pre-occupied from 1816, it is at least so since 1839.

Herrich-Schäffer has inadvertently adopted both these generic names; and we find he has a genus *Sophronia* in vol. ii. for *Emortualis*, and another genus *Sophronia* in vol. v. for *Illustrella* and its allies. I leave to the next writer on the *Pyralidæ* the task of proposing a new generic name of *Emortualis*.

#### MARGARODES UNIONALIS, Hübner.

(Fig. 4.)

The occurrence of a specimen of this insect is noticed in the *Intelligencer* (vol. vii. p. 19); it was taken by Mr. George King within two miles of Torquay. Mr. King has since met with two other specimens, but not in such splendid condition as the specimen figured.

It is widely distributed in the South of Europe, but does not seem to occur in the north of Germany or in the north of France.

#### TINEA DUBIELLA, Gregson.

*Alis anticis* (♂) *griseo-brunneis puncto pone medium obscuriore, punctis duobus ante medium obsoleteis; alis posticis griseis.* *Alis anticis* (♀) *ochraceis puncto pone medium sub-obsoleteo; alis posticis albidis.*

Exp. al. 5—6 lin.

The occurrence of this novelty is noticed in the *Intelligencer* (vol. vi. p. 183). “The larva sports a case like that of *Pellionella*, but is carnivorous and prefers dried pupa skins

to any other pabulum with which it has been tried. - The male is *excessively* like *Pellionella*, but the female is more like *Biselliella*, which it quite resembles in colour, though otherwise readily distinguished by the presence of a discoidal spot, and by the absence of the dark edging of the costa at the base. The most perceptible characters by which to distinguish *Dubiella*, male, from *Pellionella*, are that the wings are darker, especially the posterior pair, and the hind margin of the anterior wings is more obtuse."

#### TINEA FUSCESCENTELLA, Gregson.

Mr. Gregson has proposed this name for another new *Tinea* he has met with at Liverpool, which seems intermediate between *Pellionella* and *Misella*; I do not, however, feel competent to describe it without examining a more extensive series than I have yet seen.

#### DEPRESSARIA RHODOCHRELLA, Herrich-Schäffer.

Mr. Edleston records in the *Intelligencer* (vol. v. p. 133) the capture of this insect: "I took a beautiful female in the middle of August last, at Blackpool." This summer Mr. Edleston has again met with it at Blackpool.

Mr. Doubleday remarks, "The *Depressaria* which you call *Rhodochrella* was very common, at sugar, in our field twenty years ago; the black head attracted my attention."

The dark colour of the head and thorax readily separate this insect from its allies; though otherwise it has much resemblance to *Subpropinquella* and *Atomella*.

The discovery of the larva will no doubt throw much light on its specific distinctness.

## OPOSTEGA SPATULELLA, Guenée.

*Alis anticis griseis, grosse-squamatis, maculis quatuor oppositis dilutionibus luteis.*

Exp. al.  $4\frac{1}{2}$  lin.

Tuft of the head ochreous-brownish; the eye-caps yellowish-ochreous, with a grey band of variable width.

Anterior wings coarsely scaled, grey, with faint indications of two pairs of opposite marginal spots of a pale ochreous; cilia greyish-ochreous.

Posterior wings pale grey, with greyish-ochreous cilia.

Mr. H. Tompkins took four specimens of this insect at Southend in Essex, in the middle of August, among mixed herbage; it had previously only occurred in France near Chateaudun. A peculiarity of this insect is its extreme tendency to grease, whereby the pale spots become obliterated, and only the intermediate space appears a little darker; hence Herrich-Schäffer describes the anterior wings with a darker spot on the middle of the costa and inner margin, as in *Crepusculella*.

## NEPTICULA CASTANELLA, Edleston.

The occurrence of this insect is thus noticed in the *Intelligencer*, vol. v. p. 123. "Mr. Edleston lately sent for determination a number of insects, and amongst them two specimens of a *Nepticula* taken amongst Spanish chestnuts, and for which Mr. Edleston proposed the name *Castanella*; this appears to be a distinct species, something allied to *Tityrella*, but the fascia straighter and placed nearer the hind margin."

## NEPTICULA TILIÆ, Frey.

*Alis anticis saturate fusco-æneis, subnitidis, apice violaceo-purpureo, ciliis fusco-griseis; capillis atris* (Frey, Linn. Ent. xi. p. 381).

Exp. al. 2 lin.

Anterior wings dark bronzy-brown, with the apex tinged with purple; head black.

Mr. Vaughan bred a fine series of this insect in May and June, from larvæ collected the previous autumn near Bristol.

Mr. Vaughan had apparently two sorts of larvæ (see Ent. Ann. 1859, p. 163, Enigma No. 62), but the moths produced from these larvæ, which were kept perfectly distinct, were quite inseparable, and not to be distinguished from each other.

## LEPIDOPTERA.

## RARE BRITISH SPECIES CAPTURED IN 1859.

COLIAS EDUSA; has again been very abundant in the southern counties of England, and has occurred freely in the midland counties, but scarcely appears to have been found as far north as on previous occasions.

COLIAS HYALE; has not been nearly so plentiful as in the two previous seasons.

PIERIS DAPLIDICE; is becoming comparatively a common insect; a specimen was taken by Mr. Harding at Kingsdown, Kent, August 1st (Int. vi. p. 155); another was caught by Mr. Henry Fyles, at Tenterden, July 31 (Int. vi. p. 163); a third was taken near Dover, July 18 (Int. vi. p. 171; vii. p. 48); a fourth was taken near Brighton, August 19th (Int. vi. p. 178); and, lastly, three specimens were found by Rev. W. H. Hawker in an incipient's box (Int. vi. p. 186).

LEUCOPHASIA SINAPIS; was recorded in the *Intelligencer* (vi. p. 116) as occurring near Perth, a more northern locality than any previously announced for that species; but subsequent inquiries render its occurrence there doubtful.

EREBIA BLANDINA; Mr. Gregson has noticed the curious fact (Int. vii. p. 54), that *E. Blandina* is a *garden* insect in the Ulverstone district of Lancashire, where it occurs near Grange.

EREBIA CASSIOPE; this insect has been captured on Hel-

vellyn, by the Rev. H. Harpur Crewe, June 30th (Int. vi. p. 198), and by Mr. Edleston and Mr. Harrison at Sty Head Tarn, in the middle of June (Int. vii. p. 36).

*APATURA IRIS*; has not occurred as freely as in former years; notices of a curious variety will be found in the *Intelligencer* (vol. vi. pp. 138 and 154).

*VANESSA ANTIOPA*; has not kept its promise to this country; considering the number of specimens taken last autumn it was anticipated that many would have occurred in the spring of this year, but except a specimen taken near York, May 9th, and another near Huddersfield, March 27th, we have not heard of any further *captures*, though several others have been seen. The specimen last mentioned seems to have been listening to a political discussion on the new Reform Bill; if that is a partiality of the insect, we may yet have a chance before the end of April, 1860.

*THECLA BETULÆ*; has been taken as far north as Grange in Lancashire (Int. vii. p. 54).

*POLYOMMATUS ARION*; this insect has occurred near Cheltenham (Int. vi. p. 99), at Brington in Rutlandshire, (Int. vi. p. 172), and at Chatteris, near Cambridge (Int. vi. p. 178).

*POLYOMMATUS CORYDON*; an inquiry respecting the range of this species has led to two interesting observations. First, that it occurs "in the middle of Epping Forest, where there is not a particle of chalk to be seen" (Int. vii. p. 51). Secondly, that at Grange in Lancashire, on *lime-stone*, it is the commonest Blue that occurs (Int. vii. p. 54).

*PROCRIS STATICES*; has occurred in Scotland, in the neighbourhood of Oban (Int. vi. p. 182).

*SPHINX CONVULVULI*; has again been unusually plentiful.



DEILEPHILA EUPHORBIAE; at the October meeting of the Entomological Society of London, Mr. Mitford stated, that he had recently captured a single larva of this insect, in the Isle of Wight.

DEILEPHILA GALII; the captures of this insect have been too numerous to recapitulate them. (See Int. vi. pp. 123, 131, 139, 146, 147, 155, 163, 171, 179, 187; Int. vii. pp. 3, 4, 5, 13 and 27.)

CHÆROCAMPA CELERIO; two captures have been recorded, one at Newark (Int. vii. p. 4), and one at Gainsborough (Int. vii. p. 11).

CERURA BICUSPIS; a specimen of this was reared by Mr. Robert Cook (Int. vi. p. 82); a pupa was found near York, in the autumn (Int. vi. p. 171).

NOTODONTA BICOLORA; another specimen of this insect was taken near Killarney, by Mr. Bouchard, at the end of June.

PSYCHE FUSCA; has been bred rather freely by Mr. Mitford; it appears that this insect takes two years to come to perfection; the larva feeding over two winters, being hatched as it were in August, 1857, and appearing in the imago state in June, 1859.

At the February meeting of the Entomological Society of London, Mr. Tompkins exhibited three species of *Psychidæ* hitherto unrecorded as British, *viz.*, *P. roboricolella*, Bruand, bred June 26th, 1858; *P. salicolella*, Bruand, bred June 23rd, 1858; *P. tabulella*, Bruand, taken July 24th, 1854, flying about beeches at Mickleham. We do not, however, feel competent at present to point out the distinctive characters of these species (see Zoologist, 1859, p. 6464).

ACRONYCTA ALNI; several specimens have occurred, singly as usual (see Int. vi. pp. 82, 107, 147 and 163).

*SYNIA MUSCOLOSA*; a specimen, taken at Brighton, was exhibited by Dr. Allchin at the September meeting of the Entomological Society of London.

*NONAGRIA CONCOLOR*; specimens taken near Folkestone, at the end of June, were exhibited by Dr. Knaggs at the September meeting of the Entomological Society of London.

*HYDRÆCIA PETASITIS*; the occurrence of a specimen at Taunton has been recorded by Mr. Rawlinson (Int. vii. p. 19). Mr. Armstrong observes, that near Carlisle the larvæ occur in the burdock (*Arctium Lappa*), as well as in the butter-bur (*Petasites vulgaris*).

*XYLOPHASIA SCOLOPACINA*; has again occurred in the neighbourhood of Barnstaple, North Devon.

*LAPHYGMA EXIGUA*; continues to be met with occasionally in the Isle of Wight.

*LUPERINA DUMERILII*; the capture of three specimens near Freshwater, Isle of Wight, is recorded by Mr. Rogers (Int. vii. p. 35).

*AGROTIS PYROPHILA*; Mr. Armstrong notices the occurrence of this insect in the west of Cumberland at sugar, and on the blossoms of the ragwort (Int. vii. p. 30).

*TRYPHÆNA SUBSEQUA*; has been taken in the Isle of Wight, by Mr. Rogers (Int. vii. p. 35).

*CERASTIS ERYTHROCEPHALA*; Mr. A. H. Clarke took a specimen of this insect at sugar, near Marlow, on the evening of October 20th.

*PHLOGOPHORA EMPYREA*; has again been taken in the neighbourhood of Lewes.

*HADENA RECTILINEA*; was obtained in the south west of Ireland, by Mr. Birchall.

*HADENA PEREGRINA*; at the September meeting of the Entomological Society, Mr. M'Lachlan exhibited a specimen

of this insect he had captured at Freshwater in the Isle of Wight; it was taken at sugar August 23rd (see also *Zoologist*, 1859, p. 6734).

*HELIOTHIS ARMIGERA*; many specimens of this insect have occurred during the past summer—at Weston-super-Mare (*Int. vii. p. 27*); at Worthing (*Int. vii. p. 27*); at Brighton (*Int. vii. p. 35*); at Torquay (*Int. vii. p. 35*); at Freshwater, Isle of Wight (*Int. vii. p. 35*); (from this locality Mr. Bond exhibited three specimens at the October meeting of the Entomological Society of London); at Cambridge (*Int. vii. p. 51*); at Edmonton (*Int. vii. p. 52*); at Ramsgate (*Int. vii. p. 52*); at Bristol, &c. &c.

*HELIOTHIS DIPSACEA*; a pale specimen of this species was erroneously recorded as *H. scutosa* (see *Int. vi. p. 147* and *vii. p. 19*).

*ERASTRIA VENUSTULA*; a number of specimens of this insect have been taken in Epping Forest, near Loughton (see *Int. vi. p. 99* and *p. 123*); some of these specimens were exhibited at the July meeting of the Entomological Society of London.

*BANKIA BANKIANA*; was again abundant near Killarney; the moth, writes Mr. Birchall in the *Zoologist* (*p. 6766*), seems attached to the *Myrica Gale*; it flies about sunset, but is easily disturbed at any time, settling again within a few yards.

*CATOCALA FRAXINI*; two captures of this insect have been recorded; one at Scarborough by Mr. Wilkinson (*Zool. 1859, p. 6770*), and one at Bolton (see *Int. vii. p. 27*); the insect has also occurred in Norfolk.

*ACIDALIA RUBRICATA*; a specimen was taken by Mr. Birks near York, July 15th (*Int. vi. p. 130*), and one taken in Kent was exhibited by Mr. Bond at the October meeting of the Entomological Society of London.

*ACIDALIA STRIGILATA*; Mr. Mitford captured some specimens of this insect at Folkestone; they were exhibited at the August meeting of the Entomological Society of London.

*ASPILATES SACRARIA*; this insect has again occurred in different localities, and seems determined to maintain its position as a British insect; one specimen occurred near Barnstaple (Int. vi. p. 179), another at Clapham Common (Int. vi. p. 179), a third was taken near Peckham, and shown whilst alive to a gentleman who was deemed excessively incredulous on the occurrence of the insect on British soil.

*CAMPTOGRAMMA GEMMARIA*; public attention having been much devoted to this insect, it seems likely to become quite common. Many Entomologists have successfully reared it from the egg (Int. vii. pp. 27, 43, 52 and 59).

*PHIBALAPTERYX LAPIDATA*; three specimens were taken in Sutherlandshire, by the Messrs. Crotch (Int. vii. p. 36).

*MADOPA SALICALIS*; a specimen of this insect was taken on the 11th June, in Shooters' Hill Wood (Int. vi. p. 155).

*SCHRANKIA TURFOSALIS*; this insect has occurred freely near Bagshot in July.

*ENNYCHIA OCTOMACULATA*; the occurrence of this insect in the Isle of Skye is recorded by Mr. Chapman (Int. vi. p. 75).

*ACENTROPUS NIVEUS*; the occurrence of a specimen near York is recorded by Mr. Birks (Int. vi. p. 171).

*SPILODES STICTICALIS*; has turned up in various localities.

*SPILODES PALEALIS*; has also been taken at Herne Bay, by Mr. Butler (Int. vi. p. 180), who obligingly presented me with three specimens, at Folkestone by Mr. Mitford, and near Brighton.

CHOREUTES VIBRANA; at the September meeting of the Entomological Society, Dr. Knaggs exhibited a specimen of this insect taken near Folkestone, at the end of June.

PTEROPHORUS LOEWII; early in September I heard from Professor Henslow, that he had found two small caterpillars feeding inside capsules of *Chlora perfoliata*, which had, when he wrote (Sept. 2nd), entered the pupa state. Subsequently two Plumes made their appearance, and the insect is *Pterophorus Loewii*. We have thus a new locality and a new food-plant for this species; though the *Chlora* is closely allied to *Erythræa centaurea*.

PTEROPHORUS BRACHYDACTYLUS; a specimen, taken in Cumberland by Mr. Hodgkinson, was exhibited at the October meeting of the Entomological Society of London.

## OBSERVATIONS ON BRITISH TINEINA.

(SUPPLEMENTARY to the INSECTA BRITANNICA—LEPIDOPTERA, TINEINA; and to the ENTOMOLOGIST'S COMPANION, 2nd Edition.)



*Adela rufimitrella* (I. B., p. 49). The larva of this species was collected by Herr Schmid in October under fallen leaves. Herr Schmid hopes next season to find the young larvæ in the capsules of *Erysimum alliaria*.

*Swammerdamia apicella* (I. B., p. 55). The red-spotted larvæ, which were deemed indicative of a new species, *S. Pruni*, produced the long known *S. apicella*.

*Depressaria Pallorella* (I. B., p. 85). The larva of this species was sent me from Ratisbon by Herr Hofmann; it is dull greenish, with greenish-black dorsal and subdorsal lines, and with the head reddish-brown; it rolls up leaves of *Centaurea scabiosa* in a tubular form.

*Gelechia peliella* (I. B., p. 111). The larva, of a dark chocolate brown, makes silken galleries amongst the lower leaves of *Rumex Acetosella*. Herr Schmid pointed it out to me on a sandy bank between Soden and Königstein.

*Gelechia acuminatella* (I. B., p. 113). The larvæ on *Centaurea scabiosa*, mining down the midrib (Enigma No. 58), produced a *Gelechia*, for which Mr. Scott suggested the name of *G. Freyji* (Int. vi. p. 77): it proves, however, to be our old friend the thistle-miner, *G. acuminatella*. It

is extraordinary how we wiseacres mystify ourselves sometimes.

*Gelechia marmorea* (I. B., p. 126). The larva feeds on the *Cerastium vulgatum* on our coast sand-hills, and forms a loose petticoat of grains of sand fastened together with silk (see Int. vi. pp. 21, 77).

*Gelechia pictella* (I. B., p. 137). At the roots of the same species of *Cerastium*, Mr. Scott discovered at Redcar a more slender larva, also constructing a tube just under the surface of the ground. This produced, as Mr. Scott had anticipated, *G. pictella*.

*Butalis fusco-ænea* (I. B., p. 165). Herr Mühlig has discovered the larva of this species; it feeds in June on *Helianthemum vulgare*.

*Acrolepia Betuletella* (I. B., p. 172). Another specimen was taken at Castle Eden by Mr. Sang, in October (Int. vii. p. 28).

*Coleophora fuscocuprella* (*Asychna fuscociliella*, I. B., p. 246). Mr. Miller has met with the larvæ of this rarity on nut-bushes, near Highgate (Int. vii. p. 31).

*Coleophora binotapennella* (I. B., p. 212). Mr. Scott bred this insect from the larvæ found boring into the stems of *Salicornia* (Enigma No. 68).

*Coleophora saturatella* (I. B., p. 216). Mr. Miller bred this species from larvæ found at Wanstead on broom in June. I do not feel perfectly confident that the reputed new species, found near Frankfort on *Genista tinctoria*, is distinct from *C. saturatella*; it clearly is not *Onobrychiella*, as reputed by Herr Mühlig.

*Coleophora Salinella* (Ent. Ann. 1859, p. 154). I bred two specimens of this insect from the larvæ found on the seeds of *Atriplex portulacoides* (Enigma No. 63).

*Elachista triatomea* (I. B., p. 261). Mr. Wilkinson has bred this species from a dull greenish-yellow larva, which mines the tips of a fine grass (probably a *Festuca*) in May.

*Tischeria angusticollella* (Ent. Ann. 1858, p. 94). This species has been bred by Mr. Edleston and myself; the larvæ were again plentiful near Sheffield, in September.

*Lithocolletis Scopariella* (I. B., p. 275). This insect has been taken by Mr. M'Lachlan at Forest Hill (Int. vi. p. 115); there seems now some prospect of the larva being found next season. It should be looked for in April and May.

*Bucculatrix Maritima* (I. B., p. 293). This insect occurred in profusion in August, in the salt marshes on the banks of the Taw, below Barnstaple. It is evidently double-brooded (Int. vi. p. 141).

*Nepticula argyropeza* (I. B., p. 300). This species has been bred by Mr. Vaughan, who has given a detailed notice of its habits in the *Intelligencer* (vi. p. 14).

*Nepticula Quinquella* (I. B., p. 301). This species again occurred in plenty near Wickham, at the end of June (Int. vi. p. 107).



ANSWERS TO ENIGMAS.

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ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1855, 1st Edition, p. 63; 2nd Edition, p. 86.

11. Not yet solved.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1856, p. 63.

18. No further information since last year.

20. Not yet solved.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1857, p. 133.

26. Not yet solved.

27. Not yet solved.

31. It would appear that this is the *Coleophora orbitella*,  
Zeller.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1858, p. 115.

33. Not yet solved.

37. Not yet solved.

38. Not yet solved.

41. No further information.

ANSWERS to ENIGMAS in the ENTOMOLOGIST'S ANNUAL,  
1859, p. 161.

46. Not yet solved.

47. Not yet solved.

48. Not yet solved.  
 49. Not yet solved.  
 50. Not yet solved.  
 56. *Lithocolletis Helianthemis*, n. s.  
 57. Not yet solved.  
 58. *Gelechia acuminatella*.  
 59. *Carposina Berberidella*.  
 60. *Coleophora Ledi*, n. s.  
 61. No further information.  
 62. Produced only *Nepticula Tiliæ*, apparently.  
 63. *Coleophora salinella*.  
 64. *Gelechia obsoletella*.  
 65. Not yet solved.  
 66. *Nepticula argyropeza*.  
 67. *Ornix Petiolella*, n. s.  
 68. *Coleophora binotapennella*.  
 69. *Gelechia marmorea*.

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## ENIGMAS STILL UNANSWERED.

11. "An *Elachista* larva, found by Mr. Scott at the end of April, mining the leaves of *Scirpus lacustris*."

20. "A *Depressaria* larva, found by Mr. Boyd, May 2nd, 1855 (it was then young), feeding on a leaf of parsnip (*Pastinaca sativa*) under a turned-down corner; this was expected to be *Depressaria Douglasella*."

26. A "*Nepticula* larva, mining the leaves of birch; the mine has some resemblance to that of *Nep. luteella*, but the

central track of excrement is broader, not so mathematically linear."

27. "A *Gelechia*? larva, feeding in the heads of yarrow (*Achillea millefolium*)."

33. "A brown *Gelechia*-like larva, found amongst moss by Mr. Douglas, in March, 1857."

37. "A *Coleophora* larva, found on birch at West Wickham, October 31st, 1857, in a case which had much the appearance of a birch bud."

38. "A *Lithocolletis*, mining the *upperside* of beech leaves."

46. "A pretty red-spotted yellow larva, mining a leaf of *Carex riparia*, found at Hackney, March 29th."

47. "A *Gelechia*? larva, mining down the stems (near the root) of *Carex paludosa*, collected at Wicken Fen, near Cambridge, April 30th."

48. "A larva mining in the stems of the shoots of *Rhamnus frangula*, near Guildford, causing the leaves to droop; collected May 21st, 1858."

49. "A grotesquely minute, pistol-form *Coleophora* case, collected by Mr. Gregson, on *Salix fusca*, at the end of May."

50. "A *Tortrix*? larva, mining down the stems of *Centaurea nigra*, and ejecting its 'frass' from a hole in the side of the stem; collected by Mr. Boyd, at Probus in Cornwall, June 19th, 1858" (see Int. iv. p. 151).

57. "A *Gelechia*? larva, feeding inside the flowers of *Campanula persicifolia*, collected at Erlangen, at the end of June."

65. "A *Nepticula* larva, mining the leaves of *Helianthemum vulgare*, collected by Herr F. Hofmann, early in October."

## NEW ENIGMAS FOR SOLUTION.



70. A *Solenobia* larva, collected by Mr. Edleston in January on beech trees at Dunham Park (Int. v. p. 147). "These larvæ take *two* years to arrive at perfection." The right determination of all the apparent species in the genus *Solenobia* is a matter of no ordinary difficulty.

71. A brown *Gelechia*? larva, found by Mr. Scott, at the beginning of August, feeding in the heads of *Statice armeria*.

72. A greyish-white *Æcophora*? larva, found by Mr. Boyd, burrowing in the bark of apple trees, at the beginning of May; it constructs a gallery of "frass."

73. A brown *Æcophora*? larva, with interrupted yellowish-ochreous dorsal and subdorsal lines, feeding in decayed bark of oak, was found near Brussels by M. Fologne at the beginning of May. The individual specimen, which was figured, died; M. Fologne subsequently obtained another, from which he bred *Æcophora unitella*, but there is something unintelligible about this, for Mr. Wing bred that species from a very different larva.

74. A *Coleophora* larva, feeding on the seeds of *Melilotus officinalis*, found by Mr. Scott, early in August, near Stockton, and subsequently found by Herr Mühlig near Frankfort. The case is made of the seed husk: at first only a single seed is used, then two are clumsily attached together, ultimately they are so blended as to form a symmetrical, cylindrical case.

75. A *Coleophora* larva, feeding on *Artemisia maritima*, was found by Mr. Scott near Stockton, August 21st; the case is elongate, soft, of an ochreous-grey green, thus very different from the squat case of *Albicans*, or the shining black case of *Ditella*. This new larva evidently fed on the leaves of the *Artemisia*.

76. A *Coleophora* larva, found by Herr Hofmann, the beginning of October, on oak and hazel near Ratisbon. The case of this larva is most extraordinary; the cases I have seen are all rather small, but they possess large alary appendages, attached to a slender central tube: viewed from above the case is almost broader than long; the wings of this case are black, the body or rather the tail portion is brown, the anterior part of the tube being darker. These cases have a very impish look.

77. A *Coleophora* larva, found by Mr. Edleston early in April on the seeds of the *Luzula campestris*. Theoretically this ought to have been *C. murinipennella*, but the case was different, being cylindrical, greyish-ochreous, with the mouth turned round; indeed the case was very similar to that of *C. argentula*.

78. A *Coleophora*? larva, discovered by Messrs. Brockholes and Gregson, amongst grass by the side of a haystack, near Birkenhead, in the beginning of October. The case is short and rather stout, ochreous or brownish, with some darker stripes. I could not discover that the larvæ ate the grass at all. Young *Chilo* larvæ construct cases and have been mistaken for *Coleophora* larvæ; is it not possible that a *Crambus* larva may perform similar operations? The matter deserves, and will no doubt obtain, further investigation.

79. A mining larva, collected by Herr Schmid, near Frankfort, at the end of October, in the leaves of *Lysimachia vulgaris*; the mine is slightly puckered, but yet reminds one considerably of the mine which *Stephensia Brunnichella* constructs in the leaves of *Clinopodium*.

80. An *Elachista* larva, collected by Herr Hofmann at Ratisbon early in October; it mines the leaves of *Hierochloa australis*, making straight, rather narrow mines, but eventually several side by side, so as to occupy nearly the whole width of the leaf; the mine is *perfectly clean, the excrement being excluded through a hole in the cuticle.*

## NATURAL HISTORY OF THE TINEINA.

DURING the past year 50 larvæ have been described, 36 have been figured; and the mines of several which died or spun up *in transitu* have also been figured.

It will be observed that the supply, though more than adequate to the production of a volume annually treating of 24 species, is still a considerable falling off compared with previous years. The vein is not so rich as when we first penetrated the rock.

A *first-rate* observer in a *new* locality might, however, yet turn the scale and check our retrograde movement. Dresden, Vienna and the South of France may yet furnish a vast store of *matériel*.

I annex, as in the three preceding Annuals, a Table showing the amount of assistance received since the last Report.

		Discovered.	Bred.	Sent.	Known before.
Solenobia inconspicuellæ.....	Edleston ....	..	..	..	·25
Pomonæ .....	Harding, G. .	..	..	..	·25
Tinea dubiella .....	Gregson ....	·50	·25	·25	
*    argentimaculella .....	Edleston ....	·50	·25	·25	
*Adela rufimitrella .....	Schmid ....	·50	·25	·25	
*Plutella annulatella.....	Wailes .....	·50	·25	·25	
Depressaria Pallorella.....	Hofmann ...	·50	·25	·25	
Alstrœmeriana .....	Harding, H.J.	..	..	..	·25

		Discovered.	Bred.	Sent.	Known before.
Depressaria parilella .....	Mühlig .....	..	..	..	·25
Pimpinellæ .....	Zeller .....	..	..	..	·25
Achilleæ, n. s. ....	Schmid .....	·50	·25	·25	
Libanotidella .....	Hofmann.....	..	..	..	·25
Heydenii .....	Lederer .....	..	..	·25	
	Zeller .....	·50	·25		
Gelechia peliella .....	Schmid .....	·50	·25	·25	
marmorea .....	Hellins .....	·50	·25	·25	
pictella .....	Scott .....	·50	·25	·25	
*Lypusa maurella .....	Hofmann.....	·50	·25	·25	
Carposina Berberidella .....	Hofmann.....	·50	·25	·25	
Butalis fuscoænea .....	Mühlig .....	·50	·25	·25	
*Glyphipteryx Schœnicolella ....	Boyd .....	·50	·25	·25	
Coleophora fuscocuprella .....	Miller .....	..	..	..	·25
binotapennella .....	Scott .....	·50	·25	·25	
n. s., near Saturatella	Mühlig .....	·50	·25	·25	
Salinella .....	Bond .....	·50	·25	·25	
	Douglas .....	..	..	·25	
Gypsophilæ, n. s. ....	Schmid .....	·50	·25	·25	
Saponariella .....	Staudinger ..	..	..	..	·25
Ornix Petiolella .....	Schmid .....	·50	·25	25	
Elachista nigrella.....	Schmid .....	..	..	..	·25
triatomea .....	Wilkinson ..	·50	·25	·25	
*Lithocolletis Heegeriella .....	Sang .....	·50	·25	·25	
Helianthemi .....	Hofmann.....	·50	·25	·25	
quinqueguttella.....	Scott .....	..	..	..	·25
*Cemiostoma Wailesella .....	Gregson .....	..	..	..	·25
*Phyllocnistis saligna .....	Staudinger ..	..	..	..	·25
Bucculatrix Frangulella .....	Hofmann .....	..	..	..	·25
*Nepticula ulmivora .....	M'Lachlan ..	..	..	..	·25
	Mühlig .....	·50	·25		
argyropeza .....	Heyden, v. ..	·50	·25	·25	
	Vaughan .....	..	..	..	·25

Of the species marked thus \* I shall be glad of a further supply of larvæ.



The summary of this Table yields the following results:—

Schmid .....	5·25	Wailes .....	} 1·
Hofmann .....	4·50	Wilkinson .....	
Mühlig .....	3·	Zeller .....	
Scott .....	2·25	Staudinger .....	} ·50
Edleston .....	} 1·25	Douglas .....	
Gregson .....		} 1·	Harding, G. ....
Bond .....	Harding, H. J. ...		
Boyd .....	Lederer .....		
Hellins .....	M'Lachlan .....		
v. Heyden .....	Miller .....		
Sang .....		Vaughan .....	} ·25

The total awards to this time being:—

MÜHLIG .....	21·	Vaughan .....	} 1·25	
FREY .....	20·50	Winter, W. ....		
<hr/>		Bruand .....	} 1·	
Hofmann .....	17·75	Hellins .....		
Schmid .....	16·25	v. Heyden .....		
Wilkinson .....	12·50	Machin .....		
Scott .....	10·75	Miller .....		
Boyd .....	8·25	Sang .....	} ·75	
Douglas .....	4·75	Boll .....		
Gregson .....	4·25	Simmons .....	} ·50	
Edleston .....	3·75	Crump .....		
Zeller .....	3·25	Staudinger .....		
Wailes .....	3·	Beaumont .....	} ·25	
Bond .....	} 2·75	Chappell .....		
Parfitt .....		} 2·		Drane .....
Grabow .....	} 1·75			Fletcher .....
Millière .....		} 1·25		Harding, G. ..
Harding, H. J. ..	1·75			Lederer .....
Brockholes .....	} 1·25			M'Lachlan .....
Brown, T. ....			1·25	Newnham .....
Law .....			Shield .....	
Logan .....		Wildman .....		

## THOUGHTS ON SPECIES.



BY BRACKENRIDGE CLEMENS, M.D.

(Reprinted from the *Journal of the Philadelphian Academy of Natural Sciences.*\*)

IN the endeavour to form a conception of what constitutes *species*, our ideas must be separated from the *individual*, which is merely the representative of species in some one of its special states or conditions. Every mature or perfected being has had an anterior organic history included in the history of its structural progression, from a collection of simple cells to a natural body, possessing individual and distinctive characteristics. No one of its states or conditions constitutes species; neither the perfect insect, nor the pupa, nor the larva, nor the ovum, fulfil in themselves the conception involved in this term, but simply *represent* the various relations the individual maintains to physical and animated nature, and during the continuance of which its structural and peculiar biography is written. The perfect being is the temporary expression of a thought or conception involved in the series of actions which constitute in their entity a special and definite creation, and in this state has reached the acme of its perfectibility, a point beyond which

\* [In the original Memoir this forms a portion of the Introduction to a Synopsis of North American *Sphingidæ*.]

it cannot pass ; but, after a variable period, its organic part is broken up and resolved again into the simple or primary elements of matter. The species or the thought, however, does not cease to exist during the process of organic disintegration of the individual, and previously to its disappearance or death it represents its special organism, or rather its *species*, by means of an ovum, in which the organic actions, destroyed in the previous representative, are recommenced and again carried through a series of changes or states to the point of its previous organic perfection ; commencing in the simplest organic state, and continually returning to it to renew a series of predetermined special developments. We have in species a cycle of persistent, ceaseless actions, revolving in their narrow humble orbit with all the indications of design, and with comparatively as much invariability, as the great planets observe in their appointed paths. It is a conception, inasmuch, as from a structureless body or material, is evolved, in a constant pre-ordained manner, one having a highly complicated arrangement of organs, whose actions and functions result in the production of phenomena known as those of life. The ovum, in which the organic cycle may be said to have its inception, is endowed with no fortuitous or independent impulse of evolution. Up to the period of its maturity it has formed an integral and necessary part of some pre-existing natural body ; it is indeed a component of the organism quite as much as any other aggregation of specialized cells, and partakes of all its characteristics of growth. To endow it with this impulse, not even the procreative act between the male and female organism is absolutely imperative, and its specific evolution may be recommenced independently of this extraneous aid, at the inceptive point of the organism with which

it has been identified, and continued to the production of a new perfect being. It is of little consequence in how few or many instances this tendency is capable of manifesting itself, or what fractional part of the organic cycle is passed over by the unaided impulse toward development in the great majority of animal bodies. The fact now indisputably established by Von Siebold, that the eggs of a virgin moth, secluded from access to the male with the most watchful and guarded care, unquestionably produce a progeny of new beings, undistinguishable from those which had preceded them, determines the possibility of structural evolution through all the terms of at least one entire cycle, independently of any influence derived from the sperm cells of the male. The regenerative tendency in the ovum must hence be a specific endowment resulting in the production of a perfect being as a general law, only when aided by the sperm cells of the male, but analogous in its nature to reproduction by gemmation, to the formation of new beings from the division of a perfect Hydra, to the evolution of new members to replace those which have been lost. In a word, regeneration is a manifestation of continuous growth in species in their respective cycles of organic evolution, around which the structural processes revolve and repeat continuously and precisely what had been accomplished by pre-existing representative bodies, without power to exceed or restrict a designated and pre-ordained orbit. And for each there is a persisting life, never intermitted for an instant of time, running through a chain of representative bodies, and reaching from the first created conception, not only to the present time but into that future when organic existence shall have terminated. This produces, and must continue to produce, successive representatives which harmonize and agree with the original and inceptive organism,

and are not only similar to it, but identical amongst themselves. The mind can detect no essential differences on which to establish distinctions, and we recognize them as the same beings, the same conception, whatever may be their geographical origin; all structural differences have disappeared, and investigation proves that each individual repeats and reiterates one and the same biography with all its distinctive peculiarities.

The identity of natural bodies of the same species must, however, be received with certain limitations. In no portion of the organic or even the physical world does nature work within the limits of inflexibly parallel lines, but mingles with her laws of harmony or invariability *laws of disorder*, which affect the most stupendous and apparently most stable of her works, as well as the most humble and insignificant, if anything in nature can be so regarded. Thus, in considering specific life in the humble forms under view, we must allow a limit of *variability* or *disorder*, by which constancy in results are affected or apparently deranged, but within circumscribed boundaries. The subject of variation in insects has been so imperfectly investigated, and so many startling theories have been promulgated respecting it, founded on what I must regard as mistaken conceptions respecting the nature of species, that, although we have no special investigations to offer on the question, we can at least clear and define our conceptions with respect to what should be regarded a variety of a species.

From what has been heretofore said respecting species, we cannot suppose a variety can be detected simply from the study of the perfect insect in its most aberrant condition. For wherein does a variety differ from the species? Is it by any difference in the ovum, any peculiarity in the form,

structure, ornamentation or biography of the embryo,—any differences in pupation, or any essential or specific variation in the structure of the perfect insect? By no means. To be a variety, or wandering from a certain specific type, it must observe the same biographical and organic cycle, possess the same specific characteristics of structure in its perfect state, but differ from the species in its peculiarities of ornamentation, and in its size, perhaps to a degree that, without a knowledge of its embryology and biography, it would be pronounced and registered distinct from the perfect individuals towards which it shows the strongest specific affinities of structure. Another characteristic of the variety is, that there is no stability even in the peculiarities of its ornamentation; and whether it occurs in the same brood under identical climatal conditions, or is found as an isolated perfect being in a widely-separated geographical area under dissimilar conditions, it must be associated with its *normal type*; and that the ova of the variety will reproduce not only this, but also more or less aberrant perfect individuals. An invariable, fixed and constantly-recurring ornamentation in any group of perfect beings, except when it is a mere intensity or pallidness of hue, which will but rarely mislead, is not only incompatible with the conception of a variety, but would constitute a true species, even when their biographies are closely coincident. Variation, or specific instability, observing fixed and determined limits, which must be ascertained by observation, is part of the true history of species. It is not manifested to the same degree, probably, in the specific life of every true species, but wheresoever and whensoever it does occur is capable of being referred to its normal type, by its agreement in all those essential characteristics necessary to form a conception of true species. As long as the specific

diagnosis must be confined to a description of the ornamentation of the perfect being, there are no means of distinguishing certainly the variety from species, should the former differ from the latter essentially in this respect; and I have no doubt that every effort at systemization with a knowledge of perfect forms alone contains many illustrations of the attendant difficulties of discrimination.

It is not my desire to enter into any special discussion of this subject; it is sufficient to enunciate what I believe truth, and apparent to my own mind. Discussions must be founded either on principles or on prejudices; if the former should differ, there can be no advance until the truth is made apparent by a surer mode than that which is so apt to degenerate into sophistication, and if the latter is the basis on which it is conducted, it is needless to say it never has and never can effect any good.

While seeking to avoid this latter influence, it will be proper in the present connection to notice, in a very concise manner, the views of an apparently numerous and increasing body of naturalists, who advocate the existence of permanent and geographical varieties, resulting from the effect of physical agencies on the animal organism; and the tendency, on the other hand, of species and varieties to depart indefinitely from the original type. I cannot but think these opinions have arisen as the consequence of an exceedingly limited view of the nature of species, and from the study and comparison of perfect beings exclusively. Another obvious source of fallacy in the reasoning by which such views are supported, is to include in the abstract treatment of the nature of species or variety, what we know obtains amongst animals in a state of domestication or civilization; since it is, at least, a subject of grave doubt, whether domestic varieties have not pro-

1860.



ceeded from the admixture of several originally distinct species. Whilst it is a doubtful question, no illustration can be drawn from this source, and we must look for the determination of important questions from the internal evidence presented in the study of special orders, and, perhaps, especially amongst the humble beings. Neither do I imagine any light can be derived from the action of physical influences on the vegetable organism, however similar may be the nature of the vegetative process in the two organic kingdoms; for the very condition of life in the one is absolutely dependent on them, not only for its inception, but for its subsequent continuance; whilst the other is in nowise thus circumstanced within the limits of variations not actually and immediately destructive. Surely the consideration of the nature of species and varieties is important, obscure and difficult enough without being further complicated and confused by brilliantly-conceived theories, when facts should be sought for, or by mere postulatory reasoning founded on supposititious events.

The existence of modified individuals, under different climatal conditions, is no proof in itself that the modifications of structure or ornamentation are the consequence of the operation of physical influences, particularly when we are acquainted only with the perfect insect. Independently of the consideration that they are constantly met with under all climatal conditions, the idea of species includes certain established and ordained relations to physical agencies, which, so far from being adventitious in their operation, are part of its history. And, with the original conception, must have been likewise predetermined *those products of disorder*, that harmonize completely with the dominant idea, although presenting differences—the adaptability to certain modes of life, the form and structure, the relations of species to its natural



enemies, and its instruments and means of defence, and its resources for the sustenance of life. For, if this be not true, what significance can we assign to the harmony and intelligent design, everywhere characterizing the relationships of organic nature? The natural history of the earth teaches us to believe that physical influences were established antecedent to the creation of organic bodies, and we know that vegetable forms, being producers or creators from the simple elements of the material for the sustenance of the animal, must likewise have been its precursor, and we must look for adaptability in the latter to the conditions under which it was to pass its life, and not that it is capable of being indefinitely moulded, modified and controlled by the existence of agencies and conditions, which had fully recognized and established existence previously to its appearance upon the earth. I know, as well as any one, that there is nothing like positive organic immobility or fixity in the animal organism; that it is a scene of constant, perpetual fluctuation; that the condition of life is one of change, waste and renovation throughout its continuance, but under an immutable and predetermined plan, comprehending a certain degree of adaptiveness, by which it is accommodated to the unequal action of the conditions under which it may exist. Within this limit the operation of organic processes are evidently, one may say eminently, influenced by physical agencies. Cold represses and retards their action and development; heat stimulates and advances; and the animal being incapable of generating or creating a single element of the simplest of its constituents, but assimilating those already prepared for its use by other organisms, scarcity or abundance of food likewise affect it. And though this, more than either the influences mentioned, may produce physical degeneration, yet, even combined with the external

agents, is there a single fact in physiological science which justifies the belief, that they influence cell-development in any other manner save that of disease, leading not only to the extermination of the individual but of its progeny ?

Contemplate the climatal changes and the altered facilities of obtaining sustenance as taking place almost insensibly, and extending their range of effects into geological periods, adding isolation to intensify their influence, and where must permanent variation of species, or the tendency to change indefinitely, have its inception? Beyond doubt, as the advocates of the latter doctrine especially claim, in the cell-action of the reproductive system. If this is capable of undergoing any other change than that which produces monstrosities, organisms are thus successively and insensibly altered by almost imperceptible modifications, until in the course of ages nothing remains to them that was originally specific, and, by parity of reasoning, nothing that was generic, or tribal, or ordinal, or pertaining to classes. Thus when it is once admitted that modification may take place in any organ or part essential in specific life, there is no limit to what may take place under the supposed operation of physical influences. All closely allied forms cease to be the object of special design; special creation itself becomes problematical, since, under this view, the primitive germs themselves may have originated from the accidental combinations of inorganic matter. But the physiological truth of the question lies in the incapability of germ-cells to vary from their specific plan of ultimate development. And although the ovum has formed an integral part of an antecedent form, the structural evolution of a perfect being from it, or the germinal capacity of the ovum, does not represent the parent or organism pro-

ducing it, but its *species*, and at the same time its genus, family, order and class.

There remains still another element of disorder to be taken into consideration, which results in the production of a variety known as the *hybrid*.

The entire question of hybridity stands in need of a careful re-examination. Conclusions have been promulgated and received as the general laws upon this subject, and are usually regarded as decisive, although I cannot conceive why its investigation should be looked upon as exhausted. Probably no other portion of natural history affords opportunities so convenient to pursue this study as Entomology, and I hope some student will follow it in the proper philosophic spirit.

The variety resulting from hybridity is generally regarded as transient, displaying the specific characteristics of both parents; as incapable of continuing itself with one of its own kind, but fertile with the parent stock, and of course reverting to it. Whether it is possible to establish a *permanent variety*, either by the intermixture of a hybrid and a species closely allied to the parent stock, or by any other means, is an interesting but undetermined question in Entomology. Dr. Hagen, of Germany, has recently displayed much interest in this subject, but has not investigated it experimentally, so far as I am informed. The few cases of hybridity that have been recorded have taken place in nature, or have been the result of mere individual caprice on the part of experimentalists and without reference to the determination of any of the numerous questions to which it gives rise. Hence, hybridity can be noticed here only as a cause of variation in insects, and how far it may have complicated, or may be capable of complicating, the determi-

nation of species from the characters of the perfect being, must be left to future investigation.

Since the above was written, my friend Dr. John L. Le Conte, of Philadelphia, has suggested an important consideration, which should not be forgotten by those who may attempt to investigate this subject. If hybridity is capable of giving rise to a *permanent variety*, or seriously complicating the determination of species, *such intermixture has most probably already taken place, in species of the same geographical distribution, to a degree that has exhausted the capability of further intermixture.* For it seems most improbable to suppose that species, capable of producing permanent intermediate forms by crossing, could be associated together for indefinite periods of time in the same area, and not have had the tendency called into activity long since by the production of permanent hybrids, now indistinguishable and registered as true species. Hence, if there be anything of truth in a supposition so probable, it is easy to perceive why the hybrid is incapable of propagating with its own kind, and why in mixing with the parent stock there is a constant tendency to revert to it.

To arrive at any satisfactory solution of the question, however, it will be necessary to determine the effect of the intermixture of closely allied but distinct species from widely separated countries.

In order to make the foregoing ideas respecting species as clear and definite as possible, it may be well, perhaps, to throw them into the form of a definition. It may be regarded, therefore, *as a specific cycle of organic and instinctive actions, manifested in the production of representative forms and in their biographies, having reference*

*chiefly to the continuance of special forms, these being unchangeable and immutable in all their essential characters, but variable in size and colour.*

Species, then, has an ideal existence in nature, and its representatives, or the individual in some of its forms, is that which falls under observation, and with which the naturalist deals in his generalizations. The description of species should be a biography, and should present everything in the life of the group. It should commence with the egg and give its form, markings and colour; its relations to the food plant; the means adopted for its security or protection.

The young larva, on emerging from the egg, should be described, with its ornamentation and external structure or appearance; its metamorphoses or moultings, and the successive changes produced in ornamentation and structure, should be noticed, until it reaches the condition characteristic of maturity; its habits, instincts, and mode of association with beings of its own kind, observed; its natural enemies and means of defence, concealments or mode of self-protection ascertained; its diseases described; the nature of its sustenance determined; the physical conditions under which it lives and its geographical range established.

Its mode of preparing for pupation should be recorded, and whether the metamorphosis is immediate or delayed, and during what portion of the year it takes place; the pupa, its form and structure, should be described, and how the imago escapes from the pupa case and cocoon.

With the perfect insect should be given the number of broods during the year, and the intervals of time during which the individuals of the brood appear, and the months in which the imago may be met with; its individual pecu-

liarities of structure, and the ornamentation of the normal form, with the chief variations to which it is liable.

The determination of true species from the imago is by no means easy or simple; but when individuals agree in all these particulars, when their biographies and structure impress the mind with the idea of identity, there can be no longer any doubt that they are representatives of one and the same conception, even though the perfect forms may differ materially in ornamentation.

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