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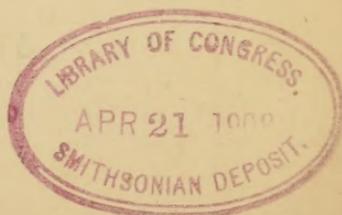
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ADDENDA ET CORRIGENDA.

- Page 15 *et seq.*, for "ciliæ," read "cilia."
 ,, 65, line 11, for "tertiamque," read "tertiaque."
 ,, 79, ,, 17, for "Pl. IV.," read "Pl. I."
 ,, 81, ,, 5, for "nassatus," read "nasutus;" and for "1850," read "1838."
 ,, 89, ,, 28, for "farinata," read "farinato."
 ,, 107, ,, 19, for "inform," read "informs."
 ,, 156, ,, 18, for "tæniaria," read "tænaria."
 ,, 197, ,, 42, after "results," insert "only."
 ,, 200, ,, 36, for "to," read "in."
 ,, 203, ,, 12, for "." put " ,"
 ,, ,, ,, for "T," put "t."
 ,, 206, ,, 11, after "fly," insert "with a like result."
 ,, 210, ,, 2, for "knat," read "gnat."

JOURNAL OF PROCEEDINGS.

- Page xiv. line 24, for "banchseite," read "bauchseite."
 ,, xv. ,, 5, after "bifractella," read "(Tis.)"
 ,, ,, ,, 18, for "Ctenostoma," read "Cemiostoma."
 ,, xvi. ,, 5, for "retiella," read "reticella."
 ,, ,, ,, 11, for "Saville," read "Serville."
 ,, ,, ,, 42, after "albidis," insert "posticè."
 ,, ,, ,, 45 and 46, for "Parameria, Savigny," read "Pseudomeria, S. S. Saunders."
 ,, lxxi. ,, 31, for "February," read "March."
 ,, xcix. ,, 40, for "Blackwell," read "Blackwall."

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Annals and Magazine of Natural History. Feb. 1850.

Athenæum. 1850 and 1851.

Berichte des Lepidopterologischen Tauschvereins. Jena, 1842-7.

Bevan, E., Hints on the History and Management of the Honey Bee.

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Do. Monographia Cassidarum. Tome 1.

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Charpentier, Libellulinæ Europææ descriptæ ac depictæ.

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Curtis, J., Descriptions of Insects brought home by Commander J. C. Ross.

De Haan, Fauna Japonica.—*Crustacea*.

Doubleday, H., Synonymic List of British *Lepidoptera*.

Docte, Henry Le, Exposé Générale de l'Agriculture Luxembourgeoise.

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Fitch, A., The American Currant Moth.

Do. Catalogue of Homopterous Insects in State Cabinet, New York.

Do. On the Hessian Fly.

Förster, Arnold, Hymenopterologische Studien.

Gemminger, Max., Systematische Uebersicht der Käfer um Munchen.

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Guerin Méneville, Analyse des Expérimens sur la Muscardine.

Do. Énumération des Insectes qui consomment les Tabacs.

Do. Essai sur les Insectes utiles et nuisibles.

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Do. Extrait des Matériaux recueillis pendant la Campagne séricicole de 1850.

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Insecta Saundersiana. Diptera, Parts 1—2.

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Kolenati, F. A., Melitemata Entomologica. Fasc. 1.

Le Conte, Dr. J. L., on the *Pselaphidæ* of the United States.

Do. Synopsis of the *Cleridæ* of the United States.

Literary Gazette. January, February, November and December, 1851.

Macquart, J., Diptères Exotiques, Suppl.

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Maury, Lieut., Investigations of the Winds and Currents of the Sea.

Meigen, J. W., Systematische Beschreibung Zweigelflügeligen Insekten, Vol. vii.

Mulsant, Rey and Wachanru, Descriptions of three new Coleopterous Insects.

Observations des Phénomènes Periodiques.

On the probable Relation between Magnetism and the Circulation of the Atmosphere.

Plomley, F., Lectures on Blights.

Roth, J. R., Diagnosen neuer *Coleoptera* aus Abyssinien.

Schaum, Dr., On the *Fulgoroellæ*.

Do. Bericht über die Leistungen in der Entomologie während des Jahres 1848.

Schiödte, Specimen Faunæ Subterraneæ.

Do. Om en afvigende Slægt af Spindlernes Orden.

Selys-Longchamps, Revue des Odonates ou Libellules de l'Europe.

Separat-Abdruck der Zeitschrift der Entomol. Gessellschaft zu Breslau.

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— des Sciences, Belles-Lettres, et Arts de Lyon. 1848—50.

Akademie Königliche de Wissenschaften, Bulletin, No. 1—33.

— Königliche Bayerischen. Band v. pt. 2—3, abth. 1. Band vi. abth. 1.

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— Reports to the.

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Société de Physique et d'Histoire Naturelle de Geneve. Tom. 12, pt. 2.

— des Sciences, &c. de Lille. 1842—49.

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 ——— „ Proceedings of. 1847—49, pp. 341—401.
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 ——— Microscopical. Vol. 3, parts 1 and 2.
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 ——— Silesian Soc. Nat. Hist., Bericht, 1850.
 ——— Stettin Entomologische Zeitung. 1850—51.
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 ——— Zoological. Vol. 4, part 1.
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- Stephens, J. F., List of British *Lepidoptera* in British Museum.
- Stevens, S., Directions for collecting and preserving Specimens of Natural History
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- Verloren, H., Catalogus Systematicus ad Cramerum.
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- Westwood, J. O., Monograph of African *Saturniæ*, &c.
- Wild, J. J., A Letter to Lord Brougham on the Scientific Exploration of Egypt
 and Ethiopia.
- Zoologist, 1850 and 1851.
- Zuchold, E. A., Bibliotheca Historico-Naturalis et Physico-Chemica. 1851.

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 Mr. Foxcroft *Chrysomela cerealis* (2).
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 Mr. H. W. Newman . Hornet's nest.
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 Mr. Lubbock *Sirex duplex*.
 Mr. Meade *Theridion variegatum*, nest of.

BY-LAWS
OF THE
ENTOMOLOGICAL SOCIETY
OF LONDON,

ALTERED AND ADOPTED AT A SPECIAL MEETING
HELD ON THE 1ST SEPTEMBER, 1851.

CHAP. I. *Object.*

THE ENTOMOLOGICAL SOCIETY OF LONDON is instituted for the improvement and diffusion of Entomological Science.

CHAP. II. *Constitution.*

The Society consists of British and Foreign Ordinary Members and Subscribers, the number of whom shall be unlimited; of Foreign Honorary Members, whose number shall not exceed ten; of Foreign Corresponding Members, the number of whom shall be unlimited; and of English Associates, the number of whom shall not exceed ten.

CHAP. III. *Management.*

The affairs of the Society shall be conducted by a Council, consisting of thirteen Members, to be chosen annually (five of whom shall form a quorum), four of whom shall not be re-eligible for the following year.

CHAP. IV. *Officers.*

The Officers of the Society shall consist of a President; three Vice-Presidents; a Treasurer; two Secretaries; and a Curator.

CHAP. V. *Annual Election of Officers.*

1. The President, Treasurer and Secretaries shall be elected annually out of the Council. The Vice-Presidents shall be nominated by the President, at the Meeting next after the Anniversary

Meeting, from the Council. The President and two of the Vice-Presidents shall not, however, remain in office more than two years successively. The Curator shall be appointed by the Council.

2. In the event of any vacancy occurring in the Council or Officers of the Society, at the next Meeting of Council after such vacancy has been made known, the Council shall recommend to the Society the name of some Member to be elected to the vacant situation; and the next Ordinary Meeting of the Society shall be made a Special General Meeting and the Members summoned accordingly, and the Election shall take place as provided for at the Anniversary Meeting, Chap. XX.

CHAP. VI. *President.*

The duty of the President shall be to preside at the Meetings of the Society and Council, and regulate all the discussions therein, and to execute, or see to the execution of, the By-Laws and orders of the Society.

CHAP. VII. *Vice-Presidents.*

1. In case of the absence of the President, it shall be the duty of a Vice-President to fill his place, or, in the absence of all the Vice-Presidents, a Member of the Council shall preside.

2. If no Member of the Council shall be present at any Ordinary Meeting, the Members present shall nominate and appoint by a majority to be Chairman such Member as they shall deem fit.

3. The Chairman so appointed shall for the time being have all the authority, privilege and power of President.

CHAP. VIII. *Treasurer.*

1. It shall be the duty of the Treasurer to receive for the use of the Society all sums of money payable to the Society, and to disburse all sums payable by the Society out of the funds in his hands.

2. No payment exceeding £5, excepting for rent or taxes, shall be made by the Treasurer without the consent of the Council.

3. The Treasurer shall keep a book of Cheque Receipts for admission fees and annual payments; each receipt shall be signed by himself, the date of payment and name of Member or Subscriber paying being written both on the receipt and on the part of the cheque which is left in the book.

4. The Treasurer shall demand all arrears of annual payment, after such payment shall have been due three months.

5. The Treasurer shall, moreover, furnish the Auditors with a detailed account of all receipts and disbursements up to the 31st December, previous to each Anniversary. The accounts of the Treasurer shall be audited annually previously to the Anniversary Meeting by a Committee of three Members of Council, and three Members of the Society, to be appointed by the President at the Ordinary first Meeting in January, of which Committee three shall be a quorum.

CHAP. IX. *Secretaries.*

1. It shall be the duty of the Secretaries to keep a list of all the Members, Subscribers, and Associates of the Society, together with their addresses; to produce to the Council all correspondence in any way connected with the Society at the next Meeting after such correspondence shall have been received, or taken place; to edit the Transactions and Proceedings under the direction of the Council, and to take care that the Proceedings are published and ready for delivery to the Members and Subscribers at a Meeting of the Society within six months after the entry of such Proceedings in the Minute Book has been confirmed.

2. Minutes of the Proceedings of Monthly and Council Meetings shall be taken by one of the Secretaries; or, in their absence, by any Member whom the Chairman may appoint for the occasion.

3. The Minutes shall be fairly copied by one of the Secretaries into a Minute Book, and at the next Meeting read aloud for confirmation.

CHAP. X. *Curator.*

It shall be the duty of the Curator to take care of the Library and Cabinets of the Society; * to arrange and class the insects, &c.; to keep a Catalogue of the Library; and to call in all books borrowed, as directed in Sect. 5, Chap. XI.

CHAP. XI. *Library and Cabinet Regulations.*

1. A Catalogue of the Library and MSS. shall be kept by the Curator, with the names of the Donors.

* The Curator is in attendance at the Rooms of the Society every Monday between the hours of Two and Seven o'clock, P.M., for the purpose of showing the Collections, &c. to Members and Subscribers.

2. The Library and Cabinets shall be under the superintendence of a Committee, consisting of the President and four Members, who shall be elected by the Council at the first Meeting in February in every year (three of whom shall be a quorum), and who shall render an Annual Report to the Council at the first Meeting in the following January.

3. No Member or Subscriber shall, without special permission of the Council, be allowed to borrow or have in his possession from the Library more than four volumes at one time, or to retain the same longer than one month, without leave of the Curator.

4. If the books are torn, injured, lost, or not forthcoming when demanded by the Curator, full compensation shall be made for the same by the borrower.

5. The Curator shall call in all books borrowed from the Library on the 5th day of January and 5th of July in every year; and in case the same be not returned on or before the General Meeting of the Society in the following month, notice thereof shall be given by him to the Council, who shall then direct a second notice to be sent to the Member or Subscriber retaining such books, and in case the same be not returned within the further space of four weeks from the date of such second notice so sent, such Member or Subscriber shall in future be disqualified from borrowing books from the Library without the special permission of the Council.

6. All Members of and Subscribers to the Society shall have free access to the Library and Cabinets, at the time specified in the By-Laws, for the purpose of examination and description, and shall be allowed, with the permission of the Council, to borrow specimens from the collections for such purposes; excepting that if a Member, Subscriber or Stranger present specimens of new insects to the Society with manuscript names attached, specifying his intention of publishing the same, then no individual, whether Member, Subscriber or Stranger, shall during the space of twelve months publish any description or figure of such specimen.

7. No Stranger shall be allowed to see the Library or Cabinets unless introduced by a Member or Subscriber; but a note addressed to the Curator or Secretary shall be deemed a sufficient introduction.

8. No Stranger shall be permitted to take away or to describe any insect, or to make a drawing of the same, except by special permission of the Council previously obtained.

CHAP. XII. *Election and Admission of Members and Subscribers.*

1. Every Candidate for admission into the Society shall be proposed by three or more Members, who must sign a Certificate in recommendation of him.

2. The Certificate shall specify the name, and usual place of residence of the Candidate.

3. The Certificate for a Member, having been read at one of the Ordinary Meetings, shall be suspended in the room, read again at the following Ordinary Meeting, and the person therein recommended shall be balloted for at the next Ordinary Meeting.

4. The Certificate for a Subscriber, having been read at one of the Ordinary Meetings, shall be suspended in the Room, and the person therein recommended shall be balloted for at the next Ordinary Meeting after such reading.

5. The Certificate for an Associate shall be subject to the approval of the Council, and shall be subject to the same regulations as adopted for a Member.

6. The method of voting for the election of Members and Subscribers shall be by Ballot, and two-thirds of the Members balloting shall elect.

7. The Elections of Ordinary Members shall be void unless the admission fee shall be paid within twelve months after the date of their Election ; the Council shall, however, possess a discretionary power to extend the time of payment.

8. Members and Subscribers shall sign the Obligation Book of the Society at the first Ordinary Meeting of the Society at which they are present, and shall then be admitted by the President.

CHAP. XIII. *Admission Fee and Annual Contribution.*

1. The Admission Fee for Members shall be £2 : 2s., the Annual Contribution £1 : 1s.

2. The Annual Contribution for Subscribers is £1 : 1s., without Admission Fee.

3. The composition in lieu of the Annual Contribution is £15 : 15s. ; the composition for Members and Subscribers elected previous to the 1st January, 1852, is £10 : 10s.

4. The Annual Contribution shall become due on the first day of January in every year in advance ; but any Member or Subscriber elected after the 30th of September will not be called upon for his subscription for the remaining portion of that year.

CHAP. XIV. *Withdrawing and Removal of Members and Subscribers.*

1. Every Member or Subscriber, having paid all fees due to the Society, shall be at liberty to withdraw therefrom upon giving notice in writing to the Secretary.

2. Whenever written notice of a motion shall be delivered to the Secretary for removing any Member, Subscriber, or Associate, signed by the Chairman for the time being on the part of the Council or by five or more Members, such notice shall be read from the chair at the two Ordinary General Meetings immediately following the delivery thereof, and the next following Ordinary Meeting shall be made a Special General Meeting and the Members summoned accordingly, when such Motion shall be taken into consideration and decided by ballot; whereat if a majority of the Members balloting shall vote that such Member, Subscriber or Associate be removed, he shall be removed from the Society.

3. Whenever any Ordinary Member of the Society shall be in arrear for three years in the payment of his Annual Contribution, notice thereof in writing shall be given or sent to him by the Treasurer, together with a copy of this section; and in case the same shall still remain unpaid, the Treasurer shall give notice thereof to the Council, who shall cause the name of such Member, together with a statement of the sum due by him for arrears, to be read at the three following Ordinary Meetings of the Society, after the last of which a second similar notice shall be sent to him, and at the fourth Ordinary Meeting such Member of the Society shall be removed, and the President shall erase his name from the List of Members.

4. Whenever the Annual Contribution of a Subscriber shall be in arrear one year, such Subscriber shall have his name erased from the List of Subscribers and cease to belong to the Society.

CHAP. XV. *Privileges of Members and Subscribers.*

1. The Members have the right to be present, to state their opinion and to vote at all Meetings; to propose Candidates for admission into the Society; to introduce Visitors at general Meetings of the Society, and to introduce scientific Strangers to the Library and Museum; to purchase the Transactions of the Society at reduced prices, and to have personal access to the Library and Museum.

2. No Member to introduce more than one Visitor.
3. Ordinary Members of the Society resident more than fifteen miles from London shall be entitled to receive the Transactions gratuitously when their Annual Contribution has been paid.
4. All the Honorary and Ordinary Members are eligible to any office in the Society, the latter provided they are not more than one year in arrear in the payment of the Annual Subscription.
5. No Member shall be entitled to vote on any occasion until he shall have paid his subscription for the year last past.
6. Subscribers enjoy all the privileges of Members excepting those of voting at the Meetings, holding office in the Society, and proposing Candidates.
7. Subscribers have no claim upon or interest in the property of the Society.
8. Associates shall have the right to be present at the Meetings, and to have personal access to the Library and Collections.

CHAP. XVI. *Foreign Members.*

1. Every Foreigner who has distinguished himself as an Entomologist, or who has shown himself able and willing to promote the ends for which the Society is founded, may be elected a Foreign Member; his Annual Contribution shall be £1 : 1s., and he shall be entitled to the same privileges as other Members.
2. Foreign Members shall not be required to sign the Obligation Book until present at an Ordinary Meeting of the Society, and when so present shall be admitted as other Members.
3. Foreign Members shall be exempt from the payment of any Admission Fee.
4. Foreigners and Residents abroad may be elected as *Corresponding Members*, who shall not be subject to the payment of any Annual Contribution, and who shall be entitled to a copy of the Journal of Proceedings of the Society, but not to the Transactions; which, however, may be purchased by them at the reduced price paid by the Ordinary Resident Members. The Privileges of Corresponding Members shall however cease in case they shall at any future time be residents in the United Kingdom for the space of twelve months, unless sanctioned, in the case of any particular Member, by a special vote of the Council.

CHAP. XVII. *Honorary Members.*

1. Every person proposed as an Honorary Member shall be recommended by the Council, and be balloted for, and elected, and be liable to be removed in the like form and manner, and be subject to the same rules and restrictions, as an Ordinary Member.

2. Honorary Members shall be exempted from the payment of Fees and Contributions; and shall possess all the privileges of Ordinary Members.

3. No resident in Great Britain can be an Honorary Member, except William Spence, Esq., F.R.S.

CHAP. XVIII. *Meetings of the Society.*

1. The Ordinary General Meetings of the Society shall be held on the first Monday in each month in the year, beginning at eight o'clock precisely in the evening, or at such other time as the Council shall direct.

2. At the Ordinary Meetings the order of business shall be as follows.

1. The names of the Visitors allowed to be present at the Meeting shall be read aloud by the Chairman.
2. The Minutes of the last Meeting shall be read aloud by one of the Secretaries, and proposed for confirmation by the Meeting, and signed by the Chairman.
3. The Presents made to the Society since their last Meeting shall be announced and exhibited.
4. Certificates in favour of Candidates for admission into the Society shall be read or submitted to ballot.
5. Members and subscribers shall sign their names in the Obligation Book, and be admitted.
6. Exhibitions of specimens, &c. shall be made.
7. Entomological communications shall be announced and read either by the Author or one of the Secretaries. When the other business has been completed, the persons present shall be invited by the Chairman to make their observations on the communications which have been read, and on the specimens or drawings which have been exhibited at the Meeting.

3. The President shall have a discretionary power as to the Papers to be read at the Meetings of the Society; and the Secretaries, assisted by the President and any Member or Members of the Council, shall determine as to the priority in which such papers shall be read, and propriety of omitting any portion of the same.

4. All Memoirs which shall be read at any General Meeting of the Society shall become the property of the Society, unless otherwise stipulated for previous to the reading thereof.

5. No Motion relating to the government of the Society, its By-Laws, the management of its concerns, or the election, appointment or removal of its Officers, shall be made at any Ordinary Meeting.

CHAP. XIX. *Special General Meeting.*

Upon the requisition of any six or more Members, presented to the President and Council, a Special General Meeting of the Society shall be convened, and any proposition to be submitted to such Meeting shall be stated at length in the Notice to Members.

CHAP. XX. *Annual General Meeting.*

1. The Annual General Meeting of the Society shall be held in the Meeting-room on the fourth Monday in January of every year.

2. The objects of the Meeting shall be to choose the Council and Officers for the then ensuing year; and to receive from the Council, and hear read, their Annual Report on the general concerns of the Society.

3. The Council for the time being shall annually cause to be prepared two written Lists, one of which (No. 1 in the Schedule hereto) shall contain the names of four Members, whom they shall recommend to be removed from, and of four other Members to be elected into the Council; and the other List (No. 2) shall contain the names of such Members as they shall recommend to fill the offices of President, Treasurer and Secretaries, for the year ensuing; which Lists shall be read at the Monthly Meeting in January, and shall then be fixed up in the Meeting-room until the day of election. And copies of such Lists shall be transmitted to every Member whose known residence shall be in London, or within twenty miles thereof, at least seven days before the Annual General Meeting shall take place.

4. The Secretaries, assisted by the Treasurer, shall prepare a List of the Members entitled to vote, and each Member voting shall give his name to the Scrutineers to be marked on the said list.

5. On the day of voting, each Member present shall put his balloting Lists into the respective Glasses to be provided for such occasion; before doing which, however, in case he shall have added

any name or names to the Lists proposed by the Council, he shall strike out the name or names of those persons recommended for whom he does not vote. And if more names shall be suffered to remain in any List than the number of persons to be elected or removed, such List shall be rejected. And in case the names suffered to remain shall be less than the number of vacancies to be supplied, those names only which shall remain in the List shall stand as voted for.

6. The President shall appoint two or more Scrutineers from the Members present, not being Members of the Council, to superintend the Ballots and report the results to the Meeting.

7. The Ballot for the Council shall remain open for one quarter of an hour, at the least; and the Ballot for the Officers for one quarter of an hour, at the least, after the result of the Ballot for the Council shall have been declared.

8. If from any cause an election shall not take place of persons to fill the Council, or any of the offices aforesaid, then the election of the Council and Officers, or the election of Officers, as the case may be, shall be adjourned until the next convenient day, of which notice shall be given, in like manner as is directed for the Annual General Meeting.

9. No Ballot, either for the election of Members or any other business, shall be taken unless nine Members are present.

CHAP. XXI. *Transactions.*

1. The Transactions shall consist of Papers communicated to the Meetings of the Society.

2. The Transactions shall be published quarterly, and at such prices as the Council shall direct for each Part or Volume; but the price for one copy of each Part or Volume, to each Member or Subscriber who shall have paid his Annual contribution for the year in which such Part or Volume shall be published, shall not exceed three-fourths of the price charged to the public.

3. Foreign Members of the Society who shall have paid the Annual Subscription for the year, and Ordinary English Members and Subscribers resident more than fifteen miles from London, shall be entitled to receive the Transactions of the Society published during the year without any further payment.

4. The superintendence of the Publications shall be by a Committee, which shall consist of thirteen Members to be appointed by the Council, including the President, Vice-Presidents, Treasurer, and Secretaries.

5. The Committee of Publication shall consider every Paper which shall have been communicated to a General Meeting of the Society, and shall report to the Council thereon; but no Paper shall be reported on at any Meeting of the Committee unless there shall be three or more Members present: and such Committee shall be convened by the Secretary every third month or oftener, when all papers read since the last Meeting of Committee shall be produced and referred.

6. Authors of Memoirs to be published in the Transactions shall be allowed 25 copies of their communications with uncoloured plates, gratis. If any additional number be required, the entire expense thereof and the colouring of all plates to be paid for by the Authors.

7. A Journal of Proceedings of the Society shall also be published quarterly or half-yearly, containing Abstracts of the Papers read and Notices of other Matters communicated at the Ordinary Meetings of the Society, which Journal, together with the Transactions, shall be edited by the Secretaries, or one of them, and shall be bound up and sold with the Transactions.

CHAP. XXII. *Alteration of the By-Laws.*

Any of the By-Laws of the Society may at any time be repealed, or altered and amended, or others adopted in lieu thereof, at any Meeting of the Society, to be specially summoned in pursuance of Notice to be given to the President and Council, to be signed by six Members at least, such Notice to specify the intended repeal or alteration, and to be read at three General Meetings of the Society previous to such Special Meeting.

THE SCHEDULES REFERRED TO IN CHAPTER XX.
OF THE PRECEDING BY-LAWS.

No. 1.

Form of the List for the Council.

List of Four Members of the present Council recommended by the present Council to be removed at the Election on the _____ day of January, 18 ____.*

A. B.	
C. D.	
E. F.	
G. H.	

List of Four Members recommended to be elected into the Council.

I. K.	
L. M.	
N. O.	
P. Q.	

No. 2.

Form of the List for the Officers.

List of Persons recommended by the present Council to be appointed to the offices of President, Treasurer, and Secretaries of the Society, at the Election on the _____ day of January, 18 ____.*

President R. S.	
Treasurer T. U.	
Secretaries { W. X. Y. Z.	

* If any of the Names in these Lists be objected to, they must be struck out previous to the Ballot, and other Names substituted in the blank spaces left for that purpose.

List of Members

OF

THE ENTOMOLOGICAL SOCIETY

OF LONDON,

DECEMBER 31st, 1850.

LIST OF MEMBERS
OF
THE ENTOMOLOGICAL SOCIETY
OF LONDON.



HONORARY MEMBERS.



Honorary English Member.

WILLIAM SPENCE, Esq., F.R.S. F.L.S. 18, Lower Seymour Street,
Portman Square.

Honorary Foreign Members.

EDWARDS, M. Milne. La Musée d'Histoire Naturelle, Paris.

Gravenhorst, Prof. J. L. C. Breslau, Silesia.

Haan, Herr W. de. Haarlem.

Hammerschmidt, Herr L.

Klug, Dr. Frederick. Royal Museum, Berlin.

Kollar, Herr. Royal Museum, Vienna.

Lefebvre, M. Alexandre. Bouchevilliers, près Gisors, Département de l'Eure.

Passerini, Signor Carlo. Professor of Zoology, at the Royal Museum, Florence.

Zeller, Herr P. C. Gross-Glogau, Silesia.

(*One vacant.*)

List of Members
OF
THE ENTOMOLOGICAL SOCIETY
OF LONDON.

ORDINARY MEMBERS AND SUBSCRIBERS.

Marked * are Original Members.

Marked † have compounded for their Annual Subscriptions.

Marked S. are Subscribers.

Date of
Election.

- | | | | |
|------|----|--|---|
| 1849 | S. | ALLIS, T. H., Esq. | York. |
| 1835 | | Ashton, R. J., Esq., F.L.S. | 2, Pelham Crescent, Brompton. |
| * | † | Babington, C. C., Esq., M.A. F.L.S. F.G.S. | St. John's Col-
lege, Cambridge. |
| 1850 | S. | Baly, J. S., Esq. | 13, Southampton Terrace, Kentish Town. |
| 1849 | S. | Barlow, F., Esq. | Cambridge. |
| 1849 | S. | Bedell, G., Esq. | 7, Chester Place, Old Kent Road. |
| * | | Bell, Thomas, Esq., Sec. R.S. F.L.S. F.G.S. | 17, New Broad
Street, and Selborne, Hants. |
| 1849 | S. | Bell, William, M.D. | 37, Albemarle Street. |
| * | | Bevan, Edward, M.D. | Hereford. |
| 1849 | S. | Bladon, J., Esq. | Pont-y-pool. |
| 1841 | | Bond, F., Esq. | Kingsbury. |
| * | | Bowerbank, J. S., Esq., F.R.S. F.G.S. F.L.S. | 3, Highbury
Grove. |
| 1850 | S. | Bree, C. R., Esq. | Stricklands, Stowmarket. |
| 1849 | S. | Brown, Edwin, Esq. | Burton-on-Trent. |
| 1840 | | Bruck, Herr Emil von. | Crevelt. |
| 1837 | | Burlington, William, Earl of, M.A. F.R.S. F.G.S. | 10, Belgrave
Square. |
| 1838 | | Charlesworth, E., Esq. | York. |
| 1848 | | Christie, Arthur, Esq. | 9, Stanhope Street, Hyde Park. |
| * | | Christy, J. F., Esq. | Stangate Glass Works, Lambeth. |
| 1850 | | Clark, Rev. Hamlet. | Northampton. |

- | Date of Election. | | | |
|-------------------|----|---|--|
| 1849 | S. | Cooke, Henry, Esq. | London and County Bank, Hastings. |
| 1849 | S. | Cooke, Nicholas, Esq. | Hope Mills, Warrington. |
| 1849 | | Dallas, W. S., Esq., F.L.S. | 5, Albion Grove West, Islington. |
| * | † | Darwin, Charles, Esq., M.A. F.R.S. | Down, near Bromley, Kent. |
| 1850 | S. | Dashwood, John, Esq., B.A. | Barton-under-Needwood, near Lichfield. |
| 1849 | S. | Dawson, John, Esq. | Carron, near Falkirk, Stirlingshire. |
| * | † | Desvignes, Thomas, Esq. | Fir Tree Cottage, Woodford. |
| * | | Doubleday, Henry, Esq. | Epping. |
| 1845 | | Douglas, J. W., Esq., <i>Secretary</i> . | 2, Eton Grove, Lee, Kent. |
| 1849 | | Dunning, J. W., Esq. | Elmwood Lodge, Leeds. |
| 1849 | S. | Ellman, J. B., Esq. | Landport, Lewes. |
| * | | Engleheart, N., Esq. | Blackheath Park. |
| 1838 | | Evans, W. F., Esq. | Admiralty. |
| 1847 | | Fortnum, C. D. E., Esq. | 12, Grosvenor Street West. |
| 1845 | | Frend, Benjamin, Esq. | |
| 1849 | S. | Gear, Robert, Esq. | 19, Oxford Square. |
| * | | Gould, J., Esq., F.R.S. F.L.S. F.Z.S. | 20, Broad Street, Golden Square. |
| 1835 | † | Grant, Dr. | Richmond, Surrey. |
| 1848 | | Grant, Fred., Esq. | Putney. |
| 1850 | | Gray, John, Esq. | Wheatfield House, near Bolton-le-Moors. |
| 1842 | † | Gray, J. E., Esq., F.R.S. | British Museum. |
| 1850 | S. | Greene, Rev. Joseph. | Lower Guiting, near Stow, Gloucestershire. |
| 1837 | | Greenough, G. B., Esq., F.R.S. F.L.S. F.G.S. M.R.A.S. | Grove House, Regent's Park. |
| 1849 | S. | Gregson, C. S., Esq. | 107, St. James's Street, Liverpool. |
| 1845 | | Griffith, C. H., Esq. | Twyford, Winchester. |
| 1846 | | Grut, F., Esq. | |
| 1846 | | Gutch, J. W. G., Esq., M.R.C.S. F.L.S. | 77, Great Portland Street. |
| 1850 | S. | Guyon, G., Esq. | Richmond, Surrey, and Ventnor, Isle of Wight. |
| 1845 | | Haliday, A. H., Esq. | 23, Harcourt Street, Dublin. |
| * | | Hanson, Samuel, Esq. | Botolph Lane. |
| * | | Heales, G. S., Esq. | Doctors' Commons. |
| 1847 | | Hearsey, Lieut.-Col. John Bennett. | India. |
| 1846 | | Hewitson, W. C., Esq. | Oatlands, near Esher, Surrey. |
| * | | Horsfield, Thomas, M.D. F.R.S. F.L.S. F.G.S. M.R.A.S. | East India House, and 21, Downshire Hill, Hampstead. |
| 1849 | S. | Ingall, George, Esq. | 81, High Street, Borough. |
| 1849 | S. | Ingall, Henry, Esq. | Glengall Grove, Old Kent Road. |
| 1849 | S. | Ingall, Thomas, Esq. | 16, Park Road, Stockwell Park. |

- Date of Election.
- 1843 Janson, E. W., Esq., *Curator*. 61, Gracechurch Street.
* Jenyns, Rev. L., M.A., F.L.S., F.G.S. Swaffham-Bulbeck, Newmarket.
- 1849 S. Jobson, Henry, Esq. Carron, near Falkirk, Stirlingshire.
- 1842 Kuper, Rev. C. Trellich, Monmouth.
- 1849 S. Labrey, B. B., Esq. Manchester.
- 1839 † Lamb, Charles, Esq. Beauport, near Hastings.
- 1849 † Lee, John, LL.D. F.R.S. F.S.A. F.R.A.S. Hartwell House, Aylesbury.
- 1835 † Lingwood, R. M., Esq., M.A. F.L.S. F.G.S. Lyston, near Ross, Herefordshire.
- 1849 S. Logan, R. F., Esq. Hawthornbrae, Duddingstone, near Edinburgh.
- 1850 S. Lowe, Dr. Balgreen, Slateford, near Edinburgh.
- 1850 † Lubbock, John, Esq. High Elms, Farnborough.
- 1849 S. Maitland, A., Esq. Torrington Place, Torrington Square.
- 1850 S. Meade, R. W., Esq. Bradford, Yorkshire.
- 1849 S. Michael, J. L., Esq. Lord Mayor's Court Office, Old Jewry.
- 1849 S. Michael, Walter, Esq. 9, Red Lion Square.
- 1841 Mitchell, John, Esq.
- 1850 Murray, Alexander, Esq. Shenley, Herts.
- 1849 † Newman, Edward, Esq., F.L.S. F.Z.S. 7, York Grove, Peckham.
- 1849 S. Ogilvie, R. A. Esq. 15, Wharton Street, Lloyd's Square.
- 1841 † Owen, Richard, Esq., M.D. LL.D. F.R.S. F.L.S. F.G.S. Royal College of Surgeons.
- 1840 † Parry, J. F. S. Esq., F.L.S. Steyne, Worthing.
- 1850 S. Potter, Mr. C. Lewes.
- 1849 S. Ransome, G. Esq., F.L.S. F.Z.S. Ipswich.
- 1849 S. Salt, G. M., Esq. Shrewsbury.
- 1849 S. Saunders, S. S., Esq. Albania.
- 1849 S. Saunders, W. F., Esq., East Hill, Wandsworth.
* † Saunders, W. W., Esq., F.L.S. East Hill, Wandsworth.
- 1847 Schaum, Dr.
- 1847 Shepherd, Edwin, Esq. 176, Fleet Street.
- 1850 S. Shepherd, James, Esq. Brown Street, Blackburn.
- 1850 Smith, Frederick, Esq. British Museum.
- 1849 S. Smith, J. P. G., Esq. Everton, Liverpool.
* † Spence, R. H., Esq.
* † Spence, W. B., Esq.
- 1836 Spinola, le Marquis Maximilian. Genoa.
- 1848 † Stainton, H. T., Esq., *Secretary*. Mountsfield, Lewisham.

Date of Election.			
*		Stephens, J. F., Esq., F.L.S.	Eltham Cottage, Foxley Road, Kennington.
1837		Stevens, S. Esq.	24, Bloomsbury Street.
1850	S.	Stopford, Miss.	Newbliss, Co. Monaghan.
1841		Tatum, T. Esq.	3, George Street, Hanover Square.
1836	†	Taylor, R. Esq., F.L.S. F.S.A. F.G.S. M.R.A.S.	Red Lion Court, Fleet Street.
1838		Thompson, C. T. Esq.	Bedford Place, Kensington.
1850	S.	Thompson, Thomas, Esq.	Hull.
1845		Thurnell, Charles, Esq.	Duxford, Cambridgeshire.
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TRANSACTIONS
OF THE
ENTOMOLOGICAL SOCIETY
OF
LONDON.

- I. *Description of a new Hemipterous Insect, from Boutan, East Indies, forming the Type of a new Genus. By W. S. DALLAS, Esq., F.L.S.*

[Read 7th May, 1849.]

I HAD the pleasure of laying before the Society, at its February meeting, a notice of some species of *Hemiptera*, from Boutan, belonging to the Museum of the East India Company. The insect which I have now to describe is contained in the same collection, and perhaps should have been brought forward at the same time as the others, but the singularity of its structure induced me to consider it worthy of a separate notice. It is indeed one of those species to which it is difficult to assign any exact position in a systematic arrangement. In the mass of its characters it appears to agree with the *Pentatomidæ*, but the form of the head approaches very closely to the *Coreid* type, although the general structure of the other parts of the body will hardly allow it to rank among the members of the family *Coreidæ*.

The antennæ in the specimens before me are unfortunately mutilated, only one of them possessing four joints; but I have little hesitation in regarding the antennæ as five-jointed, the pit at the apex of the fourth joint, for the reception of the base of the fifth, being quite distinct.

The species appears to form the type of a new genus, which I have called *Urochela*, in allusion to the singular claw-like processes which form a portion of the male generative organs, and is probably closely allied to the singular genera *Urolabida* and *Urostylis* of Mr. Westwood, which present the same character in a greater degree.

Genus UROCHELA. (Pl. II. fig. 1.)

Head (fig. 1 *a*) small, short, broader than long, suddenly narrowed immediately before the eyes; the three lobes produced, distinct, rounded; the central lobe longer than the lateral ones. *Eyes* large, prominent, globose. *Ocelli* moderate, situated close to each other, at the back of the head. *Antennæ* (1 *a*) as long? or longer? than the body, of five joints?, inserted on a tubercle, which appears beyond the margin of the head, immediately before the eyes; first joint thickest, as long as the thorax, cylindrical, thinner at the base; second about half as long again as the first, slender; third joint shortest, about half as long as the first, and a little thicker than the second; fourth about as long as the first, slender; fifth wanting? The antennæ are thickly clothed with fine short hairs, which are longer on the first joint. *Rostrum* (fig. 1 *b*) inserted close to the anterior margin of the head, short, reaching only to the middle of the medipectus, of four joints, the first and third nearly equal, the fourth shorter, the second longest; the first joint enclosed at its base in a small groove of the underside of the head. *Labrum* reaching the middle of the second joint of the rostrum, transversely striated.

Body broad, very flat above, convex beneath. *Thorax* trapezoidal, slightly margined laterally, much narrowed in front, the anterior margin being considerably narrower than the head and eyes. *Scutellum* rather short, triangular, with the sides nearly straight, and the apex acute. *Elytra* (fig. 1 *f*) ample; the coriaceous portion larger than the membranous, with the basal half of its outer margin much elevated; the membrane reaching beyond the apex of the abdomen, containing six nervures, of which the outer one is very short, placed in the basal angle; the other five all spring from a common footstalk. *Abdomen* convex beneath, the margins thin, projecting a little beyond the elytra on each side. *Anal apparatus* in the male (fig. 1 *e*) consisting of two claw-like processes, which project nearly as far as the posterior angles of the terminal segment of the abdomen, with their points turned outwards; a small triangular plate is situated at the base of

these, which it partially covers, and within the cavity appears the apex of a second triangular piece, which is probably the margin of the dorsal portion of the segment; all these parts are clothed with long woolly hairs, which nearly fill the intermediate spaces. In the female the vulvar plates present no remarkable characters. *Breast* (fig. 1 c) flat; the medipectus broad, placing a considerable interval between the insertions of the anterior and intermediate legs; on each side of the postpectus, close to its anterior margin and near the intermediate coxæ, is a small spine (fig. 1 d), directed outwards and forwards. *Legs* moderate, slender, the posterior pair longest. *Tarsi* of three joints, the first and third about equal, the second minute.

The neururation of the elytra is of a singular character; a nervure, which arises from a strongly elevated line at the base of the coriaceous portion, runs about two-thirds the length of that part, when it emits a branch on its inner side, which attains the base of the membrane, and, passing into it, gives rise, after running singly for a short distance, to the five nervures of the disc of the membrane, of which the two inner and the two outer ones are united at the base, before joining the common footstalk.

The small lateral spines on the anterior margin of the postpectus constitute one of the greatest peculiarities of this insect. They appear to be perforated on their posterior surface, at about half their length, and are evidently formed by the produced margins of the orifices of the odoriferous apparatus.

Species *Urochela 4-punctata*. (Pl. II. fig. 1.)

U. supra ferrugineo-grisea, punctata, thorace scutelloque linea media flava, elytris punctis 4 nigris. ♂ ♀

Hab. Boutan.

Long. lin. $4\frac{1}{2}$. (9 mill.)

Body elongate-ovate, above ferruginous grey, finely and thickly punctured. Thorax narrowly margined with yellow, and with a narrow, impunctate, longitudinal line on the disc of the same colour; a small black spot on the lateral margin near the lateral angle. Scutellum with a narrow longitudinal yellow line, continuous with that of the thorax, the lateral margins yellowish. Coriaceous portion of the elytra with the basal third of the outer margin, and the apical margins, yellow; the remainder of the outer margin, and a small line in the yellow basal portion, a spot on the disc, and another at the centre of the apical margin, black. Membrane pale brown, with the nervures paler. Margins of the

abdomen banded with yellow and black. Abdomen beneath smooth, impunctate, yellow; a spot on each side of each segment within the stigmata, and another on the lateral margin, black. Head beneath, breast and rostrum testaceous; the apex of the latter pitchy. Legs dusky testaceous, the thighs punctured with pale brown. Antennæ with the basal joint dusky testaceous, second black, pale at the base, third and fourth black, the basal portion of the latter yellowish white.

II. *Notice of some Hemiptera from Boutan, in the Collection of the Hon. East India Company.* By W. S. DALLAS, Esq., F.L.S.

[Read 1st October, 1849.]

IN a former notice (Vol. V. p. 186), under the above title, I laid before the Society a list of some species of *Scutelleridæ* and *Pentatomidæ*, from Boutan, contained in the Museum of the East India Company. Although these were not very numerous, the Collection is still more scantily furnished with examples of the other divisions of *Hemiptera*, there being but twenty species in all, including two belonging to the Homopterous family *Cercopidæ*.

Of the eighteen Heteropterous species, ten belong to the *Coreidæ*; namely, *Derepteryx Hardwickii*, White; two species of the genus *Acanonicus*, Westw. (*Dalader*, Am. & Serv.), of which one appears to be the *A. rubiginosus*, Hope, whilst the other is most probably a variety of the Javanese *Dalader rotundicosta*, Am. & Serv.; it is rather smaller, and has the sides of the thorax and abdomen and the third joint of the antennæ less dilated than that species. Other described species are, *Homæocerus biguttatus*, Hope; *Gonocerus calumniator*, Fab.; and *Mictis Tragus*, Fab. Two other species, also belonging to the genus *Mictis*, I have not been able to determine satisfactorily.

The remaining two species of *Coreidæ* appear to be decidedly nondescript. One belongs to the genus *Nematopus*,—I have called it—

Sp. 1. *Nematopus serripes*. (Pl. II. fig. 2.)

N. rufo-fuscus, punctatissimus; capite, thorace, scutello, elytrorumque membrana nigro-æneis; femoribus posticis elongatis,

incrassatis, tuberculatis, nigro-cæruleis; tibiis fusco-rufis, intus serratis. ♂.

Long. lin. $9\frac{1}{2}$ (20 mill.)

Head brassy black, finely granulated. Eyes pale brown; ocelli yellow. Prothorax and scutellum brassy black, shining, very thickly and finely punctured,—the former with a large pit within each lateral angle. Elytra diminishing gradually in breadth from base to apex; the coriaceous portion reddish brown, obscure, very thickly and finely punctured, the punctures being larger at the base; the membrane brassy. Margins of abdomen projecting slightly beyond the elytra on each side, reflexed, testaceous, with a black band on the posterior margin of each segment; the extreme edge is black and very finely denticulated throughout. Abdomen beneath brownish red, shining; the margins yellowish, marked with black, as on the upper surface; anal plate black, with the edges fringed with yellow hairs. Breast pitchy black, slightly shining, finely punctured and granulated on the sides, smooth in the centre. Rostrum, antennæ (two first joints, rest wanting) and four anterior legs ferruginous; posterior legs with the thighs very long, much thickened, blackish blue, shining, covered with small tubercles, and with a row of six spines beneath, of which the one nearest the base is very small, the others gradually increasing in size to the fourth, which is the largest; fifth and sixth about equal, the latter being inserted close to the apex of the thigh; tibiæ brownish red, as long as the thighs, slightly curved inwards, especially at the apex, strongly channelled on the outside, with the edges finely crenulated; the inner margin serrated throughout its entire length, with the teeth pitchy. Tarsi ferruginous.

This species is remarkable for the contrast of its colours and the structure of the posterior thighs and tibiæ.

The other species is an *Anisoscelis*, and, from the general form of the head and body (the posterior legs being wanting) appears to belong to that division of the genus *Anisoscelis*, Burm., to which the name *Leptoscelis* has been applied by Laporte and Amyot and Serville.

Sp. 2. *Anisoscelis rufiventris.*

A. thorace utrinque spina parva acuta armato; supra nigro-ferruginea, punctata, tenuissime rufo-marginata; subtus rufa, nigro-maculata, antennis pedibusque nigris. ♀.

Long. lin. 9 ($19\frac{1}{2}$ mill.)

Above ferruginous black, opaque, thickly and rather finely

punctured; beneath orange red, slightly shining, punctured. Head oblong, rather short and obtuse, the central projection short and rounded; the red colour of the under surface appears on each side, forming a red margin to the head. Thorax with the lateral angles produced on each side into a slender acute spine, directed upwards and forwards; the lateral margins narrowly edged with red. Scutellum pitchy black. Elytra with a narrow red outer margin, which disappears before the apex of the coriaceous portion; membrane brownish, semitransparent, with a triangular, opaque piece at the internal basal angle. Abdomen above red, with the margins variegated with black; beneath red, with the margins as on the upper side; a black spot on each of the stigmata; two small patches at the base of the third segment, and a ring on the second, of the same colour; basal segment variegated with black. Breast reddish orange, thickly and strongly punctured, with two black spots on each side of the postpectus and medipectus, one on each side of the antepectus and one at the base of each of the coxæ; the centre of the breast is black and smooth, furnished with a distinct furrow. Head beneath reddish orange, finely punctured, with a black furrow down the centre for the reception of the basal joint of the rostrum. Rostrum black, with the basal joint and the base of the second yellowish white. Anterior and intermediate legs and basal joint of antennæ black. The remainder of the antennæ and the posterior legs are wanting in the only specimen before me.

Of the eight species remaining, two belong to the genus *Pyrrhocoris*, Burm.; they are both Fabrician species,—*Lyg. faber* and *Schlanbuschii*, Fab.

Four are members of the family *Reduviidæ*, and of these, three appear to be undescribed. The first is a large species of the genus *Platymeris*, Burm., apparently belonging to *Acanthaspis*, Am. & Serv.

Sp. 3. *Platymeris fulvipes*. (Pl. II. fig. 3.)

P. niger, subopacus; thoracis lobo antico 5-sulcato, lobo postico utrinque spina acuta recurva armato; elytrorum maculis quatuor, femorum apicibus, tibiis tarsisque fulvis. ♂.

Long. lin. $13\frac{1}{2}$ (28 mill.)

Head and thorax black, somewhat opaque, finely granulated, and beset with numerous hairs of moderate length, especially on the sides. Eyes brownish testaceous; ocelli brown. Anterior lobe of the thorax with five deeply impressed, longitudinal furrows,

of which the central one is forked anteriorly, and gives off a short branch on each side near the base, and with a small tubercle at each anterior angle; posterior lobe hexagonal, transverse, with a strong, acute spine at each lateral angle, and a small tubercle within each posterior angle above the base of scutellum. Scutellum black, opaque, granulated, with a few longish hairs, and with the apex produced into a slender, acute, elevated spine (fig. 3 a). Elytra black, slightly shining, with a few scattered raised points on the surface, a small triangular orange spot at the base on the outer margin, and a large roundish spot of the same colour towards the apex of the coriaceous portion, touching the outer margin and the base of the membrane. Margins of the abdomen banded with black and yellow. Abdomen beneath pitchy, smooth, slightly shining, with the apex reddish, and a yellow band on each segment towards the lateral margins. The second abdominal segment bears a small, sharp, longitudinal keel in the centre, and the apical half of the terminal one is finely wrinkled transversely. Breast black, rough; metasternum with a faint longitudinal central keel, prosternum with a narrow central furrow. Legs rather long, clothed with long fine hairs; thighs pitchy, with the apex reddish orange; tibiæ and tarsi reddish orange, the former with their apices pitchy on the inside. Rostrum and antennæ pitchy black, the former smooth and shining, reaching the base of the anterior coxæ; the latter with the second joint thickly clothed with fine short hairs, basal and setiform apical joints with short scattered hairs.

This fine species also occurs in Assam, but the specimens from that locality are paler in colour than the one above described, being pitchy instead of black on the upper surface, pitchy brown beneath.

A large species of *Harpactor* I have named

Sp. 4. *Harpactor obscurus*. (Pl. II. fig. 4.)

H. supra fuscus, obscurus, subtus rufus, totus pilis numerosis parvis vestitus; capite nigro, thoracis lobo antico nigro, utrinque spinoso, fusco-verrucoso, tibiis omnibus rufis. ♀.

Long. lin. $11\frac{1}{2}$ (24 mill.)

Head subcylindric, black, impunctate, somewhat opaque, clothed with short yellowish hairs. Eyes brown. Thorax with the anterior lobe black, opaque, with several reddish brown warts, and a small blunt spine or tubercle of the same colour at each of its posterior angles; posterior lobe brown, obscure, rough, wrinkled transversely and clothed with very short yellow hairs, the lateral

angles considerably produced but not acute. Scutellum pitchy brown, pilose. Elytra brown, obscure; membrane blackish brown, wrinkled, with a brassy reflection. Margins of the abdomen projecting beyond the elytra on each side, pitchy red, with the posterior margin of each segment narrowly edged with red. Abdomen beneath bright red, smooth, impunctate, with a sharp longitudinal central keel on all the segments except the two basal ones. Breast dull red, pitchy in the centre. Head beneath pitchy; rostrum pitchy red. Antennæ black. Thighs and coxæ pitchy, the anterior thighs thicker than the others, the posterior longest. Anterior tibiæ orange red, the four posterior brownish red. Tarsi orange.

The entire surface, above and beneath, is clothed with short yellow hairs, especially the abdomen and breast, and the under surface of the anterior and intermediate thighs and tibiæ.

The only specimen of this insect in the collection is deformed in the thorax, the left lateral angle being, as it were, crushed forwards; I have, however, figured it with both angles alike.

The third is a small species of *Arilus*.

Sp. 5. *Arilus nigricollis*. (Pl. II. fig. 5.)

A. capite, thoracis lobo antico, scutello, pectore, antennis, pedibusque nigris; thoracis lobo postico flavo, abdomine rufo. ♀.
Long. lin. 7 (15 mill.)

Head black, smooth, impunctate, with a few fine hairs on the sides; a deep, transverse, impressed line across the disc at the posterior margin of the eyes, immediately behind which are placed the ocelli, inserted on two tubercles. Thorax hexagonal, with the antero-lateral margins longest, and nearly straight, the constriction between the lobes being very faint; the anterior lobe small, black, with two obtuse tubercles in the centre, separated by a longitudinal furrow, and which are again slightly notched transversely at their apices; the posterior lobe large, yellow, smooth, impunctate and slightly shining, rather convex, with a slight circular depression in the centre; lateral angles somewhat prominent, separated from the central portion by a strong depression. Scutellum black, slightly shining, with a raised line at the apex. Elytra brownish testaceous; the coriaceous portion indistinctly punctured, the membrane semitransparent. Abdomen projecting slightly beyond the elytra on each side, with the margins bright red; beneath convex, bright red, shining, impunctate. Breast black, impunctate, smooth, but more or less clothed with short

greyish hairs. Prosternum with a longitudinal central furrow, in which the point of the rostrum rests; the interior of this furrow is testaceous. Head beneath yellow in the centre, with the margins black; smooth, shining, impunctate. Legs, rostrum and antennæ black; legs and antennæ clothed with numerous very fine hairs.

The fourth is the *Eulyes amœna*, Guér., which completes the list of the terrestrial species.

The two remaining species fall under the genus *Ranatra*, Fab.; the first, belonging to a section of that genus which has been separated by Amyot and Serville under the name of *Cercotmetus* for the reception of a Javanese species, their *C. Asiaticus*, I have named

Sp. 6. *Ranatra (Cercotmetus) pilipes*. (Pl. II. fig. 6.)

R. (C.) *elongata*, luteo-fusca, obscura; capite tuberculo inter oculos; setis caudalibus brevibus, latis, compressis; elytris abdominis segmentum apicale non attingentibus, tibiis tarsisque 4 posticis interne pilis longis instructis.

Long. corp. unc. $1\frac{1}{2}$.

Linear-elongate, yellowish brown, opaque. Head small, with a tubercle on the vertex between the eyes. Elytra not reaching the apex of the penultimate segment of the abdomen, with the coriaceous portion covered with very small hairy tubercles. Caudal setæ very short, not more than one-fourth the length of the body, broad, compressed, and strongly pilose externally. Abdomen beneath strongly keeled, the keel continued upwards along the sternum, disappearing about the centre of the mesosternum; prosternum with two deep longitudinal furrows extending its whole length. Legs somewhat robust and pilose; anterior thighs and tibiæ very short; intermediate and posterior tibiæ and tarsi furnished on the inner side with a double row of long yellow hairs.

It is not without doubt, that I describe this species as new, for although Amyot and Serville make no mention of the strong fringes of hairs on the two posterior pairs of legs in the description of their species, I am inclined to think that this omission may be the result of accident, perhaps of their specimens being in bad condition. Their statement that the *Ranatræ* have "*les jambes frangées*" can hardly be taken to convey the impression of such a decided character as is exhibited in this species, the fringes in the other species of *Ranatra* being very slight. It appears to me, that the character is rather generic than specific, and tends to confirm Amyot and Serville's separation of their genus *Cercotmetus*

from *Ranatra*; for these fringes indicate a much greater velocity of motion than is possessed by the other *Ranatræ*; the short, broad anal setæ will act as a rudder, rendered necessary by the increased activity of the animal, whilst the elongated anterior legs being no longer requisite, and tending rather to impede its movements, become contracted into more moderate dimensions. Indeed, it appears to be a rule in the genus *Ranatra* that any increase in the length of the caudal setæ is accompanied by an increase, although to a less extent, in the length of the anterior legs, and probably a diminution of the activity of the animal.

The second is a true *Ranatra*.

Sp. 7. *Ranatra gracilis*.

R. elongata, ferrugineo-fusca, obscura; capite tuberculo acuto inter oculos; setis caudalibus brevibus, tenuibus; abdomine carinato, prosterno bisulcato; pedibus quatuor posticis subpilosis.

Long. corp. lin. $12\frac{1}{2}$.

Linear-elongate, ferruginous brown, obscure. Head with an acute tubercle between the eyes. Scutellum with two small pits on the disc towards the apex. Elytra reaching beyond the base of the apical segment of the abdomen. Caudal setæ short, rather longer than the head and thorax together, slender, very slightly pilose externally. Abdomen beneath keeled, the keel not continued beyond the base of the posterior legs. Prosternum with two longitudinal furrows. Legs very long and slender, subpilose, anterior thighs with six very faint teeth beneath at the base; the four posterior tibiæ and tarsi simple.

This species appears to be allied to the *R. filiformis*, Fab., but wants the grey rings on the legs mentioned in his description; it is also a much larger insect than that figured by Guérin under that name, and has the caudal setæ much shorter in proportion.

Of the *Homoptera*, there are, as above mentioned, only two species, both belonging to the genus *Cercopis*.

Sp. 8. *Cercopis fulviceps*.

C. capite, thoraceque fulvis, elytris nigro-rufis, corpore subtus, pedibusque nigris. ♀.

Long. lin. $10\frac{1}{2}$ (22 mill.)

Head and thorax bright orange, shining, very finely punctured, the latter with a narrow but very distinctly raised border. Scu-

tellum small and triangular, with the lateral margins incurved; reddish black, rather convex and transversely wrinkled. Anterior wings reddish black, somewhat obscure, very minutely and thickly punctured, with the outer margins pitchy red. Wings brownish, semitransparent. Abdomen beneath black, shining. Breast, legs and rostrum pitchy.

This species appears to approach very closely to the *C. fuscipennis*, Le P. & Serv., and may perhaps be a very dark variety of it; it differs in the colour of the legs and underside of the body.

Sp. 9. *Cercopis dimidiata*.

C. nigra, thorace fascia lata rubra; elytris rubris, fasciis tribus nigris. ♀.

Long. lin. 7 (15 mill.)

Head black, punctured. Eyes pale-brown; ocelli yellowish-white. Thorax very thickly and finely punctured, with its posterior half, and a transverse quadrangular patch on the anterior margin, black; the remainder bright red. Scutellum black, transversely wrinkled. Elytra bright red, very thickly and finely punctured, with three broad irregular transverse black bands on each, of which the first arises at the apex of the scutellum, the second a little behind the middle, and the third forms a broad black margin round the apex. Body beneath black, shining. Legs and rostrum pitchy.

III. *Observations on Two of Gravenhorst's Subgenera of Ichneumons, namely, Macrus, forming the Fifth Family of Ophion, and Coleocentrus, the Fourth Family of Banchus.* By THOMAS DESVIGNES, Esq.

[Read 4th June, 1849.]

I HAVE brought with me two insects for exhibition, which I captured in an unfinished building in Vienna; and at the time I considered to be the sexes of one species; since then closer investigation has convinced me in this particular. Their palpi and neuration of the wings perfectly correspond, independent of other minor points. Gravenhorst makes no mention of the construction of the former. The maxillary palpi consist of five articulations: the basal short; 2nd, stout, reniform; 3rd and 4th, slightly subclavate; the 5th filiform, the apex somewhat mucronate, their comparative lengths 5, 3, $\frac{4}{3}$, 1. The second articulation of the labial palpi cylindrical, and a little longer than broad, incurved, and stouter than the rest; all are setose. The antennæ of the male are setaceous, those of the female filiform; the joints of the latter lay parallel, but obliquely one to the other, and are longer than in the ♂, of which the specimen here exhibited agrees perfectly with Gravenhorst's *Macrus longiventris*, and the female with his *Coleocentrus excitator*.

The specific characters in these two subgenera are scarcely distinct, with the exception in the form of the abdomen. In referring to the generic descriptions as given by Gravenhorst, their difference consists in the form of the scutellum, which in *Coleocentrus* is triangular, and in *Macrus* subquadrangular; the basal abdominal segments, and the eighth or apical ones in both, agree in form, the latter in the ♀ is more reflexed than in the ♂.

The vomeriform appendage in the ♀ is stated by Gravenhorst to have its origin from the sixth ventral segment; but upon closer examination it appears to me to consist of three counter segments, the first arising from the apex of the third ventral segment. This may be erroneous, and arising only from the greater production of the ordinary segments. In *Arotes* and *Acoenites*, the ♀ of which are similarly constructed, this appears to be the case, and forms a continuation of the ventral carina, but the upper and lower margins of the segments of —? *excitator* do not coincide as in the two last genera; this has led me to come to the former conclusion as regards that insect.

It seems presumptuous to say that so able an author as the one quoted should be in error; but in this instance, from the apparent disparity of the sexes (still not greater than in some of the fossorial *Hymenoptera*), such I feel confident to be the case.

I propose the generic name of *Macrocoleus* as a combination of the two; by doing so *Coleocentrus* would become a synonyme, and the species would stand thus:—

Macrocoleus excitator, ♂ and ♀ .. Syn. ♀, *Coleocentrus excitator* (Grav.)

♂, *Macrus longiventris* (Grav.)

Do. *caligatus*, ♀ Syn. ♂, *Macrus* ———? (Grav.)

which is a very similar ♀; and it may be inferred, that the ♂ cannot be very different to *longiventris*, but *Macrus filiventris* ♀ (abdomen *angustissimum*) appears to be very distinct. However, I think it likely that his *M. Croccicornis* and *Soleatus* may have females similar to *M. excitator*, and would naturally class under the proposed genus; these males Gravenhorst considers varieties of one another.

Mr. Curtis, in his Guide, has *C. excitator* indicated as British. I have not seen an English specimen, but it is not improbable that it may be so, as I took, in the same place, specimens of *Sirex Gigas* and *Spectrum*. The wood consisted of rough deal planks, and floors of the same.

IV. *On the British Species of the Genus Gelechia of Zeller.** By J. W. DOUGLAS, Esq. (Continued from Vol. V., page 201.)

[Read November 5th, 1849.]

Sp. 41. *Lappella*.

G. Lappella, Z.

Ti. Lappella, L. (non W. V., H., Haw., St.)

G. æstivella, Z. (Isis, 1839.)

Re. Silacea, var. α , Haw.

Cleod. Silacella, St., Wood, 1236.

In the "Entomologische Zeitung" of the Entomological Society of Stettin, 1842, Herr Zeller has published an elaborate memoir on this species, showing that it is the *Tinea Lappella* of Linné, and that the name had been erroneously applied to *Tinea ganomella*, Tischer. In the same volume is an account by Dr. Löw of the habits of the larvæ which feed on the seeds of the common burdock (*Arctium Lappa*), as stated by Linné. Last year it was reared in this country from these seeds by Mr. J. J. Weir.

Sp. 42. *Paucipunctella*.

**G. paucipunctella* (Mtzn.), Z.

Re. Silacea, var. β , Haw.

Cleod. falciformis, St.? Wood, 1241, (non *Re. falciformis*, Haw.)

Differs from the preceding species, which it much resembles, chiefly in being generally smaller, wings narrower, deeper brown on the upper, and brighter yellow on the inferior edge, the two black spots nearer to each other and more conspicuous, and the fuscous margin beyond the oblique yellow stria darker. In one of my specimens I see distinctly three spots, and a trace of a fourth. Zeller (Isis, 1839) says there are four; probably in this respect it varies.

Mr. Allis has Haworth's specimens of this and the preceding species.

* The species marked * are in the collection received from Herr Mann of Vienna.

Sp. 43. *Neuropterella*.

G. neuropterella (F. v. R), Z.

Lita. neuropterella, Dup. Supp. IV. 249, Pl. 72, f. 1.

Expansion of wings, 8—11 lines.

Head and thorax ochreous, palpi long, red brown. Anterior wings long and pointed, with the nervures, some blotches on the disc, the apex and cilia, cinnamon brown. Posterior wings fuscous.

In the cabinets of Mr. T. Ingall and Mr. S. Stevens, by both of whom it has been captured; also in the collection of Mr. Curtis.

Sp. 44. *Lutulentella*.

G. lutulentella, Z.

Expansion of wings, 8 lines.

Head, antennæ, palpi and thorax concolorous with the anterior wings, which are luteous brown of one tint throughout, very glossy, and having a small blackish dot on the disc beyond the middle. Posterior wings yellowish grey, with the ciliæ of the colour of the anterior wings.

I know but two British specimens, one taken by Mr. Stainton many years since—he thinks at Ham Common, Surrey; and one taken by Mr. Allen Hill, in the neighbourhood of Bristol, among *Hippuris vulgaris*, by the side of Bagwood Brook, in the evening of July 22nd, 1849. Zeller says it is found in June in damp waste meadows.

Sp. 45. *Lucidella*.

Cleod. lucidella, St., Wood, 1240.

G. stagninella, Z. (MSS.)

Varies in expansion of wings from 7 to 8 lines, and in colour from light brown to nearly black. In the lighter specimens are seen two interrupted lines of a lighter colour than the wing, of which one runs parallel to the costa, which it joins about the middle, the other lies in the groove of the wing; in the centre of the wing, opposite to where these lines terminate, is a light linear blotch, at the farther end of which is a black dot; at the apex of the costa are 4—5 long yellow dots. Posterior wings deep fuscous, with brownish ciliæ.

Found in July, among rushes, near Hammersmith, by Mr. Shepherd and others.

Sp. 46. *Æthiops*.*An. Æthiops*, Westw.

Expansion of wings, 8—9 lines.

Head, antennæ, palpi and thorax jet black. Anterior wings long, narrow and pointed, also jet black, with 4—5 raised scales of the same colour. Posterior wings fuscous, lighter at the base.

Found in the neighbourhood of Manchester, I believe on poplars.

Sp. 47. *Tenebrella*.*G. tenebrella*, Z.*Æcoph. tenebrella*, Tr.*Ti. tenebrella*, H. 434?**G. unicolorella*, Z. (olim.)*G. metallella*, Sta. (Cat.)*Glyph. subcuprella*, St.?

Expansion of wings, $5\frac{1}{2}$ —6 lines. Head, antennæ, palpi and anterior wings all shining dark bronze colour. Posterior wings fuscous.

This species is most probably Hübner's *tenebrella*, 434, but the figure is so coarse that it cannot be referred to with certainty. The *G. unicolorella* of Zeller is the variety wanting the purplish tint which the typical insect has. Mr. Stephen's description of *Glyph. subcuprella*, like Hübner's figure above referred to, cannot be quoted, neither being sufficiently precise to distinguish the species from others like it.

Not rare in June in many places.

Sp. 48. *Tenebrosella*.*G. tenebrosella* (F. v. R.), Z.

Expansion of wings, 5 lines.

Head, palpi and thorax shining bronze colour. Antennæ bronzy, with the tips distinctly white. Anterior wings shining bronze. Posterior wings fuscous.

This species most closely resembles *tenebrella*, but may at once be distinguished by the white apices of the antennæ.

Found in June and July, but rarer than *tenebrella*.

Sp. 49. *Affinis*.

Re. affinis, Haw.

An. affinis, St.

An. diffinis, Wood, 1205.

G. umbrosella, Z.

Expansion of wings, 4—5½ lines.

Head and antennæ fuscous-black; palpi, second joint ashy, terminal joint black, fully as long or longer than the second. Anterior wings fuscous black, with four black spots, of which the first is faint (sometimes wanting), and is placed at the base of the groove; the second is in the groove, and the other two are in a line above and beyond. To the outside of the second and third is joined a white spot; and beyond all these is a curved whitish fascia. Posterior wings and ciliæ fuscous.

The Entomological Society has Haworth's specimen.

In a note to me, Herr Zeller says of this species, "certissime mea *umbrosella*."

Taken on the sand-hills at New Brighton, and the Chesil-bank, Weymouth; also near London, in July.

Sp. 50. *Anthyllidella*.

**G. Anthyllidella*, Z.

Ti. Anthyllidella, H., 330.

Expansion of wings, 5—6 lines.

Anterior wings shining, black, with a small yellow spot on the costa towards the apex, and another still smaller nearly in the centre of the wing. Zeller says this last spot is wanting in all his specimens. But it is distinctly visible when the insect is in fine condition, especially when alive; and is represented in Hübner's figure. Zeller says the larva feeds on *Anthyllis vulneraria*. This species is in some cabinets as *atrella*.

Sp. 51. *Atrella*.

Ti. atrella, Haw. (non H.)

Expansion of the wings, 6½ lines.

Head, thorax and antennæ brownish black; palpi ashy white. Anterior wings shining brownish black, with a conspicuous orange spot on the costa towards the apex, and another nearly opposite on the inferior margin, nearer to the base. Posterior wings fuscous.

In the Bentleyan Cabinet, under the name of *spiniferella*. Mr. Allis has Haworth's specimen.

Found in August, among heath and furze, at Weybridge and Wickham Wood.

Sp. 52. *Pictella*.

G. pictella, Z.

Expansion of wings, 5 lines.

Head cinereous brown; antennæ brown, faintly annulated with white, *the tips white*; palpi ashy. Anterior wings glossy, rich brown-black, with three silvery equidistant fasciæ, of which the first two slope towards the anal angle, and do not quite reach across the wing, the third slopes towards the second, and extends quite across the wing. Posterior wings silver grey, with somewhat darker ciliæ.

This pretty species was first taken in this country, near South-end, by S. Stevens, Esq. It is much like another species which has not yet been seen in Britain, *G. superbella*, Z., which is not nearly so large, and has not white tips to the antennæ.

Sp. 53. *Albiceps*.

G. albiceps, Z.

Re. nana, var. *a*, Haw.

An. aleella, St., Wood, 1225 (non F.)

Said by Zeller to be rare in Germany, but it is not uncommon in this country on fences of gardens.

Sp. 54. *Nigrovittella*.

Lita. nigrovittella, D. xi. 315, pl. 298, fig. 5.

**G. lepidella*, (F. v. R.), Z.

Re. nivea, Haw.

Alucita nivella, F.?

An. nivella, St.

An. maculella, Wood, 1222.

Sp. 55. *Notatella*.

Lita. notatella, Tr.

G. proximella, var. β , Z. (Isis, 1839.)

Expansion of wings, 6 lines.

Head griseous-fuscous; antennæ brown, annulated with white; palpi griseous, the terminal joint with a black spot in the centre, and another at the apex. Anterior wings grey-brown, with two

fasciæ sloping obliquely outwards from the costa, each composed of three black dots. The first fascia is before and the second beyond the middle; between and below them, in the groove, lies a single black dot, and there are a few black streaks towards the apex. Posterior wings fuscous.

This insect has been reared in May, from larvæ found on salwos in September. It is quite distinct from *proximella*, as a variety of which it was placed by Zeller (Isis, 1839).

Sp. 56. *Humeralis*.

G. humeralis, Z.

An. Lyellella, C., Westw.

Ti. decorella, Haw.

This species varies much in its markings. Sometimes it is grey, with scattered black streaks; sometimes the costa is white and the inferior edge broadly black, and at others the whole surface of the wings is deep fuscous, but the strong black mark on the edge of the costa at its base is always constant.

The Entomological Society has Haworth's specimen of *decorella*, which is certainly this species, but from an unfortunate error his description, which I subjoin, cannot be applied to this or any other species.

“*Tinea decorella*, Haw. (the neat).

“*Alis anticis capiteque niveis, costa ipsa interruptim, plagaque communi niveis.*” — (Transactions Ent. Soc. Lond. 1812, page 338.)

Sp. 57. *Costella*.

An. costella, St., Westw.

Expansion of wings, 6—7 lines.

Head, thorax and palpi ochreous, the terminal joint of the latter black at the tip and in the centre; antennæ fuscous, faintly annulated. Anterior wings deep ochreous; at about one-fourth of their length from the base commences a large black, somewhat angular blotch, beginning abruptly, extending downwards to the groove, and then continued upwards and onward to three-fourths of the length of the wing, leaving the remaining fourth ochreous. Towards the apex are mostly some black dots, and more are sometimes seen on the outer margin down to the anal angle. Posterior wings fuscous. Varies considerably in the intensity of the colouring.

Taken in hedges near London, throughout the summer.

Sp. 58. *Atriplicella*.**Lita. Atriplicella*, F. v. R. pl. 78, p. 223.*G. Atriplicella*, Z.

Expansion of wings, 7 lines.

Head and thorax griseous brown; antennæ dark brown; palpi second joint griseous, terminal joint brown, with a light ring in the middle. Anterior wings griseous brown, with four black dots faintly encircled with red, of which two are before the middle, one obliquely above the other, the other two are beyond the middle, side by side. Beyond these is a faint curved fascia, and then some scattered black specks. Abdomen grey, on the under side more yellow, with a black line on each side. Posterior wings griseous, with yellowish grey ciliæ.

This species is figured and elaborately described by Fischer (l. c.), who says the larvæ feed on *Atriplex laciniata*.

Taken in Charlton Sand Pits, in July.

Sp. 59. *Obsoletella*.*Lita. obsoletella*, F. v. R., pl. 79, p. 225 (non *Ti. obsoletella*, W. V.).*Ti. elongella*, W. V.?

Expansion of wings, 6 lines.

Head, thorax and palpi yellowish grey, the terminal joint of the latter darker; antennæ fuscous, annulated with grey. Anterior wings yellowish grey, dusted with brown, and having four black dots, of which two are just before the middle, one obliquely above the other, the other two beyond the middle, close together, and often joined, then forming a curved mark. Beyond these is a faint fascia, or sometimes only the rudiments of one on the costa and inferior margin. Ciliæ somewhat luteous, sprinkled with brown. Posterior wings silver-grey, with luteous grey ciliæ. Abdomen griseous, the basal joints bright luteous, especially when the insect is alive.

This species varies much in colour and in distinctness of marking. It much resembles, except in colour, the preceding *G. Atriplicella*, and is said by Fischer (l. c.) to feed, when in the larva state, on the same plant, and all species of *Chenopodium*. I found it common on the coast near Weymouth, and Mr. Bedell took it near London.

Sp. 60. *Walkeriella*.

G. Walkeriella, mihi.

Cleod. Cytisella, Curt., vol. 14, pl. 671 (non *T. Cytisella*, Tis., Tr.)

Astyages Picæpennis, St. Mus. (non Haw.)

Taken by Mr. Curtis, 18th July, on a hill at Glengariff, in Ireland, and by Mr. F. Walker, in the Isle of Wight.

The name *Cytisella* being previously occupied by Treitschke for another species of *Gelechia*, I have had to give the present species another name, and have called it in honour of one of its early discoverers.

V. On *Elachista æratella*, Zeller, and several Species with which it is likely to be confounded. By H. T. STAINTON, Esq.

[Read 5th November, 1849.]

THIS species is briefly described by Zeller, in his catalogue of *Tineidæ*, in the *Isis* of 1839, and is there placed next to *Festaliella*, H.: it indeed bears a close resemblance to that species in having a very perplexed synonymy; and as a paper of mine on the synonymy of *E. Festaliella* was considered of sufficient importance to be published in the Society's Transactions, I have thought that a like indulgence might be accorded to the present paper, which includes several species which have perplexed many of our Entomologists, but which I hope to be able to make sufficiently clear and distinct, to enable any Entomologist of ordinary capacities at once to separate.

The species are *Æcophora fusco-ænea*, Haw.; *Æcophora senescens*, Sta.; *Æcophora fusco-cuprea*, Haw.; *Gelechia tenebrella*, Tr.; *Gelechia tenebrosella*, F. v. R.; *Elachista æratella*, Z.; *Elachista fusco-ciliella*, Sta.; and *Elachista modestella*, D.

All these species are destitute of markings on the anterior wings, and in all, the colour of the anterior wings is more or less of a greenish or brownish copper; it would thus appear, at first sight, that it would be very difficult to distinguish them, but this is by no means the case. The form of the posterior wings at once separates the *Æcophoræ* from the *Gelechiæ*, and from the

Elachistæ, and the *Gelechiæ* from the *Elachistæ*, and even *Elachista æratella* from the other two species in the same genus.

I proceed now to describe the three species of *Æcophora*, and as they are sufficiently distinguished from the *Gelechiæ* and *Elachistæ* by the form of the posterior wings, I shall only have to point out the distinctive characters by which they can be separated from each other.

They all three resemble *Æc. grandipennis* (which I believe is now in most of our collections), in the form of the posterior wings (see Plate III. fig. 20), and in the peculiar method of sitting when alive, with the wings going to a point.

- Sp. 1. *Æcophora fusco-ænea*, Sta. Cat., p. 14, No. 29.
Porrectaria fusco-ænea, Haw. Lep. Brit. 537, No. 21.
Pancalia fusco-ænea, St., Illust. iv. 276.

Allied to *Æc. grandipennis*, but smaller and greener, and anterior wings rather narrower in proportion to its size. Larger than *Æc. senescens*, and without the white scales on the disk of the anterior wings. Larger than *Æ. fusco-cuprea*, and much greener in colour.

Haworth's description — "Alis anticis fusco-æneis, lucidis, tinctura cupri; alis posticis lineari-subulatis, atris, lucidis. Exp. alarum 7 lin."—appears to me quite distinct enough to identify the species, especially when contrasted with his description of *Porrect. fusco-cuprea*, which is represented as being smaller and less bronzy (less green).

This appears a scarce species; it was formerly taken by Mr. Chant, but I have seen no recent specimens, except two that Mr. Allis met with near Grassington in Wharfedale, in June. The specimens mentioned by Mr. Stephens as being taken in Darenth Wood, in June, are not referable to this species; they are *Gelechia tenebrella*.

- Sp. 2. *Æcophora senescens*, Stainton.
seliniella, Sta. Cata. p. 13, No. 30 (non Z.)

Slightly larger than *fusco-cuprea*, and at once distinguished from it by its greener anterior wings being clothed with numerous white scales; these white scales equally distinguish it from *fusco-ænea*, from which it differs also in being smaller, and the anterior wings being less glossy.

The *Æc. seliniella* of Zeller, which I had imagined this to be, is much larger, nearly as large as *Æc. fusco-ænea*, but has broader anterior wings, and much broader posterior wings. (I have two specimens sent me by Herr Zeller.) My specimen of *senescens* still remains unique.

- Sp. 3. *Æcophora fusco-cuprea*, Sta. Cat. p. 14, No. 31.
Porrectaria fusco-cuprea, Haw. Lep. Brit. p. 537, No. 22.
Pancalia fusco-cuprea, St. Illust. iv. p. 276.
Æcophora parvella, Mann. in litt.

Differs from *fusco-ænea* in being smaller and much browner, and the anterior wings rather broader in proportion to its size; differs from *senescens* (which it resembles in size) in not having any white scales on the disk of the anterior wings.

Haworth's description—"Alis anticis fusco-cupreis, immaculatis. Præcedenti (*fusco-ænea*) nimis affinis at minor, alis latioribus ratione magnitudinis; posticis fuscis nitidis. Exp. alarum $5\frac{1}{2}$ lin."—very well identifies this species. The female of this species has a large oval white spot on the under side of the abdomen.

Not scarce with Mr. Sircom on Durdham Downs. I have taken it on the downs at Mickleham, in July. The two specimens mentioned by Mr. Stephens, as having been taken by him at Ripley, in June, 1827, are not this species; they are *Gelechia tenebrosella*.

We now come to the two species of *Gelechia*, *tenebrella* and *tenebrosella*. These are at once distinguished from the *Æcophoræ* and *Elachistæ* by their trapezoidal posterior wings (see Pl. III. fig. 21), and by their longer recurved palpi.

- Sp. 4. *Gelechia tenebrella*, Zeller, Isis, 1839, S. 201.
 Douglas, Tran. Ent. Soc., N.S., vol. i.
 p. 16.
Æcophora tenebrella, Treitschke, x. 3, 216.
Tinea tenebrella, Hübner, 434?
Glyphipteryx subcuprella, Stephens, Illust. iv. p. 273.
Gelechia metallella, Sta. Catal. p. 18, No 42 (non St.)
 Var. *Gelechia unicolorella*, Zeller, in litt.

At once distinguished from *G. tenebrosella* by the unicolorous antennæ. The typical insect has the anterior wings coppery-

brown, that is, with a purple tint; in the variety *unicolorella* this purple tint is entirely wanting, the wings being then of an unicolorous greenish hue.

The *Gly. subcuprella* of Mr. Stephens's cabinet is truly this species, but the description would apply equally well to *fusco-cuprea*.

- Sp. 5. *Gelechia tenebrosella* (F. v. R.), Zeller, Isis, 1839, S. 201.
Sta. Cat. p. 18, No. 43.
Douglas, Trans. Ent. Soc., N. S.,
vol. i. p. 16.

Readily distinguished from *G. tenebrella* by the white tips to the antennæ; I am not aware that this species ever occurs destitute of the purple tint on the anterior wings.

We now arrive at the three *Elachistæ*, and, as I have already mentioned, *æratella* differs considerably in the form of the posterior wings from *modestella* and *fusco-ciliella*. (See Pl. III. fig. 22, posterior wing of *æratella*, and fig. 19, posterior wing of *modestella*.)

- Sp. 6. *Elachista æratella*, Zeller, Isis, 1839, S. 212 (non Sta.)
Glyphipteryx metallella, Stephens, Illust. iv. 273 (non Sta.)

This is also distinguished from *modestella* and *fusco-ciliella* by its shorter and thicker antennæ, and by the much deeper colour of the anterior wings, which considerably resemble those of dark specimens of *G. tenebrella*, but are more brilliant. I annex a translation of Zeller's description—"as large as, and of the habit of, *Gelechia tenebrella*; anterior wings dark greenish, bronze-coloured; the palpi short, thin, and pointed; the antennæ much shorter than the anterior wings."

On the 11th of last month, Mr. Wilkinson brought to me to be named a specimen of this species; I soon found it was a stranger to me, though evidently coming near the *æratella* of my catalogue; and, on referring to Zeller's descriptions in the Isis, I at once perceived that I had erred in referring Mr. Sircom's species to the *æratella* of Zeller, for that this was most decidedly Zeller's insect. Mr. Wilkinson having several specimens of the insect, taken near Brighton in June, kindly begged my acceptance of that which he had brought to be named. Last Wednesday, at Mr. Douglas's urgent request, I went to Mr. Stephens, to examine his *Glyph*.

metallella, and, to my extreme astonishment, found there two specimens of this insect, which are doubtless those mentioned and described in the Illustrations as *metallella*; and had this description any character by which to identify the species, this name being older than *æratella* should have been retained, but unfortunately neither the peculiar form of the posterior wings, nor the peculiarly short and thick antennæ, are mentioned, so that I have been compelled to adopt Zeller's name in preference. This species has been taken by Mr. S. Stevens in Devonshire.

Sp. 7. *Elachista fuscociliella*, Stainton.

æratella, Sta. Catal. p. 25, No. 18 (non Z.)

Smaller and darker than *modestella*, and easily distinguished by the fuscous cilia of the posterior wings; antennæ dark, unicolorous.

Mr. Sircom has not again met with this species.

Sp. 8. *Elachista modestella*, Sta. Cat. p. 25, No. 17.

Butalis modestella, Dup. xi. p. 347, pl. 299, f. 8.

Astyages serratella, Stephens, Illust. iv. 280.

Larger and paler than the preceding, and at once recognized by the ochreous cilia of the posterior wings; the antennæ are not annulated with *white*, but appear through a lens alternately *pale* and dark.

The name *serratella*, St., cannot be retained for this, as there is already a closely allied species of that name, *serratella*, Tr.

This species frequents oaks in May; I found it not very scarce at Lewisham, last spring.

TABLE OF THE FOREGOING SPECIES.

I. Posterior wings broadish, with distinct anal angle.

- | | | |
|----|-----------------------------|--|
| 1. | <i>Æcophora fusco-ænea.</i> | Exp. $6\frac{1}{2}$ lines; anterior wings bronzy green. |
| 2. | <i>senescens.</i> | Exp. $5\frac{1}{2}$ lines; anterior wings greenish, with white scales. |
| 3. | <i>fuscocuprea.</i> | Exp. $5\frac{1}{4}$ lines; anterior wings coppery brown. |

II. Posterior wings trapezoidal.

- | | | |
|----|-----------------------------|---------------------------------|
| 1. | <i>Gelechia tenebrella.</i> | Antennæ unicolorous. |
| 2. | <i>tenebrosella.</i> | Antennæ brown, with white tips. |

III. Posterior wings lanceolate, with prolonged point.

1. *Elachista æratella*.

IV. Posterior wings lanceolate (point not prolonged).

1. *Elachista fusco-ciliella*. Cilia of posterior wings fuscous.
2. *modestella*. Cilia of posterior wings ochreous.

 VI. *A Monograph of the British Species of the Genus Micropteryx of Zeller.* By H. T. STAINTON, Esq.

[Read February 4th, 1850.]

THIS interesting and very distinct group of insects is sadly in want of investigation; the metamorphoses of none of the species are known, and several of our species were in such confusion, that in my catalogue I lumped together, as one species, three which are truly quite distinct.

The number of species will probably be much augmented by more active investigations; several of the known species appear very early in the season,—for instance, *purpurella* in February, and *unimaculella* and *semipurpurella* in March; and it is exceedingly probable that other equally early species lurk undetected. Several other species occur on the continent.

From the affinities of this group to the *Adelæ* (long horns), of which the larvæ are known to be case-bearers, feeding on various plants, there is little doubt but that the larvæ of these insects feed in a similar way; and if those collectors who take *calthella* in plenty, would devote a little of their time to the furtherance of science, by searching for the larvæ and pupæ of that insect, though they might not enrich their collections by so doing, they would have a better claim to the title of Entomologists.

The genus is thus characterized by Zeller, in the *Isis*, 1839: "With thickly woolly head, in the hairs of which the long convergent downy-haired palpi are concealed, the antennæ hardly longer than the body, the wings moderately long-fringed, the posterior oval-lanceolate."

The structure of the palpi is very peculiar; they are six-jointed, and are folded over themselves, so that the extremity lies

just over the base. Curtis says, "palpi longer than the head, porrected;" but this is not the case in any of the specimens I have observed. But Mr. Curtis assures me that he believes the palpi are porrected when the insect is alive; this *may be* so, though I must confess I should very much doubt it. The hairs of the head, which in some cases furnish good specific distinctions, are easily rubbed off, and the head then assumes a black appearance, whatever may have been the colour of the hairs; this is apt to occasion mistakes: the shortness of the antennæ is very striking in most of the species, indeed in some they have quite the appearance of having been broken; and in the subdiaphanous posterior wings we have another peculiarity of the genus.

According to the neuration of the wings, the genus divides into two sections; in the first section the apical nervure is simple from the cell, in both wings, and in the second section this nervure has a fork towards the costa, between the cell and the apex, in both wings.

Section A. ERIOCEPHALA, Curtis.

Section B. MICROPTERYX, Hübner.

The following is my arrangement of the British species:

A.

α Head ferruginous.

- | | | |
|-----|-----------------------------|--|
| 1. | <i>Calthella</i> . | Anterior wings golden, with the base entirely purple. |
| 2. | { <i>Aruncella</i> ♀.
♂. | Anterior wings golden, with the base purple on the costa. |
| | | Anterior wings golden, with two silvery fasciæ, and a silvery spot. |
| 3. | <i>Allionella</i> . | Anterior wings purple, with two golden fasciæ, and a golden spot towards the apex, reaching neither margin. |
| 4.* | <i>Subammanella</i> . | Anterior wings purple brown, with two yellowish fasciæ and a yellowish spot. |
| 5. | <i>Rubrifasciella</i> . | Anterior wings greenish golden, with a reddish spot on the costa at the base, a reddish fascia before the middle, and another bifurcate beyond the middle. |

* I cannot speak confidently of the colour of the head of this species, my unique specimen having met with a misfortune and lost its head; I believe it *was* ferruginous.

β Head blue-black.

6. *Mansuetella*. Anterior wings greenish golden, with three very indistinct reddish fasciæ.

B.

α Head grey.

7. *Subpurpurella*. Anterior wings greenish golden, with a faint paler spot towards the anal angle.
8. *Semipurpurella*. Anterior wings purple, irrorated with pale golden; antennæ more than half the length of the anterior wings.
9. *Sparmannella*. Anterior wings golden, with numerous transverse purple fasciæ.

β Head dark fuscous.

Antennæ less than half the length of the anterior wings.

10. *Purpurella*. Anterior wings golden, with numerous irregular purple fasciæ, and the veins purple.
11. *Unimaculella*. Anterior wings golden purple, with a conspicuous whitish spot at the anal angle.

Sp. 1. *Calthella*, Linnæus. (Plate III. fig. 1—4.)

Capillis ferrugineis; alis anticis aureo-brunneis basi purpureo, a costa usque ad marginem interiorem; alisque (post mortem) sulcatis.

Calthella, Linn. S. N. 895, 422; F. S. 367, 1432; Wien. Ver. 144, 36; Fabricius, Ent. Syst. 3, 2, 340; Haworth, Lep. Brit. (α ♀ & γ ♂), 573, 43; Treitschke, ix. 2, 117; Stephens, Ill. iv. 361, 18; Duponchel, xi. 401, pl. 302, fig. 6; Curtis, Brit. Ent. vol. xvi. folio 751; Zeller, Isis, 1839, p. 185; Zetterstedt, Ins. Lapp. 1008, 12; Eversmann, Fauna Lep. V. U. 587, 2; Stainton, Cat. Tin., p. 8.

Pusilella, Hübner, 341?

Sulcatella, Bentley, Zoologist, 1086.

Exp. alar. ♂ $3\frac{1}{2}$ lin., ♀ $4\frac{1}{2}$ lin.

Head of the male luteous, of the female ferruginous. Antennæ dark fuscous, about half the length of the anterior wings. Thorax golden brown. Abdomen, legs and tarsi dark fuscous. Anterior wings golden brown, with the base purple from the costa to the inner margin; when the insect is dead the wings have a sulcated appearance. (Zeller states that when alive they are even and

smooth; but never having seen the species alive, I cannot verify this statement.) Posterior wings pale grey, the apical half tinted with purple. The larvæ, which I have no doubt are case-bearers, most probably feed on the Ranunculaceæ.

This species was taken last summer in considerable plenty near Warrington, by Mr. Nicholas Cooke, and also near Huddersfield, by Messrs. Inchbald and Dunning, from whom I received several pairs taken in copulâ, which enabled me to ascertain the specific distinction between this and *aruncella* ♀.

This distinction consists in the purple at the base of the wing, extending to the inner margin in *calthella*, whereas in *aruncella* it never reaches the inner margin. *Calthella* has also (when dead) a more sulcated appearance.

Mr. Bentley first directed the attention of the Entomologists of this country to the existence in this genus of two very closely allied species, which were distinguished by one having the anterior wings sulcated, and the other having them smooth, but unfortunately he named the present species afresh as *sulcatella*, and applied the name *calthella* to the ♀ *aruncella*. It is true he alludes to the sexes of his *calthella*, but in this there must have been some mistake, and in his description of *sulcatella* he says, head of the male *black*; this is only the case when the luteous hairs have been rubbed off, which, as Treitschke mentions, is very frequently the case.

Haworth's *calthella* is, I have no doubt, our species, from the particular mention of the "basi læte purpureæ;" his var. β "absque purpureo" may be *aruncella* ♀, the *calthella* of Bentley. The Linnæan insect frequenting the *Caltha* is, I have no doubt, also the present species, as *aruncella* shows no particular predilection for the Ranunculaceæ, whereas our species most decidedly is extremely partial to them, though found also on other flowers in their vicinity.

In Duponchel's figures of this genus there is a continuous error of the antennæ being represented much too long; this is important, as the extreme shortness of the antennæ is a peculiarity of the group; and in some species the relative lengths of the antennæ furnish distinctive characters.

Sp. 2. **Aruncella*, Scopoli. (Plate III. fig. 5, 6.)

Capillis ferrugineis; ♂ alis anticis aureo-brunneis, basi ad costam purpureo, maculâ argenteâ transversale ante, fasciâque rectâ argenteâ pone medium, et post hanc maculâ parvâ argenteâ

* See Remarks at page 40.

prope costam; ♀ *alis ant. aureo-brunneis, basi ad costam solùm purpureo, immaculatis.*

Aruncella, Scop. Faun. Carn. p. 254, No. 660; Zeller, Is. 1839, 185; Sta. Cat. Tin., p. 9.

♂ *Scppella*, Fab, 3, 2, 320; Haw. L. B. 573, 44; Steph. Ill. iv. 362, 20.

♂ *Podevinella*, Hbn. 342; Treit. ix. 2, 119; Dup. xi. 399, pl. 302, fig. 5.

♂ *Concinnella*, Steph. Ill. iv. 361, 19?

♀ *Calthella*, Bentley, Zoologist, 1086.

Exp. alar. ♂ 3 lin. ♀ 4 lin.

Head and face ferruginous. Antennæ dark fuscous, in the ♂ nearly as long as the anterior wings, in the ♀ about half the length of the anterior wings. Thorax golden brown. Abdomen, legs and tarsi dark fuscous. Anterior wings of the ♂ golden brown or greenish golden, with the costa at the base purple; a little before the middle of the wing is a transverse silvery spot which reaches neither margin, and about the middle of the wing is a silvery fascia placed rather obliquely, it being nearer the base on the costa than on the inner margin; beyond this is a small silvery spot near the costa. Cilia golden brown. Anterior wings of the ♀ (entirely destitute of the silvery markings) golden-brown, with the costa at the base purple. Posterior wings pale grey, with the apical half tinted with purple.

A common species; I have several times found it in plenty,—in a wood near Ambleside and in a lane near Coniston in June, 1846, and on a grassy bank near Carron in June, 1847, when I took several pairs in copulâ; last year I again took it in the same place. The sexes are so different that they have long been considered as distinct species, although Scopoli appears to have been aware of the several discrepancies.

The ♀ much resembles *calthella*, but independent of the wings not being sulcate; the base of the anterior wings is never purple to the inner margin, but only a little way from the costa.

The ♂ somewhat resembles *subammanella* and *Tinea bistrigella*, but is distinguished from the former by its more golden anterior wings, silvery spots and fascia, whereas in *subammanella* there are two entire yellowish fasciæ on the purple anterior wings. From *T. bistrigella* it is distinguished by its ferruginous head (Stephens, it is true, says "head black"—this, probably, arises from his description being made from a worn specimen,) and also by the differently coloured anterior and posterior wings; the latter in the *Micropteryx* being subdiaphanous, and purplish at the apex; in the *Tinea* they

are opaque, unicolorous, ash-coloured; besides, in *bistrigella* the first fascia is entire, and the second arched, and frequently interrupted, and also placed more posteriorly than in *aruncella* ♂.

Sp. 3. *Allionella*, Fabricius. (Pl. III. fig. 7.)

Capillis ferrugineis; alis anticis purpureis, fasciis duabus transversis aureis, prima recta ante, altera obliqua pone medium, maculaque irregulari aurea juxta costam, apicem versus.

Allionella, Fab. 3, 2, 321; Zell. Isis, 1839, 185; Sta. Cat. Tin. 9.

Ammanella, Hbn. 388; Treit. ix. 2, 125? Steph. Illust. iv. 362, pl. xli. fig. 2; Zett. Ins. Lapp. 1008, 10 (non Dup.)

Exp. alar. 5 lin.

Head and face ferruginous. Antennæ black, more than half the length of the anterior wings. Thorax fuscous. Abdomen, legs and tarsi dark fuscous. Anterior wings purple or brownish purple, with a golden fascia nearly straight before the middle, and another placed rather obliquely beyond the middle; midway between this and the apex of the wing is a large irregular gold spot nearer the costa than the inner margin. Posterior wings pale cinereous, with a purple gloss towards the apex.

Hitherto a scarce species with us; I have met with it in Torwood, Stirlingshire, in June, but very sparingly, and last summer I beat a single specimen from a mountain-ash, near Airthrey, Stirlingshire. Mr. Douglas took a specimen last May in West-Wickham Wood, and Mr. Dunning met with it among oaks near Huddersfield. Treitschke says of his *ammanella*, "only the size of *calthella*;" he was probably comparing it with the ♀ *calthella*, which is much larger than the ♂; he begins his description of *Ander-schella* (which we know to be the same size as *Allionella*) by saying "size and form of *ammanella*." In Mann's Catalogue, *ammanella*, Tr., is placed as distinct from *ammanella*, Hbn., which led me to imagine that it might be my *subammanella*, as indeed, if it were the size of *calthella* ♂, it probably would be.

4. *Subammanella*, Stainton. (Pl. III. fig. 8.)

Alis anticis brunneo-purpureis, fasciis duabus luteis rectis, una ante, altera paulo pone medium, maculaque parva lutea post fasciam secundam; ciliis fuscis, apice albidis.

Subammanella, Sta. Cat. Tin. 9.

Exp. alar. 3 lin.

Anterior wings purple brown, with two straight yellowish fasciæ, one near the base, the other a little beyond the middle, and a small

round yellowish spot immediately beyond the second fascia; cilia fuscous, but at the extreme apex whitish.

The above imperfect description is all I am able to give, having had an accident with my unique specimen, of which I have now only the two anterior wings remaining.

This specimen I took in Torwood, Stirlingshire, July 18th, 1848, among mixed underwood.

From the preceding it is at once distinguished by its size, the straighter fasciæ, and smaller spot; from *Tinea bistrigella*, which it more closely resembles, the purple-brown anterior wings and yellowish (not whitish) fasciæ immediately distinguish it.

Zetterstedt has an *Adela abalienella* (Ins. Lapp. 1008, 9), which is very probably this species; he says, "alæ nitidæ, anticæ ferrugineo-fuscæ, fasciis duabus integris rectis transversis albis, una ante medium et altera in medio—fimbria fusca, summo apice albo." The position and form of the fasciæ are here well given, but the colour is white instead of yellowish (thus more appropriate to *bistrigella*); the mention of the apical spot in the cilia also appears to point out the present species, but the spot on the disk is omitted.

Sp. 5. *Rubrifasciella*, Haworth. (Pl. III. fig. 9.)

Capillis ferrugineis; alis anticis nitidis, viridi-aureis, macula basale rufescente ad costam, fascia obliqua rufescente ante, alteraque duabus furcis, pone medium.

Rubrifasciella, Haw. Lep. Brit. 572, 41; Sta. Cat. Tin. p. 9.

Hellwigella, Steph. Illust. iv. 360, 16 (non Hbn.)

Anderschella, Dup. xi. 403, pl. 302, fig. 7, (non Hbn.)

Exp. alar. 4 lin.

Head and face ferruginous. Antennæ black, about half the length of the anterior wings. Thorax purplish. Abdomen, legs and tarsi dark fuscous. Anterior wings very glossy, greenish golden, with a reddish spot on the costa at the base, an oblique reddish fascia a little before the middle (which is nearest the base on the costa and does not reach the inner margin); and beyond the middle another reddish fascia, with two branches, one terminating on the costa, the other in a reddish spot towards the apex. Posterior wings pale grey, with a purple tint towards the apex.

Not generally a common species; it occurs in May, and appears rather partial to chalky districts. I have met with it on the Dartford Heath fence, and Mr. Sircom takes it at Brislington.

Haworth has well described this species, but errs in giving *Hellwigella*, Hbn. as a synonym.

Duponchel's figure and description are very good, but there is some mystery attending his insect, as he says he received it from Herr Fischer von Röslerstamm, under the name of *Anderschella*, which is inconceivable, as *rubrifasciella* was not known in Germany in 1839, though Herr Mann now sends us the insect, but with a manuscript name; moreover, the true *Anderschella* (a very beautiful species) is figured and described by Duponchel as *ammanella* (vol. xi. 404, pl. 302, f. 8), and he says it was sent to him by Herr Fischer von Röslerstamm under that name.

Haworth's *Tinea sanguinella*, of which he says "præcedentis (*rubrifasciellæ*) forte varietas," does not belong to this genus; it is the *Tortrix rutilana* of Hübner. Haworth's specimen is in Mr. Stephen's collection.

Sp. 6. *Mansuetella*, Zeller.

Capillis atris; alis anticis aurco-viridis, macula basale ad costam, fascia ante medium, apiceque, rufescentibus, obsoletis.

Mansuetella, Zell. Fünfter Bericht des Schlesischen Tauschvereins, 1844, p. 16.

Exp. alar. 4 lin.

Head and face deep black, almost blue black. Antennæ black, about half as long as the anterior wings. Thorax, abdomen, legs and tarsi fuscous. Anterior wings greenish golden, with some very indistinct reddish markings, namely, a costal spot at the base, and a fascia before the middle, and the apical half of the wing is entirely reddish; cilia cinereous. Posterior wings pale grey, with the apex purplish; cilia cinereous.

Mr. Douglas has two specimens which he took some years back, along with *Calthella*. From Zeller's account the species occurs near Glogau, at the same time as *Calthella*, on *Sorbus aucuparia* and *Spiræa ulmaria*.

It is readily distinguished from every other known British species of the genus by its deep black head; but independently of this character, it may be recognised by being of the size of *Calthella*, with the markings on the anterior wings somewhat resembling *rubrifasciella*, only more indistinct.

Sp. 7. *Subpurpurella*, Haworth. (Pl. III. fig. 10—13, 18.)

Capillis cinereis; alis anticis aurco-viridis, macula pallidiore fere obsoleta ad angulum anale, posticis cinereis apicibus purpurascensibus.

Subpurpurella, Haw. Lep. Brit. 571, 37; Steph. Illust. iv. 359, 11; Sta. Cat. Tin. p. 9.

Exp. alar. 6 lin.

Head and face cinereous. Antennæ fuscous, about half the length of the anterior wings. Thorax, abdomen, legs and tarsi fuscous. Anterior wings bright golden green, with a faint appearance of a paler spot at the anal angle, and a still fainter appearance of another midway between this and the apex of the wing; cilia fuscous. Posterior wings pale grey, with the apex purplish; cilia cinereous.

The commonest species of the genus frequenting oaks in May. Its greenish anterior wings distinguish it readily from all its congeners, except *Calthella* and *Aruncella* ♀; from these, however, it is at once distinguished by its size and cinereous head.

Haworth gives three varieties, but they appear to have been merely specimens in different degrees of preservation.

Sp. 8. *Semipurpurella*, Stephens. (Pl. III. fig. 17.)

Capillis cinereis; alis anticis purpureis aureo-irroratis, maculaque pallida subindistincta ad angulum anale; antennis longioribus quam dimidium alis anticis.

Semipurpurella, Steph. Ill. iv. 359, 12.

Solierella, Dup. xi. 407, pl. 302, f. 11?

Exp. alar. 5—7 lin.

Head and face fuscous, clothed with cinereous hairs, which apparently are easily rubbed off. Antennæ dark fuscous, *more than half the length of the anterior wings*. Thorax, abdomen, legs and tarsi fuscous. Anterior wings purple, with numerous golden irrorations, and generally with a pale golden or whitish spot at the anal angle, not however as distinct as in *unimaculella*. Posterior wings pale grey, almost transparent, with the apex purplish; cilia grey.

Not a scarce species among birches in March and April; occurring plentifully at West Wickham Wood and other places. The difficulties in the genus begin with this species, which in my Catalogue I have lumped together with *purpurella* and *unimaculella* as one species; these are, however, truly distinct, and with fine specimens they are easily separated, though in the ordinary run of specimens found in collections it is no easy matter to say to which they should be referred. One main reason for our specimens being so poor is, that we do not collect them soon enough, they should be sought for in March; by

delaying to collect them till April, the specimens become wasted. I have no doubt many might be met with in February in forward seasons. Haworth distinctly states that Mr. Hatchett took two specimens of *purpurella* in copula in February.

Semipurpurella differs from *purpurella* in being generally larger, in having the hairs of the head cinereous instead of dark fuscous, and in the purple of the anterior wings not being disposed in fasciæ or streaks; but it is principally distinguished by having much longer antennæ. It differs from *unimaculella* also by the greater length of the antennæ and by the less distinct spot at the anal angle, and the anterior wings being more irrorated with golden.

Sp. 9. *Sparmannella*, Fabricius. (Pl. III. fig. 14.)

Capillis cinereis; alis anticis aurcis, numerosis fasciis purpureis irregulariter transversis, ciliis cinereo-luteis fuscisque variis; ciliis alarum posteriorum lutescentibus.

Sparmannella, Fabr. 3, 2, 324; Hbn. 408; Dup. xi. 405, pl. 302, f. 9; Zell. Isis, 1839, p. 185; Sta. Cat. Tin. p. 9.

Auropurpurella, Haw. Lep. Brit. 572, 39; Steph. Illust. iv. 360, 14.

Exp. alar. 4 lin.

Head and face cinereous. Antennæ dark fuscous, not half as long as the anterior wings. Thorax and abdomen dark fuscous. Legs and tarsi pale fuscous, the ends of the joints dark. Anterior wings gold coloured, with numerous irregular transverse purple fasciæ, the thickest of which is a little beyond the middle, and is furcate on the inner margin; the gold coloured space between its forks, being the largest unicolorous portion of the wing, appears rather conspicuous; cilia varied yellowish grey and fuscous. Posterior wings pale grey, the apical half purple; cilia pale yellowish.

A scarce species with us, occurring among birches in May. Mr. Douglas took a specimen at West Wickham Wood last May.

Zeller says, "from the middle of April to the middle of May, on the twigs of oaks, alders, especially birches."

Sparmannella is not likely to be confounded with any species except *purpurella*; from this it differs in the hairs of the head being cinereous instead of dark fuscous, in the veins of the anterior wings not being purple, and in the reticulations being more delicate; in the broader anterior wings having varied cilia, and in the cilia of the posterior wings being yellowish and not cinereous.

Sp. 10. *Purpurella*, Haworth. (Pl. III. fig. 15.)

Capillis fuscis; alis anticis aureis, numerosis fasciis irregularibus, venisque purpureis, ciliis cinereo-luteis; ciliis alarum posticarum cinereis.

Purpurella, Haw., Lep. Brit. 571, 38; Steph. Ill. iv. 360, 13;
Donzelella, Dup., xi. 408, pl. 302, 12?

Exp. alar. 5 lin.

Head and face dark fuscous. Antennæ fuscous, not half the length of the anterior wings. Thorax and abdomen dark fuscous. Legs and tarsi fuscous. Anterior wings golden with a slight greenish tinge, with numerous irregular purple fasciæ, and the veins purple; thus much concealing the ground colour, as in *Sparmannella* the largest portion of the wing left of the ground colour is at the anal angle; cilia yellowish grey. Posterior wings narrower than in *unimaculella*, pale grey, with a slightly purple tint towards the apex; cilia pale grey.

Not scarce. Mr. Henry Doubleday writes me word, that in Epping Forest it often swarms on birches at the end of March, along with *semipurpurella*; and it is owing to his calling my attention to this species and its allies, that I discovered the great blunder I had committed in my Catalogue with regard to them. (I shall always feel much obliged to any entomologist who will call my attention to any point in which he may think I have erred, as it is only by such criticism of one another that truth can be elicited and progress made.)

Purpurella differs from *semipurpurella* in being smaller, with much shorter antennæ, in the hairs of the head being dark fuscous, and in the anterior wings being streaked and veined with purple; it differs from *unimaculella*, which it resembles in size, also by the streaking and veining of the anterior wings, by the anal spot being less conspicuous, and by the posterior wings being narrower and more pointed. The differences between *purpurella* and *Sparmannella* have been already mentioned under the latter species. Haworth's *Tinea rubroaurella* (Lep. Brit. 572, 40) is apparently an injured specimen of this species; he says, "alæ anticæ rubro sive purpureo-aureæ; lente puncto postico aureo, in quo punctulum minutum fuscum. In medio marginis tenuioris punctum alium aureum;" which certainly rather appears as if he had had a specimen of *Adela fibulella* before him, yet the insect in Mr. Stephens' collection, labelled by Haworth rubro-aurella, is truly a *Micropteryx*, and apparently identical with *purpurella*.

Zetterstedt has an *Adela cicatricella* (Ins. Lapp. 1008, 13), which may perhaps be this species. He says, "alis anticis aureo-violaceoque irroratis, posticis purpurascenti griseis ♀." "*Ad. Calthella* nonnihil major. Alæ anticæ læves, nec striatim impressæ aureo-pallido-cupreoque undique, crebre irroratæ, fimbria grisea; posticæ purpureo-micantes. *Tin. Sparmannella*, Thunb. et Fab., huic similis, sed illa est fere duplo major et alis anticis aureis punctis striguliformibus transversis undique adspersis, a nostra certe distincta." This would all appear to point out our *purpurella*, except the size; but he distinctly says hardly larger than *Calthella*, and little more than half the size of *Sparmannella*,—now our insect is as large as *Sparmannella* and nearly twice the size of *Calthella*.

Zeller's *fastuosella* (Isis, 1839, p. 185) must also come very near *purpurella*; he says, "very like *Sparmannella*, but certainly distinct; larger, the wings narrower, with fine violet and steel-blue scales, the posterior wings paler; flies after the beginning of May, near Glogau, on old blooming sloe-bushes."

Sp. 11. *Unimaculella*, Zetterstedt. (Pl. III. fig. 16.)

Capillis fuscis; alis anticis aureo-purpureis, macula albida ad angulum anale.

Unimaculella, Zett., Ins. Lapp. 1008, 11; "alæ anticæ purpureo-aureæ, macula ad angulum ani alba."

Exp. alar. 5 lin.

Head and face dark fuscous, almost black. Antennæ dark fuscous, about half the length of the anterior wings. Thorax, abdomen, legs and tarsi dark fuscous. Anterior wings greenish-golden with a purple gloss, with a conspicuous whitish spot (slightly curved outwardly) on the inner margin at the anal angle; cilia grey. Posterior wings broader than in the preceding, pale grey, with the apex purple; cilia grey.

Scarce with us at present; most of the specimens I have seen have occurred in the north of England. Mr. Douglas took a specimen at West Wickham Wood last April; it probably also appears in March.

Unimaculella is distinguished from *semipurpurella* by its smaller size, shorter antennæ, darker head, and paler spot at the anal angle of the anterior wings. In size it resembles *purpurella*, but here again it is at once recognised by its paler spot at the anal angle, and by the want of the purple fasciæ and veins, and by the broader posterior wings.

Duponchel has an *Adela unipunctella* (xi. 370, pl. 302, fig. 10);

but in that, the spot is in the centre of the wing, not on the inner margin, and I strongly suspect his insect was a true *Adela*, but unfortunately the antennæ were broken off from the only specimen he had seen, so that we have no certain knowledge on that point. Duponchel's figures of this and *Donzelella* look rather singular from the paint used for the white spots having turned black.

I here conclude this imperfect essay, which will, I hope, lead to the investigation of the habits and transformations of our known species, and also to the discovery of new ones. I have not included the continental species in this memoir, although we have several new to us from Herr Mann, as only one of those, *Anderschella*, Hbn. Tr., is described; the others will probably be described in Zeller's paper on the *Microptera* taken in Tuscany by Herr Mann, which paper was commenced in the July number of the *Zeitung* of the Entomological Society of Stettin.

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Supplemental Note to the above Paper.

[Read July 1st, 1850.]

IN my Monograph of the genus *Micropteryx*, I have incorrectly described as *Aruncella*, Scopoli (see page 29), a distinct, but closely allied species; the name to be retained for the insect there described is *Seppella*, Fabricius, and its correct synonymy, should stand thus:

♂ *Seppella*, Fab. 3, 2, 320; Haw. L. B. 573, 44; Steph. Illust. iv. 362, 20.

♂ *Podevinella*, Hbn. 342; Treit. ix. 2, 119; Dup. xi. 399, pl. 302, fig. 5.

♀ *Calthella*, Bentley, Zool. 1086.

Aruncella, Sta. Cat. Tin. p. 9 (non Scop. non Zell.)

♂ *Eximiella* (Kollar), Zeller, Ent. Ztg. Feb. 1850, p. 62.

Whereas the synonymy of *Aruncella* will run thus:

Aruncella, Scop. F. C. p. 254, No. 660; Zeller, Isis, 1839, 185.

♂ *Concinnella*, Steph. Illustr. iv. 361, 19.

I now proceed to describe this latter insect.

Capillis ferrugineis, ♂ alis anticis aureo-brunneis, basi ad costam purpureo, fascia recta tenui argentea ante medium, maculaque indistincta argentea prope basin; ♀ alis anticis aureo-brunneis, basi ad costam solum purpureo, immaculatis.

Exp. alar. ♂ $3\frac{1}{2}$, ♀ 4 lin.

Head and face ferruginous. Antennæ dark fuscous, in the ♂ nearly as long as the anterior wings. Thorax golden brown, abdomen, legs and tarsi dark fuscous.

Anterior wings of the ♂ golden brown, with the costa at the base purple. Not far from the base is a rather faint silvery spot;

and rather before the middle of the wing is a slender, almost perpendicular, silver fascia. Cilia golden brown.

Anterior wings of the ♀ (entirely destitute of the silvery markings) golden brown, with the costa at the base purple.

Posterior wings pale grey, with the apical half tinted with purple.

Hitherto scarce in this country. Mr. Stephens has specimens from Darenth Wood, and Mr. Thomson once met with it on the grassy bank between Sydenham and Penge.

The best character by which to distinguish the ♂ of this species from the ♂ *Seppella* is the position and form of the fascia; it is *more slender, straighter, and placed nearer the base* than in *Seppella*. The entire absence of the silver spot on the costa towards the apex would appear at first sight a more decided character; but it is often no easy matter to see this spot in set specimens of *Seppella*; and I last week took a specimen of *Seppella* entirely destitute of this spot, and which I was therefore inclined to take for *Aruncella*. The anterior wings of *Seppella* ♂ are *narrower and greener* than those of *Aruncella* ♂. I am not at present aware of any character by which to separate the females of these two species.

Till I received from Herr Zeller specimens of this species as *Aruncella*, and of *Seppella* as *Eximiella*, I had not the slightest conception that my *Aruncella* and his were not identical. *Podevinella*, Tr., which Zeller gives as a synonym of *Aruncella*, is most certainly *Seppella*.

How many similar errors may lurk undetected for want of comparison of specimens, it is impossible to say.

VII. *Descriptions of two new Species of Exotic Hymenoptera.* By FREDERICK SMITH, Esq.

[Read August 6th, 1849.]

Family VESPIDÆ, Leach.

Genus PARAGIA, Shuck.

THE genus *Paragia* was established by Mr. W. E. Shuckard, in the second volume of the Transactions of the Entomological Society, for the reception of an insect possessing several remarkable exceptions to the usual characteristics of the family to which it belongs. It was suggested in the paper referred to that these insects were probably social; but I am not inclined to adopt that opinion. Of one of the species described, I am fortunate in having an opportunity of describing both sexes, and these are not characterized by the usual disparity observable in opposite sexes of social species. I should be inclined to place this genus in close proximity to the genus *Abispa*, also a native of New Holland. The second species so closely resembles an *Odynerus*, that it was only upon a careful examination of that genus at the British Museum that I detected it. I have named it in reference to its deceptive appearance.

Sp. 1. *Paragia tricolor.* (Pl. V. fig. 1).

Fem. (length 10 lines). Black, opaque, the clypeus entire, having a few deep punctures on its apical margin; the mandibles robust, tridentate. Thorax; a bell-shaped impression on the disk of the thorax, with a central longitudinal line reaching to the prothorax, a short smooth impression on each side over the tegulæ, a narrow yellow fascia on the margin of the prothorax; the scutellum very prominent, subquadrate; the wings dark brown, paler towards their apical margins, and also the basal portion of the externo-medial cell; the claws ferruginous. Abdomen of a violet blue, finely and closely punctured, an angular yellow macula on the lateral apical margin of the basal segment. The four following segments have a narrow yellow marginal fascia; beneath the second, third and fourth segments have a broad marginal fascia.

Male (length 9 lines). Black; the clypeus and scape of the antennæ in front yellow; a narrow interrupted fascia of the same colour on the margin of the prothorax; the disk of the thorax sculptured as in the female, the wings and legs as in the opposite

sex. Abdomen of a violet blue; the first, second and third segments have laterally on their apical margins a large angular yellow macula, beneath coloured as in the female; the second segment has in the centre a large acute conical tubercle.

Perth, W. Australia.

In the British Museum.

Sp. 2. *P. Odyneroides*. (Pl. V. fig. 2.)

Male (length 5 lines). Black, head deeply punctured, the clypeus, a narrow line along the inner margins of the eyes, a coronated spot between the antennæ, and a short narrow line at the outer margins of the eyes towards their apex, yellow. Thorax coarsely punctate; a lateral angulated spot on the collar; the tegulæ and a small dot beneath the wings yellow; the wings have a fuscous cloud along their anterior margins; all the tibiæ, tarsi and extreme apex of the femora ferruginous, the anterior tibiæ stained with yellow in front. Abdomen finely punctured; the apical margins of the first, third and fourth segments have an orange yellow fascia, the intermediate one broadest; the margins of the fifth and sixth segments are narrowly piceous; beneath, the second and third segments have a yellow fascia, which on each side in front is sinuated.

From Hunter River, New Holland.

In the British Museum. Presented by the Earl of Derby.

REFERENCES TO THE PLATE.

Vol. I. New Series, Plate V, *Paragia tricolor*. Fig. 1 *a*, male; 1 *b*, mandible of do.; 1 *c*, lateral view of abdomen of do.; 1 *d*, tarsus of do.; 1 *e*, female; 1 *f*, mandible of do.; 1 *g*, tarsus of do.; 1 *h*, anterior wing of do.; 1 *i*, anterior leg of do.; 1 *k*, posterior leg of do.

Fig. 2. *Paragia Odyneroides*.

VIII. *Descriptions of two new Strepsipterous Insects from Albania, parasitical on Bees of the Genus Hylæus; with some Account of their Habits and Metamorphoses.* By S. S. SAUNDERS, Esq.

[Read 1st April, 1850.]

MUCH insight has gradually been obtained, especially during late years, into the singular economy of the *Strepsiptera*, which has formed the subject of several interesting notices in the Transactions of this Society, followed by many important facts recorded by Dr. Siebold of Erlangen,* by an elaborate paper, accompanied by microscopic details of extreme nicety, contributed by Mr. George Newport to the Transactions of the Linnæan Society (vol. xx. part 2, 1847), by critical disquisitions on their affinities by Mr. Newman, published in the *Zoologist*, &c.; and in adding to the list of this pigmy tribe, two new species, reared from the bodies of bees, of the genus *Hylæus* of Latreille (*Prosopis* of Jurine), I avail myself of the opportunity which presents itself, to offer some remarks on their eventful history and extraordinary career.

The first of these species I obtained from a large oak-gall, which, being tenanted by some Hymenopterous larvæ, I had placed in a box, where it remained forgotten until autumn, when, I observed, among several specimens of *Hylæus*, which had been produced and died in the interim, some exhibiting abdominal protuberances, caused by the presence of Strepsipterous insects, still shrouded in their pupa envelopes, having perished *in situ*, although ready to burst forth in the imago state.

The following year my endeavours to obtain more of the *Hylæi* from oak-galls proved ineffectual; but knowing that these bees also nidicated in briars, I collected a quantity of briar-snags, and on the 28th of May, having examined some of the cells, I selected from among their occupants five already-formed pupæ, the remainder being still in the larva state; of these pupæ three completed their transformations after the lapse of two days, when I had the satisfaction of perceiving that each of the bees then produced presented the usual parasitical phenomena, not previously apparent; and the next morning, on placing them in a phial accessible to the sun, two of the winged parasites—smaller than those previously obtained from the *Hylæus* of the gall—speedily

* In Weigmann's Archiv für Naturgeschichte, 1843.

came forth. The remaining pupæ, selected as aforesaid, having perhaps experienced some injury, never attained the imago state.

From the ample stock of larvæ and briars remaining, I expected to have been able to obtain a considerable number of the parasites; but in this I was mistaken, the gestation of the latter apparently rendering the *Hylæus precocius*,* for none of the bees whose metamorphoses were deferred to a late period produced any parasites; such transformations being, in some cases, exceedingly protracted and irregular. I noticed the same result on other occasions, those bees which produced parasites being always observed in the imago state before others not parasitically affected; their appearance varying, according to the season, from about the middle of May to the middle of June.

The parasitic pupæ—with the exception of one possibly overlooked at first—always appeared contemporaneously with the imago-bee (never sooner), whose contortions in wriggling itself out of the pupa-envelope may not impossibly assist the parasite in driving the prominent carinated apex of the male pupæ, or the subcuspidate cephalo-thorax of the female, through the abdominal folds. Jurine, however, on one occasion discovered no less than six larvæ entirely concealed within the abdomen of a fully-developed *Polistes*;† and Mr. Westwood, also, “in examining the interior of the abdomen (of an *Andrena imago*), from between the segments of which the heads of two *Stylops* larvæ were exerted, found a third larva similarly attached, but entirely hidden within the abdomen of the bee.”‡ It may therefore be assumed, as Dr. Siebold appears to think, that the preliminary act of protruding its head is performed by the parasite previously to entering upon the inert pupa state, its anterior region becoming indurated about that period, and subsequently (as Professor Peck, of Boston, also observed) presenting a “rounder form;” although, indeed, it may be difficult to determine with precision when the one condition terminates and the other commences; the outer tegument not being discarded at the time, but the real pupa or nymph remaining encased, and finally divesting itself of its slender pellicle within; where, as I shall have occasion to explain, it may continue for some time undisclosed in the imago form. The rapidity however with which, in these parasites on *Hylæus*, this

* A similar circumstance was noticed by Mr. Thwaites, in a species of *Andrena*; as mentioned in Westwood's *Introd. Mod. Classif. of Insects*, vol. ii. p. 300, note. [Just as the presence of the *Blastophaga* by caprification renders the figs precociously ripe.—*Trans. Ent. Soc.* vol. ii. p. 214.]

† *Mem. Acad. Turin*, tom. xxiii.

‡ *Trans. Ent. Soc.* vol. ii. p. 185, note.

ultimate transition has been accomplished in some instances,—the winged parasite having been produced as aforesaid within twenty-four hours after the first indication of its presence between the abdominal folds of the newly-developed bee,—would seem to imply that the entire change, from larva to imago, can scarcely be effected, as it were, *per saltum*, on such occasions.

Among a number of other larvæ and pupæ of *Hylæus*, set apart and carefully watched, I could discover no symptom of Strepsipterous distension during either of those stages; but at length having noticed two pupæ, extracted from a briar, on the 2nd of June, exhibiting on the right side only the dark markings which usually precede the development of the bee, I found, on their pupa-pellicles being discarded the next day, that Strepsipterous parasites, ready to burst forth, had become conspicuously prominent on the opposite side, where their hitherto concealed presence would seem to have had the effect of exhausting the ordinary secretions within. I am also inclined to believe, upon a comparison of numerous specimens of *Hylæus*, reared from the briars, that the colour of the abdomen in the perfect bee was often considerably affected by the abstraction of those substances which had afforded sustenance to Strepsipterous intruders (particularly where the winged parasites were produced), as in the pale-coloured specimens now exhibited.

So long as the *Hylæi* remained in the dark, the parasites, deprived of those external influences which, under ordinary circumstances, would serve to stimulate their dormant energies, made no attempt to abandon their pupa tenements; as an incentive to which, light appears to be absolutely essential, in order that their perceptions may be awakened to an intuitive consciousness of the bees having quitted their cells. Thus, as with those first obtained from the oak-gall, some briars occupied by the larvæ of the *Hylæi* having remained shut up in a box, and the bees having come to maturity and died unobserved, none of the parasitic skull-caps were found to have been removed,—an operation which seems attributable, therefore, to the unaided efforts of the parasite from within; so that, although fully prepared to quit their pupa-cases, unless the parasites be aroused from their lethargic stupor by the exhilarating influence of the solar rays, they terminate their existence, together with the bee, without ever regaining that liberty of action which at an earlier period they were privileged to enjoy in their incipient hexapod larva form; for, as Dr. Siebold's careful investigations into the economy of the *Strepsiptera* have served to elicit, the little acariform beings so frequently

seen to emanate from what had formerly been regarded as mere abortive Strepsipterous larvæ, under the influence of some other parasitical attack, now require to be acknowledged as the true lineal representatives of insects of this order, the perfect female retaining the vermiform condition, and remaining encased in the the body of the bee, into which, at an earlier period, the young hexapod may have found means to insinuate itself, her cephalo-thorax being the only part externally visible.

In an early part of the Transactions of this Society,* Mr. Westwood, in describing and figuring some of these hitherto supposed hexapod parasites upon the *Strepsiptera*, appended a note to his remarks, suggesting "that the individuals producing these minute parasites might be females, and the parasites their young," which Dr. Siebold's observations have served to confirm; and Mr. Newport has since illustrated, with inimitable precision, the whole series of changes which "take place in the ovum within the body of the female *Stylops* herself, contained within that of the bee.†" It may indeed be observed, that the primary question as to the *origin* of these ova, is not hereby entirely set at rest; nor is the distension progressively acquired by such ova of unexampled occurrence, as it is recorded also among the *Tenthredinidæ* and *Cynipidæ*; neither does it appear that their presence has ever been detected in any vermiform Strepsipterous insect obtained from a bee not taken at large, whereby the possibility of extraneous ovi-position (considering also the previous seclusion of the internal-feeding larva within the body of the bee) would be absolutely negatived; but the circumstantial evidence affecting the relations of these hexapods with the *Strepsiptera* is so convincing, and the conditions essential to their future maintenance and propagation—involved in the exploded theory of their hyper-parasitic character—have been so nearly reduced to an *argumentum ad absurdum* by Mr. Westwood,‡ that no reasonable doubt can be entertained upon this point.

These never-to-be-emancipated females, in their apodal apterous imago-form, destitute also of visual organization and antennæ, wherewith their more favoured partners are so munificently endowed, may be recognized by the depressed condition of the exerted cephalo-thorax, which is but slightly concavo-convex, and usually of a paler colour than the distended conical

* Vol. 2, p. 187.

† Trans. Linn. Soc. vol. xx. p. 339.

‡ Westwood's Introd. &c. vol. 2, p. 303.

cephalo-thoracic caps of the pupa cases from which winged males may be obtained. The latter exhibit also a transversely carinated apex, furnished with three small equidistant basal rugosities above, two others, somewhat larger and wider apart, being seen upon a parallel line lower down, when viewed in front; the occipital summit being traversed by a faint sutural line, where this capsule or operculum eventually separates, being thrown off as a mask on the exit of the perfect insect. The apod female, moreover, is not devoid of certain additional discriminative characters, wherein, however, the condition of the cephalo-thorax appears to be subject to considerable modification; which (whether depending upon generic, specific, or metamorphic distinctions) a comparison between the figures and descriptions of this part in the *Xenos Rossii*, as given by Dr. Siebold,—in the *Stylops aterrima*, by Mr. Newport,—and in these parasites on *Hylæus*,—may serve to exemplify.

In this latter sex also a small glossy distension towards the anterior portion of the cephalo-thoracic region, is observable on each side, and dark protuberances at the basal angles, corresponding apparently with others more prominently developed in the pupa-cases of males, and analogous to those noticed in other instances by different observers.*

With respect to these several markings and protuberances, the question naturally suggests itself, to what corresponding organs they may respectively be referred, regard being had also to the very limited portion of the cephalo-thoracic region strictly attributable to the head itself, according to the relative distribution which has been ascribed to the larva-segments. This brings me to notice a remarkable circumstance to which Dr. Siebold has directed attention,† namely, “that the feet of the pupa lie,” as he states, “always and *ab initio* beneath that surface of the pupa-case which is turned away from the ventral region of the stylotized Hymenopterous insect; . . . whence it is to be understood that the *convex* surface of the cephalo-thorax” (as represented in his figures) is the *ventral*, and the *concave*, the *dorsal* region;” and, furthermore, that he had “likewise always distinctly observed, when the males of *Xenos Rossii* were on the point of issuing, after the operculum of the pupa-case had been cast off, that they had both their face and their feet turned away from the

* See the figures of supposed larvæ with exerted heads, as represented by Mr. Curtis (Brit. Ent. pl. 226, fig. B.); by Mr. Westwood (Trans. Ent. Soc. vol. i. pl. 17, fig. 9, 10, 12); by M. Léon Dufour (Ann. Sci. Nat. tom. 7, 1837, pl. 1. fig. 15, &c.).

† Loc. cit. p. 152.

body of the Hymenopterous insect; and, consequently, that those *Xenos* males which had become transformed into pupæ on the dorsal region of the *Polistes gallica*, emerged from their pupa-casès with the ventral side uppermost."

Notwithstanding the frequent opportunities of noticing so anomalous a proceeding, which have from time to time presented themselves, no mention of such a circumstance appears among the observations hitherto recorded in connection with the ultimate ecdysis of Strepsipterous parasites; nor can I supply any corroborative testimony on the present occasion; for whenever I have seen any of these parasites produced, or have extracted them from their pupa-cases, I should say (speaking from recollection) that their position was the reverse of that described by Dr. Siebold, and as such, not calling for remark. Dr. Siebold's expositions upon this point are however so precise, and his opinions entitled to so much weight, that all controversial discussion upon the subject must resolve itself into a careful comparison of facts; the more especially as it was long since remarked by Dr. Peck, that, in the American species which bears his name, "the head of the larva was, in the feeding state, turned towards the base of the abdomen of the wasp;" this direction being subsequently reversed prior to its exit (those found by Jurine, as before stated, being in this position); so that, supposing the larva to double back upon itself for such purpose, in close contiguity along the upper abdominal region, as appearances would seem to indicate, the natural result of this proceeding would be, to subvert its original position within the body; which the male might afterwards rectify within the pupa-case.* Analogy moreover would seem to lead to the conclusion, that the oviduct being situated on the convex upper surface of the cephalo-thorax in the females, this position is more appropriately ascribed to the ventral than to the dorsal region.

With all its superior organization—exhibiting so marked a contrast with the hapless condition of its secluded partner—the delicate conformation of the male throughout this tribe, at once suggests that ephemeral existence which the concurrent testimony of all observers has served to confirm; whereas the functions devolving upon the viviparous female until her hexapod progeny have acquired their preliminary development, necessarily imply a more prolonged, and, in some cases protracted, career; suscep-

* Some pupæ perform a series of evolutions within. (Vid. *Ichn.-gyrator*, *Ann. Soc. Ent. de France*, Tome 9, p. 43.)

tible, doubtless, of some subtle appreciations of external influences, although deprived of independent action and visual discrimination. The earliest specimens producing these hexapods, taken at large with the *Hylæi*, were found towards the beginning of the fourth week in June; which, assuming the final metamorphosis of the bees to have been at least synchronous with the most precocious of those produced in the house, would indicate about three weeks as the usual term of gestation in these parasites on *Hylæus*; nearly agreeing with Mr. Newport's computation in the case of his *Stylops aterrime*, namely, about eighteen days.

It has, however, been announced by Dr. Siebold, as if generally applicable throughout this class of parasites, that the hatching of the eggs in the Strepsipterous females proceeds very slowly (*geht sehr langsam vor sich*), and that many of the latter hibernate with the insects upon which they subsist (29th result); which observations however can only be understood as applicable to the females of *Xenos*; and indeed, under the peculiar embryogenous and metamorphic conditions affecting the continuation of the species, it is manifest that these parasites could not perpetuate their existence in company with the social *Vespidæ*, unless the epoch of parturition were thus protracted until the following year, so as to enable them to transfer their hexapod progeny to the succeeding colony of wasps. In the case of *Stylops*, however, the converse necessity exists for the rapid development of the ova, the *Andronæ* enjoying but a limited term of existence at large, and it being therefore essential that, within the brief period of a few weeks, the female parasite should fulfil the part assigned her, and the young hexapods be ready to occupy their appointed stations in the larva cells of the bee, soon about to be closed. A corresponding urgency is imposed upon these parasites on *Hylæus*; although the larva state of the latter continuing throughout the winter and spring, involves the necessity of a suitable conformity of habit in the parasite, under those altered conditions wherein nature, in the plenitude of her resources, delights to exhibit her ever-varying appliances.

The pupæ of the males, as Dr. Siebold proceeds to explain, always first appearing at the beginning of summer, (*immer erst im anfang des sommers*;) but never surviving the winter; it follows that the hexapod larvæ to which he alludes, produced before the aforesaid pupæ of the males, must, by a speedy transition, assume the pupa state at the time when these latter are first observed; which well accords with the habits and equally rapid

metamorphoses of the *Polistes*,* while offering a remarkable contrast to the tardy development of the larvæ of other Strepsipterous parasites, which, like *Stylops*, *Halictophagus*, and those affecting the *Hylæi*, are associated with bees long retaining their immature condition, and enjoying comparatively but a brief existence after quitting their cells in the imago state.

But, on the other hand, it is well known that among wasps, neuters alone are produced up to a certain period, upon which the duty subsequently devolves of preparing the cells set apart for females; and the *Xenos* being essentially dependent upon the hybernation of the latter, the female parasite of the preceding year must either await the occasion when the cells of the female wasps are so prepared for the reception of ova, or otherwise, transmitting her posterity to these females through the intermedium of neuters in the first instance, the *Xenos* would thus prove to be double-brooded, a circumstance which could scarcely have escaped the observation of Dr. Siebold; although indeed the time at which the first pupæ of the males are stated to show themselves, (*preceded* by the appearance of the young hexapods as already recited, such hexapods being also necessarily present *after* the formation of the female cells,) would seem to warrant such a conclusion.†

It has also to be considered that bees, whose vital energies have become impaired, and internal economy disorganized, by the sustenance and accommodation afforded to Strepsipterous parasites, are generally believed to be sterile and impotent; as long since suggested by Kirby, and confirmed by subsequent observers, particularly by Mr. Newport, when describing the condition of the ovaries in his stylopized specimen of *Andrena Trimmerana*. It may then be asked, does this law apply with equal force and effect to the parasite-bearing *Polistes*? If such be the fact, the hibernating wasps so attacked, not being themselves capable of forming new colonies, the hexapod brood of the *Xenos*, like that of *Stylops*, must be transferred by adventitious means to the larva cells of some other constructor; nor does it seem probable that under such circumstances the unproductive hibernating *Polistes* should survive to an advanced period, the prevailing efficacy and sustaining power of instinct being already withdrawn.

It does not, however, appear to be specifically averred whether the hexapods and pupæ, which Dr. Siebold noticed so early in

* Saint Fargeau, Suites à Buffon—Hyménoptères, (Histoire des Polistides,) tome i. p. 475, *et seq.*

† Jurine informs us that his males of *Xenos* were produced from the *Polistes*, on the 27th and 28th July, and 1st of August.

summer, were in reality those of the true *Xenos* found upon *Polistes* or those of *Stylops*; some being also mentioned which, completing their final metamorphosis within the space of a few weeks, did not assume the imago state until towards the end of summer (31st result); thus coinciding with the period when Rossi was accustomed to meet with the pupæ of *Xenos*, namely, during the months of August and September.*

It is therefore to be regretted that, by collectively embodying under one category results derived from the *Stylops Melittæ*, *Xenos Rossii* and *Xenos? Sphæcidarum*, and by simply setting forth the deductions so obtained, Dr. Siebold has afforded us no opportunity of classifying the evidence for the purpose of comparison, whereby its bearing upon other points might be correctly ascertained, and a consistent series of well-assorted facts more accurately propounded.

Much still remains to be ascertained in connection with the history of these parasites; no satisfactory explanation having yet been afforded of the phases which more immediately precede, accompany, and follow, the ingress of the hexapod progeny into the bodies of the Hymenopterous larvæ; of the instincts displayed to this effect by the former, the preliminary development acquired by the latter, or the conditions (of abstinence or otherwise) imposed upon the parasites during the interim; nor indeed, after so locating themselves, does it appear unequivocally demonstrated by what process they then pass from the hexapod to the apodal form, unless indeed it should be understood that Dr. Siebold actually verified the casting of the larva skin, (alluded to under his 8th result,) followed perhaps by that atrophy of the organs of locomotion and plethoric distension of other parts, noticed by Mr. Newport in the larva of *Meloë*, although he is disposed to believe that the latter "does not enter the body of the bee-larva; that in all probability it wounds it, and preys on its fluids from without; . . . and either that, having destroyed the recently hatched bee-larva, its first tegument is cast, its mandibles are altered, and it then subsists on the food that had been stored up for the bee in the closed cell, and there gradually changes its form; . . . or that, like the larva of *Clerus*, having destroyed the bee in one cell, it penetrates into another and preys on the inhabitant until it has attained its full growth, when it remains in one of these cells and undergoes its metamorphoses;" various circumstances recited, leading him "to incline to the first of these views." †

* *Fauna Etrusca*, Mantissa, App. No. 97, p. 115.

† *Trans. Linn. Soc.* vol. xx. p. 354.

At all events, considering the facilities which offer to continental entomologists, of procuring the exposed *Polistes* nests, furnished with the eggs and larvæ of their respective founders in every progressive stage of development, as well as of introducing some of the hexapod parasites for the purpose of watching their operations, it may be assumed that additional links will not long be wanting in order to connect the chain of evidence and complete the magic circle within which the destinies of these singular beings have been mysteriously cast.

Thus Nature, chary of superfluous endowments, and constantly indulging in freaks of inexhaustible variety, adapts and concentrates her resources to the ends to be attained, withholding such organs as circumstances may have rendered unavailing, while conferring additional perfection upon others, the same design being effectually promoted in either case: so that whereas, on the one hand, among the insects now under consideration the short-lived male is appropriately invested with most inordinately expansive eyes and antennæ, wholly unnecessary to the apterous female; the vital energies of the latter are engrossed, on the other hand, by those complex and capacious ovaries which pervade the whole system, suitable for the reception of a multitude of infinitesimal germs,* each constituting the nucleus of a future being, admirably fitted to perform its allotted part, however humble, amid the works of creation: thereby maintaining those due proportions which, regulated by the most elaborate processes of a corrective and compensating tendency, serve to perpetuate the unerring perfection of all: nor among the least curious subjects of inquiry are the laws which govern such divergence of structure and production of dissimilar conditions from homogeneous molecules. While considering the perplexing obscurity in which the biography of these little parasites has hitherto been involved, it cannot be matter of astonishment that their affinities to other Orders, and consequently their fitting position in the natural system, should have given rise to interminable controversy.

With regard to the genus to which these enemies of the *Hylæi* may belong, the general structure of the antennæ and tarsi might tend to associate them with *Xenos*; yet, consorting with the *Mel-lifera*, their habits bring them into close relation with *Stylops* and *Halictophagus*; so that they seem to supply a connecting link between *Xenos* and *Stylops*, coinciding with the position which the *Hylæi* themselves have been considered to occupy between the *Vespidæ* and the *Mellifera*,—thus constituting a new genus, for

* Mr. Newport has computed that more than 7000 hexapods were produced by one female. (Loc. cit. p. 341.)

which I would propose the name of *Hylethrus*, readily distinguished at first sight by the broad laminæ of the antennæ, which are nearly of equal width throughout, whereas in *Xenos* they gradually taper from the middle to the apex; the veining of the wings being also different; the palpi less conspicuous in the former; and the thorax considerably more gibbous, as well as wider and shorter in proportion.

It may furthermore not be unworthy of notice, that among the hitherto described species of *Xenos*, a portion (including the type of the genus) being parasitic upon the social *Vespidæ*, whose larvæ subsist on disgorged juices, chiefly of vegetable extraction, administered to them from mouth to mouth in open cells,—whereas another portion, being derived from the solitary and exclusively carnivorous *Sphigidæ* &c., reared in closed cells, wherein the young hexapod must therefore be incarcerated at a time when, as in the solitary *Mellifera*, the ovum and store only are to be met with,—it seems reasonable to infer that, inasmuch as all remarkable variations of structure afford presuasive evidence of corresponding modifications of economy, so, vice versâ, habits thus widely differing will also be typified in the minutiae of some peculiar character, whereby we may be enabled to discriminate the respective groups, and associate the species justly appertaining to each.

With reference to an opinion which has long prevailed, that the larvæ of the *Hylæi* are parasitical feeders on the stores of other *Mellifera*,—founded upon apparent structural incapacity in the perfect insect for the task of collecting and conveying nutriment for its progeny, this inference does not appear to be borne out in those which I have reared; for, having obtained a considerable number of specimens from cells adapted to the size of the larvæ, and constructed in appropriate channels through the pith, forming sometimes a double or triple series of parallel galleries, occasionally crossing each other (as in the accompanying briar marked *A.*), the peculiar transparent iridescent tapestry of the *Hylæi* being continued throughout each series of cells in uninterrupted succession, I cannot but infer that these are no casual intruders or predatory usurpers, but, on the contrary, rightful heirs of the original constructors and purveyors.

Similar parasitical habits have also been ascribed to other Hymenopterous insects, upon *primâ facie* evidence of structural organization,—such as the absence of pollen-plates and pollen-brushes in the pollinivorous, or the non-existence of spinal armature of the tibiæ, considered essential to the Zoophagous for the transport of their prey,—which inferences, however, more careful

observation has in several instances served to disprove. Thus, in an interesting notice which appeared some time since in the *Annales of the French Entomological Society*, (tome 9, premier trimestre, 1840,) “sur les Insectes Hyménoptères qui nichent dans l'Intérieur des Tiges sèches de la Ronce” (p. 35), the writers (MM. Léon Dufour and Edouard Perris) have evinced a laudable desire to vindicate the reputation of some of their Hymenopterous protégés from the aspersions previously cast upon them in this respect,—as in the case of *Ceratina* (pp. 16—23) and *Trypoxylon* (pp. 28—33); while however they arrive at a different conclusion respecting a species of *Hylæus* they had in like manner reared from briars (the *Prosopis signata* or *annulata*), upon which head they remark as follows: “La *Prosopis* usurpe les nids de l'*Osmia parvula*, et ses larves réduisent celles de cette *Apiaire* à mourir de faim, en dévorant les provisions recuëllis par cette dernière.”—p. 35.

I have myself, on more than one occasion, reared specimens of *Hylæus* from briars wherein a species of *Osmia* was also met with,—such being however unusual and exceptional cases, when the cells of the one appeared perfectly independent of those of the other; the *Hylæus* having, as I conceive, simply availed itself of the unoccupied portion of an excavated briar, after the *Osmia* had completed her labours; the cells constructed by the latter, and the pupa-cases of her young, forming an uninterrupted series lower down,—the limits of the slender tapestry of the *Hylæi* above being readily distinguishable, and on one occasion a deposit of liquid acidulous honey being found intermediate between the two (as in the accompanying briar marked *B*).

Whence could this honey have proceeded, and for what purpose could it have been collected and deposited? Can this be the nature of the food upon which the *Hylæus* larvæ subsist, and could it have found its way hither by exuding from the cells of the *Hylæi*, or have been so placed to prevent the egress of the *Osmia*? This is a problem difficult to explain; the solution of which, as defining the habits and economy of the *Hylæi*, offers an interesting subject of inquiry.

The allied genus *Colletes* (long known as a constructor,* and furnished with polliniferous organs) has been observed by Mr. Smith filling her cells with a “liquid mixture of pollen and honey;”† and may not the *Hylæi* also—the peculiar conformation of whose oral organs, as well as those of *Colletes*, approximates to that of the social *Vespidæ*—supply their larvæ with some viscous

* Reaumur, Mem. 5, tom. vi.

† Zoologist, 1846, p. 1275.

saccharine essences, possibly in a less condensed form? At all events I feel assured, from the circumstances under which I have usually found them, as already narrated, that their alleged parasitical habits will ere long be disproved, as in the case of *Ceratina*.

It should also be remarked, that it is not an uncommon occurrence for briars previously occupied by the progeny of one insect, to be again made available by a different insect after the original tenants have quitted their abode; and that on one occasion I found some pupæ of *Hylæus* ensconced in a mud-cased briar containing the deserted cells of an *Odynerus*; the *Hylæi* in this instance being arranged obliquely, on account of the large diameter of the excavated channel (as in the briar marked *C.*, to which is appended a specimen of the *Hylæus* reared therefrom, and some of the pupæ in spirits). It will however scarcely be contended that the *Hylæi* in this instance were parasitical feeders upon the store laid up for the Zoophagous *Odynerus* larvæ, nor is there any trace of subsequent occupation by an *Osmia*.

The same remarks equally apply to another briar (now exhibited and marked *D*), the lower end of which I found to be tenanted by three larvæ of *Cemonus*, with several others of *Hylæus* above, the tapestry of the latter serving to determine the limits of each: but, having carefully reunited the split portions of the briar for the purpose of ascertaining the result of this joint occupancy, the time for the appearance of the perfect *Cemoni* being prior to that of the *Hylæi*, the former alone were produced, having annihilated the latter while effecting their exit towards the middle of May; and it would seem not improbable that a similar result should ensue in the briars occupied by *Osmia* and *Hylæus* as aforesaid, unless the progeny of the original constructor be altogether precluded from issuing, there being no other opening for the purpose, nor do the *Osmiæ* ever perforate the side of the briar; and the lodgment of the *Hylæus* being subsequently effected, the former must have belonged to a species which attains maturity before the latter,—like the *Osmia ruborum* of the French writers already referred to, produced early in May.

The *Trypoxylon* also is not averse to profit by such opportunities of economizing labour; which the same writers characterize as “une sorte d’intelligence industrielle,” surpassing the ordinary inspirations of instinct, although not unattended with risk. This insect however usually prepares for its larvæ a gallery, with cells proportioned to their size, excavated amid the main body of pith. The distinction which the same writers have pointed out, between such casual appropriations of a deserted tenement, from which the

entire pith has been removed by some former constructor, and the ordinary proceedings of the *Trypoxylon* as aforesaid, equally applies to the *Hylæi*, whose diminutive tunnels, perforating and often winding through the pith, essentially differ from any made by an *Osmia* or an *Odynerus*.

In concluding these observations upon the *Strepsiptera*, and the insects on which they parasitically subsist,—a subject wherewith the name of our honorary President is indissolubly associated,—I cannot better dispose of the specimens illustrative of this communication than by consigning them to the Museum of this Society.

DIAGNOSIS OF THE SPECIMENS.

1. *Hylecthrus Rubi*, ♂. (Pl. VIII. fig. 1), with its foster-parent *Hylæus versicolor* ♀.
2. Bred-specimens of the *Hylecthrus Rubi* ♀. (Pl. VIII. fig. 2a—2d), with *Hylæus rubicola*, ♂ and ♀.
3. Cephalo-thorax of hexapod-bearing female (Pl. VIII. fig. 2e), with some of her progeny.
4. Corneous operculum of pupa-case of the male (Pl. VIII. fig. 1h).
5. *Hylecthrus Quercûs* ♂.
6. *Hylæus gibbus* ♀, with exuvixæ of the preceding.

BRIARS.

- A. Briar exhibiting the normal construction of the cells of *Hylæus versicolor* and *rubicola*, in galleries perforating the pith,—often in a double or triple parallel series, as in this instance.
- B. Briar-s snag excavated by an *Osmia*, whose pupa-cases remain below; the upper portion being occupied by *Hylæi*, and the intervening space having contained some liquid acidulous honey.
 - B. 1. Specimen of the *Osmia*.
 - B. 2. Pupa of the same in spirits.
- C. Briar containing the mud-constructed cells of a large *Odynerus*, with others of *Hylæus* superposed, and arranged obliquely.
 - C. 1. *Hylæus* reared from this briar.
 - C. 2. Nymph of the same in spirits.
- D. Briar occupied in part by *Cemonus unicolor*, with the tapestried cells of *Hylæus* above; the occupants of the latter having been destroyed when the *Cemõni* effected their exit.

Order STREPSIPTERA, Kirby.

Genus HYLECTHRUS.* (Pl. VIII.)

Caput magnum, transversum. *Oculi* ingentes. *Antennæ* 5-articulatæ; articulo basali brevi; secundo parvo, truncato; tertio longissimo, spatulato, totâ ferè latitudine subæquali, quartumque basin versùs latere externo ferenti; hoc parvo, annuloso; extimo (5to) tertio simillimo, et in illum recumbenti. *Palpi* parvi, articulo basali crassiori, apice obliquo; apicali graciliori, setoso. *Thorax* anticè constrictus, disco gibboso; capiti latitudine subæquali; scutello maximo; elongato-triangulari, margine antico sinuato, lateribus rectis, angulo postico subacuto porrecto. *Pseudelytra* parva, apice valdè dilatato, crassiori, subconcauo. *Alæ*, costæ dimidio basali inspissato, seu potiùs venâ subcostali abbreviatâ cum costâ quasi conjunctâ; primâ discoidali, prope basin furcatâ, ramo antico ejus cum costâ parallelo, ultra medium alæ evanescenti, ramo postico ejusdem longitudinis, recto, deflexo: prope apicem alæ incrassatio exstat, cujus basis, venaque duplex tenuissima de margine externo sinuatè producta, intra furcam retrò extendunt: venis reliquis rectis, deflexis; quarum una gracilis, margini externo attingens; duæ subapproximatæ, margini interno propiores, basi robustiores; altera (?) analis ferè oblitterata. *Abdomen* valdè constrictum. *Pedes* longitudine mediocres, posteriorum tibiis dilatatis, compressis, genibus constrictis; tarsorum articulis quatuor, apicali integro. Mas.

Femina (cui, modo congenerarum, alæ, pedes, antennæ, necnon oculi, desunt), vermiformis; cephalothoracem complanatum, suprâ subconvexum, infrâ subconcauum, e dorso apicis educantis tantum modò protrudens; vaginæ aditû, olim clauso, post coitum sat amplè patenti.

Sp. 1. *Hylecthrus Rubi*. (Pl. VIII. figs. 1, 2, 3, and details.)

Niger, gibbosus; pedibus luteis; alis lacteis, venis saturatè piceis. Mas.

Long. corp. $\frac{1}{2}$ — $\frac{5}{6}$ lin. Expans. alar. ferè $1\frac{1}{2}$ lin.

Femina, nuper declarata, cephalothorace pallido, lineolâ marginali tenuissimâ nigricanti; vittâ utrinque, maculis binis

* From Hylæus, and ἑχθρὸς, hostis.

parvis transversis prope basin, angulisque posticis, brunneis : parturientes autem disco convexiori, ferè omninò flavescenti, vittâ mediâ longitudinali dilutiori.

Habitat in Epiro, intra corpus *Hylæi versicoloris* parasiticus.

Fig. 1, male ; fig. 2, details of female ; fig. 3, young larvæ.

Sp. 2. *Hylecthrus Quercûs*.

Differt magnitudine duplò majori, alis parùm obscurioribus, venisque magis nigricantibus. Mas.

Long. corp. $\frac{2}{3}$ —1 lin. Expans. alar. ferè $1\frac{3}{4}$ lin.

Individua mutilata tantum vidi.

Habitat in Epiro, *Hylæi gibbi* parasitus.

Order HYMENOPTERA.

Section MELLIFERA, Latr.

Family ANDRENIDÆ, Latr.

Genus HYLÆUS, Latr. (PROSOPIS, Jurine.)

Sp. 1. *Hylæus rubicola*.

Niger ; genis, clypei que puncto, luteis, vel albicantibus, vel denique omninò nigris ; antennis subtùs ferrugineis ; prothoracis lineolâ sæpè interruptâ, humeris, squamâque alarum, flavescantibus ; tibiis tarsisque plus minusve ferrugineis vel pallidis ; abdominis segmento primo omninò, secundo nonnunquam ad basin, rufo-fulvis, reliquis nigro-piceis, marginibus posticis pallidioribus ; alis subhyalinis, venis piceis. Femina.

Long. corp. $\frac{5}{8}$ unc. Exp. alar. $\frac{7}{8}$ unc.

Mas differt, genis clypeoque albidis ; thorace, abdomine, squamâque alarum, nigris.

Habitat in Epiro, circum Ambracicum Sinum, in rubos exsiccatos fodiens.

Sp. 2. *Hylæus versicolor*. (Pl. VIII. fig. 4.)

Niger ; genis, clypei lineâ, prothoracis lineâ interruptâ, humeris, squamâque alarum, flavescantibus ; antennis subtùs ferrugineis ; tibiis tarsisque anterioribus ferè omninò, intermediis posterioribusque basin versus, pallidioribus ; abdomine vel toto vel parte majori pallidè flavo ; alis subhyalinis, venis piceis. Femina.

Long. corp. $\frac{5}{4}$ unc. Exp. alar. $\frac{7}{4}$ unc.

Variat genis luteis, clypei puncto concolori, vel disco omninò nigro.

Habitat in Epiro, in rubis exsiccatis. (An species distincta?)

The dissimilarity in appearance between this and the preceding species is very striking, but although I am inclined to consider the difference as resulting from parasitical attack, it would perhaps be hazardous to assert this without further proof. It is, however, remarkable that all the male parasites which I have obtained were derived from these pale-coloured specimens, whereas the apterous females were restricted to the former,—a circumstance not unworthy of attention, as connected with the physiology of sexual development.

Sp. 3. *Hylæus gibbus*.

Niger, gibbosus; genis tibiisque anterioribus anticè, luteis; posterioribus ad basin, intermediis vix, tarsorumque quatuor posteriorum articulo primo, albicantibus; antennis subtùs ferrugineis; prothoracis lineolâ interruptâ tenui, humeris, alarumque squamâ, flavescens; abdomine nigro; alis fuscescentibus, venis piceis. Femina.

Long. corp. 3 lin. Expans. alar. $4\frac{1}{2}$ lin.

Habitat in Epiro, prope Sinum Ambracicum, in gallis querceis.

The *Hylethrus Quercús* was obtained from this species, the abdomen exhibiting irregular rufous patches in some specimens parasitically affected.

IX. On the British Species of the Genus *Gelechia* of Zeller.
By J. W. DOUGLAS, Esq. (Continued from page 21.)

[Read 6th May, 1850.]

Sp. 61. *Mulinella*.

G. mulinella (Tis.), Z.

Re. interrupta, Haw. (non *Ti. interruptella*, H.)

An. interruptella, St.

G. interruptella, Sta. (Cat.)

“ Alis anticis griseo-fuscescentibus, dorso obscuriore, vitta media obsoleta fusca, pustulis marginis postice subquatuor nigricantibus.” (Tis. MSS.)

Head ashy-fuscous; palpi fuscous; antennæ brown-black; thorax darker than the head. Anterior wings greyish fuscous, darker in the inner margin, with a dark, not well defined vitta in the centre, and a few very small black dots on the posterior margin. Posterior wings greyish-fuscous.

This species is very like *Ti. interruptella*, H., but is held to be distinct from it by the continental entomologists, who take both. The most apparent difference is that the ground colour of the wings of *mulinella* is darker, and the central vitta is less clearly defined than in *interruptella*.

Not scarce in July on furze bushes and broom; from the latter I have reared this species.

Sp. 62. *Divisella*, mihi.

Alæ anticæ griseo-luteæ, dimidio inferiori griseo-fuscæ, punctis tribus atris, uno minimo humerali, altero majori ante, tertioque post medium: alæ posticæ griseo-fuscæ.

Expansion of wings $7\frac{1}{2}$ lines.

Head, palpi and thorax luteous; antennæ luteous, faintly annulated with fuscous. Anterior wings luteous, the lower half shaded with fuscous; cilia luteous; on the shoulder near the costa is a very small dark dot; another, larger, lies in the groove before the middle, and a third opposite the anal angle half way between the anterior and inferior margins. Posterior wings greyish, with luteous cilia; body fuscous. Posterior legs and tarsi

luteous. This species resembles *mulinella* and *interruptella*, but is truly distinct.

Taken near Whittlesea Mere. In the collections of Messrs. Doubleday, Shepherd and Allis.

Sp. 63. *Næviferella*.

G. næviferella, Z.

Ti. Knockella, Haw. (non F.)

G. Knockella, Sta. (Cat.)

Ti. miscella, Haw. (non H. 273.)

Micros. aurofasciella, St.

G. aurofasciella, Sta. (Cat.)

“Alis anticis nigricantibus, maculis tribus posticis; una dorsali, unaque minore disci aureis, una costali pallida.” Z.

Expansion of wings, $4\frac{1}{2}$ lines.

Head and thorax concolorous with the anterior wings; palpi black; antennæ faintly annulated black and white. Anterior wings shining greenish-black, with three golden spots, of which one is in the middle of the inferior margin, one on the costa towards the apex, and the other between them: another evanescent yellowish spot may also generally be seen at the anal angle extending into the cilia; it is more conspicuous when the wings are closed. Posterior wings fuscous.

The colours of this species fade much after death, rendering it difficult to describe.

Found on *Atriplex erecta* at Charlton sandpit in July; also in hedges at Camberwell.

Sp. 64. *Fugitivella*.

**G. fugitivella*, Z.

G. fugacella, Sta. (Cat.)

Expansion of wings, 6 lines.

Head ashy; palpi griseous, terminal joint black in the middle and at the tip; antennæ black, faintly annulated with griseous; thorax griseous. Anterior wings griseous, with some raised scales on the disk; near the base is an oblique black streak, two black spots on the costa, one before, the other beyond the middle, and some scattered black dots on the disk. Posterior wings grey-fuscous.

Varies considerably in the colour of the anterior wings, some-

times even to black, so that no markings are visible, the base and apex, however, being mostly paler than the rest of the wing.

Not rare on fences under elm trees at Camberwell in July.

This species is exceedingly like *G. fugacella*, Z., and not easy to distinguish from it. Herr Zeller, however, assures me it is quite distinct, *fugacella* being rather larger, and having broader anterior wings: it is not yet discovered in this country.

Sp. 65. *Desertella*, Edleston (MSS.)

Alæ anticæ angustæ, luteo-fuscæ vel luteæ, punctis quatuor nigris, apicibus punctis nigris circumdatis. Alæ posticæ griseæ, apicibus acuminatis.

Expansion of wings, 6 lines.

Head, palpi and thorax luteous; antennæ annulated black and white. Anterior wings narrow, linear, in colour varying from light to dark luteous, and in some cases nearly fuscous, with four black dots, of which one, faint, lies in the groove near its base; another, also in the groove, before the middle; the third, near it, but above and beyond; and the fourth, in a line with the third, still further removed; the apex surrounded with black dots. Posterior wings greyish, with the apices acute. Body light fuscous. Legs luteous.

Very like *G. terrella*, but smaller, unvarying in size, and without a trace of a fascia; also the apex of the posterior wings is more acute, and not so gradually produced.

Found abundantly in the sand hills at New Brighton and near Weymouth in June and July. Herr Zeller has sent me a specimen of his variety *a* of *G. terrella*, which agrees in most respects with this species, except that it has a faint fascia, a character which I have never seen in any one of the multitude of *desertella* I have observed.

Sp. 66. *Ligulella*.

**G. ligulella*, Z.

Ti. ligulella, W. V.

Harp. albistrigella, St. ?

Expansion of wings, 6 lines.

Anterior wings black, with a whitish fascia just beyond the middle, curving slightly *outwards*, opposite to which, on the under side, is a small yellowish costal spot. Posterior wings fuscous.

Found in several places near London.

Sp. 67. *Vorticella*.

G. vorticella, Z.

Ti. vorticella, Scop.?

Expansion of wings, $5\frac{1}{2}$ lines.

Anterior wings black, with a snow-white fascia just beyond the middle, curving slightly *inwards*, opposite to which, on the under side, is a white costal spot. Posterior wings fuscous black.

Exceedingly like *ligulella*; but it differs in being smaller, blacker, the fascia curving slightly from, not to, the anal angle, and the spot underneath being white, not yellowish. I have long doubted if these species were distinct, but I now believe they are so. Herr Zeller informs me that he rears plenty of *vorticella* from the larvæ found on *Genista tinctoria*, but not one *ligulella* among them, nor does he even take the latter near Glogau. I would advise any one who has the two species to place them and also *tæniollella* side by side, when the difference will be more apparent. From *tæniollella*, *vorticella* is at once separated by the want of the fascia on the underside, and from *ligulella* by its smaller size, darker colour and whiter spot underneath.

In Mr. Stephens's cabinet, and found by Mr. Weir in Sussex.

Sp. 68. *Coronillella*.

G. Coronillella, Z.

Lita Coronillella (Tis.) Tr.

Expansion of wings, 6 lines.

Anterior wings black, with a small yellow costal spot, and another, very small, opposite to it in the anal angle. Posterior wings fuscous, very broad, with the apex long, acute, and very abruptly produced. Body and posterior legs fuscous.

I took this species on the 30th May, by sweeping in the hilly field in Headly Lane, Mickleham.

Sp. 69. *Hübneri*.

Re. Hübneri, Haw. (non *Ti. granella*, H.)

An. Hübneri, St., Wood, 1211.

Expansion of wings, $5\frac{1}{2}$ lines.

Head white; palpi white, terminal joint black; antennæ annulated, black and white; thorax ashy white. Anterior wings ashy white, with two cloudy fasciæ, in which are some black marks, one of the most conspicuous being in the first fascia on the costa;

apex clouded and margined with black dots, cilia fuscous. Posterior wings dark griseous, with fuscous cilia.

This species is rare, and I do not know the places of its capture. It is in the collections of Messrs. Doubleday and Shepherd, and Haworth's specimen is in the collection of the Entomological Society.

Sp. 70. *Mundella*, mihi.

Alæ anticæ griseæ vel cinereæ, costâ plerumque pallidiori, puncto humerali tribusque in disco atris, apicibus ciliisque fuscis. Alæ posticæ griseæ.

Expansion of wings 5 lines.

Head and thorax griseous; palpi griseous, terminal joint black; antennæ black. Anterior wings griseous or cinereous, generally paler on the costa, a humeral spot and three on the disk black, of these three, one lies in the groove, and two above and beyond; the apex either wholly fuscous or only surrounded by black dots; cilia fuscous, with a griseous tinge at the extremity. Posterior wings griseous.

This pretty species is found on the sand hills at New Brighton, Cheshire, in June.

Sp. 71. *Suffusella*, mihi.

Alæ anticæ angustæ, pallidè luteæ, griseo-fusco suffusæ, punctis duobus elevatis atris, uno costali, alteroque opposito in disco pone medium; ciliis luteis. Alæ posticæ griseæ, ciliis luteis.

Expansion of wings, 6 lines.

Head and thorax pale luteous; palpi pale luteous, with the tip of the terminal joint black. Anterior wings narrow, pale luteous, suffused more or less with greyish fuscous, palest on the costa, with two raised black dots, of which one is on the costa, the other below it, opposite the anal angle, exactly half-way between the anterior and inferior margins; cilia luteous. Posterior wings griseous, with luteous cilia. Posterior legs luteous, tarsi spotted with black.

In the collection of Mr. Shepherd, from Whittlesea Mere.

Sp. 72. *Pernigrella*, Stainton (MSS.)

Alæ anticæ immaculatæ atræ, fasciâ suffusâ aterrinâ pone medium. Alæ posticæ nigræ.

Expansion of wings, 6 lines.

Head, antennæ and thorax jet black; palpi fuscous, with black tips. Anterior wings jet black, spotless, with a still darker fascia

beyond the middle, not easily seen. Posterior wings and body dark fuscous.

This species must be closely allied to *G. subsequella*, F. v. R., and *G. Temerella*, Lienig, but from both of which it essentially differs, in being entirely without a spot of any colour.

In the collection of Mr. Edleston, and reared in July by Mr. Gregson, from larvæ found by him on sallows at New Brighton, Cheshire.

Sp. 73. *Inornatella*, mihi.

Alæ anticæ luteæ, atomis fusco-griseis irroratæ, punctis tribus atris, quorum duo ante, tertiamque pone medium, plagâque obliquâ apicali fuscâ. Alæ posticæ griseæ.

Expansion of wings, 7 lines.

Head and palpi luteous; antennæ luteous, annulated with fuscous. Anterior wings luteous, dusted throughout with griseous atoms, on the disc are three black spots, each surrounded by a pale ring, of which the first is in the groove, the second above it, both before the middle, and the third in a line with the second beyond the middle; from the apex a fuscous dash stretches obliquely towards the centre, and a few dark dots are on the posterior margin. Posterior wings griseous.

In the collections of Messrs. Doubleday and Shepherd, from Whittlesea Mere.

Sp. 74. *Gerronella*, Z. (MS.)

Alæ anticæ ochraceæ, punctis tribus medio atris, puncto minimo versus basin, alteroque majori margine inferiori, lineâ curvâ costæ bis connexâ, fasciâ obliquâ ad angulum posticum, alterâque rectâ juxta marginem posteriorem, ferrugineis; ciliis ferrugineis. Alæ posticæ griseæ.

Expansion of wings $5\frac{1}{2}$ lines.

Head and thorax deep ochreous; palpi lighter; antennæ ferruginous. Anterior wings deep ochreous, with three black central spots, a small spot near the base, and one on the inner margin, ferruginous; above this last, on the costa, commences a thick lunate line of the same colour, which extends to beyond the middle, where it again joins the costa, leaving the clear ground colour within the curve; joined to its outer end a fascia stretches obliquely to the anal angle, where it is met by a thick, still darker fascia going along but not touching the posterior margin, between

which and the dark cilia an ochreous line is perceptible. Posterior wings griseous.

Taken at Charlton, in July and August.

Sp. 75. *Inopella*.

G. inopella, Z.

Apheloseitia? *Inulella*, Curt. Ann. and Mag. N. Hist. ser. 2, vol. v. p. 117.

“ It expands five lines and is white ; scales on head depressed ; palpi recurved, scaly to the apex ; superior wings narrow, lanceolate, ochreous and freckled ; costa, a line along the middle, with the radiating nervures and inferior margin white, and sometimes there is an oblique white stripe near the inner angle directed towards the tip ; cilia long, pale, and dotted at the base ; inferior wings silky, dove-colour, nearly as broad as the superior, truncated at the extremity, the apex produced ; cilia long and thick ; hinder tibiæ stout, with hairy scales.

“ Very like *A. rufo-cinerea*, Haw., at first sight, but besides other differences, the under wings are not lanceolate, which indicates an affinity to *Cleodora*. I bred two from flowers of *Inula dysenterica*, the 28th of August, 1848, collected near Ryde in the Isle of Wight, and no doubt the caterpillars fed upon the seeds in the receptacles.”—Curtis, loc. cit.

Sp. 76. *Bifractella*.

G. bifractella, Mann. (MS.)

Caput testaceum, palpi ochraceæ. Alæ anticæ brunneo-nigræ, maculis duabus posticis obliquè oppositis ferè confluentibus, fulvis. Alæ posticæ nigræ.

Expansion of wings 5—6 lines.

Head testaceous ; face and palpi paler ; antennæ black. Anterior wings brown-black, with two nearly opposite fulvous spots, one on either margin towards the apex, generally connected by a curved line. Viewed with a lens these wings are dusted with griseous atoms. Posterior wings black. Posterior tarsi black, annulated with white.*

* In July and August this year I reared this species, and also *G. inopella* preceding, from the dry receptacles of the flowers of *Inula dysenterica*, gathered last winter at Folkestone.—J. W. D. 6th Sept. 1850.

Sp. 77. *Littorella*, mihi.

Alæ anticæ angustæ, albidæ, punctis quinque fuscis; ciliis griseis.
Alæ posticæ pallidè griseæ.

Expansion of wings 5 lines.

Head, palpi and thorax concolorous with the anterior wings; antennæ fuscous. Anterior wings ashy-white, with five fuscous spots, two of them pale before the middle, two central, and one beyond the middle; cilia griseous. Posterior wings pale griseous. Body fuscous; posterior legs and tarsi ashy.

Found by Mr. S. Stevens in May on the coast of the Isle of Wight.

Sp. 78. *Immaculatella*, mihi.

Alæ anticæ sericeæ, immaculatæ, nigrae. Alæ posticæ griseæ.

Expansion of wings 5 lines.

Head, palpi, antennæ and thorax concolorous with the anterior wings, which are of an uniform blue-black and without any spot. Body black; posterior legs and tarsi pale griseous.

Of this very distinct species I have a single specimen which I caught flying in West Wickham Wood, August, 1849.

Sp. 79. *Fumatella*, mihi.

Alæ anticæ fumato-griseæ, punctis tribus aliquantulum elevatis, fasciâ obscurâ sinuatâ griseâ; ciliis griseo-sparsis. Alæ posticæ griseæ.

Expansion of wings 7 lines.

Head and thorax concolorous with the anterior wings; palpi paler, darker just before the tip; antennæ fuscous. Anterior wings smoky-grey, brown, with three black spots somewhat raised, an obscure wavy greyish fascia; the posterior margin pale, dotted with black; cilia dusted with ashy. Posterior wings griseous, with paler cilia. Body fuscous; posterior tarsi spotted with black.

Mr. Gregson took three of this species at New Brighton, and very liberally gave me one. Mr. Stainton has also received it from Mr. Jordan, by whom it was captured in Devonshire.

Sp. 80. *Senectella*.

G. senectella, Z.

Expansion of wings 6 lines.

Head fuscous or greyish fuscous; palpi griseous, the tip darker; antennæ fuscous. Anterior wings acute, fuscous, with lighter cilia, and three very obscure black central dots. Posterior wings shining, dark griseous. Considerably like the dark varieties of *G. terrella*, but smaller; anterior wings more acute, and the posterior more produced at the apex, as observed by Herr Zeller (Isis, 1839).

Some of my specimens differ from this description, inasmuch as all the wings and the terminal joint of the palpi are nearly black, but I do not see in them sufficient difference to constitute a distinct species.

Found on the downs at Stoa's Nest in thatch, and flying, also at West Wickham Wood, in July and August.

X. *Descriptions of some new Aculeate Hymenoptera from Epirus.* By S. S. SAUNDERS, Esq.

[Read June 3rd, 1850.]

Fam. MUTILLIDÆ, Leach.

Genus MYRMOSA, Latr.

M. nigriceps.* (Pl. VI. fig. 1.)

Nigra, thorace rufo, anticè rectè truncato, angulis acutis; abdominis segmentis pilis albidis postice fimbriatis; alis obscuris; antennis pedibusque nigris. Mas.

Long. corp. $\frac{7}{12}$ — $\frac{2}{3}$ unc.

Exp. alar. 1 unc.

Habitat Nicopolin, prope Sinum Ambracicum, mense Junio capta.

Four specimens of this fine species were captured at intervals upon flowers in the same locality, towards the middle or end of June.

Fam. SCOLIADÆ, Leach.

Genus PSEUDOMERIA,† S. S. Saunders.

Alæ brevissimæ, thoraci ferè longitudine cœquales ad volandum ineptæ; anticarum margine apicali profundè sinuato, disci usque medium incisæ; cellulæ alarum orisque structura ut in genere Parameriâ Guerin (delineante Savignio); pedes mediocres, tiliarum calcaribus rectis, acutis.

* EDITOR'S NOTE. The name of this species should have been *nigripes*, but owing to a typographical error it appeared in the report of the proceedings of the June meeting, in the *Zoologist*, p. 2861, as *nigriceps*, which name, according to the laws of nomenclature, must be retained.

† In the original memoir upon this insect communicated to the Entomological Society, (an abstract of which has been published in the *Proceedings* for June, 1850, p. 16,) it was referred to the genus *Parameria* of Guérin; a more extended examination of the allied species than I had then had an opportunity of making has however rendered necessary the establishment of a new genus for its reception.

P. Græca. (Pl. V. fig. 3.)

Castanea, pilis albidis densè vestita; femoribus, tibiis, mandibularum apice costâque alarum, piceis; abdominis segmentis quatuor basalibus (præter petiolum) nigris; secundo tertioque fasciâ apicali, medio interruptâ, utrinque emarginatâ, lateribus haud attingenti, albâ notatis; alis obscuris; oculis nigris. Femina.

Long. corp. $\frac{5}{12}$ unc.

Exp. alar. $\frac{1}{3}$ unc.

Habitat in Epiro, apud Nicopolin, prope Sinum Ambracicum, mense Junio capta.

This insect—closely allied to *Meria*, from which it may be distinguished by its abbreviated wings, and by the absence of the small triangular cell which exists between the first and second submarginal cells in the former—approximates to the division which Guérin has suggested,* founded upon an insect figured by Savigny in the great work on Egypt,† and which the former characterizes as differing from *Meria* “par les cellules des ailes supérieures, par la forme des jambes, et de leurs épines terminales,” the wings being of ordinary dimensions and adapted for flight; whereas in the present species they are merely rudimental, employed (like those of the ostrich) as an adjunct to the legs during rapid circumvolutions along the ground or in close proximity thereto. The tibial armature also differs from that of Savigny’s undescribed species characterized as aforesaid; while the situation of the apical margin of the wing, not observable in the latter, is strongly developed in the former; the discoidal incision however, which is present also in *Meria*, being probably a constant character throughout the group.

The following tabular statement may serve to indicate the several divisions which have been proposed for *Meria* and its allies:—

* Dict. Pitt. d’Hist. Nat., tome 5, p. 575, 1837.

† Expéd. d’Egypte, Hymen. pl. 15, fig. 21.

1. Wings with a small triangular cell between }
the first and second submarginal cells. } *MERIA, Illg.*
2. Wings without the small triangular cell.
- a* Wings fitted for flying; spurs of hind
legs long, curved, and obtuse.
- * Posterior tibiæ elongate-triangular; }
last joint of posterior tarsi scarcely }
smaller than the fourth. } *MACROMERIA,*
Westw. MSS.
(Meria Klugii,
Westw. Proc.
Zool. Soc.
April 14, 1835.)
- ** Posterior tibiæ globose; last joint }
of posterior tarsi very minute. } *PARAMERIA,*
Guérin(loc. cit.)
6. Wings unfit for flight; spurs of hind }
legs moderate, straight, and acute. } *PSEUDOMERIA.*

Fam. EUMENIDÆ, *Westwood.*

Genus *RAPHIGLOSSA*,* *Saunders.*

Caput magnum subrotundum, subtùs obliquè complanatum, thoraci ferè latitudine coæquale. *Oculi* internè emarginati. *Mandibulæ* obtusæ apice transversè serrato. *Labium* longissimum, inter coxas acuformè retrorsùm, cum maxillis vix brevioribus, productum. *Clypeus* anticè excavatus, labium porrectum ad recipiendum et dirigendum. *Thorax* truncatoconvexus, medio vix dilatatus, subtùs canaliculatus. *Antennæ* thoraci ferè longitudine coequalis. *Alæ* anticæ cellulis cubitalibus quatuor, quarum secunda et tertia singulatim venam recurventem accipiunt; primâ magnâ, basi ampliori; secunda parvâ subtriangulari, lateribus anticè valdè approximatis, venam recurrentem recipiente; tertiâ subquadratâ, externè latiori, secundam recurrentem accipienti; apicali clausâ.

A. Abdomen segmento basali elongato, infundibuliformi: Mas, antenarum apice integro: cellula radialis simplex.

* ῥαφίς, acus; γλῶσσα, lingua.

Sp. 1. *Raphiglossa Eumenoides*. (Pl. VI. fig. 4, ♀.)

Elongata nigra, flavo-notata; labio usque abdominis petiolum producto; antennis testaceis, pedibus concoloribus, basi nigris; abdomine flavo-fasciato.

Long. corp. $\frac{2}{3}$ — $\frac{3}{4}$ unc.

Exp. alar. 1 unc.

Habitat in Epiro, prope Sinum Ambracicum, in rubis exsiccatis nidificans.

Descr. Nigra, nitida; maculâ frontali truncato-conicâ, alterâ parvâ utrinque pone oculos, aliaque magnâ utrinque ad angulos posticos, flavis; clypeo nigro, puncto utrinque (sæpè obliterato) flavo; oculis luteis, latere externo nigro-striatis, vel punctis nigris circumcinctis; antennis testaceis, apicem versus obscuris, articulo basali anticè flavo; thoracis angulis anticis posticisque, alarum squamâ, maculâ trianglari subtùs alas, scutellique maculis quatuor, flavis; abdominis segmentis posticè flavo-fasciatis, secundi fasciâ infrâ continuâ; pedibus testaceis, plus minusve flavo-notatis, femoribus basi nigris; alis subhyalinis, anticè flavescentibus, propè apicem nebulosis. Femina.

Mas differt clypeo sulphureo, maculâ pone oculos obsoletâ; antennarum articulo basali breviori, robustiori, posticè nigro, apicalibus omninò testaceis; abdominis fasciis sex; coxis intermediis puncto magno flavo.

B. *Abdomen segmento basali campanulato: Mas, antennarum articulo apicali corneo, vix uncinato: cellula radialis appendiculata.*

Sp. 2. *Raphiglossa Odyneroides*. (Pl. VI. fig. 2, ♂; fig. 3, ♀.)

Nigra, flavo-notata; labio usque pectoris medium producto; pedibus flavis, basi nigris; abdomine flavo-fasciato; *maribus*, antennis nigris, subtùs flavescentibus; *feminis*, capite maximo, antennis flavescentibus, prope apicem obscuris.

Long. corp. 6—7 lin. ♂; $8\frac{1}{2}$ lin. ♀.

Habitat in Epiro cum præcedentibus.

Descr. Caput nigrum, clypeo, maculâ subcordatâ frontali, ante oculos vittâ minimâ, punctoque parvo ad angulos posticos, flavis; mandibulis concoloribus, apice piceo; antennis testaceis, supernè nigrostriatis, articulo basali robusto, anticè flavo, apicali testaceo, mucrone parvo nigro. Thorax angulis

anticis, alarum squamâ, maculâ rotundâ subtùs alas, scutelli utrinque puncto lineolâque marginali, flavis. Abdomen nigrum, segmenti basalis fasciâ posticâ latâ, ad latera anticè valdè productâ, flavâ; reliquorum margine postico flavo-fasciato, fasciis subtùs productis. Pedes flavi, basi nigri. Alæ subhyalinæ. Mas.

Femina differt staturâ majori, capite maximo, maculâ triangulari frontali, alterâ utrinque minori juxta oculos, alioque magno utrinque ad angulos posticos, flavis; antennarum articulo basali subgracili, arcuato, testaceo, anticè sulphureo, reliquis testaceis, prope apicem supernè obscurioribus; thoracis angulis anticis, alarum squamâ, maculâ rotundâ subtùs alas, scutelli fasciâ emarginatâ transversali lineolâque marginali posticè, flavis; abdominis segmento primo ferè omnino flavo, vittâ basali nigrâ disci usque medium retrò productâ, reliquis nigris, fasciâ apicali utrinque dilatatâ flavâ, 2^{di} 3^{ti}que subtùs margine postico flavo; pedibus flavis, basi nigris; alarum disco iridescenti, marginis antici dimidio apicali obscuriori, venis purpureis, areolis basalibus flavo-notatis.

These remarkable insects—closely resembling *Eumenes* on the one hand, and *Odynerus* on the other—although differing much in general aspect are nevertheless associated by several important characters; the peculiar veining of the wings being consistently maintained in connection with other evidences of structure and economy; both species exhibiting an extraordinary prolongation of the proboscis,* which is turned back and laid between the coxæ in a groove prepared for its reception along the under side of the thorax; both nidificating in briars, for which purpose this conformation of the lingua is obviously most appropriate; and the veining of the wings, although coinciding together in both, yet differing essentially from that of all other established genera of Diplopterous *Hymenoptera*, the second submarginal cell receiving only one recurrent nervure, and the third submarginal receiving the other.

The larvæ of the first, when full grown, measures about two-thirds of an inch in length, and one sixth of an inch in diameter, being of firm fleshy consistency, its colour opaque-white, each successive segment presenting an overlapping margin; it is nearly of equal thickness throughout, with a slight distension about the thoracical region, somewhat flattened beneath, and having the posterior margin of each segment below vaulted and hollow.

* See Kirby, Mon. Ap. Angl. 1, p. 90.

These larvæ are found occupying spacious elongate-oval cells, in galleries containing a series of such receptacles, from which the entire pith has been removed; with intermediate spaces of varying dimensions, partly filled with mud and partly with compressed particles of pith in sectional divisions; each cell being first securely closed by a well-connected convex top of firm pergameous consistency, followed by a small portion of black mud.

The store provided by the parent-insect, judging from the remains occasionally found about the cells, consists apparently of some small yellow-headed larvæ, which Mr. Westwood considers to be Coleopterous, and probably to belong to some species of *Curculionidæ*; after consuming which, the full-fed larva remains as usual during a considerable period in an inert state, assuming the condition of a fully-developed pupa a few weeks only previously to its final metamorphosis towards the middle or end of June.

These pupæ are endowed with the singular faculty of executing a rotary motion when disturbed, by bringing the apex of the abdomen into play around the bottom of the cells, performing these revolutions for a number of times in rapid succession, the direction being occasionally reversed. A similar proceeding on the part of a species of *Ichneumon* (hence termed *gyrator*) is described by MM. Dufour and Perris in the *Annales* of the French Entomological Society.*

The perfect insect effects its exit by gnawing a circular aperture through the side of the briar, for which operation its powerful serrate mandibles are well adapted.

The dark brown corneous case of a species of *Chrysis* is not unfrequently found in the cells, closely enveloped in a thin tissue covering of its own.

Of the second species males alone were obtained from a briar which had been confounded with others occupied by the larvæ of *R. Eumenoides*. With these, however, I have not hesitated to associate a female, possessing all the characters of the genus which I captured, flying along a sandy road, another having subsequently been found among a miscellaneous collection of briars; and, unless properly referred to this species, the latter would constitute a third.

* Vol. ix. p. 43, 1840.

DESCRIPTION OF THE PLATES.

PLATE V.

Fig. 3. *Pseudomeria Græca*, ♀.

3a, front view of head; 3b, under side of do.; 3c, maxilla; 3d, labium;
3e, antenna; 3f, wings; 3g, foreleg.

Fig. 4. Briar-cells of *Raphiglossa Eumenoïdes*.

† Convex top of cell, consisting of a firm well-connected pergameneous cap.

* Interior of cell.

‡ Concave lower extremity of ditto, resting on successive layers of comminuted particles of pith (***) and black earth (††) in distinct compartments; the former being limited in some instances to mere sectional divisions at varying intervals.

PLATE VI.

Fig. 1. *Myrmosa nigriceps*, ♂.

1a, mandibles; 1b, antenna; 1c, maxilla; 1d, labium; 1e, anterior tarsus; 1f, apex of abdomen seen in profile; 1g, anal appendages as seen from above; 1h, intermediate ditto. ditto.

Fig. 2. *Raphiglossa Odyneroides*, ♂.

2a, under side of head, showing the labium and maxillæ united as when at rest, and projecting backwards beneath the thorax like a needle; 2b, mandible; 2c, antenna of male; 2d, maxilla; 2e, labium.

Fig. 3. *Raphiglossa Odyneroides*, ♀.

3a, antenna of ditto.

Fig. 4. *Raphiglossa Eumenoïdes*, ♀.

4a, the same seen in profile of the natural size; 4b, labrum; 4c, maxilla; 4d, labium; 4e, antenna of male; 4f, ditto, of female; 4g, anterior tarsus.

XI. *On various Australian Longicorn Beetles.* By W.
WILSON SAUNDERS, Esq., F.L.S.

[Read November 4th, 1850.]

A GREAT many interesting forms among the smaller *Longicornes* having during the last few years been brought to this country from our Australian colonies, I have thought that an account of some of them would be interesting to entomologists; particularly if I combined with them figures and short descriptions of some of the interesting, nearly allied forms which had only before been described, but wanted good portraits to point out their structure. The species now brought together form no particular family or group, but will probably be divisible into several; but their affinities are not easy to mark out distinctly with our present knowledge of the subject, and I therefore leave this point for future observers to determine. The whole of the Australian *Longicornes* want careful revision; and it is to be hoped that such an interesting investigation will soon be taken up by some entomologist who has time and opportunity to work the subject out.

FIRST DIVISION.

WINGS NOT ABBREVIATED.

EYES ROUNDED OR OVATE.

ENCHOPTERA. New genus (*εγχος πτερον*).

Head produced into a long, declining, gradually tapering snout. *Antennæ* not so long as the body, filiform, 11-jointed, geniculate, with the 1st joint long and clavate; 2nd, short, rounded; 3rd to 11th, long, subclavate, gradually decreasing in length. *Eyes* moderate, ovate. *Thorax* elongate, cylindrical, with rounded obsolete tubercles on the sides. *Elytra* tapering to a point, not so long as abdomen, and gaping at the suture. *Abdomen* long, clavate. *Legs* long and attenuated, with the femora clavate.

This genus is nearly allied to *Macrones* of Newman, but differs in the longer thorax, which is nearly smooth on the sides, and the longer and pointed snout.

Sp. 1. *Enchoptera apicalis*. (Pl. I. fig. 7.)

Dark chesnut brown, with the forehead and apices of the femora black; the three terminal joints of the antennæ yellow, and the elytra yellowish brown. Head produced into a long, gradually tapering, declining snout, with the face slightly furrowed, and having a bronzy tinge of colour over the dark chesnut, much contracted behind the eyes, which are ovate, black, and situate immediately under the antennæ, on the sides of the head. Antennæ 11-jointed, filiform. Thorax about as broad as the head, bulging out in the after portion; the surface somewhat undulating, sub-tuberculate, with a slightly elevated transverse ridge above, in front, and clothed with a short, yellowish, silky pubescence. Scutellum small, triangular. Elytra somewhat broader than the thorax, gradually tapering to a point, gaping at the suture, and not so long as the abdomen, marked above with four elevated ridges. Abdomen clavate, long, 5-jointed. Legs long, attenuated, with the thighs clavate, tarsi moderate.

Habitat Van Diemen's Land.

Length $\frac{7}{10}$ inch.

In my own collection, and that of the British Museum.

Sp. 2. *Enchoptera nigricornis*. (Pl. I. fig. 5.)

Head pale chesnut brown, slightly furrowed down the face, and somewhat hairy on the underside of the snout, with the antennæ pitchy brown, inclining to black. Eyes black. Thorax nearly smooth, cylindrical, slightly rounded at the sides, pale chesnut brown, and clothed with short adpressed silky yellow pubescence. Scutellum minute, chesnut brown. Elytra pale chesnut brown, clothed with yellowish pubescence, and marked with four faintly elevated ridges. Abdomen long, clavate, five-jointed, pale brownish green. Legs pitchy brown, with the anterior and middle thighs yellowish brown.

Habitat New South Wales.

Length $\frac{1}{2}$ inch.

In my own collection and that of the British Museum.

MACRONES, Newman. Entomologist, p. 33.

Sp. 1. *Macrones exilis*, Newman. (Pl. I. fig. 6.)

Black, with the sides of the thorax dark rufous brown, elytra yellowish brown, with four darker elevated ridges, and the posterior tarsi white.

Hab. Van Diemen's Land.

Length $\frac{85}{100}$ inch.

In the cabinets of the British Museum and J. O. Westwood, Esq.

The above short characters will serve to distinguish the *exilis* of Newman from the species which follows. The figure is from the original specimen from which Mr. Newman drew up his description, and a good representation of it, with descriptions, will serve to point out the peculiarities of its structure more forcibly than words, and show how it differs from the foregoing genus, and the one immediately following, all being nearly allied.

Sp. 2. *Macrones rufus*. (Pl. I. fig. 8.)

Rufous brown, with a broad ring of black on the first joint of the antennæ, and another of the same colour on the hind femora.

Head projecting considerably beyond the eyes into a short broad snout, with the sides parallel, much contracted immediately behind the eyes; eyes small, subovate, black. Antennæ geniculate, filiform, 11-jointed; 1st joint long, clavate, equalling in length the three following; 2nd joint small rounded; 3rd to 11th subclavate, gradually decreasing in length. Thorax broader than the head, with a strongly marked raised ring in front; behind which is an expanded portion, having a spine on each side, and tuberculated above. Scutellum small, subtrigonal. Elytra a little broader than the thorax, gradually tapering to sharp points, terminating before the apex of the abdomen and gaping at the suture, marked above with four elevated longitudinal ridges, and the surface somewhat rugose. Abdomen long, clavate, five-jointed. Legs long, with the femora clavate.

Hab. Hunter's River.

Length 1 inch $\frac{3}{10}$.

In my own collection.

I have seen but one example of this remarkable insect, which was presented to me by my friend the late Rev. J. W. Horsley.

BRACHOPSIS, new Genus ($\beta\rho\alpha\chi\nu\varsigma\ \omicron\psi\iota\varsigma$).

Head slightly produced in front, abruptly truncate, with the sides parallel; deeply furrowed between the eyes. *Eyes* round. *Antennæ* filiform, with the 1st joint long, clavate, equalling the three following in length; 2nd, short, rounded; 3rd, long; 4th, much shorter; and the remainder rapidly decreasing in length. *Thorax* cylindrical, the sides slightly projecting, with obtuse tubercles. *Elytra* gradually tapering to a point, gaping at the suture, and of the same length as the body. *Abdomen* long, spatulate. *Legs* short, somewhat robust, with the femora clavate.

This genus differs from *Macrones* in the less projecting head, unarmed thorax, and shorter and stronger legs, besides other characters. This and the two preceding genera form a very natural group.

Brachopsis concolor. (Pl. IV. fig. 4.)

Dark chesnut brown, with the tips of the first joint of the antennæ, forehead, face, and a longitudinal line along the upper surface of thorax, black. Elytra marked with four elevated longitudinal ridges.

Hab. Van Diemen's Land.

Length $\frac{1}{2}$ inch.

In the collection of the British Museum.

STENODERUS, Dejean.

Stenoderus maculicornis. (Pl. IV. fig. 2.)

Dull orange, with the antennæ, except the fourth, fifth and sixth joints, black, the latter nearly white, tipped with black, and with the eyes, apices of elytra, apices of hinder femora, apices of all the tibiæ, and three terminal joints of tarsi, also black.

Head and thorax impunctate, opaque. Elytra punctate, with five elevated striæ, two vanishing before the shoulders.

Length $\frac{4}{10}$ inch.

In the collection of the British Museum.

Collected by Mr. Byrne on the north and west coasts of New Holland and Abrahos Islands. This species is clearly distinguishable from the other *Stenoderi* by the antennæ being partly of a whitish colour.

PSILOMORPHA, new Genus. (ψιλὸς μορφή.)

Head produced in front into a short snout, with the sides somewhat approximating at the apex. *Eyes* large, round, situate immediately beneath the insertion of the antennæ. *Antennæ* longer than the body, filiform, 11-jointed; 1st joint long, clavate; 2nd, short, rounded; 3rd, 4th, and 5th, long, gradually increasing in length; 6th, 7th, 8th, and 9th equal to 5th; 10th and 11th shorter than 5th. *Thorax* long, cylindrical, swelling out at the base. *Elytra* broader than thorax, gradually tapering to a rounded point as long as the abdomen, and not gaping at the suture. *Legs* long and very slender, femora subclavate.

A small genus, having some resemblance to Mr. Shuckard's genus *Stephanops*, but abundantly distinct in the less projecting head, ovate eyes, and other characters.

Psilomorpha tenuipes. (Pl. IV. fig. 1.)

Pale chesnut brown, with the eyes, first joint of antennæ, tips of the other joints of the antennæ, and legs, black. Elytra striate.

Hab. New Holland.

Length $\frac{4}{10}$ inch.

In the collection of J. F. Parry, Esq.

SECOND DIVISION.

WINGS NOT ABBREVIATED.

EYES RENIFORM OR EMARGINATE.

STEPHANOPS, Shuckard, Ent. Mag. vol. 5, p. 510, 1850.

Stephanops nassatus, Shuckard. (Pl. IV. fig. 4.)

Dark chesnut brown, with the head and thorax pitchy brown. Face smooth and shining. Thorax and elytra opaque, smooth, with a velvety texture,

Hab. Van Diemen's Land.

Length $\frac{7}{10}$ to $\frac{8}{10}$ inch.

In my own collection and that of the British Museum.

This singular insect not having been hitherto figured I have thought it desirable to give a representation of it. Its remarkable eyes distinguish the genus at the first glance.

ORODERES, new Genus.

Head slightly produced in front, with the sides parallel. *Antennæ* not so long as the body, filiform; 1st joint robust, clavate; 2nd, small, rotundate; 3rd, as long as the first, subclavate, remainder somewhat shorter, sub-equal. *Thorax* elongate, cylindrical, armed near the thorax with a row of acute elevated tubercles. *Scutellum* triangular, minute. *Elytra* a little broader than thorax, not quite so long as the body, gaping at the suture and gradually tapering to a point. *Legs* short, rather robust. *Femora* subclavate.

A genus, having a general resemblance to the *Macrones* group, but essentially differing in the shape of the eyes, structure of antennæ, &c.

Oroderes humeralis. (Pl. I. fig. 3.)

Black, with a purplish metallic tint, except the elytra, which are orange at the base, and the abdomen, which has a bright steel blue tint. The first five joints of the antennæ are hairy, as well as the head and thorax; the latter are deeply punctate. Elytra hairy at the base, deeply and irregularly punctate-striate. Abdomen with the sides parallel, very shining. Legs hairy.

Hab. New South Wales.

Length $\frac{1}{2}$ inch.

In the collection of the British Museum.

HEPHÆSTION, Newman, Entomologist, p. 10, 1840.

Hephæstion ocreatus, Newman. Entomologist, loc. cit. (Pl. IV. fig. 5.)

Head, antennæ and thorax black, the latter armed with four spines set in a transverse row. Elytra bluish purple, smooth and shining. Abdomen rufous brown, with the apex above black. Legs yellow brown, with the tips of the femora, tibiæ and tarsi black.

In the collection of A. Melly, Esq.

Length $1\frac{4}{10}$ inch.

A large and beautiful species, received by Mr. Melly from Australia, but stated to be from the Island of Chiloe by Mr. Newman in the Entomologist.

BIMIA.

Bimia femoralis. (Plate IV. fig. 7.)

Yellow ochre, with the antennæ, eyes, a narrow line along the upper surface of the thorax, posterior legs and middle and anterior tibiæ and tarsi, black. Hairy. Face with a slight furrow down the centre. Thorax gibbous above, and spiny at the sides. Elytra broader than thorax, pointed, gaping at the suture. Legs robust, rather short.

Habitat New Holland.

Length $\frac{1}{10}$ inch.

In the collection of the Rev. J. W. Hope.

This species closely resembles the *Bimia bicolor* of White, in the Illustrated Proceedings of the Zoological Society, but will be found to differ in the narrow instead of broad, black, thoracical band, in the forehead being ochraceous instead of black, and in the middle femora having the same difference of colour.

AKIPTERA, N. G. (Ακτις πτερον).

Head slightly produced in front, with the sides parallel. Antennæ filiform, nearly twice the length of the body, 11-jointed. 1st joint robust, pyriform; 2nd, minute, rounded; 3rd, about as long as 1st; 4th to 11th longer than 3rd, gradually increasing in length, sub-clavate. Eyes reniform, clasping the base of the antennæ. Thorax transverse, armed on each side with a pointed

tubercle, and gibbous above. *Elytra* broader than thorax, about the length of the abdomen, gradually tapering to a point, and gaping at the suture. *Legs* robust, moderate in length.

Akiptera semiflava. (Plate IV. fig. 6.)

Head black, hairy, with a yellow patch. Antennæ black. Thorax hairy, dull orange, with the disk black. *Elytra* hairy, dull yellow, with the apical half black, marked with two elevated longitudinal ridges. *Legs* hairy; the anterior dull yellow, with the tips of the femora and tibiæ and tarsi black, middle and posterior black, the former having the tibiæ dull yellow, with the tips black.

From Australia.

Length $\frac{7.5}{100}$ inch.

In the collection of A. Melley, Esq.

Somewhat allied to Mr. Newman's genus *Brachytria*, but differing in the length and structure of the antennæ, and in other important characters.

BRACHYTRIA, Newman. (Annals, Nat. Hist. vol. v. p. 16.)

Brachytria gulosa, Newman, loc. cit. (Plate IV. fig. 3.)

Hairy, black, with the head and forepart of the thorax bright orange, and three large yellow spots forming a triangle on the elytra, pale yellow.

Hab. New Holland.

Length $\frac{6.5}{100}$ inch.

In the British Museum collection, and in my own cabinet.

This species varies much in its markings. The dorsal spot is sometimes wanting, and occasionally the three spots are united into one angular band of pale yellow.

THIRD DIVISION.

WINGS MUCH ABBREVIATED.

HESTHESIS, Newman.

Hesthesis ornata. (Plate I. fig. 1.)

Head pitchy black, with the face somewhat prolonged, and excavated longitudinally; the excavation having a large somewhat cordiform patch of bright yellow hairs in the centre. Antennæ dark chesnut brown, about as long as the body. Eyes large, subreniform, black brown. Thorax quadrato-rotundate, rather broader than long, black, narrowly margined in front, with a row of bright, yellow, short hairs, and with a small triangular patch of the same coloured hairs on the upper side, in the centre of the hinder margin. Elytra somewhat broader than thorax or abdomen: about one-third the length of the latter, quadrate and somewhat rounded on the outer margin; dark umber brown, with darker shoulders. Wings dusky brown, darker on the anterior margin. Abdomen black, with the first and fourth joints margined posteriorly with a bright yellow band of short adpressed hairs. Legs and tarsi dull chesnut brown.

Length $\frac{1}{2}$ inch.

In my own collection.

I have only seen one specimen of this interesting species of *Hesthesis*, which was collected by Mr. Horsley at Hunter's River, New South Wales. It is the smallest species of the genus with which I am acquainted; and is most nearly allied to a species called by Mr. Newman *variegatus*.

AGAPETE, Newman. (Zoologist, vol. iii. p. 1017.)

Agapete carissima, New. (Plate I. fig. 2.)

Head rufous brown, covered with short erect down, furrowed along the vertex and down the face. Palpi piceous, but little projecting. Antennæ black, 12-jointed, somewhat longer than the body. 1st joint shortish, somewhat clavate, robust; 2nd

nearly orbicular; 3rd, about as long as the 1st, clavate; 4th, shorter than 3rd, of the same shape; 5th, as long as the 2nd, 3rd and 4th joints combined, cylindrical, the remainder same shape, but gradually diminishing in length. Eyes black, round, placed below the base of the antennæ, with a narrow offset projecting round the base of the antennæ posteriorly. Thorax rufous brown, quadrate, somewhat gibbous at the sides, covered with short, erect down. Elytra not attaining half the length of the abdomen, broad at the base, and then suddenly contracting into a long spatulate point, pitchy brown, with a whitish-brown semitransparent vitta running along the length of each. Wings somewhat longer than the abdomen, dark smoky brown. Post-thorax black, the sides covered with pale, yellowish, silky hairs. Abdomen above pale dull rufous brown at the base; the apical joints black brown; beneath of the same colour, with the 1st, 2nd and 3rd segments broadly margined with a band of pale yellowish silky hairs. Legs and tarsi black.

Hab. Hunter's River.

Length $\frac{9}{16}$ inch.

In my own collection.

Mr. Newman was the first to describe this remarkable *Longicorn* in the *Zoologist*, but no figure of it has yet appeared. I have seen two specimens, both taken by Mr. Horsley, at Hunter's River, New South Wales; and up to the present time it is very rare in collections. The singular conformation of the antennæ, this organ being 12-jointed, immediately distinguishes the genus from others of the *Molorchidæ*.

XII. *On Ornix Meleagripennella and its Allies; a Group of Lepidoptera, Family Tineidæ. By H. T. STAINTON, Esq.*

TILL the appearance of the second volume of the Linnæa Entomologica, in which Herr Zeller described *Ornix anguliferella*, I believe there was no suspicion that with *Meleagripennella* were confounded several very closely allied species. Haworth, it is true, had in his "Lepidoptera Britannica," described at p. 532 *Gracillaria nebulæ*—" *alis anticis cinereis, nebulis magnis nigris, costa fasciis nigris, strigis albidis interrupta,*" which is manifestly one of this group; and at p. 578 he has *Tinea meleagripennella*—" *alis cinereis apice punctulo ocellari atro,*" which he places after *Cramerella*, observing "*præcedente minor et angustior;*" but it appears to have been known to him from only a single specimen, and as little information is to be gained from his description, and he does not attempt to compare it with his *Nebulea*, we may safely consider that Haworth was acquainted with this group only under the name of *Nebulea*. Mr. Stephens has certainly two descriptions in his Illustrations, vol. iv. p. 364, applicable to this group, viz. *Nebulea* and *Meleagripennella*; but these species are not compared with each other, and there is nothing to identify them with any species with certainty. His *Nebulea* may have been either the *Meleagripennella* or the *Anglicella* of this paper, and his *Meleagripennella* may have been either the *Anglicella* or the *Torquillella* of this paper. Hübner's figure of *Meleagripennella* No. 189, is much too coarse to be identified with any species. Treitschke's description of *Meleagripennella*, vol. ix. 2, p. 209, and Duponchel's, supp. vol. iv. p. 467, pl. 86, f. 4, are both unsatisfactory and are not sufficiently precise to be identified with any of the species I am about to enumerate. I have now brought the history of the literature of this group up to the appearance in 1847 of Zeller's Monograph, in the second volume of the Linnæa Entomologica, where we are first informed that there is a species very closely allied to *Meleagripennella*. The mere statement of this fact, having had the effect of causing Entomologists to examine their specimens in order to try and detect *Anguliferella* lurking in their collections, has resulted in the discovery of at least six additional species. In my monograph of *Argyromiges*, in the Zoologist, I described at p. 2162 one of this group, under the

name of *Loganella*. The specimen from which this description was made being destitute of cilia, I was at that time not at all aware of its relationship, but in my Catalogue it appears in its proper place, p. 23, after *Meleagripenella*. In the May number of the *Entomologische Zeitung*, of the present year, Zeller describes two new species of this group, p. 161, under the names of *Torquillella* and *Finitimella*. *Ampliatella*, the very beautiful new species discovered last year by Herr Mann, at Fiume, will probably be described in the Publications of the Imperial Academy of Vienna; but the knowledge that it is there described will be small consolation to Entomologists, to whom such a work is almost unattainable. It is a great pity but that Herr Mann had sent his descriptions of new species to the Stettin Society, to appear in its widely-circulated *Zeitung*.

I briefly recapitulate the generic characters, as given by Zeller in the *Linnæa*.

ORNIX (Tr.), Z.

Caput lanatum. Palpi labiales squamis appressis, fasciculo pilorum nullo.

Readily distinguished from the genera, *Gracilaria* and *Coriscium*, by the woolly head, by the labial palpi being destitute of a tuft of hairs, and by the broader anterior wings.

In their general appearance and mode of sitting, the insects are at once recognised as allied to *Gracilaria*.

Treitschke's observations on the larva and pupa (which were communicated to him by Fischer-von-Röslerstamm) appear to me most appropriately appended here, since we are at present unable to attach them to any one species, though future observations may enable us to do so. "The fourteen-footed larva feeds in September in the united leaves, or the turned-down edges of leaves, and certainly always on the underside, of mountain ash, blackthorn, and birch. It is yellow-green, almost transparent, with hardly perceptible little warts of the same colour. The head likewise, with brown spots on the sides. The similarly coloured thorax has two stronger, and two fainter brown spots. The claws are brown, spotted.

"At the end of September or in October it shuts itself up in its habitation, for which purpose it weaves therein a narrower and firm brownish case. Before winter it changes into a thin, very long pupa, which is at first yellow, and afterwards becomes grey-brown, and has long leg and tongue sheaths reaching beyond the anus."

The following is my arrangement of the species :—

A. With the palpi spotted.

α. The last joint of the palpi with a dark spot underneath.

1. *Meleagripennella*. Anterior wings pale grey; no white line along the hinder margin.
 2. *Devoniella*. Anterior wings ochreous.
 3. *Anguliferella*. Anterior wings grey, with a white line along the hinder margin.
 5. *Loganella*. Anterior wings black.
- β. The last joint of the palpi encompassed with a broad black-brown ring interrupted on the upper side.
4. *Finitimella*.
 - c. The last joint of the palpi encompassed by a broad uninterrupted black-brown ring.
 6. *Anglicella*.

B. With the palpi entirely white.

α. Face grey.

7. *Torquillella*.

β. Face white.

8. *Scoticella*. Anterior wings grey, with the base and inner margin whitish.
9. *Ampliatella*. The ground colour of the basal half of the anterior wings white.

Of these nine species, three have not yet been discovered in Britain; viz. *Anguliferella*, *Finitimella* and *Ampliatella*; two, *Meleagripennella* and *Torquillella*, are common to this country and the continent; and four, *Devoniella*, *Loganella*, *Anglicella* and *Scoticella*, are exclusively British, not having yet been discovered on the continent.

Sp. 1. *Meleagripennella*, Zeller.

Alis anticis pallidè fusco-cinereis, dorso albido farinato, costæ strigulis numerosis albidis, ciliis externe fusco-cinctis, puncto atro apicali nullo.

Meleagripennella, Z. (Linnæa Entomologica, vol. ii. p. 374.)

Distinguished from its allies by the *pale grey* anterior wings having *no* strongly marked *black spot* at the apex.

Head and thorax whitish grey, with some brown hairs inter-

mixed; face white; antennæ white, annulated with brownish; palpi white, with a greyish spot on the under side of the terminal joint; the four anterior legs brownish, spotted with white, tarsi white, with brown ends to the joints; hind legs dirty yellowish-grey, tarsi brownish, with the basis of the joints whitish.

Anterior wings five times as long as broad, pale grey, intermixed with white, especially along the inner margin; along the costa are numerous oblique white streaks, those nearest the apex gradually become longer and less oblique, the five last are much more distinct than those which precede; in the fold of the wing, beyond the middle, is a darker brown spot, and another near the anal angle; at the apex of the wing is a dark ocellus-like spot (not nearly so dark as in the following species); cilia whitish, with a curved dark line from the apex to the inner margin, followed by a second line beyond it, but only corresponding to the lower half of the first line.

Posterior wings six times as long as broad, gradually pointed, grey, with paler cilia.

This species will, probably, eventually prove common; but at present it is a scarce species with us. I have once or twice taken it at Lewisham, but more frequently at West Wickham Wood. It is not improbable that it is a birch feeder. It is, probably, often overlooked as a pale specimen of our commonest species *Anglicella*. It occurs in many parts of the Continent; but whether all the localities given by Zeller for this species really belong to it, individually, is very questionable.

Sp. 2. *Devoniella*, n. sp.

Alis anticis ochraceis, dorso albido farinata, costæ strigulis numerosis indistinctis albidis, ciliis-externe ochraceo-cinctis, puncto apicale atro.

Readily distinguished from any of its known congeners by its ochre-coloured anterior wings. A further point of distinction between it and the preceding species is the deep black apical spot.

Head and thorax whitish, with some ochreous hairs intermixed; face white; antennæ white, annulated with pale grey; palpi white, with a faint appearance of a dark spot on the under side of the terminal joint; the four anterior legs ochreous, spotted with whitish, tarsi whitish, the ends of the joints ochreous; hind legs dirty ochreous, tarsi dirty ochreous, with the bases of the joints whitish.

Anterior wings five times as long as broad, ochreous, intermixed with white, especially along the inner margin; along the costa are numerous indistinct, short white streaks, towards the apex they become longer and more distinct; in the fold of the wing, beyond the middle, is a spot of darker ochre; at the apex is a distinct deep-brown or black ocellated spot; cilia whitish, with a curved ochreous line from the apex to the inner margin.*

Posterior wings six times as long as broad, pale grey, with ochreous cilia.

Of this beautifully distinct species I took a single specimen on the 1st of May, 1850, in a lane near Dawlish, in Devonshire. I beat it out of a hedge in which there was a great deal of birch, but also bramble, willow, hornbeam and honeysuckle. I beat the same hedge most assiduously the whole of the next day, but without having the good fortune to meet with another specimen.

Sp. 3. *Anguliferella*, Zeller.

Alis anticis cinereis, dorso albedo farinato, costæ strigulis numerosis albidis, linea albida ab angulo anale ad apicem, ciliis externe bis fusco-cinctis.

Anguliferella, Zeller. (Linnæa Entomologica, vol. ii. p. 377; (Z. Ent. Zeitung, 1850, p. 162.)

Best distinguished from all the allied species, by the whitish line which runs along the hinder margin, from the anal angle to near the apex.

Head and thorax whitish-grey, with some darker hairs intermixed; face white; antennæ white, annulated with brownish-grey; *palpi white, with a blackish spot on the under side of the terminal joint*; the four anterior legs grey, spotted with white, the tarsi white, with the end of the joints dark brownish-grey; hind legs whitish, spotted with grey, tarsi brownish-grey, with the bases of the joints whitish.

Anterior wings four times as long as broad, pale grey, intermixed with white, especially along the inner margin; along the costa are numerous short white streaks, the five last being much the most distinct, and longer than the others; the fifth from the

* I believe this should be followed by a second outer line, at the lower half of the cilia, as in the preceding species; but my specimen is a little rubbed at the extreme tips of the cilia.

apex is produced towards the apex of the wing, and there meets the hinder marginal white line, forming with it an acute angle (hence the name); on the fold of the wing are two dark spots, one before the middle, the other a little beyond; at the apex of the wing is a dark ocellus-like spot; cilia whitish, with two complete curved dark lines from the apex to the inner margin.

Posterior wings five times as broad as long, blunter than in the two preceding species, grey, with paler cilia.

Of this species I have not yet seen a British specimen; the specimen I have described was sent me by Herr Zeller, who states in the *Zeitung* that the species occurs "in a small garden at Breslau, not scarce on orchard trees."

Sp. 4. *Finitimella*, Zeller.

"Minor, alis anticis fusco-cinereis, glaucescentibus, costa albido-strigulata, ciliis apicis obtusis externe fuscocinctis, epistomio fusciscenti, palpis albidis, annulo articuli ultimi lato fusco." *Ent. Ztg.* 1850, p. 162.

"Even smaller than *Meleagripennella*; its anterior wings are darker, with the violet gloss of *Torquillella*, and with smaller, fainter costal streaks; the cilia of the apex of the wing have the complete brown double encompassing-line as in *Torquillella*; face brownish-grey; the whitish palpi have the terminal joint encompassed at the base with a broad black-brown ring, interrupted on the upper side." *Z. l. c.*

I have never yet seen a British specimen of this insect, and having only a bad foreign specimen, unfit for description, I have been obliged to copy Zeller's description in the *Entomologische Zeitung*, in order to make this memoir as complete as possible. Zeller says it occurs "at Glogau (a fine male on the 25th July) and at Jena."

Sp. 5. *Loganella*, Stainton.

Alis anticis atris, dorso maculis duabus albis, costa albo-strigulata, ciliis fuscis.

Loganella, Stainton, *Zoologist*, 1848, p. 2162.*

Not likely to be confounded with any of its congeners.

* The figure there shown, Pl. 3, f. 37, is very bad, and hardly gives an idea of the insect.

Head greyish, with some brown hairs intermixed; face brownish; antennæ dark grey, with paler annulations; *palpi white, with a faint appearance of a dark spot on the under side of the terminal joint*; thorax black, with a few whitish scales; legs dark grey; the four anterior tarsi white, with the ends of the joints dark grey; the posterior tarsi dirty ochreous.

Anterior wings five times as long as broad, very dark grey or black, not irrorated with whitish, as in the allied species, the white marks are few in number, and from the contrast of colour, stand out very prominently; on the inner margin, towards the base, are a few white scales; about the middle of the inner margin is an oblong white spot, and a little beyond the middle of the inner margin is another smaller white spot, followed by a few white scales at the anal angle; along the costa are several short white streaks, of which the four nearest the apex are the most distinct, the fourth from the apex is connected by white scales with the second inner-marginal spot, thus forming, as it were, a white fascia; the apical streak is continued round the black ocellated spot to the hinder margin; cilia at the apex whitish, surrounded by a black curved line; cilia at the anal angle dark grey.

Posterior wings five times as long as broad, grey with paler cilia.

This species was discovered by Mr. R. F. Logan (after whom I have named it); he took a single specimen off a hazel bush near Luss, in Dumbartonshire, on the evening of the 5th of July, 1847; this remained unique till this year, when a second specimen was taken by Mr. Jobson, at Kilmun, about the middle of June.

This species appears to form a connecting link between this group and *Guttea*.

Sp. 6. *Anglicella*, n. sp.

Alis anticis cinereis, dorso albido farinato, costa albido-strigulata, ciliis externe bis fusco-cinctis; palpis albis, articulo tertio annulo lato fusco.

Nebulea, Haw.?

Meleagripennella, St.?

Distinguished from *Meleagripennella* by the much darker anterior wings, and from *Torquillella* and *Scoticella* by the broad black ring on the terminal joint of the palpi.

Head whitish grey, with some ochreous, and dark grey hairs on the crown of the head; face grey; antennæ whitish, annulated with dark grey; *palpi white, the terminal joint with a broad dark grey or black ring, leaving only its base and apex white*; thorax whitish-grey, with some dark grey scales; the four anterior legs dark grey, spotted with whitish, tarsi white, with the ends of the joints dark grey; hind legs dirty brownish ochre, tarsi rather darker, with the bases of the joints paler.

Anterior wings five times as long as broad, dark grey intermixed with white, especially along the inner margin; along the costa are numerous short white streaks, those towards the apex being most distinctly marked, and the apical one is continued round the ocellated apical black spot, to the hinder margin; in the fold of the wing are two distinct oblong black spots, one before, the other beyond the middle, and between this latter and the apex of the wing is a smaller black spot, bounded externally by a whitish mark, which appears to form a continuation of the costal streak situated the fifth from the apex; cilia whitish, with a complete curved black line from the apex to the inner margin, followed by a second almost as complete, but slightly interrupted at the extreme apex.

Posterior wings six times as long as broad, pale grey, with paler cilia.

By far the commonest species of the group in the south of England; at Lewisham it swarms in every hedge in May, and again in July. I have sent specimens of it to Herr Zeller, who pronounces it quite new to him.

Sp. 7. *Torquillella*, Zeller.

Alis anticis cinereis, glaucescentibus, dorso albido farinato, costa albido-strigulata, ciliis externe fusco-cinctis; palpis albis, immaculatis; epistomio cinereo.

Torquillella, Zeller, *Entomologische Zeitung*, 1850, p. 161.

Distinguished from all the preceding species by the white palpi being entirely unspotted, and from *Scoticella* by the darker face, darker base of the anterior wings, and less sharply defined markings on the anterior wings.

Head ochreous grey, with some darker hairs intermixed; face grey; antennæ dark grey, with paler annulations; *palpi entirely white*; thorax whitish grey, with some darker scales; the four

anterior legs dark grey, spotted with whitish, tarsi white, with the ends of the joints dark grey; hind legs dirty brownish, tarsi pale, with the ends of the joints darker.

Anterior wings five times as long as broad, dark grey with a purple gloss, with the inner margin whitish, and with several short whitish streaks along the costa, the fifth before the apex being continued obliquely across the wing towards the anal angle, and the apical streak continued round the ocellated black spot, to the hinder margin; in the fold of the wing are two oblong black spots, one before, the other beyond, the middle, and between this latter and the continuation of the costal streak, which is fifth from the apex, is a smaller black spot; cilia whitish, with two complete curved dark lines from the apex to the inner margin.

Posterior wings six times as long as broad; pale grey, with paler cilia.

This species appears rather partial to the chalk here. I have taken it at Sanderstead in May, and at Mickleham in July. It has been taken in Italy by Herr Mann, near Florence, Pisa and Leghorn, "everywhere abundant on blackthorn." Zeller states that it also "occurs near Vienna and Jena."

Sp. 8. *Scoticella*, n. sp.

Alis anticis nigro-cinereis, basi dorsoque albedo farinato, costa albo-strigulata, ciliis apicis externe bis fusco-cinctis, palpis albis immaculatis; epistomio albedo.

Resembles *Torquillella* in having unspotted white palpi, but readily distinguished from that species by the paler face, paler base, and whiter markings of the anterior wings.

Head white, with a few grey hairs on the crown; face white; antennæ dark grey, with paler annulations; palpi white, unspotted; thorax white, intermixed with grey; the four anterior legs dark grey, spotted with white, tarsi white, with the ends of the joints dark grey; hind legs dirty brownish grey, tarsi the same, with the bases of the joints paler.

Anterior wings five times as long as broad, dark grey, with the base and inner margin copiously sprinkled with whitish; along the costa are numerous short white streaks, the fifth before the apex being continued towards the anal angle, and the apical one being continued round the apical black spot to the hinder margin; in the fold of the wing are two deep black oblong spots, one before and the other beyond the middle (the third spot is lost in the dark

ground colour of the apical portion of the wing); cilia greyish, with two complete curved dark lines from the apex to the inner margin.

Posterior wings six times as long as broad, rather pointed, grey, with paler cilia.

I had the good fortune to discover this species in Torwood, in June, 1849, in considerable plenty; the insects, when alive, have a greenish appearance (which they entirely lose after death); I was thus struck with them at the time, but only suspected it to be a northern variety. In September, 1849, I collected a number of small larvæ in this locality, and in June of this year I had the pleasure of breeding a specimen of the insect from one of these larvæ found on mountain ash. I have never met with it in any other locality, and the species has not yet been detected on the continent.

Sp. 9. *Ampliatella*, Mann.

Alis anticis albidis, cinereo-irroratis, apicem versus suffusis, costa nigro-strigulata, maculis nigris tribus in disco; ciliis apicis externe bis fusco-cinctis; palpis albis immaculatis; epistomio albo.

Ampliatella, Mann in litt.

Known at once from all its congeners by the general whiteness of the anterior wings.

Head white, with a few grey hairs; face white; antennæ grey, with paler annulations; *palpi white, unspotted*; thorax white, intermixed with grey; the four anterior legs dark grey, spotted with white, the tarsi white, with the ends of the joints blackish; hind legs dirty greyish white, tarsi the same, with the ends of the joints darker.

Anterior wings four times as long as broad, white, irrorated with grey; along the costa are numerous short black streaks, which, by their union, form a dark grey patch at the apex of the wing, where accordingly the ground colour seems reversed, the markings at the apex appearing white on a dark ground, whereas in the remaining portion of the wing the markings appear dark on a white ground; the apical white costal streak is continued round the ocellated black spot to the hinder margin; in the fold of the wing are two conspicuous oblong black spots, one before and the other beyond the middle; the third spot occupies its usual place, but is not as conspicuous as the other two; cilia whitish, with two

complete curved dark lines from the apex of the wing to the inner margin.

Posterior wings five times as long as broad, grey, with paler cilia.

This very beautiful species was discovered last year in Croatia by Herr Mann, of Vienna; of its food and time of appearance I know nothing. It appears to form a connecting link between this group and *Caudulatella*.

I have not thought proper to extend this paper to a Monograph of the entire genus *Ornix*, the species allied to *Meleagripennella* form such a very distinct group, and at present we only know of one other British species in the genus, *Guttea*. On the continent two other species are known; one *Cælatella*, Zeller (Linn. Ent. vol. ii. p. 585), somewhat allied to *Guttea*, with silvery white markings along the costa; the other, *Caudulatella*, somewhat resembling *Ampliatella*, but with a black hook in the apical cilia. It is by no means improbable that *Guttea* and *Caudulatella* may both form centres of groups of species, as is the case with *Meleagripennella*, and I would therefore advise collectors to keep a sharp eye to any aberrant specimens of these species, besides bearing in mind, that the allies of *Meleagripennella* I have here enumerated are probably not the whole number of these species, and that many allied species may yet have to be discovered.

XIII. *Descriptions of New Butterflies, with Drawings, also Remarks on the Sexes of some Papilios.* By
W. C. HEWITSON, Esq.

[Read December 2nd, 1850.]

MANY of the true *Papilios*, which now bear separate names, will, I believe, if better known, prove to be only sexually and not specifically distinct.

In the great group of South American *Papilios*, known by their colouring of black, red and white, several females hitherto described as species have been mated with their proper males by Messrs. Bates and Wallace.

Pap. Tullus proves to be the female of *P. Sesostris*; and *P. Hippason* and *Vertumnus* are accompanied by similar females, all of which will be better explained on the return of those gentlemen to England.

Pap. Proteus and *Arcas*, both from Venezuela, are male and female, and I have not the least doubt myself that the four butterflies which have up to the present time been considered as distinct, *P. Licophron*, *P. Thersites*, *P. Pirithous* and *P. Acamas*, are only the opposite sexes of two species, and will stand thus:

Papilio Licophron, Boisd. Sp. Gen. n. 194.

♀ *P. Pirithous*, Boisd. Sp. Gen. n. 201.

Papilio Thersites, Fab. Boisd. Sp. Gen. n. 195.

♀ *P. Acamas*, Fab. Boisd. Sp. Gen. n. 203.

P. Licophron and *Pirithous* are both Brazilian.

P. Thersites and *Acamas* are from Jamaica.

Doubleday's *P. Pallas*, which differs but slightly from *Licophron* in the breadth of yellow and position of the lunules of the posterior wing, will no doubt find its female in Boisduval's *P. Cebalus*, which I have not seen, but which, he says, only differs from *P. Pirithous* in the same particulars. *P. Mentor* will most likely have also a dark female.

These butterflies, much as the sexes are unlike each other in colour, are not more so than the male and female of *Polycaon*.

Fam. PAPILIONIDÆ.

Genus PAPILIO.

Papilio Bolivar. (Pl. X. fig. 2.)

UPPER SIDE of a deep uniform black. Anterior wing with an irregular patch of bright silvery green, extending from the inner

margin to the first median nervule; nearer to the base than the outer margin.

Posterior wing with a rather large rounded patch of dark crimson, which, occupying the lower half of the cell, and extending beyond it, is cut into five unequal portions by the nervures; the outer margin with very distinct white lunules.

UNDER SIDE lighter than above, of a uniform black, except the marginal lunules, and a band of white, slightly tinted with red, which does not occupy the same position as the crimson patch above, but is placed half-way between the end of the cell, and the outer margin, and extends, from the abdominal fold where it is widest, more than half-way across the wing, cut into four unequal portions by the nervures; the outer portion clouded and indistinct. Expan. $3\frac{3}{10}$ inch.

This species is most nearly allied to *P. Vertumnus*. The green patch is much more beautiful, and the red one without its iridescence; and though in a different position above, occupies nearly the same below.

It is in my own collection, and was captured by Mr. Bates on the Amazon.

Papilio Columbus. (Pl. X. fig. 1.)

UPPER SIDE cream colour, the outer margin of the wings and a large space at the apex of the anterior one black, the posterior wing dentated, with a narrow linear tail of moderate length.

Anterior wing with the costa at the base bordered with black, and forming part of a triangular belt of black, which crosses the middle of the cell at the costa and at right angles with it; just beyond the end of the cell upon the black is a short line of white.

On the posterior wing the black margin is marked with several irregular white spots, and from its inner margin rise three upright lines of black, which are crossed at their points by another line of black, one end of which runs to the middle of the upper margin of the wing, the other is joined to a black spot, which occupies the anal angle, and encircles a lunular spot of scarlet.

UNDER SIDE does not differ from above, except that the margin of the anterior wing, and the adjoining part of that of the posterior wing, are lighter; that the black lines on the posterior wing are more distinct, and that some of the nervures are also black. Expan. $3\frac{3}{10}$ inch.

In my own collection from the river Amazon.

This species is nearly allied to *P. Dolicaon*.

Fam. PIERIDÆ.

Genus LEPTALIS, Dalman.

Leptalis Acræoides. (Pl. XI. fig. 1.)

UPPER SIDE. Anterior wing dark brown, with three groups of spots. The first orange, oblong-triangular, commences in its acute point at the base of the wing, runs parallel to the median nervure, by which and its first nervule it is cut into three unequal parts. The second, which is yellow, tinged with orange, runs obliquely across the middle of the wing, from the costa to the second median nervule, and is divided into five unequal parts by the nervures. The third group, which is half-way between the last and the tip of the wing, runs in the same direction, and is composed of three distinct oval yellow spots.

Posterior wing orange, bordered by dark brown, and cut into numerous striæ by the nervures, and by parallel lines of brown, which run between each nervure.

UNDER SIDE differs only in being less distinct, the posterior wing being without the brown margin.

Expan. $2\frac{1}{8}$ inch.

In my own collection from Minas Geraes.

This is an exceedingly interesting species of *Leptalis*, and so nearly resembles *Acræa Thalia* in colour, that I have twice received it mixed with that species.

Fam. NYMPHALIDÆ.

Genus CALLITHEA, Boisduval.

Callithea Batesii. (Pl. XI. fig. 2.)

UPPER SIDE of a deep purple, the base of the wings of a brilliant orange, in a large rounded spot.

Anterior wing with the apex and outer margin of a shining green, widest at the tip.

Posterior wing with a submarginal line of the same colour.

UNDER SIDE of a brilliant silvery green.

Anterior wing with the basal spot of orange margined with black below the middle; half-way between it and the outer margin, and parallel to the margin, are four oval spots of deep black.

Posterior wing with the orange patch at the base larger than above, sinuated at its margin, with four rows of deep black spots of various shapes and sizes between it and the outer margin; the rows of seven or eight spots each, parallel to the margin and each other. Exp. $2\frac{3}{10}$ inch.

In my own collection, and that of Mr. Saunders, from the river Amazon.

This very beautiful genus was, until lately, represented in England by an imperfect specimen in the collection of the Entomological Society; and this must be my excuse for an unsatisfactory drawing in the "Diurnal Lepidoptera."

To Messrs. Bates and Wallace we are indebted, not only for a supply of the two species before known, but also for the beautiful unknown one now figured from the far distant and unexplored locality into which their enthusiasm has led them. It was first taken by Mr. Bates, and has, by common consent, been named after him.

Genus CATAGRAMMA, Boisduval.

Catagramma Astarte, female.

Papilio Astarte, Cramer; *Nymphalis Condomanus*, Godart.

(Pl. XI. fig. 3.)

I have figured this very beautiful butterfly as the female of Cramer's *Astarte*. It was sent home by Messrs. Bates and Wallace from the river Amazon, and was accompanied by specimens (males), which in no way differ from *Astarte*, except in being larger and more brilliant in colour.

The under side of the insect figured is exactly similar to that of *Astarte* in Cramer and *Condomanus* of Godart.

It is in my own collection, in which is also a very beautiful variety, having the orange of the wing replaced by rich yellow.

XIV. *On the British Species of the Genus Gelechia of Zeller.* By J. W. DOUGLAS, Esq. (Continued from page 68.)

[Read 6th Jan., 1851.]

Sp. 81. *Fraternella*, mihi.

Alæ anticæ latæ, obtusæ, griseo-fuscæ, puncto humerali, maculâ magnâ nigrâ ante medium, fasciâ posticâ interruptâ flavescenti internè nigro irregularitèr marginatâ; apice medio nigro, ciliis griseis. Alæ posticæ griseæ.

Expansion of wings $5\frac{1}{2}$ lines.

Head fuscous; face pale; palpi griseous, terminal joint black; antennæ annulated black and white. Anterior wings greyish-fuscous, broad in proportion to their length, and obtuse; a small humeral spot followed by a large black, somewhat linear blotch, reaching obliquely to the groove; beyond the middle the colour becomes nearly black on the costa and inferior margin, a somewhat rufous mark being in the centre, extending across the adjacent rather broad yellowish fascia; apex black, broadly bordered with the lighter colour of the wings, which extends through the cilia. Posterior wings griseous.

Taken by Mr. Stainton at Lewisham, in August, out of mixed hedges, in company with *G. contigua*.

From this species it may be distinguished by the absence of the continuous black costal blotch, and by wanting the rufous tinge on the inner margin of the anterior wings, which in *fraternella* are also shorter and more obtuse.

Differs from *G. vicinella* in the greater breadth and obtuseness of the anterior wings, in the inferior margin not being pale, and the posterior fascia being narrower.

Differs from *G. maculiferella*, in the larger size, more obtuse anterior wings, on which the large blotch is not angulated, the generally darker colour, and other minor characters.

It is perhaps more like *G. peliella* than any other; but may at once be known from that species by its smaller size, and having the end of the posterior fascia on the inner margin nearer the base of the wing than that on the anterior edge; whereas in *peliella*, the spots answering to the posterior fascia are reversely placed.

Sp. 82. *Vicinella*, mihi.

Alæ anticæ fuscæ, puncto basali, maculâ latâ costali ante, alterâ-que minori discoidali pone medium, atris, fasciâ posticâ latâ vix interruptâ albidâ. Alæ posticæ griseæ.

Expansion of wings 6 lines.

Head griseous; palpi griseous, terminal joint black; antennæ faintly annulated black and white. Anterior wings greyish fuscous, interior margin whitish, a basal spot, a large blotch reaching obliquely from the costa to the groove, before the middle, and a smaller central one beyond the middle, black; a broad whitish posterior fascia barely interrupted in the centre; apex fuscous, with a black spot in the centre; cilia griseous. Posterior wings and cilia griseous.

Two specimens in the cabinet of Mr. Stainton, taken by Mr. Jobson near Belfast.

Resembles *G. contigua*, but differs in the large black blotch of the anterior wings not being continued along the costa, in the presence of a second blotch beyond the middle, in the inferior margin being pale, not rufous, and in the breadth of the hinder fascia.

Differs from *G. fraternella* in the anterior wings being longer and more acute, in the first blotch being larger, in the posterior fascia being broader, and in having the inferior margin pale.

Sp. 83. *Maculiferella*,

* *G. maculiferella*, (F. v. R.), Mann. (MSS.)

Re. proxima, Haw. (non *Ti. proximella*, H.)

“Alæ anticæ griseæ, maculâ magnâ ante medium atrâ angulatâ, vel sinuatâ fasciæformi, à costâ fere ad marginem tenuiorem; et pone hanc nebulis aliquot atris.”—Haworth.

Expansion of wings 5 lines.

Head fuscous, face pale; antennæ annulated black and white; palpi griseous, terminal joint black. Anterior wings griseous or greyish-fuscous, paler at the base, near which is a small black spot; before the middle is a large, somewhat angulated blotch, the point of which reaches nearly to the inner margin; beyond the middle are two or three irregular black marks, and then a pale fascia; apex griseous with a black angular spot in the centre. Posterior wings and cilia griseous.

Found by Mr. Bentley on the trunks of poplars.

Haworth's specimen is in the collection of the Entomological Society.

Differs from *G. junctella* in the greater paleness of the base, in the angular form and larger size of the blotch before the middle, in the absence of the rufous patch beyond, in the slighter whitish fascia, and the broader margin of griseous to the apex.

Differs from *G. marmorea* in being less, in the paler base and darker inner margin, in the form and distinctness of the blotch before the middle, and in the dark colour not being continued along the costa.

Haworth places it next to *contigua* and *sequax*, and says, "Hæc et duæ præcedentes forte mera varietates sunt, sed characteribus valde diversis." I do not see so much resemblance to *sequax*; but it is more like *contigua*, from which it differs in being smaller, in the costal blotch being very different in form, not touching the costa in its whole length, but only at its origin; in the whitish hinder fascia not being expanded on the costa, and in the absence of a rufous tinge on the inner margin.

Sp. 84. *Junctella*, mihi.

Alæ anticæ griseo-albidæ, puncto humerali, fasciâ latâ abbreviatâ obliquâ ante, alterâ punctorum formâ pone medium, atris; tertiâque rectâ albidâ: apice atro. Alæ posticæ griseæ.

Expansion of wings $4\frac{1}{2}$ —5 lines.

Head shining bronze; palpi griseous, terminal joint black; antennæ annulated black and white. Anterior wings greyish-white, a black humeral spot, a thick black sub-linear fascia or blotch reaching obliquely to the groove, before the middle; beyond the centre an oblique row of black dots disposed as a slender fascia, joined to which and reaching to a whitish fascia which stretches quite across the wing, is an angular rufous blotch; apex black, bordered with griseous; cilia griseous. Posterior wings and cilia griseous.

Found by Mr. Bouchard in August on trunks of oaks, in company with *G. Hübneri*, to which species this bears considerable resemblance in the disposition of the markings; but the general darker colour and the nearly straight whitish fascia are so different that I cannot consider it identical therewith. There is also great resemblance to the preceding *G. maculiferella*, from which however it may be known at first sight by the first fascia or blotch

being linear, not angulated; the inner margin also is paler. From *G. marmorea* it differs in being slightly less, of a greyer colour, paler on the inner margin; the first fascia well defined, not merged in the ground colour; the whitish fascia being also well defined, and the apex of the wing darker.

Sp. 85. *Marmorea*.

Re. marmorea, Haw.

An. marmorea, St.

An. guttifera, Wood, 1216.

**G. Manniella* (F. v. R.), Z.

Expansion of wings 5 lines.

Head rufous; palpi, second joint griseous above, black beneath, terminal joint black. Thorax rufous. Anterior wings rufous, sometimes nearly black, with a darker, thick streak extending from the costa before the middle, and a blackish spot on the disk beyond, adjoining which is a slender yellowish fascia; the inner margin is pale rufous or ochreous to beyond the middle, extending upwards to the centre of the wing in the form of a double arch. Posterior wings griseous.

Found abundantly on the sand-hills at New Brighton, Cheshire, at Chesil Bank near Weymouth, and Dawlish Warren. There is not a tree of any kind near these places, and therefore I am inclined to think that, although it is taken on trunks of firs at Glogau and Frankfort, it only goes there for shelter. Neither can I concur in the opinion that *maculiferella* and *junctella* are only varieties; for among hundreds of specimens of *marmorea*, many of them most extraordinary variations, I never saw one that could be referred to either of those species; and all three are found by us in different localities and under different circumstances, as I have indicated under each.

Differs from *G. junctella* in being larger; anterior wings having the colour of the superior and inferior margins more distinct and meeting abruptly in the centre, the hinder fascia narrower and more obliquely placed; apex paler.

Differs from *G. maculiferella* in being larger, anterior wings browner, wanting the pale base and the large angulated blotch; in the entire costa being dark, and in having a well-defined, light inner margin.

These last five species, possessing characters very much in common, form a group not easily divisible, and difficult to iden-

tify if one be taken alone ; but when seen together and in quantity they seem to me, independently of the variation of time of appearance and the circumstances pertaining to different localities, to be naturally divisible into distinct species.

Sp. 86. *Basaltinella*.

G. Basaltinella, Z.

Re. domestica, var. β , Haw.

Head and thorax concolorous with the anterior wings ; palpi griseous, terminal joint black ; antennæ black, faintly annulated with white. Anterior wings ashy-fuscous, with an apical yellowish fascia, a spot at the base of the costa, and four black ones placed as in *G. domestica*, the two central ones being, as in that species, frequently confluent. Posterior wings griseous.

Several specimens taken by Mr. Bedell, last June, out of old thatch at Addington.

Under the head of *G. domestica* (vol. v. p. 198) I have without doubt given *G. Basaltinella* as a synonym, but an examination of recent specimens has led me to think with Herr Zeller that it is distinct. The whole insect is very much darker than *domestica*, although the size and markings are the same ; it agrees exactly with Haworth's var. β , which is preserved in the collection of the Entomological Society, and of which he observes, "Forte propria species."

Sp. 87. *Boreella*, mihi.

Alæ anticæ latae, obtusæ, griseo-fuscæ, punctis, tribus disco, atris, lineâ brevi medio, fasciâque posticâ acutè bi-angulatâ, albidis. Alæ posticæ griseæ.

Expansion of wings $6\frac{1}{2}$ lines.

Head and thorax concolorous with the anterior wings ; palpi of the same hue, terminal joint black ; antennæ black. Anterior wings broad, obtuse, grey-fuscous ; in the groove a black spot, another above and beyond, but both before the middle ; a third beyond the middle in a line with the second, from which it is divided by a linear whitish streak ; a posterior, narrow whitish fascia, acutely bi-angulated in the centre, beyond this the apex is darker than the rest of the wing, bordered on the hinder margin with a black line, and on the costa with black dots ; cilia griseous ; Posterior wings griseous.

A single specimen, taken by Mr. Stainton, 14th July, 1850, on boggy ground on the shores of the Holy Loch, Argyleshire.

Sp. 88. *Paupella*.*G. paupella*, Z. (Isis, 1847, p. 858).

“ Alis anterioribus albidis, lineis longitudinalibus fusco-marginatis, striga marginis postici latiore utrinque attenuata. Mas.”

“ Most closely allied to *G. inopella*, of which it almost appears to be merely an enlarged, sharper and yellower form of the South; however, its palpi are proportionably longer and the tongue is shorter. Head and thorax white; antennæ whitish, towards the apex more distinctly dark grey annulated; tongue (accidentally unrolled) only as long as the labial palpi; labial palpi recurved, three times as long as the head, thin, somewhat compressed, whitish, the last joint a little thinner than the second, shorter, pointed. Legs white, the first two pairs on the anterior side brown, the ends of the joints white; all the tibiæ covered with long hairs. The pale grey abdomen has a long white anal tuft. Anterior wings white; from the base a posteriorly pointed yellowish streak goes close to the costa, ceasing before the middle (in *inopella* the white costa is broader); under the middle of the wing is another longer, attenuated streak reaching further than this, three shorter ones on the disk, and a sixth on the hinder margin, broad, attenuated at both ends, but not touching the opposite margins; behind it the cilia are white and round, their apices are marked with two rows of brown scales running nearly parallel to the hinder margin, between them the ground colour is yellowish; the costa has at the base of the cilia five remote, brown spots; all the streaks are encompassed with scattered brown scales on their margins. Posterior wings very narrow, somewhat shining, pale grey, with rather long apex, before which the hinder margin is deeply and bluntly emarginated; cilia very long, yellowish-grey. Under side shining, pale grey, on the anterior wings darker; all the wings are paler on the disk.

“ One male I took near Syracuse in a flowery path through the moist meadow between the Anapo and the columns of Jupiter’s Temple, on the 19th of May.”—Z. loc. cit.

I have one specimen which I took flying at Folkestone in July, 1850, in a somewhat wasted condition, having only traces of the streaks, but which, nevertheless, Herr Zeller pronounces without doubt to be *paupella*, adding the remark, “ thus England has another species in common with Sicily.”

Sp. 89. *Cerealella*.

Alucita cerealella, Encycl. Méthod., Entom. tom. i. p. 121, No. 15.

Butalis cerealella, D. Supp. p. 444, pl. 85, fig. 3.

Æcophora granella, Latr.

**G. Pyrophagella*, Kollar in lit., Z. in lit.

Expansion of wings $6\frac{1}{2}$ lines.

Head pale ochreous; palpi concolorous, with the extreme tip fuscous; antennæ luteous. Anterior wings narrow, acute, deep ochreous or luteous, with brownish atoms at the apex and on the cilia. Posterior wings narrow, with long, acute apex, greyish, with a luteous tinge, especially on the cilia. Posterior legs and tarsi pale luteous.

I have one specimen taken by myself many years since, but I have no record of the locality.

In France this *Tinea* has proved very destructive to corn; wheat, barley and rye being indiscriminately attacked by it. Duponchel (*loc. cit.*), quoting from the Memoirs of Reaumur, Duhamel-Dumonceau and Tillet on its natural history, inform us that the female lays her eggs on the grains of these three kinds of corn before they are ripe. Six or seven days afterwards the caterpillars appear, being hardly as thick as a hair, and each one attacks a grain, introducing itself into it by a hole so small that it is not visible to the naked eye. Here it lives, taking care not to break the husk of the grain, so that the affected seeds cannot be distinguished from the sound except by putting into water, when the former swim and the latter sink. When arrived at perfection, the caterpillar, still within the grain that has afforded it food, spins a cocoon of white silk, having first taken the precaution to gnaw one of the ends in such a manner as to form a kind of operculum, which readily yields to the efforts of the moth to escape from its prison. This escape usually takes place after the corn is thrashed and laid up in granaries, but specimens sometimes appear before this is accomplished.

Several methods for preventing or diminishing the ravages of this *Tinea* have been suggested, the principal being exposure in machines to heat or carbonic gas. In the former it was found that corn would germinate after exposure to a temperature of 70 degrees, Reaumur, and that a higher temperature, 76 to 96 degrees, for a short period, was less effectual in accomplishing the destruction of the larvæ than a lower one, 45 to 50 degrees, continued for a longer time. In the other method the corn has been found not to be deteriorated for making bread, nor to have lost the power of germinating.

I am not aware that this insect, which appears to be a great pest in granaries in France, has been observed in similar places in this country, though from the ignorance of insects generally among those most immediately affected by their ravages, it may exist in plenty without having been distinguished from other moths whose larvæ feed on grain. My own is the only British specimen I have seen.

Sp. 90. *Nigritella*.

G. nigritella, Z. (Isis, 1847, p. 857.)

“Alis anterioribus fusco-nigris, guttalis duabus posticis oppositis pallidis obsoletis; posteriorum apice valdè producto; palporum articulo terminali longo; antennis fuscis. Mas.”

“Very near to *G. Coronillella*, and from it certainly distinguished by the narrow anterior wings and unicolorous brown (not pale-annulated) antennæ. A little larger than an ordinary male *Coronillella*; anterior wings narrow and more pointed, darker spots on the disk are not visible, except one with difficulty perceptible on the fold at the beginning of the last third; the two pale opposite spots are very small and faint, especially the lower one, which stands inwards, instead of, as in *Coronillella*, perpendicularly under the other. The pale, grey posterior wings have in the male sex a stronger, more prolonged apex, the emargination below it is much blunter, and the projecting part of the hinder margin, before the emargination, is not so convex. The entire underside is rather paler than in *Coronillella*. The antennæ in this latter are distinctly annulated brown and white, and have on the under side of the basal joint a white long streak; in *nigritella* they are quite unicolorous brown, on the under side of the basal joint whitish; in the palpi of both species the terminal joint is the longest, but in *Coronillella* it has on the outer and inner side a white long line, in *nigritella* it glitters on the entire inner side and also on the back, whitish, but nowise in a fine long line. Hinder tibiæ and tarsi are in *nigritella* more slender.”

“A single male, taken 3rd May near Messina, high on the southern slope of a mountain, among wild lupins.” Z. loc. cit.

A single specimen captured several years since, but of whose capture I have no record, has been submitted to Herr Zeller, who says that he has no hesitation in pronouncing it to be *nigritella*, although it differs from his specimen in having the terminal joint of the palpi shorter, the white on the back of the palpi in a more distinct line, and the traces of two opposite spots on the wings less evident.

XV. *Note on the British Species belonging to the Genus Acanthosoma, Curt.* By W. S. DALLAS, Esq., F.L.S.

[Read January 6th, 1851.]

THE genus *Acanthosoma*, established by Curtis in 1824, upon the *Cimex hæmorrhoidalis*, Linn., includes five European species, of which only four are found in this country. Notwithstanding the small extent of the genus, however, the synonymy of the species contained in it is by no means settled, and that of two of them in particular is in a very confused and unsatisfactory state; almost every author, in fact, who has had occasion to touch upon them, having departed more or less from all that had been previously published on the subject. Under these circumstances I have endeavoured, by careful examination and the inspection of the Linnæan cabinet, to arrive at some satisfactory conclusion on the subject, and I hope in the present paper to be able to set the matter on a more secure basis than it has hitherto occupied.

GENUS ACANTHOSOMA.

Cimex, p. Linné, De Geer, Fabricius, Schrank, Fallen.

Pentatoma, p. Latreille, Le Pelletier et Serville.

Acanthosoma, Curtis, Herrich-Schäffer, Burmeister, Amyot et Serville, Sahlberg.

Clinocoris, Hahn.

Head rather small, with the central lobe as long or longer than the lateral ones. Antennæ five-jointed. Rostrum slender, reaching the base of the abdomen. Membrane of the elytra with longitudinal nervures. Sternum with a large central keel, which is attached to the mesosternum, and projects forward nearly to the base of the head. Abdomen with a long spine at the base, which runs up at one side of the sternal keel. Scutellum triangular, with the sides nearly straight. Tarsi of two joints.

Amyot, in his "Entomologie Française," published in the "Annales de la Société Entomologique de France," having made use of characters drawn from the shape and proportionate size of the different parts of the external sexual organs, to assist in the determination of the species, some account of the structure of these parts may be acceptable to the British Entomologist, although the species present a sufficiency of obvious characters

to enable them to be easily distinguished from one another, without having recourse to any purely sexual character. The structure of the male organs, moreover, is very peculiar, and differs considerably from the form usually observed throughout the *Pentatomidæ*. This peculiarity consists principally in the great development of those organs which in other genera are concealed beneath the ordinary anal plate, which usually closes the aperture of the last ventral segment, but here becomes, as it were, a seventh abdominal segment, and the space thus left at the apex of the abdomen is occupied by the enlarged sub-internal organs above mentioned, of which the dorsal portion is frequently more or less produced on each side, and in some exotic species projects considerably beyond the apex of the body. The female organs consist, as in the other genera of the family, of five principal plates, namely, two basal (*pièces antérieures*, L. Duf., *pièces basilaires*, Amyot), divided from each other by a longitudinal suture, and occupying the central emargination of the last ventral segment,—two apical (*pièces postérieures*, L. Duf., *pièces dernières*, Amyot), forming the posterior and dorsal portion of the whole apparatus,—and two intermediate (*pièces intermédiaires*, L. Duf. and Amyot), which separate the basal from the apical plates, but do not meet in the centre, the small notch thus left being occupied by a small central plate, which is probably the apex of some internal organ.

A. Head pointed in front, central lobe projecting beyond the lateral. Margins of the abdomen scarcely projecting beyond the elytra, not variegated with black.

a. Basal joint of the antennæ projecting beyond the apex of the head.

Sp. 1. *Acanthosoma hæmorrhoidale*.

Cimex hæmorrhoidalis, Linn. F. S. 925 (1761), and S. N. i. 720, 35 (1767); De Geer, *Mém.* iii. 254, 3, pl. 14, fig. 7 (1773); Schr. *Enum. Ins.* 267, 515 (1781), and F. B. ii. 70, 1099 (1801); Fab. *E. S.* iv. 98, 76 (1794), and S. R. 160, 27 (1803); Don. *Brit. Ins.* vii. 5, pl. 218, fig. 2 (1798); Wolff, *Ic. Cim.* 10, tab. 1, fig. 10 (1800); Fall. *Mon. Cim.* 44, 3 (1807), and *Hem. Suec.* 23, 3 (1829).

Cimex pabulinus, Harris, *Exp. Eng. Ins.* 88, pl. 26, fig. 2 (1776).

Pentatoma hæmorrhoidalis, Le P. et Serv. *Enc.* x. 53, 1 (1825).

Acanthosoma hæmorrhoidale, Curtis, B. E. I. 28 (1824); H. Schöff. Nom. Ent. 57 and 94 (1835); Burm. Handb. ii. 360, 3 (1835); Am. et Serv. Hém. 154, 1 (1843); Kolen. Mel. Ent. iv. 58, 186 (1846).

Clinocoris hæmorrhoidalis, Hahn, Wanz. ii. 71, tab. 52, fig. 158 (1834).

Acanthosoma, Amyot, Ann. Soc. Ent. Fr. 2me. ser. iii. 456, 72 (1845).

Geoff. Ins. i. 465, 63.

Stoll. Pun. 31, pl. 6, fig. 44.

Above pale olive or brownish green, rather strongly punctured with black. Thorax with the posterior angles spinous, black and tinted with red. Membrane transparent, spotless. Body beneath and legs greenish, yellowish or orange red; anus red. Antennæ pale green or reddish brown, with the apex brown.

Length $7\frac{1}{2}$ lines.

This species is the largest in the genus. In the male the posterior margin of the anal plate is not denticulated. In the female the basal plates are smaller than the apical, and form a somewhat irregular circle with the intermediate plates; the intermediate plates are much smaller than the basal.

Sp. 2. *Acanthosoma dentatum*.

Cimex dentatus, De G. Mémoires. iii. 260, 7 (1773).

Cimex hæmagaster, Schrank, Enum. Ins. Aust. 270, 520 (1781).

Cimex collaris, Fab. S. R. 170, 83 (1803).

Pentatoma Stollii, Le P. et Serv. Enc. x. 53, 2 (1825).

Cimex lituratus, var. β . Fall. Hem. Suec. 24, 4 (1829).

Acanthosoma hæmagaster, H. Schöff. Nom. Ent. 57 and 94 (1835).

Acanthosoma hæmatogaster, Burm. Handb. ii. 360, 4 (1835); Kolen. Mel. Ent. iv. 59, 187 (1846); Sahlb. Geoc. Fenn. 32, 1 (1848).

Hæmatogaster, Amyot, Ann. Soc. Ent. Fr. 2me. ser. iii. 456, 73 (1845).

Stoll. Pun. 129, pl. 33, fig. 229.

Above pale olive green, rather finely punctured with black, with the inner and apical margins of the coriaceous portion of the elytra, the posterior margin of the thorax, and the base of the scutellum, more or less tinted with red. The lateral angles of the thorax are prominent, and there is a smooth, transverse band, generally of a yellow colour, close to the anterior margin of the thorax. Membrane transparent, with a large brown spot on the

outer margin about the middle. Body beneath and legs yellow; the apex, and sometimes the whole of the abdomen, is reddish. Antennæ yellowish, or greenish at the base, with the two apical joints brown. Length 6 lines.

In the male, the anal plate is large and distinctly denticulated on the posterior margin, where it also bears two strong brushes of hairs; in the female the basal plates are transverse, forming an irregular oval, and much larger than the apical; the intermediate plates are nearly as large as the apical and reach their posterior margin; the central plate is larger than in the other species, and appears to be divided longitudinally.

Amyot (Ann. Soc. Ent. Fr.) refers the *Cimexagathinus*, Fab. to this species, but it is evident both from the description given by Fabricius in the "Entomologia Systematica" and the figures quoted by him in the "Systema Ryngotorum," that the insect described is identical with *Cimex griseus*, Linn.

A specimen of this insect stands in the Linnæan collection with the name *Cimex interstinctus* attached to it. I am inclined to think, however, that it has been placed there by Linnæus in error, probably some time after the publication of his description of that insect, for it is impossible to make it agree in any respect with the characters given in the "Fauna Suecica." I have referred the *Cimex interstinctus*, as a synonym, to the *Cimex griseus*, with which Linnæus says it agrees in size, appearance and colour, differing only, in fact, in having the upper surface of the abdomen red, with the base black, instead of entirely black.

b. Basal joint of the antennæ not passing the apex of the head.

Sp. 3. *Acanthosoma lituratum*.

Cimex lituratus, Fab. E. S. iv. 114, 134 (1794), and S. R. 170, 84 (1803); Wolff, Ic. Cim. 14, tab. 2, fig. 14 (1800); Panz.

F. G. 40, 19; Fall. Mon. Cim. 44, 4 (1807), and Hem. Suec. 24, 4 (1829).

Acanthosoma picta, Newman, Ent. Mag. i. 287 (1833).

Acanthosoma lituratum, H. Schöff. Nom. Ent. 57 and 94 (1835); Kolen. Mel. Ent. iv. 60, 188 (1846).

Acanthosoma clypeata, Burm. Handb. ii. 361, 7 (1835).

Saranus, Amyot, Ann. Soc. Ent. Fr. 2me. ser. iii. 458, 75 (1845).

Above pale green, thickly and rather finely punctured, with a broad red band along the inner and apical margins of the coriaceous portion of the elytra, and sometimes a reddish band across the posterior portion of the thorax. The red portion of the

elytra and the base of the scutellum have some patches of black punctures. Membrane hyaline, with a brown spot near the middle of the base, and a brown band across near the middle. Body beneath and legs yellowish or pale green. Antennæ yellow, pale green or reddish, with the apex dusky. Length 5—6 lines.

In the male the anal plate is broadly emarginate at its apex, but not denticulated; in the female, the basal and intermediate plates form together a nearly perfect circle; the basal plates are larger than the apical, and these again larger than the intermediate.

B. Head rounded in front, lateral lobes as long as the central. Margins of the abdomen projecting beyond the elytra, variegated with black and orange.

Sp. 4. *Acanthosoma griseum*.

Cimex griseus, Linn. F. S. 926 (1761), and S. N. i. 721, 43 (1767).

Cimex interstinctus, Linn. F. S. 927 (1761), and S. N. i. 721, 44 (1767); Fab. E. S. iv. 116, 141 (1794), and S. R. 171, 88, (1803).

Cimex Betulæ, De G. Mém. iii. 261, 8, pl. 14, fig. 9 (1773).

Cimex agathinus, Fab. E. S. iv. 114, 133 (1794), and S. R. 170, 82 (1803); Fall. Mon. Cim. 45, 5 (1807), and Hem. Suec. 24, 5 (1829); Zett. Faun. Lapp. i. 464, 4 (1832), and Ins. Lapp. 260, 4 (1840).

Cimex achatinus, Wolff, Ic. Cim. 58, tab. 6, fig. 55 (1801).

Acanthosoma agathinum, H. Schöff. Cont. Panz, F. G. 114, 10, 11, and Nom. Ent. 57 and 94 (1835).

Acanthosoma grisea, Burm. Handb. ii. 360, 6 (1835); Sahlb. Geoc. Fenn. 33, 2 (1848).

Acanthosoma interstinctum, Kolen. Mel. Ent. iv. 61, 189 (1846).

Mearus, Amyot, Ann. Soc. Ent. Fr. 2me. ser. iii. 457, 74 (1845).

Above pale olive green, more or less clouded and variegated with red, thickly and rather strongly punctured with black; sometimes entirely of a pale brick red. Scutellum with a large blackish or dark brown triangular patch at its base. Membrane hyaline, more or less clouded with brown. Body beneath and legs pale yellow; stigmata black. Antennæ concolorous with the legs at the base, becoming brownish towards the apex, with the apical joint pitchy brown. Length 4 lines.

In the male the anal plate is very small and not denticulated on its apical margin; in the female the basal plates are semicircular and larger than the apical; the intermediate plates smallest.

This species varies greatly in colour, but is easily distinguished from the other species of the genus by the form of its head, and by its having the projecting margins of the abdomen banded with black and yellow or orange. The green specimens generally have a reddish band across the posterior margin of the thorax, and the coriaceous portion of the elytra more or less tinged with red; the brown clouds of the membrane are frequently very indistinct.

This species is evidently the true *Cimex griseus* of Linnæus, both according to his descriptions and the specimens preserved in his cabinet. Nevertheless the name has been applied by most authors since his time to the *Cimex punctipennis* of Illiger, an insect of much larger size belonging to the genus *Rhaphigaster*. This error has probably arisen, in a great measure, from the careless manner in which Fabricius has given the synonyms of his *C. griseus*; for he quotes as belonging to that species the *C. griseus* of Wolff and Panzer, which represent *Rhaphigaster punctipennis*, and also the *Cimex Betulæ* of De Geer, which agrees precisely with the true *C. griseus* of the Linnæan cabinet. This error has been to a certain extent rectified by Amyot in the "Annales de la Société Entomologique de France," where he quotes *Cimex griseus* Fab., Wolff and Panzer as synonyms of *Raphigaster punctipennis*, stating particularly that it is not the same insect as the *Cimex griseus*, Linn., but afterwards again quotes them in giving the synonymy of the present species.

I have placed the *Cimex interstinctus*, Linn., as a synonym of this species, although the insect to which that name is attached in the Linnæan cabinet is a specimen of *A. dentatum*; for Linnæus states particularly in the *Fauna Suecica* that the margins of the abdomen are banded with black, which is the case in no species except *A. griseum*. The description given by Linnæus in the above work agrees precisely with specimens of *A. griseum* in the British Museum collection, but cannot by any means be made to suit the insect to which the name is attached in his own.

XVI. On *Gracilaria*, a Genus of Tineidæ. By H. T. STAINTON, Esq.

[Read January 6th, 1851.]

THE genus *Gracilaria* forms a portion of an exceedingly natural group, the other genera included in the group being *Coriscium* (which differs from *Gracilaria* only in the palpi having a tuft beneath), and *Ornix* (which has the head rough). The whole of this group are readily recognized by their long filiform maxillary palpi, and by the thickness of the middle pair of tibiæ. The perfect insects when at rest have a peculiar mode of sitting, by which they may be at once known; they sit with their long narrow wings closed over the back, with the head raised, the body of the insect forming an angle of at least 30° with the surface on which it rests; the antennæ turned backwards, under or over the wings.

The essential characters of the genus *Gracilaria* are, head and face smooth; palpi thin, recurved, the terminal joint pointed; maxillary palpi long, thin and projecting; antennæ as long as the anterior wings, or nearly so, slender, not enlarged at the base; anterior wings long and narrow, with long cilia; posterior wings long and narrow, lanceolate, with long cilia; middle pair of tibiæ much thickened, with hairy scales.

The larvæ of all the species are probably, when young, leaf-miners, some continue always so; those of most of the species, on attaining a certain age, roll up portions of the leaf generally in the form of a cone; of this cone they mostly eat the inner surface, thus discolouring it, and betraying their habitation. Some species change to the pupa in the cone formed by the larva, but I doubt whether this is most frequently the case. The larva of *Auroguttella* leaves the cone, and rolls up a leaf of the plant on which it feeds (*Hypericum perforatum*) in the form of a cigar.

The genus *Gracilaria* may be divided into two sections, by the number of veins arising out of the discoidal cell. In Section A. there are nine veins, in Section B. only eight.

In order to assist young Entomologists easily to be able to name their species, I arrange the genus in the following form; but first I should observe that many of the species have a trigonal mark on the costa, extending nearly to the inner margin.

Note.—The species marked § have not yet been detected in this country.

Section A.

- a. With a distinct, paler, trigonal mark on the costa.
- * The trigonal mark reaches with its apex beyond the fold of the wing.
 - Sp. 1. *Franckella*. The base of the trigonal mark is prolonged along the costa towards the apex of the wing.
 - § Sp. 2. *Oneratella*. The base of the trigonal mark is not prolonged along the costa.
 - ** The trigonal mark does not reach beyond the fold of the wing, but its apex is prolonged posteriorly.
 - Sp. 3. *Stigmatella*.
- b. With a more or less distinctly margined, but hardly paler trigonal mark on the costa; the trigonal mark does not reach beyond the fold of the wing.
- Sp. 4. *Straminella*. Anterior wings straw colour.
 - Sp. 5. *Hemidactylella*. Anterior wings reddish ochreous; costal triangle paler.
 - Sp. 6. *Falconipennella*. Anterior wings reddish-grey-brown.
 - Sp. 7. *Semifascia*. Basal half of the costal triangle very conspicuously paler than the posterior half.
 - Sp. 8. *Populetorum*. Costal triangle *very indistinct*; a conspicuous black spot on the costa beyond the middle.
 - Sp. 9. *Inconstans*. Anterior wings rufous-ochreous, or rufous; costal triangle not paler than rest of the wing. (Most of the varieties of this species.)
- c. With no trigonal mark on the costa; anterior wings unicolorous, or spotted longitudinally.
- * Anterior wings rufous.
 - Sp. 9. *Inconstans*. Hinder femora pale yellowish. (A few varieties of this species.)
 - Sp. 10. *Elongella*. Hinder femora entirely brownish.
 - § Sp. 11. *Rufipennella*. Hinder femora with the base whitish; apex brownish-black.
 - ** Anterior wings bone colour, or pale yellowish.
 - Sp. 12. *Tringipennella*. Costal portion of the wing whiter.
 - § Sp. 13. *Limosella*. Costal portion of the wing not whiter.

d. Anterior wings with fasciaform markings.

Sp. 14. *Syringella*. Anterior wings brownish, with paler markings.

§ Sp. 15. *Simploniella*. Anterior wings snow-white, with pale yellow markings.

Section B.

† Anterior wings with no hook in the cilia.

a. Anterior wings with fasciaform markings.

Sp. 16. *Omissella*.

b. Anterior wings with paler inner margin, and faint spots on the costa.

§ Sp. 17. *Scalariella*. Head and palpi snow-white.

Sp. 18. *Phasianipennella*. Head and palpi yellowish-brown.

c. Anterior wings with four distinct spots, two on the costa, two on the inner margin.

* First costal spot not touching the costa, first dorsal spot extending to the base.

Sp. 19. *Auoguttella*.

** First costal spot touching the costa, first dorsal spot not extending to the base.

Sp. 20. *Quadruplella*. Spots narrow, and inclined obliquely.

§ Sp. 21. *Quadrisingella*. Spots broad, and placed perpendicularly.

d. Anterior wings with numerous silvery spots.

Sp. 22. *Ononidis*.

† † Anterior wings with a hook in the cilia.

a. Anterior wings golden, with four costal and three dorsal silvery spots, and a silvery basal line (as in *Lithocolletis*.)

§ Sp. 23. *Pavoniella*.

b. Anterior wings brownish, with the inner margin and 4—5 costal streaks snow-white.

§ Sp. 24. *Kollariella*.

I now proceed to describe these species in the order enumerated above. Of those species of which I have not been able sufficiently to examine specimens, I have translated the descriptions given by Zeller, in the *Linnæa Entomologica*. *Simploniella*, *Scalariella* and *Pavoniella* I have never seen.

I just say a few words here in defence of what many people will be apt to call unnecessarily wordy descriptions. It is easy

enough of two *known* species, however closely allied, by a very few words sufficiently to distinguish both; but a voluminous description is necessary to distinguish an insect from an allied species that *may not yet be known*; we can by no means foresee what character will be important as distinguishing two allied species, one of which has yet to be discovered; and it is only by a minute circumstantial description of all the parts of a species that we prevent doubts hereafter arising which of two very similar species it was that we intended by our description. Hence the great uselessness of nearly all descriptions of *Micro-Lepidoptera* made by most authors.

Section A.

Sp. 1. *Franckella*, Hübner. (Pl. XIV. fig. 10.)

Alis anticis rufis violaceo-nitidis, triangulo costali ad costam producto, dorsoque ad basim, flavis.

Franckella, Hüb. Tin. 379; Zell. Linn. Ent. ii. 314.

Thunbergella, Steph. Illust. iv. p. 366; Fabr. 3, 2, 326?

Hilaripennella, Tr. ix. 2, S. 196; x. 3, S. 297; Dup. xi. 583, pl. 511, fig. 1.

Swederella, Thun. M. N. Ac. Upsal. Part VI. p. 80 * figs. 1 and 2?

Var. b, ut a, sed *alis anticis saturatoribus, costa obsoletissimè fusco-punctata.*

Not to be confounded with any known species.

Expansion of the wings $5\frac{1}{2}$ —6 lines.

Head reddish brown, with a violet gloss; face pale yellow; palpi pale yellow, the terminal joint externally brown before the apex (in var. b, this joint is also brown on the upper side); antennæ pale yellow, with brown annulations; thorax pale yellow in the middle, reddish brown on the sides and in front; abdomen grey, beneath dirty white; the four anterior legs have the femora and tibiæ dark reddish brown, tarsi yellowish white; posterior legs, base of the femora whitish, apex dark brown, tibiæ at the base pale brown, towards the apex darker, tarsi dirty yellowish white.

Anterior wings bright rufous-brown, with a violet gloss; a little before the middle the costal triangle commences, it is pale yellow, and reaches beyond the fold of the wing, has no prolonged apex, but its base is prolonged on the costa to near the apex of the wing; a yellow triangular spot extends from the base along the

inner margin, it is broadest at the base, but continually decreases in breadth, terminating a little before the apex of the costal triangle; apical cilia reddish yellow; inner marginal cilia pale grey.

Posterior wings shining grey, with grey cilia.

In var. b, the yellow of the anterior wings is of a deeper colour than usual, and appears to shade off gradually into the red, instead of having sharply defined margins; and along the costa in the middle of the triangle are two *very faint* brownish spots.

Common among oaks in May, June and August. My specimen of var. b was taken on Dartford Heath fence, April 19th, 1848.

The objection to retaining the Fabrician name for this insect lies in the words "*Alæ posticæ auratæ*."

I certainly think this must be Thunberg's *Svederella* (under which name a specimen was sent by Bohemann to Zeller), and if so, the name *Franckella* must fall. I leave the matter in the hands of the next writer on this species.

Sp. 2. *Oneratella*, Zeller. (Pl. XIV. fig. 12.)

Alis anticis brunneo-rufis, postice flavido-mixtis, triangulo costæ stramineo, plicam superante.

Oneratella, Zel., Linn. Ent. ii. 317.

Not nearly allied to any other species of the genus; in the pale colour of the trigonal mark it resembles *Franckella*, but the form of the mark is quite different, not being prolonged along the costa.

Expansion of the wings 6 lines.

Head reddish brown; face pale straw-yellow; palpi pale yellow, the terminal joint brown before the apex; antennæ pale yellow, with dark brown annulations; thorax reddish brown, with a fine yellow line along the middle; abdomen brownish grey, beneath yellowish; the four anterior legs have the femora and tibiæ reddish-brown, the latter with a white spot on their middle, tarsi shining white at the ends of the joints, with a brown spot; posterior legs dirty, shining, reddish white, tarsi the same, with the ends of the joints darker.

Anterior wings reddish brown, the darkest parts are the margins of the costal triangle (especially that towards the base of the wing), and the inner margin towards the base; the costal triangle reaches beyond the fold of the wing, almost touching the inner margin, its hinder margin is slightly angulated, turning towards the base of the wing; it is pale straw yellow, and there are a few red-brown spots along the costa. At the base of the wing is a

small yellow streak, along the fold of the wing; the apical portion of the wing is varied with several small yellowish spots along the costa and inner margin; apical cilia are reddish brown, the inner marginal cilia grey.

Posterior wings grey, shining, with yellowish grey cilia.

Not yet detected in this country, and very rare on the Continent; it has only occurred near Glogau; and of its food and habits nothing is known.

Sp. 3. *Stigmatella*, Fabricius. (Pl. XIV. fig. 14.)

Alis anticis rufis, purpureo-nitidulis, triangulo costali exalbido, plicam tangente, apice suo postice producto.

Stigmatella, Fabr. Ent. Syst. 3, 2, 304; Schr. F. B. 2, 1, 106; Steph. Illust. iv. 366; Zel. Linn. Ent. ii. 319.

Upupæpennella, Hüb. Tin. 203; Tr. ix. 2, S. 195; x. 3, S. 217 & 279; Dup. xi. 602, pl. 311, f. 13.

Purpurea, Haw. L. B. 528; St. Ill. iv. 366.

Trigona, Haw. L. B. 529.

Var. b, alis anticis dilute ochraceis, circa triangulum fusciscentibus.

Ochracea, Haw. L. B. 528; St. Ill. iv. 366.

Readily distinguished from all its congeners by the posteriorly projecting apex of the costal triangle.

Expansion of the wings 6—6½ lines.

Head and face greyish red; palpi red brown, the inner side of the second joint and apex of the terminal joint yellowish; antennæ pale yellowish, with brown annulations; thorax greyish red; abdomen grey, beneath whitish; the four anterior legs have the femora and tibiæ reddish brown, tarsi whitish, the ends of the joints brown; the posterior legs have the base of the femora yellowish white, the apical half dark brown, tibiæ and tarsi dirty yellowish white, the ends of the joints darker.

Anterior wings reddish brown, darkest along the costa, paler along the inner margin and towards the hinder margin. The costal triangle is whitish, it is situated about the middle of the costa, and has its shortest side towards the base of the wing; the side opposite is longer, and slightly concave; the apex of the triangle, which reaches the fold of the wing (rarely crosses it), is produced obliquely towards the hinder margin of the wing. The costal triangle is more or less suffused with rufous in the middle, and on the costa itself are several fine red brown spots; apical cilia rufous, inner marginal cilia grey.

Posterior wings shining grey, with yellowish grey cilia.

In var. b, the anterior wings are very much paler than in the typical form of the insect, the ground colour being ochreous.

This species is by no means rare, but is generally only taken singly; it is widely distributed, occurring in most parts of Europe. Zeller thinks that it is double-brooded, but I do not feel confident on this point; the larva feeds on sallow, and curls up the end of the leaf so as to form a cone, of which it eats the inner cuticle; these cones are in September and October by no means scarce, and I have several times found the larvæ in them (more frequently they are empty). The perfect insect appears at the end of autumn, and hibernating is again to be met with in spring, when of course it is rather the worse for wear.

Sp. 4. *Stramineella*, n. sp. (Pl. XIV. fig. 9.)

Alis anticis stramineis, rufo-brunneo irroratis, triangulo costali rufo-brunneo marginato, non dilutiore.

Sulphurella, Wood, Ind. Ent. pl. 51, f. 1623 (non Haw. St.)

In the colour of the anterior wings this comes nearer to *Coriscium sulphurellum* than any other allied species; but its straw yellow, and not sulphur or lemon colour, and the dark margin of a costal triangle, sufficiently distinguish it, independently of the generic difference.

Expansion of the wings $6\frac{1}{2}$ lines.

Head and face pale straw yellow; palpi the same, the terminal joint externally rufous brown before the apex; antennæ pale yellow, with dark brown annulations; thorax straw colour; abdomen grey brown, beneath whitish; the four anterior legs have the femora and tibiæ dark rufous brown, tarsi yellowish, with the ends of the joints darker: the posterior legs have the tibiæ dirty whitish yellow at the base, and pale reddish brown at the apex, tarsi dirty yellowish, the ends of the joints darker.

Anterior wings pale straw colour, with numerous red brown scattered spots, of which the two most conspicuous form the margins of the usual costal triangle, which is concolourous with the rest of the wing; towards the apex the wing is suffused with reddish; apical cilia straw colour, mixed with reddish, inner marginal cilia grey.

Posterior wings shining grey, with grey cilia.

Of this species, which is totally unknown on the continent, I have two specimens, which were taken in Torwood, Stirlingshire, in September. Mr. Stephens has the specimen that was figured by Wood.

Sp. 5. *Hemidactylella*, W. V. (Pl. XIV. fig. 8.)

Palpis externe brunneo-rufis, apice albido; alis anticis fusco-rufis, triangulo costali dilutiore, costa fusco-punctata.

Hemidactylella, W. V. Hüb. Tin. 276; Zeller, Linn. Ent. ii. 326; Ent. Ztg. 1850, S. 160.

Hemidactylella, Fabr. 3, 2, 307?

Allied to *Falconipennella*, but smaller, broader winged, the anterior wings redder, and the inner margin unspotted. Some of the varieties of *inconstans* come very near *hemidactylella*, but the broader, shorter anterior wings, and more sharply defined basal margin of the costal spot, sufficiently distinguish the latter species.

Expansion of the wings $5\frac{1}{2}$ lines.

Head and face rufous ochreous; palpi reddish brown, on the upper side and at the apex whitish; antennæ annulated yellow and reddish brown; thorax reddish brown; abdomen grey, beneath whitish; the femora and tibiæ of the two first pair of legs reddish brown, tarsi reddish brown, with the bases of the joints whitish; posterior legs, apex of the coxæ and base of the femora dirty yellowish white, terminal half of the latter reddish brown, tibiæ and tarsi dirty yellowish grey, the ends of the joints faintly brownish.

Anterior wings dark ochreous, with reddish brown markings, the most conspicuous of which is that which borders the costal triangle towards the base; the costal triangle does not reach beyond the fold of the wing, and is distinctly paler than the rest of the wing, appearing more prominent from the darkness of its margins, that towards the hinder margin being, however, never so dark as that towards the base; a small dark blotch lies along the base of the inner margin; along the costa are several minute dark brown spots; the apical portion of the wing is marbled ochreous and reddish brown, the extreme apex just before the cilia being dark; cilia at the apex reddish ochreous, on the inner margin grey.

Posterior wings shining grey, with yellowish grey cilia.

With us a scarce species; it has been taken in Whittlebury Forest, in September, by Mr. Desvignes; and I am not aware of any other locality in this country. Zeller states that it flies near Vienna in July and September on maple, and Mann found it in Italy in May, also on maple.

Sp. 6. *Falconipennella*, Hübner.

Palpis externè fuscis, apice exalbido; alis anterioribus griseo-brunneis, triangulo costali dilutiore obsoleto, costa dorsoque fusco punctatis.

Falconipennella, Hüb. Tin. 317; Tr. ix. 2, S. 203; x. 3, S. 237; Zeller, Linn. Ent. 2, 323.

Nearest allied to *hemidactylella*, but the anterior wings are longer, narrower and darker, and the costal spots are generally more distinct. The inner margin beyond the middle has also some small brown spots, which in *hemidactylella* are entirely wanting.

Expansion of the wings 6—6½ lines.

Head and face greyish brown; palpi on the upper side dirty whitish, the terminal joint reddish brown (in all the three specimens I have before me; Zeller states in the Linn. Ent. that this joint is frequently entirely whitish on the upper side), the apex whitish, externally the palpi are entirely of a red brown, except the apex; antennæ annulated yellowish and red brown; thorax reddish, or greyish brown; abdomen dark grey, beneath white; the two first pair of legs have the femora and tibiæ reddish brown, the tarsi dirty yellowish, with the ends of the joints reddish brown; posterior legs, femora and tibiæ dirty yellowish white at their bases, and dirty brownish at the ends, tarsi dirty yellowish white, with ends of the joints browner.

Anterior wings reddish or grey-brown, darkest from the base to the basal side of the costal triangle; this triangle is hardly perceptibly paler than the rest of the wing, it does not reach beyond the fold of the wing, and has dark margins on both sides; these, however, are not as sharply defined as in *hemidactylella*. The costa itself, from the commencement of the triangle to immediately before the apex, is whitish-yellow, with numerous dark brown spots, and along the inner margin beyond the middle are also some dark brown spots, and in the apical portion of the wing there is generally a brown patch above the anal angle; apical cilia reddish brown, with the ends darker, inner marginal cilia grey.

Posterior wings grey, with yellowish grey cilia.

Scarce in this country; specimens are in the collections of Messrs. Stephens, Shepherd and Bedell.

Zeller says that "it flies in oak, birch, and especially alder woods, from the branches of which it is beaten out. Its proper period of flight is the end of summer and entire autumn. It also occurs in April, but has then usually the appearance of having hibernated. It is nowhere abundant," but occurs in many parts of the Continent.

Sp. 7. *Semifascia*, Haw. (Pl. XIV. fig. 13.)

Palpis fuscis, apice albido; alis anticis rufo-brunneis, macula obliqua albida costali ante medium; tarsis posticis brunneis, albido-maculatis.

Semifascia, Haw. L. B. 528, St. Ill. iv. 365.

Picipennella (F. v. R.), Zell. Linn. Ent. ii. 328.

Nearest allied to *Falconipennella*, but smaller, the costal triangle strikingly paler on the side next the base of the wing, the side next the apex of the wing being much suffused with, or entirely lost in, the ground colour of the wing; besides, the hinder tarsi are dark brown, with only the bases of the joints dirty whitish.

Expansion of the wings 5—5½ lines.

Head and face greyish-brown or greyish-yellow; palpi pale at the base, the terminal joint brown, except the apex, which is whitish; antennæ pale, with strong dark brown annulations; thorax greyish or reddish brown; abdomen grey, beneath whitish; the four anterior legs have the femora and tibiæ reddish brown, tarsi reddish brown, the bases of the joints whitish; the posterior legs have the femora yellowish at the base, the apical half brown, tibiæ and tarsi dark brown, the bases of the joints whitish.

Anterior wings very variable in colour, reddish brown, with more or less of a violet tint, and frequently much intermixed with yellowish; the darker markings on this ground vary much in distinctness, the most prominent is the dark margin of the costal triangle towards the base of the wing; the costal triangle is towards its hinder margin so much suffused with the ground colour, that it is with difficulty it can be traced, and in some specimens is entirely lost; that portion of the costal triangle which is nearest the base of the wing is pale yellowish, therefore very prominent, and is continued a short distance along the fold of the wing, forming an oblique *semifascia*; the costa beyond the middle is alternately spotted with black and yellowish, and along the inner margin are also several yellowish spots; apical cilia rufous, or reddish brown, inner marginal cilia grey.

Posterior wings shining grey, with grey cilia.

Not scarce in many places; at Whittlebury, at Almondsbury, near Bristol, and at Mickleham, in September and October.

Sp. 8. *Populetorum*, Zeller. (Pl. XIV. fig. 11.)

Alis anticis osseis, vel purpurascens, griseo-nebulosis, puncto costali post medium, duobusque distantibus supra plicam nigris.

Populetorum, Zell. Isis, 1839, S. 269; Linn. Ent. ii. 330.

The dark-coloured specimens of this insect have some resemblance with *Falconipennella*, but *Populetorum* may always be at once recognized by the distinct black spot beyond the middle of the costa.

Expansion of the wings 6—6½ lines.

Head and face greyish yellow; palpi yellowish, the terminal joint brown, with the apex yellowish; antennæ yellowish, with brown annulations; thorax greyish yellow; abdomen grey, beneath yellowish; the four anterior legs have the femora and tibiæ dark reddish brown, the tarsi shining whitish, at the ends of the joints brown; the posterior legs have the femora yellowish grey, tibiæ and tarsi dirty whitish, the joints of the latter with the ends brownish.

Anterior wings pale yellowish purple (a specimen sent me by Herr Zeller is entirely of dirty bone colour), with some cloudy grey markings, forming the usual costal triangle; behind the hinder margin of this triangle is the conspicuous black spot, and along the costa are various other small blackish spots; a small black spot lies in the fold of the wing, near the apex of the costal triangle, and another larger one lies on the fold, towards the anal angle; apical cilia purplish brown, inner marginal cilia grey.

Posterior wings shining grey, with purplish grey cilia.

A scarce species. I once took it in Birch Wood, September, 17th, 1846. It is also in the collections of Messrs. Stephens, Curtis and Douglas.

Zeller states that "it was several times bred by Fischer von Röslerstamm from larvæ off birches and aspens, and that he himself had taken fine specimens in June and July, almost only in unmixed aspen woods; yet that in April and May he obtained specimens which were wasted, and appeared to have hibernated."

Sp. 9. *Inconstans*, Stainton. (Pl. XIV. figs. 1—7.)

Alis anticis ochraceo-rufis, triangulo costali non dilutiore, brunneo-rufo marginato, nebulis brunneo-rufis apicem versus; femoribus tibiisque quatuor anterioribus brunneo- vel cinereo-rufis, femoribus tibiisque posticis albidis (fig. 1, 2).

Hemidactyla, Haw. L. B. 527.

Hemidactylella, Stephens, Ill. iv. 367,

Var. b, ut a, sed alis anticis saturatoribus, maculis indistinctioribus (fig. 3).

Var. c, alis anticis ochraceo-rufis, punctis tribus fuscis supra plicam (fig. 4).

Signipennis, Haw. L. B. 527.

Elongella, Stephens, Ill. iv. 367?

Var. d, alis anticis ochraceo-rufis, punctis numerosis juxta dorsum; striga brunnea apicali supra plicam (fig. 5).

Var. e, ut b, sed costa post medium dilute ochracea (fig. 6).

Var. f, alis anticis saturate brunneo-rufis, costa dorsoque dilute ochraceis (fig. 7).

Var. g, alis anticis rufis, unicoloribus, immaculatis.

The phases of this insect are truly endless; the variety I have taken for my type is by no means unlike *hemidactylella*, but differs essentially in the longer and narrower anterior wings; the dark margin of the costal triangle towards the base is never so sharply defined, and the costal triangle itself is hardly perceptibly paler than the rest of the wing: var. g in appearance exactly resembles the plain varieties of *elongella*, but from this the pale hinder femora and tibiæ sufficiently distinguish it. The average size of this insect is also less than the average size of *elongella*; many of the other varieties of *inconstans* are similar, but in these respects, to the corresponding varieties of *elongella*.

Expansion of the wings $6\frac{1}{2}$ — $8\frac{1}{2}$ lines.

Head reddish ochreous, face rather paler (in one specimen the face is strikingly paler); palpi reddish ochreous externally, inwardly yellowish; antennæ annulated brown and ochreous; thorax ochreous or rufous, concolorous with the anterior wings; abdomen grey, beneath yellowish white; the femora and tibiæ of the two first pair of legs are reddish brown, tarsi pale yellowish, with the ends of the joints brown; posterior legs, femora and tibiæ pale ochreous, or greyish white, tarsi dirty yellowish, with the ends of the joints darker.

Anterior wings reddish ochreous, varying extremely in intensity of colour, the apex mostly darker; apical cilia reddish ochreous, inner marginal cilia grey. The form and number of the markings on the wings are very variable; in what I have considered as the typical form the markings are reddish brown on a reddish ochreous ground colour, and consist of two oblique blotches extending from the costa to the fold of the wing, and these form the mar-

gins of the trigonal costal mark, which is hardly any paler than the rest of the wing; there are also several scattered reddish brown spots along the costa, and between the fold and the inner margin, and a larger one across the fold towards the anal angle. In var. b the dark markings are less sharply defined, and appear gradually to fade into the less ochreous ground colour. In var. c the dark markings consist only of three very distinct brown spots along the fold, and a few smaller spots along the costa and inner margin. In var. d there is a brown spot on the fold a little before the middle, and another in the middle, from the latter a brown streak extends to the extreme apex of the wing. In var. e, which in other respects resembles var. b, the costa from the commencement of the trigonal mark is pale yellowish. In var. f, the ground colour of the anterior wings is deep reddish brown, with the pale costa of var. e, and also a pale inner margin. In var. g, the anterior wings are unicolorous rufous, with a slight purplish gloss, and entirely unspotted.

Posterior wings shining grey, with greyish, slightly ochreous, cilia.

This insect, the critical examination of which has cost me a great deal of time, has been taken in considerable numbers by Mr. Cooke of Warrington, and it is owing to that gentleman's extreme industry in capturing so many specimens, and to his great liberality in sending me a splendid series of interminable varieties, that I have been able to describe it so fully. I must candidly confess to some still remaining doubts whether it be identical or not with *elongella*. But *elongella*, not a scarce insect on the continent, appears never to have a costal triangle; now in *inconstans* the costal triangle is generally present: the only good distinctive character of the unicolorous specimens is the pale hinder femora.

In this country *inconstans* is widely distributed, occurring, though generally only singly, nearly in every part of England, and in the south of Scotland.

Sp. 10. *Elongella*, Linnæus.

“Alis anticis rufis postice purpurascens; femoribus tibiisque quatuor anterioribus brunneo- vel cinereo-rufis, coxis posticis apice albidis.”

Elongella, L. S. N. 1, 2, p. 890, 385; F. S. 368, 1436; Fab. Ent. Syst. 3, 2, 307; Zell. Lin. Ent. ii. 334.

Signipennella, Tr. ix. 2, S. 200; x. 3, S. 297; Dup. xi. 598, pl. 311, f. 11.

Var. b, ut a, sed punctis duobus disci in alis anterioribus supra plicam, fuscis.

Punctella, L., S. N. 1, 2, p. 890, 386; F. S. 368, 1437.

Signipennella, Hüb. Tin. 196.

Var. c, ut b, sed puncto disci tertio fusco apicem versus.

Signipennella, Dup. xi. pl. 311, f. 10.

Var. d, ut a, sed punctis alarum anteriorum fuscis multis, potissimum juxta dorsum.

Roscipennella, Dup. xi. 596, pl. 311, f. 9.

Var. e, alis anticis dilute ferrugineis, disco violaceo, oblique dissecto.

Var. f, alis anticis violaceis, marginibus ferrugineis, basi ferrugineo-mixta.

“ This species differs from *rufipennella* by its generally much larger size, by the narrower anterior wings, by the grey-red femora and tibiæ, and the want of the pale base of the hinder tibiæ.”

Expansion of the wings $7\frac{1}{2}$ —9 lines.

“ Head rust-red; palpi rust-red, inwardly yellowish; antennæ darker annulated than in *rufipennella*; thorax rust-red; abdomen grey, beneath yellowish white; the four anterior legs have the femora and tibiæ brown-red, or greyish-red, or grey-brownish, sometimes with a purple gloss, tarsi less pure white than in *rufipennella*, on the upper side at the ends of the joints brown; the posterior legs have the apex of the coxa yellowish white, femora entirely brownish, tibiæ and tarsi dirty whitish, tinted with brownish.”

“ Anterior wings narrow, rust-red of variable intensity, gradually darker towards the apex and with a purple gloss. In one specimen the dark colour and purple gloss extends nearly over the entire wing. The cilia round the apex of the wing are rusty-brown, the ends darker, below and on the costa paler, rusty-yellow, at the anal angle grey.”

“ I consider those specimens typical which have no markings on the wings. Var. b, or the Linnæan *punctella*, has before the middle of the wing, just above the fold, a black brown spot, and at some distance from it, towards the base, another; between these the ground is paler, whilst in the contrary direction faint darker shades are attached to both spots. Not rarely there are, besides the spots of var. b, brown spots between the fold and the inner margin, and also towards the apex (var. d).”

“ Posterior wings shining grey, with dull grey cilia, the basal half of those next the base of the wing yellowish.”

“ In Germany in many localities not scarce ; at Vienna, Augsburg, Regensburg (Ratisbon), Berlin, Frankfort, Glogau, Breslau ; also in Hungary, Livonia, Sweden and France. It flies principally in the autumn in alder and oakwoods, also singly after hybernation at the end of April.”

I have copied the above description from Zeller, for fear of unintentionally making some strange mistake in confusing this species and *inconstans*.

I have two specimens which I am inclined to think are truly identical with the continental *elongella* ; one of these is var. d, a variety which I have not yet found in *inconstans*.

Zeller has a *Gracilaria Roscipennella* which he places immediately after *elongella*, and which he considers distinct from the above mentioned var. d ; it was only known to him as a single specimen in the collection of Fischer v. R., taken in Switzerland ; he describes it thus :* “ Anterior wings pale yellow, with many brownish spots ; the apical cilia externally brown ; the four anterior tibiæ black-brown ;” and he lays most stress upon this last character.

I have not deemed it advisable to enumerate this myself as a distinct species.

Sp. 11. *Rufipennella*, Hübner.

“ Alis anticis rufis, postice purpurascens ; femoribus tibiisque quatuor anterioribus nigro-fuscis, femorum posteriorum basi albida.”

Rufipennella, Hüb. Tin. 204 ; Tr. ix. 2, S. 198 ; x. 3, S. 297 ; Zeller, Linn. Ent. ii. 331 (non Steph.)

“ Smaller than *Stigmatella*, hardly as large as *Franckella* ; nearest allied to *elongella*, but differing from it by its smaller size, broader anterior wings, darker femora and tibiæ, and the whitish spot at the base of the hinder tibiæ.”

“ Expansion of the wings $5\frac{1}{2}$ lines.”

“ Head rust-red ; face paler ; palpi rust-red, inwardly pale yellowish ; antennæ faintly annulated yellowish and grey ; thorax rust-red ; abdomen grey, beneath shining whitish ; the four anterior legs have the femora and tibiæ black brown, with a violet gloss, with whitish spots, tarsi shining silvery white, with the ends of the joints brown ; the posterior legs have the apex of the

* Isis, 1839, S. 209 ; Linn. Ent. ii. 338.

coxæ and the base of the femora whitish, the apex of the femora black-brown, tibiæ and tarsi dirty whitish, on the upper side and the ends of the joints of the tarsi tinted with brownish.

Anterior wings rather short, rust-red, towards the apex darker, and with faint purple gloss. Either there are no further markings, or there are brown spots between the inner margin and the fold of the wing, or there are some spots on the costa. One specimen has only a large spot in the middle of the wing above the fold, and another towards the apex of the wing. Apical cilia paler than the apex, inner marginal cilia grey."

"Posterior wings shining grey, with dull grey cilia."

"The larva has been accurately described by F. v. R., in Treitschke's work. It feeds on *Acer pseudo-platanus* (or *platanoides*), in conically rolled up ends of leaves in June. The perfect insect appears in July. It occurs in Bohemia and in Bavaria."

The above description is copied from Zeller.

This species has not yet been detected in this country, the insect in most British collections under this name is *Zelleria Heperiella*, which has a rough head, *no maxillary palpi*, short thick drooping labial palpi, and much broader posterior wings.

Sp. 12. *Tringipennella* (F. v. R.), Zeller.

Alis anticis latiusculis albis, dorso posticeque gilvescentibus, punctis fuscis dispersis.

Tringipennella, Zell. Isis, 1839, S. 209; Linn. Ent. ii. 339.

Fringilella, Dup. Supp. iv. 303, pl. 75, f. 11.

Readily distinguished from all its allies, except *Limosella*; but this latter is smaller, entirely yellowish, without any white along the costal half of the wing, and the black spots towards the hinder margin are confluent.

Expansion of the anterior wings $6\frac{1}{2}$ lines.

Head and face pale yellowish grey; palpi whitish grey, the terminal joint brown, with a whitish apex; antennæ pale, with dark brown annulations; thorax yellowish grey; abdomen grey, above and beneath, anal tuft yellowish; the four anterior legs have the femora and tibiæ of a brown-black, the tarsi shining whitish, the ends of the joints faintly brownish; the hind legs have the femora grey-brown, paler at the base, tibiæ and tarsi dirty greyish-white, darker towards the ends of the joints.

Anterior wings whitish, with a slight violet gloss; along the inner and hinder margins yellowish-ochre, with numerous scattered black scales, and two rows of black spots, one just below the costa,

the other on the fold of the wing; apical cilia pale ochreous, inner marginal cilia grey.

Posterior wings broader than usual, and the point less prolonged, shining grey, with yellowish grey cilia.

In some specimens the violet gloss on the anterior wings is entirely wanting.

This species always occurs among grass, and is double-brooded, appearing in May and August. I have taken it plentifully at Lewisham, and on the Sanderstead Downs; and once in Scotland.

Sp. 13. *Limosella* (F. v. R.), Zeller.

Alis anticis latiusculis osseis, punctis seriatis postice confluentibus, fuscis.

Limosella, Zeller, Linn. Ent. ii. 341; Dup. S. iv. 488 (non pl. 87, f. 11).

Much smaller than *Tringipennella*, the costa not paler than the rest of the wing, the spots less distinct, and towards the hinder margin confluent.

Expansion of the wings 4—4½ lines.

Head and face greyish-yellow; palpi yellowish, the terminal joint with a broad fuscous ring; antennæ yellowish, with brown annulations; thorax greyish yellow; abdomen grey, anal tuft yellowish; the four anterior legs have the femora and tibiæ grey-brown, tarsi whitish, the ends of the joints brown; the posterior legs have the femora grey, tibiæ and tarsi dirty yellowish, the ends of the joints darker.

Anterior wings pale ochreous yellow, with three rows of faint fuscous spots, one along the costa, one above the fold, and one along the inner margin; these become confluent towards the hinder margin, the apex of the wing being almost entirely suffused with fuscous; apical cilia fuscous, inner marginal cilia yellowish grey.

Posterior wings shining grey, with grey cilia.

Not yet detected in this country.

It was first discovered by Herr Mann, in woods near Vienna, in May and June; he afterwards met with it at Leghorn and other places in the North of Italy.

Sp. 14. *Syringella*, Fabricius.

Alis anticis luteo-brunneis, maculis albidis costæ dorsique, prope basim, subfasciatis.

Syringella, Fabr. Ent. Syst. 3, 2, 328; Steph. Ill. iv. 364; Zell. Linn. Ent. ii. 342; Dup. Sup. iv. 298, pl. 75, f. 6.

Anastomosis, Haw. Lep. Brit. 530; Curt. B. E. fol. 479.

Ardeæpennella, Tr. ix. 2, S. 205; x. 3, S. 298.

Not closely allied to any known species.

Expansion of the wings 6 lines.

Head and face yellowish, the former with some brown scales on the crown; palpi pale yellowish, the end of the second joint, and the terminal joint, except the apex, brown; antennæ pale, with dark-brown annulations; thorax yellowish, spotted with brown; abdomen grey, beneath whitish, anal tuft yellowish; the four anterior legs have the femora and tibiæ dark-black brown, tarsi pale yellowish, the ends of the joints brown; the hinder legs have the femora pale yellowish, spotted with brown, tibiæ pale dirty-yellowish at the apex, brownish at the base, tarsi dirty-yellowish, with the ends of the joints brownish.

Anterior wings broad, appearing from the cilia, broadest posteriorly. The ground colour is a yellowish-brown, marbled with dark red-brown patches, and with numerous pale-yellowish spots, which are thus disposed; first, near the base a yellowish angulated fascia, which, on the inner margin, is nearer the base than on the costa. Then follows a straight oblique fascia, and beyond it another angulated, which joins the preceding on the inner margin; the third fascia is generally expanded along the costa into a spot, and is sometimes united to the small spot that forms the fourth costal marking; beyond this, towards the apex of the wing, are two yellowish hooks; and in the extreme apex is frequently a small whitish spot, sometimes continued into the cilia; at the commencement of the inner-marginal cilia is a triangular yellow spot on the inner margin; the apical cilia are brownish, then whitish, with the ends brown, inner marginal cilia grey.

Posterior wings not long-pointed, grey, with grey cilia.

The larva at first mines, and afterwards rolls up the leaves of the lilac, and is very common in gardens. It is double-brooded, the perfect insect appearing in May and July.

Sp. 15. *Simploniella* (F. v. R.), Duponchel.

"Alis anticis niveis, fascia prope basim, fascia media postice angulata strigisque 3—4 posticis subconfluentibus luteis, nigro-marginatis."

Simploniella, Dup. xi. 471, pl. 305, f. 10; F. v. R. Beitr. pl. 70, f. 3, S. 197.

"This has some resemblance to the *Argyresthiæ*, allied to *Goodartella*; probably the neuration of the wings differs a little from

that of the *Gracilariæ*, already described, and unites it with the following species. Its snow-white colour, with pale yellow markings, readily distinguishes it in this genus."

"Hardly as large as *Gr. Syringella*. Thorax and head, with their adjuncts, pure white, rather shiny. Antennæ dirty-yellowish, faintly annulated with darker towards the base, above more whitish; the long basal joint is white above, brownish-yellow beneath, at the end with a brown spot. Labial palpi rather drooping, filiform, slightly curved. The second joint externally at the apex dark; the third as long as the second, short-pointed. The four anterior legs have the middle of the femora and the base and end of the tibiæ brown; the very unequal spines of the middle tibiæ have the basal half brown.

"Hinder femora dirty white; hinder tibiæ fringed on the back, externally and before the apex yellowish brown. All the tarsi have the ends of the joints brownish-yellow. Abdomen yellowish grey, beneath white.

"Anterior wings rather broad, appearing (owing to the colouring of the cilia) to expand towards the hinder margin, snow-white, with brownish-yellow, almost saffron-yellow markings. At the base of the costa is the black spot. At some distance from it is a perpendicular nearly straight fascia. Almost on the middle of the wing follows an inwardly oblique fascia, the lower half of which expands externally, and, by its prolongation, unites with the next fascia-form line. This lies still more inclined and parallel to another very near and similarly formed, with the lower half of which it sometimes unites. All the above mentioned markings are finely bordered with black. There are besides two yellow hook-shaped transverse-streaks, the colour of which, as well as of the two preceding, is continued into the hinder-marginal cilia. Beyond the apex of the wing is a deep black streak in the white cilia.

"Posterior wings narrow, long pointed, yellowish grey, with paler cilia."

"Several specimens of this insect were taken on the Simplon, in the latter half of July, among white-thorn, willow and birch bushes."

The above description is copied from Zeller. The insect has not yet occurred in this country, nor indeed do I believe it has ever been met with but on the Simplon.

(*To be continued.*)

XVII. *Specimen Faunæ Subterraneæ*; being a Contribution towards the Subterranean Fauna, by J. C. SCHJÖDTE. Reprinted from the Transactions of the Royal Danish Society of Sciences, Fifth Series, Division of Natural History and Mathematics, 2nd Vol. Copenhagen, 1849. 4to. (Translated from the Danish, at the request of W. SPENCE, Esq., F.R.S., Vice-President of the Entomological Society of London, by N. WALLICH, M. & Ph. D., F.R.S., V.P.L.S.)

[Read January 6th, 1851.]

AFTER an interval of more than three-quarters of a century, during which our knowledge of existing inhabitants of the Stalactitic caves in Carniola was limited to one single animal, attention has again been directed towards this remarkable zoological subject, by a few solitary communications recently made. To the curious reptile, known since 1768, chiefly under the name of *Proteus*, and since then occasionally found in the subterranean river which traverses the Magdalena cave near Adelsberg, were added, since 1840, two other animals belonging to the *Articulata*, the entire structure of which indicated that they were created exclusively to undergo a subterranean existence. In the course of that year Koch published in his work on the *Crustacea*, *Myriapoda* and *Arachnida*, a figure of *Pherusa alba*, a crustacean of the family of *Oniscus*, discovered in the cave of Adelsberg. Four years later we were surprised by another singular discovery in the Luege cave, of *Anophthalmus Schmidti*, an insect belonging to the *Carabidæ*, allied to the genus *Trechus*, excellently described by the well known German naturalist Sturm.*

It was not only their locality which attracted attention to these animals, though it cannot be denied that the fact was striking enough, that animals should be found to exist under conditions so very unfavourable for the support of animal life; but it was especially the circumstance of their being found to have no eyes, organs so well developed in all the other species of the respective groups to which they belong, which was so remarkable. In the

* *Anophthalmus*. Neue Gattung aus der Familie der Caraben. Mit einer color. Tafel. Nürnberg, 1844, 8vo. Also as an Appendix to the Deutschlands Fauna by the same author, V. Abth. 15 Bd.

long-known cave-animal the *Proteus*, the eyes, if not altogether wanting, are yet so little developed, being concealed under the skin, that beyond the mere perception of light, they must be incapable of receiving any impression of images by means of those organs. It is easy to perceive the connexion which exists between the want of light in the caverns, and the want of organs in their inhabitants by means of which alone light can affect the senses. So long as one form only was known to exist there, inhabiting, moreover, a running stream in the cave, and therefore not exclusively doomed to darkness, this blindness was viewed simply as an exceptional phenomenon, of which there were analogous instances. But on becoming acquainted with other occupants of those caves, not only blind, but in their structure belonging to peculiar forms (genera), the idea arose, that the three animals mentioned, stood related to each other as links of one chain; in other words, they seemed to exhibit themselves as representatives of a possibly numerous, generically consistent, subterranean Fauna, whose common characteristic consists in *blindness*. On the other hand, fresh researches, made by that meritorious collector Ferdinand Schmidt of Schischka, near Laybach, to whom we likewise owe the discovery of the *Anophthalmus*, proved that there were some few other animals in those caves not materially different from the usual forms. Erichson, in his Monograph of the Family of *Staphylinidæ*, has described a new species of *Homalota* under the specific name of *spelæa*, closely allied to *H. elongatula*, Grav., so common all over Europe, and has quoted it as an inhabitant of the cave at Adelsberg.* A species of *Carabidæ*, communicated to collections by Schmidt under the name of *Pristonychus Schreibersii*,† seems to occur only in the Stalactitic caves of Carniola. It deserves to be noticed, that these two animals differ from their allied species by their strikingly minute eyes.

New prospects were further opened in consequence of communications from quite a different quarter. Migratory Indians had long ago, and adventurers and new colonists more recently, visited the immense Kentucky cave, ramified for miles, and known at present under the name of the Mammoth cave. At a distance of about a mile (Danish)‡ from the entrance to the cave, a consider-

* Genera et Species Staphylinorum, p. 107, n. 51.

† I take this species to be *Pristonychus elegans*, Dej. (Species Général des Coléoptères, Tom. iii. p. 59, n. 17.) Dejean got possession of the specimen described by him during his journey in Carniola, without knowing the real habitat of the insect.

‡ Equal to about four English miles.—N. W.

able lake was found in 1841, extending above a quarter of a mile into its numerous branches. In this subterranean sea, which rises and falls according to the varying degree of wetness of the seasons, were found a fish and a crustacean, both colourless, with eyes concealed under the skin, like the *Proteus*. Various communications have been made to periodicals in North America and England concerning the former,* which is introduced under the name of *Amblyopsis spelæus* in the splendid Natural History of New York, published under the authority of that State, and the zoological part of which belongs to James Dekay.† Dr. Tellkamp, a German, who visited the cave several years later, has given a further account of its Fauna since his return to Europe, in two memoirs.‡ According to researches instituted partly by the celebrated J. Müller, this fish is represented as the type of a new family, *Heteropygii*, but nothing of consequence is said as to the anatomy of *Astacus pellucidus*, which name indicates that it is a congener of the river *Crustacea*; an opinion which Thompson had previously pronounced, without, however, scientifically supporting it. Our author has discovered several new *Articulata*, of which he describes the following:—*Adelops hirtus* of the family *Silphidæ*, being a new genus and species, which he distinguished from *Choleva* solely by the want of eyes, and which in fact would belong to that genus, unless, which is probable, the essential systematic characters of the animal have been overlooked: *Phalangodes armata*, a small Arachnidan of the family of *Opiliones*, white, blind, differing from the other forms by its aculeated palpi: another small, blind, white Arachnidan, *Anthrobia Mammouthia*, concerning which Dr. Tellkamp's account affords us no means of

* Jeffries Wyman, Description of a *Blind Fish* from a Cave in Kentucky, in Silliman's American Journal for July, 1843; Annals and Mag. of Nat. Hist., vol. xii., 1843, p. 298; Thompson's Notice of the Blind Fish, Cray Fish and Insects from the Mammoth Cave, Kentucky, in Ann. and Mag., &c., vol. xiii., 1844, p. 111. [In this communication Mr. Thompson states that the Crustacean agrees with Milne Edwards's description of *Astacus Bartoni*, an inhabitant of the Delaware and other American rivers, and that it possesses eyes; crickets also (as they were termed) were captured seven miles within the cave. They likewise possess eyes, and approach near to *Phalangopsis longipes* of Serville.—J. O. W.]

† Zoology of New York, or the New York Fauna, by J. E. Dekay, Albany, 1842. 4to. Four volumes have been published; the fourth containing Fishes.

‡ Ueber den blinden Fisch, &c., (on the Blind Fish of the Mammoth Cave in Kentucky, with Observations on some other Animals which live in them), in Johan Müller's Archiv. 1844, p. 381, tab. ix.; Beschreibung, &c. (Description of several Articulate Animals found, &c.) In Erichson's Archiv für Naturgesch. 10 Jahrg. vol. i. p. 318, tab. viii.

forming any conclusion as to its proximate systematic relations. This last defect applies particularly to the fourth, *Triura cavernicola*, which appears to belong to the order of *Amphipoda*, and to have a most remarkable structure. Dr. Tellkampff has likewise found a new species of *Anophthalmus*, extremely like that of Europe, but characterized as different by Erichson, who calls it *A. Tellkampffi*. Finally, a sort of fish different from *Amblyopsis*, a grasshopper belonging to the genus *Phalangopsis*, and flies of the genus *Anthomyia*, are enumerated as found in the cave.

At the time the account of these discoveries reached Copenhagen, I was preparing for a scientific tour through a great part of Europe. One of my objects was to visit the Alps, and make collections for the Royal Museum of Natural History, of which the *Insecta*, *Arachnida* and *Myriapoda*, are entrusted to my charge, divisions in which it is very poor in European species: I determined, therefore, to arrange my plans in such a way, that I might connect my tour to the Alps with a visit to the caves in Carniola, and accordingly I selected the eastern portion of the Alps for my researches.* After remaining among these during the summer of 1845, I arrived at Adelsberg early in the autumn.

I examined four caves; namely, that of Adelsberg, the Magdalena and Luege caves, all in the neighbourhood of Adelsberg, and the Corneale cave at Trieste. The result was, first, that I found every one of the animals, known before as inhabitants of those caves; secondly, that I discovered more than twice as many new kinds, among which there are five types of new genera; and finally, as these latter concern a part of the subterranean Fauna hitherto almost unknown, I believe I can offer materials for a systematic inquiry into the whole phenomenon. I will now proceed to describe what I have observed, and in conclusion I will venture to offer some remarks on the character of the subterranean Fauna.

The entrance into the first two of the four Stalactitic caves just mentioned, is horizontal, and through the two largest flow rivers; namely, the Pojk through the Adelsberg cave, and the Magdalena through the cave bearing that name. The Luege grotto is the most considerable of four grottos, placed almost perpendicularly one above the other; two underneath, and one above the castle of Luege, so famed from romantic traditions, and which itself

* My collections in the said classes made on the Alps, and during the subsequent part of my journey, especially in the Roman Campagna, Calabria and Sicily, amount altogether to about 70,000 specimens, which have safely arrived at Copenhagen, and have been deposited in the Museum.

stands in the fourth cave. The lowermost is the bed of a river, covered above, and accessible only for a short distance; the uppermost two are nothing but slight excavations into the perpendicular rock, and it is only in the third grotto from below that considerable Stalactitic formations exist and are in progress. The grotto Corneale has its entrance nearly vertical, and contains no running stream of any size. These cave-localities exhibit nothing peculiar as respects their Fauna; a moist air and low temperature are the leading features of the Stalactitic caves, with the consequent nearly total absence of vegetation. The only plant which I observed was a sort of fungus, *Byssus fulvus*, L.* I found this growing on bits of wood scattered about, on bridges, railings and fragments of torches; extending itself sparingly on the columns, especially such as are stunted in their growth.

On searching along the walls within the entrance of the caves, among the rubbish and the vegetable debris along the sides of the river, we meet with a considerable number of *Insecta*, *Myriapoda*, *Arachnida*, and *Crustacea*, of various families, which shun daylight; being such species only as inhabit promiscuously other places, provided they are moist and feebly illumined. We find species of *Pterostichus*, *Pristonychus*, *Amara*, *Quedius*, *Homalota*, *Omalium*, *Hister*, *Trichopteryx*, *Cryptophagus*, *Atomaria*, *Plinus*, *Ceraphron*, *Belyta*, a grasshopper of the Locust family, which could not be quite determined, as it was only seen in the larva state,† *Trichoptera*, *Sciara*, *Psychoda*, *Phora*, *Heteromyza*, *Sapromyza*, *Tomocerus*, *Linyphia*, *Gamasus*, *Cryptops*, *Julus*, and *Asellus*. In proportion as we recede from the entrance the number of species as well as individuals greatly decrease, and at the distance which entirely excludes the light, only single individuals are found. In the deepest recesses these species are entirely wanting, except some few which have been transported by the current; only a few *Diptera* are found, namely, a species of *Phora*, very near *P. maculata*, Meig., *Heteromyza flavipes*, Zett., and *Sapromyza chrysophthalma*, Zett., extending also very far into the caves, even to the remotest accessible places in the Adelsberg cave, more than half an hour's walk from its entrance. Dead moths are occasionally found far in the caves, being left there by the bats; and likewise accidental specimens of the parasites of the latter.

Of the five earlier known animals which inhabit these caves,

* Kindly determined by Prof. Liebmann.

† I found this species, likewise in the larva state, in the following summer, in the artificial grotto at Syracuse, called *l'orrechio di Dionisio*; also in most of the adjacent grottos.

I found, *Pristonychus elegans*, Dej., rather frequently, and *Homalota spelæa*, Er., in considerable numbers; the former in all the Luege grottos, the other in the Magdalena and Adelsberg caves. They may be observed under stones and in loose earth, close at the entrance, where a dim light is admitted; afterwards, as we penetrate deeper into the darkness, they become more frequent; after which they again disappear. I, however, saw solitary specimens of both, in the innermost portion of the Adelsberg cave, ascending on recent columns to a height of several ells above the floor of the cave. *Anophthalmus Schmidti* appears to be very rare indeed; and I have only met with two specimens in the innermost part of the Luege grotto among decayed wood.* *Pherusa alba*, Koch, was very common in all the caves, showing itself soon after entering the dark part. *Hypochthon (Proteus) anguinus* was found here and there in the Magdalena river, in the innermost part of the cave of that name, and may almost always be purchased of the conductors. On perceiving the torchlight it usually remains quiet in the water; but the first attempt to catch it is rarely successful. The moment you bring your net under it, the animal suddenly darts off with a serpentine motion to a distance of several ells; after which it remains again stationary in the water, when the attempt is more likely to succeed.

I now proceed to give an account of the new cave-animals.

The family of *Silphidæ* is increased by two remarkable new genera. Of one of these, *Bathyscia*, I am acquainted with two species, both very small, blind, and without wings; but otherwise so perfectly like *Choleva* in appearance that, without the most careful examination, they might be referred to that genus. They differ essentially in their toothed mandibulæ, the absence of the horny tooth, which in *Choleva*, *Colon*, and *Silpha*, terminates the masticatory lobe of the maxillæ; and, more strikingly, by their four-jointed tarsi of the anterior legs, a proportion which here occurs for the first time in one of the members of the family *Silphidæ*; moreover, the labellum† is much more developed, and

* In a small, completely dark space in the cave where the castle stands, behind it, and separated by a brick wall, Mr. Hellmuth von Kiesenwetter, who accompanied me during my tour in the Alps and to the caves, also found a specimen of this species.

† I propose this term for the coriaceous ciliated appendage, which projects in many families, in a more or less degree, from the under surface of the upper lip. I am aware that Erichson uses the word *Parachilia* for similar parts in the *Scarabæides*, in his most recent work (*Naturgeschichte der Ins. Deutschl.* iii. p. 553); but this term, being founded on the assumption that these parts have the same re-

the first joint in the tarsi of all the legs not longer than the following.

The two species resemble each other much, but may be easily discriminated by the structure of their antennæ and labial palpi. In the smallness of their size and their habit they resemble the *Ptilia*, having the same darting motion, which is exceedingly rapid. I met with a number of specimens of *Bathyscia byssina* in the inner part of the Adelsberg cave, occupying the small clusters of *Byssus fulvus*, on the short and stunted columns. The other species, *B. montana*, is common in the Luege grotto, among loose earth and little stones along the walls; but I have found it also, and in far greater quantities, among moist leaves in forests, on shady rocks near the castle Veldes, on the Carniolan Alps. I examined this species anatomically during my stay at Veldes; but as we do not possess more than the few observations I published some years ago* respecting the internal structure of *Choleva* and *Colon*, with which *Bathyscia* is to be compared, there is no need of my saying more on the subject for the present, except that *Bathyscia* agrees with these genera in the characteristic want of a cœcum, but differs strikingly in the following points: the malpighian vessels have the same angular nerve and thickened end as that which, on another occasion,† have been pointed out by me as characteristic of some families of the division of clavicorn beetles; the pair of spermatic vesicles are short, wide and clavate, not long and rolled up; the testicular vesicles are small and very numerous, and they form together a globular body.

As yet it is doubtful what relation *Bathyscia* has to Tellkampff's genus *Adelops*. According to the character he gives of this form, it differs from *Choleva* only by its want of eyes, and would accordingly belong to that genus, provided his account is correct, and no essential character has been omitted. The similarity of locality, and the analogy existing between the European and North American Fauna, which, as far as regards cave-animals, is strikingly exemplified by the similarity between the *Anophthalmi* of these two countries, would seem to indicate that *Adelops* ought to merge into *Bathyscia*. This supposition is somewhat supported by Tellkampff's figure, in which the first joint of the feet is repre-

lation to the upper lip, as the supplementary tongues [paraglossæ] have to the under lip, certainly can have no application as far as regards the *Silphidæ*, where it is clear that both lobes are simply a continuation of one single organ.

* Germar's Zeitschrift für die Entomologie, Bd. V. 1844, p. 475.

† Kröyer, Naturhistorisk Tidsskrift, Ny Række, 1ste B. p. 396.

sented as shorter than in *Choleva*; but the greater size of the North American species, and Erichson's remark, in a note added to Tellkampff's account, that it is principally the want of eyes which distinguishes *Adelops* from *Choleva*, is against this supposition. On the other hand, new doubts and conjectures arise from the information of Erichson, that the museum at Berlin possesses, besides the North American *Adelops*, two other species, one from Carniola, and the other from Sicily; for, one cannot help thinking that the species from Carniola, said to have been communicated by Schmidt of Schischka, may prove to be *B. montana*, which is frequent in that locality, and where Schmidt had often made collections. In that case it may be suspected that Erichson was prevented from closely examining the animal, either by the paucity of specimens or some other cause; so that it still remains doubtful as yet whether his two European species agree generically among themselves, or with *Adelops*.

BATHYSCIA.

Ordo ELEUTHERATA—Familia SILPHÆ.

Oculi nulli. Mandibulæ dentatæ. Maxillæ mala interiori spinulis terminata. Palpi maxillares articulo ultimo conico, acuminato. Antennæ longiores, extrorsum crassiores, articulo octavo contiguus minore. Mesosternum carinatum. Tarsi antichi 4 articulati, posteriores 5-articulati, omnes articulo primo subsequentibus haud longiore.

Βαθῦς; σκιά.

BATHYSCIA BYSSINA.

Breviter ovata, valde convexa, fusco-ferruginea, fulvo-pubescent, articulis palporum labialium longitudine subæqualibus; nono antennarum articulo octavum ter superante. Long $\frac{4}{3}$ lin.

BATHYSCIA MONTANA.

Ovata, convexa, ferruginea, fulvo-pubescent; articulo secundo palporum labialium brevissimo; nono antennarum articulo octavum dimidia parte superante. Long. $\frac{5}{18}$ lin.*

The next genus, *Stagobius*, is so peculiar in its structure, and so unlike all the *Silphæ*, and yet possesses nothing in its habit to remind us of any other family, that we must rigorously adopt

* For the full details (in Latin) of the generic and specific characters of these and the subsequent species, the reader is referred to the original work.—W. S.

systematic characters, in order to settle its natural place. The connate swollen and bladder-formed elytra form a curious contrast with the blind, long, narrow and depressed head and the equally long, narrow, almost cylindrical prothorax, and the strangeness of the figure is rendered still more complete by the slender and elongated shape of the limbs. However, a combination of the following characters will only admit of the animal being compared with *Silphidæ*, *Anisotomidæ* and *Scydmcænidæ*. Seven abdominal joints; the first being hidden by the hind hips; only the last two completely movable. Fore coxæ conical, freely projecting from their articulating cavities. Antennæ 11-jointed, clavate.

This last-mentioned family has been adopted by a number of authors since the time of Latreille, but remains still without being properly confirmed. I have in a former memoir* endeavoured to show that it recedes from the rest of Latreille's Clavicorns by its anatomical character, and therefore confine myself at present to the following observations.

The parts of the mouth are formed according to a peculiar type, approaching to no other than that of the *Pselaphidæ*. The upper lip wants the labellum, but is furnished with spines; the mandibles are falcate, with sharp teeth, the molar plate small, slightly grooved; maxillæ short, with broad stems and palpi, with extraordinarily large joints; the terminal part of the external maxillary lobe is quite horny, except along the *inner* suture. On account of the greater development of the divisions of the maxillæ, the faucal margin becomes deeply excavated on each side of the mentum, which is very small, and is thus supported by a more or less protruding part of the throat. The scapes of the labial palpi, which in the *Silphidæ* and *Anisotomidæ* are nearly concealed by the mentum, are protruding, free and connate throughout their whole length in the *Scydmcænidæ*. The short tongue is quite horny, with a spinose scarcely incised apex; the paraglossæ, on the contrary, are much more developed than in the two families mentioned, free at the apex, and armed along the inner margin with a row of pectinate teeth; the middle joint of the lingual palpi is of considerable size, intumescent, with a cuspidate terminal joint. It is, therefore, principally the third pair of the parts of the mouth, which presents itself by its form as the diagnosis; and, in the second place, the form of the hinder hips, which are conical, and removed from each other by the greater lateral development of the metasternum. The congregated structure of the eyes, and the

* Krøyer, Naturhistorisk Tidsskrift, Ny Række, B. 1, p. 394.

number of the joints of the feet, may be taken as secondary characters; but they are of no importance, least of all the last mentioned.

According to what we have advanced, this family may be designated in the following manner, in contradistinction to the *Silphidæ* and *Anisotomidæ*:—

Scydmænidæ. Antennæ 11-articulatæ, clavatæ. Oculi aggregati. Stipites palporum labialium maximi, detecti, connati. Ligula parva, cornea, paraglossis liberis, elongatis, pectinatis. Coxæ anticæ conicæ, exsertæ. Coxæ posticæ conicæ, distantes. Tarsi 5-articulati. Abdomen segmentis ventralibus septem.

The new genus cannot be admitted into this family, because the parts of its mouth, as will be seen below, are totally different from the type of *Scydmænidæ*, and its hinder coxæ are transversal, moveable on their axis. It only remains, therefore, to compare it with the *Silphidæ* and *Anisotomidæ*. The most recent diagnosis of the first of these families is, according to Erichson:*

Maxillæ mala utraque coriacea aut membranacea. Antennæ 11-articulatæ, clavatæ. Tarsi omnes 5-articulati. Abdomen segmentis sex compositum.

This diagnosis in its totality is obsolete; nor can we consider any of its characters as quite correct. The first is too general, and therefore insufficient; the second excludes *Necrophorus*; and the third is cancelled by the genus *Bathyscia* proposed above. It is only the fourth character which can be retained, remembering, however, that Erichson does not include the first joint, which is concealed by the hinder coxæ.

Erichson proposes the following diagnosis for the *Anisotomidæ* in his last immortal work:†

Antennæ 11-articulatæ clavatæ. Coxæ anticæ exsertæ, conicæ, posteriores approximatae. Trochanteres postici simplices. Abdomen segmentis ventralibus sex; and he adds the remark,‡ that the *Anisotomidæ* are so nearly related to the *Silphidæ*, that it is difficult adequately to discriminate between the two families. He mentions that the trochanters of the posterior supporting legs are *fulcrantes* (“stutzend”) in the *Silphidæ*, simple (“einfach”) in the *Anisotomidæ*; that the middle coxæ in the latter are more enclosed in the cavities of the joints; and that the episterna of the post-pectus (parapleura) are totally, or for the greater part, con-

* Die Käfer der Mark Brandenburg, Band 1, p. 223.

† Naturgeschichte der Insecten Deutschlands, Abth. 1, B. 3, p. 41.

‡ Ibid. p. 43.

cealed under the recurved margin of the elytra. He has since* given an account of the difference between the larvæ of *Leiodes* and the hitherto known larvæ of *Silphidæ*.

We find, according to the subjoined details of structure, that all the characters exist in *Stagobius* which, as has been said already, must be considered as common to the *Silphidæ* and *Anisotomidæ*, in contradistinction from the *Scydmænidæ*. The anterior legs are four-jointed, which is the case also in *Bathyscia*, which is in all respects a genuine form of the *Silphidæ*. It has the same type of the parts of the mouth, the antennæ, the coxæ, and the hinder portion of the abdomen; in a word, it possesses the identical essential character, with this notable exception, however, that the post-pectus, which is more developed in breadth, though not to that degree as in *Scydmænidæ*, forces the hinder coxæ (quite resembling, in their transversal position, those of the *Silphidæ*) asunder from each other. If to this is added, that this proportion, as far as I know, always represents a very different distribution of muscles in the metathorax, and implies in this case a more or less slow motion, while it renders running quite impossible; if it is further remembered, how deeply this single circumstance must influence all the functions of life of the animal; and lastly, if its very strange habits are considered, surely there are grounds for regarding the animal as the type of a peculiar family. In fact there can be no doubt that this is the correct view, if the family of *Anisotomidæ* maintains its place as a family independent of the *Silphidæ*, for the deviations of *Stagobius* from the latter are of far greater weight than those which separate the *Anisotomidæ*. But I cannot admit at present that the slight differences, pointed out by Erichson, go further than to separate the *Silphidæ* and *Anisotomidæ* as two different groups of the same family; and, accordingly, I do not place any great value on the deviations of this new form. It must be recollected that we are still very deficient in our knowledge of the series of the forms here mentioned, and that all that can be expected as yet is a modified view of their internal and external systematical relations.

* Erichson, Archiv für Naturgeschichte, 13 Jahrg, 1847, B. 1, p. 285. The point upon which he has laid the greatest stress is this: that the mandibles in the *Anisotomidæ*, and their larvæ, are furnished with a molar plate, whereas in the *Silphæ* there are none. This distinction, according to my observations, does not hold good; for *Choleva* has the molar plate ten times longer and stronger than the *Anisotomidæ*.

Some parts of the structure peculiar to this remarkable animal, demand additional notice, with reference to its mode of existence. On a former occasion* I have pointed out that the organs termed *onychia* exist more extensively among the *Eleutherata* than was hitherto supposed to be the case, and that they are found also in *Silphidæ*. They are developed in a peculiar manner in *Stagobius*, where the proper, horny, basilar-part, is greatly withdrawn, while the two bristles, at its end, are much elongated and directed backwards, towards the base of the tarsus. There exist, besides, two other setæ, equally moveable, but having a forward direction; these, together with the others, form a cross of four long setæ, which constitute the longest of a system of moveable bristles of various lengths; two pairs being inserted at the end of the joint of each foot, one pair above, the other underneath. The intention of this whole apparatus, and the very long, slender and sharp claws, as well as the elongated and attenuated tarsal joints, is very manifest in an animal, destined to roam amid the vertical stalactites, in darkness and in blindness. It is more difficult to comprehend the apparent disproportion of the prothorax, as compared with that part of the body directly behind it. I account for it in this way: it is obvious that it must be difficult for so slow and weak an animal, to procure adequate sustenance in a locality like that which it inhabits; and that, probably, it is occasionally without the means of procuring food, during a long period. The spacious vault under the elytra seems to indicate, that possibly an accumulation of fat takes place under favourable circumstances, on which the animal subsists in times of scarcity. In the specimens which I examined, the abdomen occupied only a small portion of the vault, and I consider them, therefore, to have been in a lean state. The slowness of motion, and the small respiratory foramina, are in favour of this view; for we may, I think, consider it as a fact, that the respiration of insects, is in a direct ratio to the intensity of their motion, but in an indirect ratio to the mass of fat. The necessity of a spacious abdomen, and the movements consisting of long steps, determine the necessity of a slender prothorax, which can supply the absence of freedom of motion, and afford adequate space for the insertion of legs, fitted to take long strides.

My first specimen of *Stagobius troglodytes*, as I call the species, was found seated about ten feet from the ground, on one of the stalactites, in an inner compartment of the Adelsberg cave.

* Kröyer, l. c., vol. ii. p. 360.

I afterwards found a second in a similar locality there, and a third in the Magdalena cave; the two latter nearly twenty feet above the floor. These were the only specimens which I met with in a living state; but we may conclude from the many remains of dead specimens, found in the breaks of the columns, that the animal is common at other seasons; for its skin may long be preserved in the cool air of the caves, although it is at length covered by the calcareous deposit. The animal moves slowly and cautiously, supported on its long legs, as if on stilts; it stands still the instant that light, or rather the sound of approach, reaches it, when it crouches down and remains immovable, with erect antennæ and stretched out legs, unless it is touched. Many of the remains were dispersed in such a manner, that there can be no doubt of the animal being killed and devoured by animals of prey, which, it may be easily conjectured, are the two Arachnidans subsequently described, which, it will be seen, are well fitted for hunting.

STAGOBINÆ.

Ordo ELEUTHERATA. SILPHARUM Familiæ *Tribus* nova.

Coxæ posticæ distantes.

Prothorax subcylindricus.

STAGOBIVS.

Oculi nulli. Maxillæ mala interiori spinulis terminata. Palpi maxillares articulo ultimo conico, acuminato. Ligula membranacea, apice acute emarginata; paraglossis membranaceis, breviter ciliatis, ligulam haud superantibus. Antennæ elongatæ, graciles, extrorsum crassiores, articulis clavatis, octavo contiguus minore. Pedes elongati, gracillimi; tarsi filiformes, setis longioribus, antici 4-articulati, posteriores 5-articulati, omnes articulo primo elongato, unguiculis setisque onychii terminalibus elongatis.
Στάξ, βίωω.

STAGOBIVS TROGLODYTES.

Fusco-brunneus, capite thoraceque obscurioribus, glaber, lævis, nitidus, scutello, coleopteris ventreque minutissime reticulosis punctisque impressis remotis, obsoletis. Long. $2\frac{1}{2}$ —3 lin.

In the inner cavities of the Adelsberg cave, on clusters of *Byssus fulvus*, I found a remarkable new species of the order

Thysanoura,—white, of considerable size, and approaching to the genus *Anurophorus*, Nicolet, on account of its want of a scaly covering, its rudimentary apparatus for jumping, the structure of its antennæ and limbs, as well as the number and position of its eyes. The antennæ are strikingly different from those of the well-known species, being longer than the head; the legs, besides, are longer and more slender; and the structure of the pectoral segments is remarkable, each being subdivided by a stricture into two unequal parts. It is exceedingly difficult to discover the eyes, and it was only after many attempts that I ascertained their existence, form, number and position, by the aid of Lieberkühn's mirror and a powerfully reflected lamp-light. They are snow-white, fourteen on each side, and placed nearly as in *Anurophorus fmetarius*.* Their colour plainly indicates their being rudimentary, and unfit for sensation.

Smaller specimens, found together with the larger ones, differed, besides their size, by the short antennæ having a large terminal joint, and the pectoral joints being less strongly constricted; I consider them to be a younger age. Conjointly with these two forms I met with a third, much smaller, linear, with very short antennæ, very feeble traces of constriction in the pectoral rings, and the abdomen furnished at the end with two small hooks. This small form, I think, is the larva state.

ANUROPHORUS STILLICIDIÆ.

Niveus, oculis viginti-octo; antennis capite duplo longioribus; segmentis thoracicis bilobis.

Long. $1\frac{1}{2}$ lin.

Many of the stalactites have lateral projections, arising from the inequality of the droppings from which they have originated. From these projections water drops down, which strikes on those below; and this is particularly the case, where the stalactites have reached the roof of the vault. Carbonate of lime is in time deposited between the adjoining projections, which thus gradually approach each other, beginning from without, so that a small recess is often formed between two projections, preserving its outlet, until their whole breadth is united. These little cavities are inhabited, in the Magdalena and Adelsberg caves, by two remarkable blind Arachnidans, each the type of a new genus.

* Nicolet, Recherches pour servir à l'Histoire des Podurelles, pl. 2, fig. 19.

One of them belongs to the order *Araneæ*, and is connected with the few known genera having two pairs of respiratory orifices, of which only the first pair contains air-gills, the other containing tracheæ. It is besides, in other respects, nearly allied to the genus *Dysdera*, though in its habit it still more resembles the otherwise far removed genus *Desis*.* Besides its want of sight, it differs from *Dysdera*, by various discrepancies in the parts of the mouth, the proportions of its limbs, and the naked abdomen.

STALITA.

Ordo ARANEÆ. Familia DYSDERÆ.

Oculi nulli. Antennæ mandibulares subporrectæ, conicæ, ungue sublateraliter inflexo. Maxillæ mala elongata, apice oblique truncato, margine interiori dense barbato. Labium sternale elongatum, angustum, apice subrotundato. Pedes elongati, subæquales, tertii paris breviores. Abdomen nudum.

Στηλίτης.

STALITA TENARIA.

Pallide ferruginea, antennis palpisque fusciscentibus, abdomine animalis vivi niveo: nitida, subglabra, palpis pedibusque spissius pilosis. Long. 3 lin.

The other genus, of the order of *Solifugæ*, is a colossal form of the family of *Obisia*, being closely allied to *Obisium*, though apparently differing by its remarkably slender and elongated limbs and palpi, the rudimentary state of the horny abdominal scales, its want of eyes, and, lastly, its remarkable size.

Both these Arachnidans are rust-coloured, with a white abdomen; they are swift animals, readily escaping pursuit, unless they are caught at a distance from their places of resort.

BLOTHRUS.

Ordo SOLIFUGÆ. Familia OBISIA.

Oculi nulli. Pollex antennarum mandibularium appendice nulla. Cephalothorax integer. Pedes elongati, gracillimi; tibiæ anteriores biarticulatæ; femora posteriora sutura ante medium

* At least the only known species, *Desis dysderoides*, Walck. (Hist. Nat. des Aptères, i. p. 610), which is identical with the original specimen in the Royal Museum of Natural History, of *Aranea maxillosa*, Fabr. (Entom. Syst. ii. p. 411, n. 17.)

divisa spuria; tarsi omnes biarticulati. Abdomen membranaceum, scutis corneis obsolete. Corpus setulosum, setis simplicibus.

Βλωθρός, ἢ βλώσχω.

BLOTHRUS SPELÆUS.

Pallide ferrugineus, manibus obscurioribus apice fusciscentibus, abdomine animalis vivi eburneo. Long. $2\frac{1}{2}$ — $2\frac{3}{4}$ lin.

In places of the caves, where water drops down direct upon the floor, small collections of it take place, which form a deposit of crystals of carbonate of lime at their bottom. In these pools in the Luege and Adelsberg caves, we find a snow-white, blind, crustaceous animal of the family of *Amphipoda*. It has a slender smooth figure, without any spines, and so nearly allied to *Gammarus*, that it would belong to that genus, were it not for its want of eyes, and the following very striking character:—The last abdominal feet, which are nearly void of spines, have the inner style rudimentary, while the outer is not only greatly elongated, especially in the male; but what is more remarkable, it is two-jointed. I consider this last circumstance as decisive, being supported in this view by some expressions of our celebrated Carcinologist (M. Kröyer), concerning those species of *Gammarus*, in which the style of the second joint of the sixth pair of abdominal legs is rudimentary, or entirely wanting; such as *G. Olivii*, *podager*, *Dugesii*, *brevicaudatus*, Milne-Edw.,* *affinis* and *pungens*, Milne-Edw.,† *dentatus*‡ and *anisochir*, K.§ He considers this structure to be of weight in a physiological point of view, as a generic character among animals, whose motion in a great measure consists in jumping;|| but in our new species, this apparatus for jumping differs still more, so as to resemble almost a rotatory contrivance. Another deviation deserving notice, is the very slight development of the appendicular flagellum of the uppermost antennæ, which consists of only two joints, and protrudes very little beyond the first joint of the flagellum; yet great weight cannot be attached to this structure, especially as in some degree it occurs in several

* Extrait de Recherches pour servir à l'Hist. Nat. des Crustacés-Amphipodes (Annal. des Sc. Nat. tom. xx. p. 367—372).

† Hist. Nat. des Crustacés, tom. iii. p. 47.

‡ Kröyer, Naturhist. Tidsskr. vol. iv. p. 159.

§ Ibid. New Series, vol. i. p. 327.

|| Kröyer, lo. cit. p. 326.

species of *Gammarus*, such as *brevicaudatus* and *Othonis*, M.-Edw.*

NIPHARGUS.

Ordo AMPHIPODA—Familia GAMMARI.

Oculi nulli Antennæ superiores inferioribus longiores, flagello appendiculari minuto, biarticulato. Pedes ultimi paris stylo anteriori brevissimo, exteriori valde elongato, biarticulato.

Νίφαργος.

Niphargus Stygius.

Elongatus, summa altitudine a dorso segmenti tertii ad inferiorem epimeri marginem quintuplo longior, subcompressus, crassitie maxima segmenti tertii altitudinem haud æquante, lævis, carinis dentibusque carens omnino. Color niveus. Long. 5—7 lin.

The commonest among the proper cave animals, is a species, which, not confining itself to the columns in the depths of the caves, is found wandering about on the walls, on the columns near the outlet, which have become blackened by the torches, and also along the frequented paths and roads; and it is the only animal among those treated of here, which was known before, though imperfectly only. It is a white crustacean of the family of *Oniscidæ*, and has been figured by Koch under the name of *Pherusa alba*.† He had, however, defective specimens only, without antennæ or the last pair of abdominal legs, and had to rely on the want of eyes for his generic character. On referring to Koch's work on the subject, Erichson‡ has subsequently added some remarks, derived from his examination of better preserved specimens in the Berlin Museum, concerning the appendage to the last pair of abdominal legs, and the number of joints in the flagellum of the antennæ, which he rates at eight. As this is all the information we have hitherto possessed as to this animal, I have availed myself of the present opportunity of entering into a detail of its structure.

According to M. Koch's division of the family of *Oniscidæ* (*Cloportides*, Lat.), founded on the structure of the last pair

* Annal. des Soc. Nat. tom. xx. p. 373. Milne-Edwards mentions that the appendicular flagellum is three-jointed.

† Deutschlands Crustaceen, Myriapoden und Arachniden, 34stes Heft. 1840.

‡ Archiv für Naturg. 1841, vol. ii. p. 252.

of abdominal legs, our animal belongs, as observed already by Erichson, to the middle group (the family of *Oniscidæ*, Koch), characterized by the oval or lanceolate form of those legs, and otherwise corresponding entirely with the almost identical division of *Porcellionides* of M. Milne-Edwards. Among the genera founded in this group by Latreille and Brandt, which differ only in the number of joints of the outer flagellum of the antennæ (one, two or three), *Pherusa* maintains its place in many respects. Instead of one single, or only a few joints, which in point of form or size do not contrast with the outer joint of the stalk, we find here a very developed flagellum, having a larger number of short joints (eight, to twenty). The entire form of the animal is slender, the corners of the hindermost of the thoracic segments are considerably elongated, especially in the male, without the abdomen being enclosed by the seventh thoracic segment, as is usually the case; on the contrary, it is quite free, more than half the length of the thorax, receiving a still more determined shape, from the unusual length of the two first joints; these, as well as the succeeding joints, differ in shape among themselves, as well as from the thoracic joints; the posterior corners of the third of the abdominal segments, in the male, being much elongated externally and backwards. The structure of the limbs is in uniformity with the slender form of the body, the first seven pairs of legs being very delicate, and increasing gradually in length from before, so that the last pair is very much longer than the first, which is the reverse of what is the case in the known genera. The outer joints of the last pair of abdominal legs is subulate, and exceeds in length the abdomen.

The following points remain to be noticed, being different from the other genera of the group. The middle of the three lobes, which seem to terminate the head anteriorly in these genera, may be said to be deficient here, inasmuch as it does not, as usual, form a projecting border, but is vaulted downwards with a gentle curve towards the clypeus, above which it is bordered by a strongly arched, slightly elevated line. All the parts of the mouth are remarkably slender. In the sinus of the masticatory side of the mandibulæ are found four movable appendages; the first of these is thick, with a naked, toothed joint; the other three elongated, nearly filiform, slightly hairy on the anterior surface. The first pair of maxillæ have the anterior lobe at its apex furnished with three appendages, instead of a short one; they are long and slender, nearly lanceolate, and furnished with longish lateral hairs. The palpi and lobes of the maxillary feet are unusually developed, and

both are dense and finely ciliated, but without scattered spines; the lobe has at its apex a minute, sharp, and slightly hairy appendage, and a delicate spine. The outermost joint or claw of the thoracic legs, wants the little appendage on the inner side, near the apex; but it is divided into two joints, of which the uppermost is densely bristly and furnished outwardly with a peculiar little apparatus, consisting of two threads, united at the base in a common sheath, but flabelliform and incised at the end.

The want of eyes, in addition to the above peculiarities, must assuredly be considered as differences from the known genera of the group, far more significant than the characters, which separate those genera among themselves. I hesitate not, therefore, to regard the animal as a well-founded genus. The peculiarity in the structure will be understood without difficulty. Having a much more humid locality than *Oniscus*, *Porcellio* and the other *Oniscidæ*, and compelled to seek for nourishment in the dark, we easily comprehend the intention of its general slenderness of shape, the more free abdomen, and the longer legs, especially developed behind, as adapting it for a higher degree of mobility. The flagellum of the antennæ approaches accordingly nearer to the structure, which we find among the *Ligiæ* and the other groups of aquatic animals; while the fanshaped, very flexible apparatus appended to its feet, appears well suited to support its progress on the most frequently perpendicular and wet sides of the caves and the stalactites.

Among the characters in the diagnosis, the first two are sufficient to separate the genus from the earlier ones of the group; but some of the others may have to be removed in case other species should be discovered. When it will be seen whether or not the genus occupies the same position in the group, with regard to the difference among its species, as the other genera, whose species, like what occurs in all terrestrial *Articulata*, are so closely allied to each other, that they differ only in colour, painting, covering, sculpture, and single little inequalities in their forms.

As the name applied by Koch has been repeatedly used before, even in the same class of animals, I propose a new generic name.

TITANETHES.

Ordo ISOPODA—Familia ONISCI—Tribus ONISCINI.

Oculi nulli. Flagellum antennarum exteriorum setaceum, multiarticulatum. Mandibulæ appendicibus quatuor, anteriori nuda, dentata, posterioribus æqualibus, filiformibus. Mala interior maxillarum prioris paris appendicibus munita tribus,

elongatis, pennatis. Mala pedum maxillarium elongata, appendiculata. Pedes (sic dicti) thoracici graciles, longitudine per paria crescentes; unguiculis biarticulatis appendiceque instructis gemina flabellata. Posterior abdominis portio libera, elongata. Pedes abdominales ultimi paris articulo exteriori styliiformi, elongato.

Τιτάν, — ἦθης.

Titanethes albus.

Oblongo-ovatus, posterius attenuatus, convexiusculus, niveus, unguiculis apicem versus rufuscentibus, lævis; caput, thorax, segmentaque prioris abdominis portionis superne ad latera marginemque posteriorem tuberculis adspersa minutis, rotundatis, inæqualibus. Long. 4—7 lin.

We may with propriety apply the collective term *Subterranean Fauna* to those animals, which exclusively inhabit caves, and are expressly constructed for such habitations. Still there is nothing in this name, which would indicate that these animals have any claim to be considered as a separate group, beyond the mere peculiarity of their common place of abode. I have endeavoured, but in vain, after completing my examination of them, to collect the impressions left on my mind by their various peculiarities, and to estimate the extraordinary changes which take place in regard to the more or less wide or narrow systematic groups to which each of the forms belong, with the view of ascertaining whether or not the animals might constitute some higher faunal unity. While a few of them possess such an extraordinary structure, as to stand in no comparison with those animals which inhabit the light, there are others, forming only more characteristic links in the groups of animals more or less shy of light, of which many are found common in the localities of the caves; and some belong to genera having a wide local, as well as geographical, extension. We are accordingly prevented from considering the entire phenomenon in any other light than something purely local, and the similarity which is exhibited in a few forms (*Anophthalmus, Adelops, Bathyscia*), between the Mammoth cave and the caves in Carniola, otherwise than as a very plain expression of that analogy, which subsists generally between the Fauna of Europe and of North America. Besides, it is clear to me, that the Fauna of the caves of Carniola consists of two divisions, of which the essential character is referable on the one hand to the dark locality, and on the other to the

additional confinement to stalactitic formations; as yet we are not able rigorously to discriminate between the two. We shall accordingly look upon the subterranean Fauna, or more properly Faunas, as small ramifications which have penetrated into the earth from the geographically-limited Faunas of the adjacent tracts, and which, as they extended themselves into darkness, have been accommodated to surrounding circumstances. Animals not far remote from the ordinary forms, prepare the transition from light to darkness. Next follow those that are constructed for twilight; and last of all those destined for total darkness, and whose formation is quite peculiar. Among these, some are adapted for special localities, those which inhabit dry localities or detached little reservoirs being totally blind, while others, destined for running streams, have eyes of imperfect construction, so as to receive the impression of rays of light, but no proper image of illuminated objects. We may therefore with tolerable precision arrange the inhabitants of caverns under the following heads:

Shade-animals.—Extensive genera and species, inhabiting caverns near their entrance, and, generally, all cool, shady and moist localities. Of these, those that fly, occasionally enter far into the caverns (*Antliata*).

Twilight-animals.—They belong to widely-spread genera, but are peculiar to the caves, and distinguished by their small eyes. They are principally found near the entrances to the caves, but proceed deeper into the darkness than the shade-animals, and although wingless, they penetrate often the whole extent of the dark space.—(*Pristonychus elegans*, *Homalota spelæa*.)

Cave-animals.—They form, at least in part, peculiar genera, are wingless and colourless, as far as the consistency of their integuments will admit, and exist exclusively in total darkness. The terrestrial division is blind; the aquatic has a perception of light. To this group belong all the animals in the Mammoth cave, and among those of the caves of Carniola *Anophthalmus*, *Bathyscia*, perhaps likewise *Anurophorus* and *Hypochthon*, which, however, may belong to the following group.

Stalactite-cave-animals.—Insects, Arachnidans and Crustaceans, appertaining to peculiar genera, wingless, blind, brightly coloured, according to the nature of their integuments, either light brown, yellowish, white, or snow-white, perhaps according to the preponderance of the Chitine; living in total darkness, peculiar to stalactite caves, in part occupying the columns and constructed accordingly, either for ascent or hovering over them. Here belong most of the animals treated of in this memoir,—*Stagobius*, *Blothrus*, *Stalita*, *Niphargus* and *Titanethes*.

The circumstance of all the proper cave animals belonging to those groups which feed on prey or else on fermenting vegetable and animal substances, corresponds exactly with the nature of the caves. For, all the caves in which these animals are known to occur, agree in this, that they contain, more or less, running streams, or at any rate accumulations of water, which may be supposed to receive influx from without. It is easy, therefore, to understand how the aquatic animals obtain their food. But water will also carry with it sufficient food for the land animals of the caves, consisting of living and dead animals, and putrid vegetable substances; and these animals may in their turn serve as food for the predatory ones. *Titanethes albus* may be instanced as a link between the outer animals and the predatory animals within, on account of their frequency and mode of living. But it is difficult to understand the mode of life of *Stagobius Troglodytes*; or how this slow and defenceless animal can escape being devoured by the rapid, piratical Arachnidans, or find adequate support on columns, for inhabiting which it is so manifestly constructed. We are led in this respect to consider the antennæ. Whatever signification we attach to those enigmatical organs, we must admit, that they are organs of sense, in which view an animal having them so much developed as *Stagobius*, must possess a great advantage over its enemies, if these be only Arachnidans. Its cautious and slow progress, and its timid reconnoitring demeanour, fully indicate, that it is conscious of life being in perpetual danger, and that it endeavours to the utmost to avoid that danger. Darkness, which always favours the pursued more than the pursuer, comes to its aid, especially on the uneven, excavated surface of the columns. Nor is it difficult to suppose, that it procures sufficient food, more so, perhaps, than is the case with many insects living in the open air; for, the stalactites can scarcely be more void of vegetation, or present generally a more hopeless appearance, as the abode of insects, than the spots on the confines of the snow-line of the Alps, which continue uncovered only a few weeks in summer; or the ashes and lava at the foot of the crater of Vesuvius and Ætna; or the naked sands, washed by perpetual spray from the sea, on the cliffs at the extremity of Skagen. And yet, these lofty Alp-regions are inhabited by not a few peculiar, *wingless* insects; the scanty manure, left on the sides of the volcanos by the mules and horses of travellers, is sought after by a *peculiar* *Aphodius*; and the above-mentioned sandy spots are covered, during the entire summer, by myriads of nests of *Bledius arenarius*.

The predominant part, which articulate animals perform, all over the world, in the terrestrial and fresh-water Fauna, corresponds with the fact, that most of the cave inhabitants belong to that series; while the small number of species, and even of individuals, is easily explained by the poverty of the locality, as regards the conditions favourable for organic life. But if we recollect, that only a few caves have been visited zoologically, that only few naturalists have examined them, and finally, that the animals of the caves of Carniola, which I have described above, were found in the course of half a score days only, and in but one season, we may look upon it as probable, that the number of cave-animals, even those of the caves hitherto actually visited, is far from being exhausted.

EXPLANATION OF THE FIGURES.

PLATE IX.

- Fig. 1. *Stagobius troglodytes*, seen sideways.
 Fig. 2. *Anurophorus stillicidii*.
 Fig. 3. *Stalita tæniaria*.
 Fig. 4. *Blotrus spelæus*.
 Fig. 5. *Niphargus stygius*.
 Fig. 6. *Titanethus albus*.

(All reduced from Schiödte's figures.)

The following observations have been communicated by the author, in a letter to Dr. Wallich, as an Appendix to the above Memoir:—

I. I have mentioned a peculiar insect of the family of Locusts as occurring in the caves of Carniola, and in grottos in the vicinity of Syracuse; but I could not do more than barely mention the species, not being in possession of completely developed specimens. I have since learned that the animal has been already described.

In a paper of Dr. H. Fischer (*Beiträge zur Geschichte des Orthopteren-Studiums*, in *Entom. Zeitung*, 10 Jahrg. Feb. 1849, p. 44) I was made aware of the existence of a memoir, which appears to have remained in complete obscurity even in Germany itself, but in which the insect in question is clearly described under the name of *Locusta cavicola*. The author is Vincent Kollar; the memoir is in "*Systemat. Verzeichniss der im Erzherzogthume Oestreich vorkommende geradeflügeligen Insecten*," and is also inserted in "*Beiträge zur Landeskunde Oestreichs unter der Enns*," 3d vol., Vienna, 8vo. p. 67. The insect was discovered by Director Schreibers in a small cavern in the vicinity of Baden, called the *Schelmenloch*.

Locusta cavicola is no doubt nearest to the genus *Rhaphidophora*, Serv., differing however in one important point from Serville's character of it, namely, in the structure of the legs, which are *extremely compressed*. Not having had an opportunity of examining any of the species of *Rhaphidophora* described by Serville, Harris, and De Haan, I am unable to point out anything beyond that.

II. My researches concerning the Fauna of the caves were communicated to the Royal Danish Academy of Sciences, at the Meeting of the 25th June, 1847, and a sketch of them was published the same year, in the Academy's Proceedings, No. 6, p. 75, et seq. Through the kindness of Mr. Ferd. Schmidt I have since become acquainted with a quarto paper, published by him (as it appears, a transcript from an Illyrian daily paper), entitled *Naturhistorisches aus Krain* (Communications on Natural History, from Carniola), and dated the 28th December, 1847; in which that zealous and, as respects the Fauna of the caves, very meritorious collector, gives an account of several new objects found there. A new *Anophthalmus*, from the Sele grotto, has now appeared in Sturm's "Deutschlands-Fauna," under the name of *A. Bilimeki* (named after the discoverer, a Cistercian divine). Two other animals likewise mentioned there; *Catops troglodytes* and *Obisium troglodytes*, are probably identical with *Bathyscia byssina* and *Blothrus spelæus*. Mr. Schmidt has likewise met with *Stagobius troglodytes* in the Adelsberg grotto, referring to it under the name of *Leptodirus Hohennarti*, represented in an annexed lithographic outline. It is mentioned at the same time, that fragments of the animal had already been found, in 1831, by Count Franz von Hohenwart; but that Mr. Schmidt had visited the caves annually, from 1831 to 1846, on purpose to search for it, but in vain. Sturm has now given a good account of this cave-inhabitant in his "Deutschlands-Fauna," but appears not to have been acquainted with my memoir. The anterior tarsi of the male are five-jointed, according to his account; so that my specimens must be all females, and those points, to which I thought I could attach external sexual differences, can only belong to individuals.

III. In a communication from Mr. Freyer mention is made of a new cave-crustacean, *Palomon anophthalmus*, Kollar, said to serve as food for *Hypochthon*; of which last genus he discriminates six species. *Berichte*, &c. (Reports on the Communications of Friends of Natural Sciences at Vienna, edited by William Haidinger, vol. 5, Vienna, 8vo. p. 56.)

XVIII. *On Insects injurious to the Cotton Plant.* By W. W. SAUNDERS, Esq., F.L.S.

[Read February 3rd, 1851.]

HAVING had my attention recently called to the insects injurious to the Cotton plant, I have been seeking for information on this subject from various sources, where I expected to have found the object of my inquiries fully answered. It is with surprise, however, that I discover that the insects in question have been but very little studied, and have scarcely excited the attention of those interested in the growth of cotton; although it is evident, from the accounts published of the ravages of these insects, that at times the amount of loss to the planter must have been very great. No careful description, nor well directed observations, seem to have been made by our Transatlantic brethren on the various insects which we read of under the names of Chenille, Cotton Bug, Cutworm, &c., &c., insects well known to the planters, as their worst enemies, and concerning them the particulars I have to offer are of a very unsatisfactory kind, wanting entirely in that exact information so necessary to the entomological inquirer, and which, if fully developed, might lead to some satisfactory method of diminishing, if not preventing, the injuries so much complained of. A short account of these insects, extracted from Porter's *Tropical Agriculturist*, and the *History of the Cotton Manufacture*, by Dr. Ure, is all that I can discover of any value on the subject, and the extracts hereafter made will show that the information afforded is of a very scanty and unsatisfactory nature. Pursuing the subject further, I find a brief notice and description of a moth injurious to the cotton plant in Abbot and Smith's *Insects of Georgia*, which may be one of those alluded to by Mr. Porter or Dr. Ure; but I have no means of proving their identity. There is also in the *Transactions of the Entomological Society*, vol. iii., a notice of a small moth, very injurious to the cotton plant, at Broach, in the East Indies, which I brought to the notice of this Society, and called *Depressaria Gossypiella*. The published information on insects injurious to the cotton plant, appears to terminate here, as far as I can ascertain; and it is my intention, after laying a short account of the insects alluded to before this Society, to proceed to the description of some others, about which I have more positive information, trusting that the whole may be

of some use as a first step towards a history of the insects injurious to the cotton plant; and *may* bring this important subject to the notice of Entomologists, especially of those who have opportunities of witnessing the ravages committed by these insects, and induce them to record their observations, with a view of furnishing information for a more complete illustration of the subject hereafter.

The CHENILLE, of Guiana and Bahamas.—Mr. Porter mentions this caterpillar as follows:—"Another very serious peril to which the plant is liable results from the ravages of an insect called the cotton caterpillar, but more generally known upon cotton plantations as the Chenille. This destroyer is generally about an inch or an inch and a half in length; its back and sides are glossy black; a single line of white runs down the whole length of the back, at its middle, and double white lines are seen at each side of the single line, and running parallel to it. The belly is of a whitish yellow colour, and is covered with a soft downy hair intermixed with bristles, which are short and black. These insects have a most rapacious appetite; they sometimes appear singly, or in small companies, but at other times are in such swarms that whole fields of cotton plants, which gave no sign of their presence on the previous evening, are seen in the morning completely devoured, so that not a leaf, a flower, a pod, or a green sprout remains. A very singular effect accompanies the ravages of this little enemy. Although the insect itself gives out no smell, and the plants are equally inodorous, yet while the Chenille is feeding on its leaves, a strong and uncommonly fragrant smell is perceptible at more than one hundred yards distance. This army of caterpillars moves off to another field as soon as one is destroyed; and it appears that they exhibit great capriciousness in the choice of their feeding grounds, and are often found commencing their attacks in the centre of a field instead of at the circumference, as might have been expected."—*Tropical Agriculturist*, pp. 24 and 25.

Dr. Ure says, "the cotton plant of Guiana is particularly subject to the attacks of the Chenille."—*Ure's Cotton*, p. 130.

"The Army Worm of the United States is probably identical with the Chenille, or is a caterpillar very similar to it in its mode of carrying on its ravages. The visits of the Chenille seldom recur more frequently than once in three years; its whole existence is limited to twenty-seven days, nine of which it passes in the form of a moth."—*Trop. Agric.* p. 26.

The COTTON MOTH of Georgia and South Carolina.—Dr. Ure gives the following account of this moth:—"The August full moon is likewise the time when the caterpillar makes its appearance. It is the offspring of a small brown moth, resembling the candle moth, which deposits its eggs upon the leaves of the *Gossypium*, always a night or two before the full or new moon; they hatch a few hours after they are deposited, and are so small at first as to be hardly discernible to the naked eye; they do little or no damage during the first nine or ten days of their life, like the silkworm eating little in their infancy, but a few days before they complete their growth they become so excessively voracious as to destroy an entire plantation in a few hours. Mr. Spalding has seen 400 acres of cotton of a promising aspect, which four days thereafter did not possess a green leaf, or scarcely a solitary pod upon a plant."—*Ure's Cotton*, p. 106.

CUTWORM or GRUB, of Georgia and Guiana, is thus mentioned.—"When both these sources of danger (frost and north-east wind) are past, there is another enemy, equally destructive, the cockchafer or cutworm, which prevails in the month of April. As the cotton comes through the ground and remains several days, like the pea or other pulse, with only two radical leaves, every one of the plants cut above or below the ground is destroyed, in consequence of which whole fields have not unfrequently to be replanted in the month of May."—*Ure, loc. cit.* p. 105.

"Another description of caterpillar, hurtful to the cotton plant, is one which continues either buried in, or crawling on the surface of the ground, it being incapable of climbing. The ravages of this insect are consequently at an end, after the first week following the appearance of the plant above the ground. The ravages of these insects are said by Mr. Edwards to be so great, that it is necessary every third or fourth year to resort to fresh land in order to avoid them."—*Tropical Agriculturist*, p. 26.

The COTTON BUG, of Guiana.—This insect is alluded to by Mr. Porter, as follows:—"It is a concomitant of this disease (the blast), that the plant is attacked by a peculiar kind of insect called the cotton bug, which infests the pods by swarms, and contributes greatly to the destruction of the crop; this, which is one of the effects, has sometimes been mistakenly considered as a cause of the blast. The insect, which is a species of *Cimex*, is of a scarlet colour when young. If crushed when full grown,

a powerful and offensive smell will be perceived, very similar to that given out under similar circumstances by its European and more domestic namesake."—*Tropical Agriculturist*, p. 24.

"There are, moreover, red and black bugs, which sometimes suck the seeds of the cotton plant at the period when the capsules open. When seeds so gnawed get accidentally between the rollers of the gin, they are crushed flat, and cause the wool to be soiled with the animal impurities of the bug."—*Ure, loc. cit.* p. 131.

Apate monachus, of Guiana.—Dr. Ure observes, "this species of *Scarabé*, the *Apate monachus*, is a third enemy of the cotton plant. The larva of this insect begins its attack by boring a hole in the green bark of the cotton tree; it penetrates into the album, eats it with a revolving motion under the bark, and proceeds then to the wood and pith; the branches thus attacked dry up and perish."—*Ure, loc. cit.* p. 130.

This insect may be identical with the boll or bore worm of the planters, which Mr. Turner, in a communication to Dr. Royle, supposes to be the larva of a Coleopterous insect, probably a *Curculio*.

Referring now to the species, of which there is more positive information to be obtained, I will place them in two divisions; the first containing those which have already been described, and the second such only as are for the first time brought forward as injurious to the cotton plant. In the first division may be mentioned the smeared or cotton moth, *Phalæna obliquata* of Abbot and Smith's insects of Georgia, figured on plate 94 of that work, and shortly described at page 187, *loc. cit.* in the following terms, "*Ph. noctua*, spirilinqvis cristata, alis lanceolatis, cœnis punctis nigris marginem versus effluentibus." This, more fully described from the figure, has the fore wings above pale blueish ash grey, covered with indistinct irregularly shaped darkish spot-like markings on the disk, and a row of more distinct round spots of the same colour parallel to the exterior margin; the hind wings white, with the nervures yellowish, and with a row of black marginal spots. The head and thorax are of the same ash grey as the fore wings, and the abdomen is yellowish white, with the last four or five apical joints tinged with ash grey. The caterpillar is black, with a broad irregular lateral yellow band on each side, and the joints of the body transversely margined with the same colour; the joints are marked above with red spots and

bunches of reddish brown hairs. The caterpillar feeds on the cotton and other plants, and the moth appears in April. Found in Virginia and Georgia. Pl. XII., figs. 3 and 4.

Next I may mention a small moth which I described in the Transactions of the Entomological Society, vol. iii. p. 284, under the name of *Depressaria Gossypiella*. This little moth belongs to the large family of minute moths, the *Tineidæ*, and I am under obligation to my friend Dr. Royle, who takes such a lively interest in all that concerns the commerce and agriculture of the East Indies, for bringing its habits and economy to my notice. Dr. Royle obtained his information from Dr. Barn, superintendent of the government cotton plantations at Broach, who describes the larva as very destructive to the American cotton grown at Broach, but seldom affecting the native cotton. The larva feeds upon the cotton seed until the pod is about to burst. The moth is $\frac{4}{10}$ of an inch in the expansion of the wings, and is of a dark fuscous brown colour, the anterior wings having a round blackish spot on the disk, and a band of the same colour crossing the wings a little above the apex, which itself is black.

Under the second head of species, now for the first time brought forward, as injurious to the cotton plant, in the first place I will describe two, for the knowledge of which I am indebted to Dr. Horsfield, the talented Entomologist who has charge of the Entomological collection of the Honourable East India Company, and whose researches in Java will ever render his name memorable among Entomologists.

Arctia Horsfieldii. ♂.

Antennæ blade greyish white, pectinæ reddish brown. Thorax rounded above, purplish ashy grey. Abdomen brownish orange. Anterior wings, *above*, purplish ashy grey, crossed with several abbreviated, obsolete, wavy, dark ashy grey lines, running parallel with the outer margin, and a more defined zigzag line of the same colour near the base; and with an elongate, reniform, eye-like, dark grey spot on the disk, a little behind the anterior margin, and near the centre of the same; *below*, yellowish grey, with a dark grey spot corresponding with the reniform mark on the upper surface. Posterior wings brownish orange, gradually changing to purplish ash grey on the outer margin, marked on the disk with a dark grey spot, and with radiating lines of the same colour running through the purplish grey of the outer margin, fore legs ashy grey, middle and hinder legs cream-coloured. Caterpillar yellowish white, covered with long lemon-coloured hairs. The joints of the body each crossed above with an ash grey lunulate

spot, and a round, rather large, black spot on the upper side of the third joint. Chrysalis bright shining chesnut brown, enclosed in a case of loose, thin, fragile, yellowish brown, silky fibres. Feeds on the *Gossypium herbaceum*, Lin. (Kapas, Java). A native of Java, appears in the month of August. Dr. Horsfield.

Length of body, 9 lines.

Expansion of wings, 1 inch, 10 lines.

Perfect insect, Pl. XII., fig. 2.

Caterpillar, Pl. XII., fig. 1.

Fam. PYRALIDÆ.

EUDIOPTES, Hübner.

PHAKELLURA, Land. Guelding (MSS. ? according to Poey.)

Head small, not so broad as the thorax, with the eyes round and prominent. Palpi short, but little apparent. Tongue long, spirally twisted when drawn in. Antennæ three-fourths the length of the body, setaceous, cylindrical, consisting of a great number of joints. Thorax rounded, even above. Wings with the disk covered with hyaline scales, and margined anteriorly and laterally with a broad band of dark scales. The fore wings elongate, pointed, about the length of the abdomen. Abdomen cylindrical, the terminal joint furnished with a dense radiating tuft of hair-like scales. Legs long, slender, the hinder tibiæ with one strong spur at the apex, and a pair set close together about midway between the apex and the femur.

E. Indica.

Head and thorax dark silky, sepia brown; antennæ nearly as long as the wings, greyish brown, getting darker at the base. Tongue half the length of the body. Abdomen white, with a dark sepia brown fascia across the apical joint, which is furnished at the apex with a radiating tuft of dark sepia brown closely set hairs. Legs long, creamy white, with the apices of the tibiæ strongly spurred. Anterior wings hyaline, reflecting an azure tint, with a broad dark sepia brown even band along the anterior and exterior margins, the band rather widening as it approaches the posterior angle, and showing a slight curvature on the hyaline disk. Posterior wings hyaline, with a band of the same width and colour as the anterior around its exterior margin, gradually drawing to a point as it nears the anal angle.

Expansion of wings 10 to 12 lines.

Length of body 6 to 7 lines.

Caterpillar.—Mouth pale grass green, with the head yellowish.

Pupa dull chesnut, enclosed in a case of portion of a leaf drawn together with silken threads.

Feeds on the *Gossypium herbaceum* (Kapas, Java), and on the *Erythrina corollodendron* (Dadap Srep, Java). Is common in Java from January to April.—Dr. Horsfield:

Perfect insect, fig. 7.

Caterpillar, fig. 5.

Chrysalis in case, laid open, fig. 6.

This species is a very near ally to the *Pyralis hyalinata*, Lin. Poey, Cen. Lep. Cuba, pl. 19 (which belongs to the genus *Eudiotpes*, Hüb.), but it differs from it in the somewhat smaller size, broader band round the wings, in the nature of the chrysalis case, and being found only in the East Indies, while the species described by Poey seems to be as exclusively limited to the new world, and is found in Cuba, Jamaica, Brazil and Honduras. A third closely allied but distinct species is found on the west coast of Africa.

For the information concerning the three following insects I am indebted again to Dr. Royle, who handed me a communication, accompanied by a drawing, he had received from Sam. Simpson, Esq., government cotton planter in the East Indies; and although the communication is short, it is very interesting, and tells well for the observing qualities of that gentleman, and shows how capable he is of working out the subject of the cotton insects of India to a very satisfactory termination.

Mr. Simpson states, that the effect of the attack of these insects is to cause dark greenish blotches on the leaves, as shown in figures 8, 9 and 10, Pl. XII. These blotches are occasioned by the insects having recently fed there; and the result is, that the leaves bleed from the injured parts, and, from the heat of the sun, they eventually curl up, as shown at fig. 10, assuming the appearance of leaves touched by the frost, or scorched by fire. This curling of the leaves much injures the growth of the cotton plants, and considerably influences the crop.

The first insect mentioned by Mr. Simpson is the larva of some beetle, probably of the family *Chrysomelidæ*. The appearance of the eggs of the insect, which are white, oval, and closely laid together, as observed by this gentleman at 8 A.M., is shown at *a*, fig. 8. The same eggs, just hatching, were observed at noon, and are shown somewhat magnified at *b*, fig. 9. Three hours afterwards the young larvæ were seen feeding, and are shown at *c*, fig. 9, also magnified. These larvæ are elongate, ovate, dirty green, with a red head; they have six feet, and the whole surface

of the body appears to be covered with short spine-like processes or tubercules.

The second insect mentioned by Mr. Simpson is evidently an *Aphis* of a green colour, and about one-eighth of an inch in length. The drawing is not sufficiently accurate to form any idea of the species, and I shall therefore give it the pro tem. name of *Aphis Gossypii*. This species is shown magnified, and real size? at *ce*, fig. 8; and has an ovate abdomen, furnished at the apex with two shortish setæ, and the head furnished with antennæ about two-thirds the length of the body.

The third insect is shown magnified at *d*, fig. 8 and 9, and does not exceed one-eighth of an inch in length. It has six legs, and an incurved ructorial apparatus, with a pointed abdomen, considerably projecting beyond the immature wing cases. The general colour is pale grass-green, with the wing cases of the same colour, but much darker.

Mr. Simpson has figured one specimen, *d*, fig. 8, with setaceous antennæ about half the length of the body, while there is no appearance of these organs on the other specimen, *d*, fig. 9; but they are so evidently the same insect, that there being no antennæ in the latter case is clearly an error in the drawing. This is an immature state of some member of the large order *Homoptera*, and probably will be found related to the *Cercopidæ*, and not far removed from the genus *Typhlocyba* of Germar.

As the foregoing notices are strung together without any attempt to classify the insects, it will be as well, in conclusion, shortly to recapitulate what has been said; and it results that there is evidence of twelve insects having been found injurious to the cotton plant, viz.—

6 caterpillars of moths,
3 larvæ of beetles,
1 immature state of an Homopterous insect,
1 <i>Cimex</i> ,
1 <i>Aphis</i> ,
—
12
==

which have been treated on in the following order:—

1. The caterpillar of a moth, known by the name of Chenille in Guiana, and Army Worm in the United States.
2. The caterpillar of a moth, known as the Cotton Moth of Guiana.

3. The Cut Worm or Grub of Georgia and Guiana, which is the larva of a beetle.
 4. The Cotton Bug, an insect belonging to the family *Cimicidæ*.
 5. The insect called *Apate Monachus*, of Guiana, probably identical with the Bore Worm or Boll Worm of the United States, and supposed to be the larva of a *Curculio*.
 6. The caterpillar of *Phalæna oblinata* of Abbot and Smith.
 7. The caterpillar of *Depressaria Gossypiella* of W. W. Saunders, Ent. Trans.
 8. The caterpillar of *Arctia Horsfieldii*, now described.
 9. The caterpillar of *Eudiptes Indica*, now first described.
 10. The larva of a beetle supposed to belong to the family *Chrysomelidæ*.
 11. An *Aphis*, or plant louse.
 12. The immature state of an Homopterous insect allied to *Typhlocyba*.
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XIX. *Descriptions of three new Genera of exotic Coleoptera.*

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

[Read March 3rd, 1851.]

THE three insects which form the subject of the present communication are worthy of attention, on account of their severally presenting an external resemblance to groups to which naturally they do not belong. The first of these beetles has in fact been mistaken for a small species of *Lucanidæ*, to which family however it only bears a relation of analogy, whilst in affinity it is naturally very closely allied to the genus *Ips*. The second species has a very close primâ facie resemblance to the heteromerous genus *Cossyphus*, and yet it possesses no real relation thereto; and the third species is most nearly related to *Trogosita*, although its slender filiform antennæ and general form give it the appearance of some of the smaller *Scaritidæ*.

These analogical resemblances are highly interesting, on account of the clue which they have been supposed to afford to the natural classification of the groups to which, by affinity, they belong, and as indicating, by parallelism, the precise position of these analogous species or genera in the respective families to which they belong.

PAROMIA, Westw. Gen. Nov.

Corpus oblongum, subdepressum, parallelum, postice rotundatum. *Caput* porrectum, horizontale, pronoto parum angustius, parte antica angustata, longitudinaliter sulcata. *Labrum* minutum, porrectum, angulis anticis rotundatis, ciliatum. *Mandibulæ* porrectæ elongatæ, apice curvatæ bifidæ, intus ciliatæ. *Maxillæ* transversim insertæ, lobo unico apicali elongato, valde setoso, obtuso inermi. *Palpi* maxillares lobo vix longiores, articulo basali minimo, haud in tuberculum elongatum insidenti; articulisque intermediis brevibus obconicis, apicali longiori, apice parum attenuato. *Mentum* transversum corneum, basi paullo latius, angulis anticis rotundatis. *Labium* breve et angustum, margine antico parum emarginato. *Palpi* labiales minuti, subfiliformes; articulo basali minimo, 3tio elongato ovali, lingua e laciniis duabus elongatis ultra marginem anticum labii exsertis, setosis divaricatis compressis formata; maxillarum lobo ciliato ad latera laciniarum (insecto quiescenti) applicato. *Antennæ* breves, 11-articulatæ, clava 3-articulata, articulo ultimo mamilla parva terminali instructo; singula in canali laterali faciei inferæ capitis recepta. *Prothorax* brevis transversus, angulis anticis porrectis, lateribus

fere rectis. *Prosternum* retro porrectum et supra mesosternum paullo productum, apice rotundatum. *Metasternum* basi tenuissime canaliculatum. *Pedes* parum elongati, tibiis inermibus, tarsis 5-articulatis, subtus setosis, articulis tribus basalibus parum cordatis, 4to minuto, unguibus acutis, pulvillo parvo bisetoso intermedio instructis. *Abdomen* 5-articulatum, articulo basali majori.

The chief difference between this genus and *Ips*, its most decided ally, consists in the large size of the type (being nearly three quarters of an inch long, whilst the species of *Ips* rarely exceed one-fourth of an inch), the advanced structure of the anterior parts of the head, whereby the labrum becomes porrected (thus disagreeing with one of Erichson's three characters* of the family *Ipina*); the mandibles falcated, and by the canaliculated front of the head. The maxillary palpi do not arise from a long basal scape as in *Ips*. The "instrumenta labialia" closely resemble those of *Ips*, but less so those of *Pityophagus ferrugineus*,† Shuckard, in which last the mentum is much narrowed at the base.

Sp. unica. *Paromia Dorcoides*, Westw. (Pl. XIII., fig. 1, and details.)

P. nigra, nitida, elytris castaneis, basi parum luteis, apice nigris, maculis duabus subapicalibus fulvis.

Long. corp. lin. $8\frac{1}{2}$ (cap. cum mand. $2\frac{1}{4}$, prothoracis 2, elytror. 4). Habitat in Columbia. In Mus. D. Reich. Paris.

Caput antice et versus angulos posticos punctatum, linea media longitudinaliter impressum ultra medium verticis obsoleta, impressione altera tenuissima intus oculos et marginem posticum extensa; pronotum tenuissime marginatum. Elytra ad apicem plaga magna nigra antice in medio producta notata, in quâ maculæ duæ transversæ subapicales fulvæ.

COSSYPHODES, Westw. Gen. Nov.

Corpus minutum, latum, subparallelum, antice et postice rotundatum, valde depressum, marginatum et in medio longitudinaliter elevatum et carinatum. *Caput* semicirculare, fere planum, margine laterali paullo elevato, utrinque versus angulos pos-

* "*Labrum occultum.*" Germar, Zeitsch. iv. 355.

† Mr. Curtis has unfortunately drawn his generic characters of *Ips* from this species; it is, however, certainly, if belonging to the genus *Ips* at all, a most aberrant species. Mr. Curtis's figure of the "instrumenta labialia" (Brit. Ent. pl. 306, fig. 4) gives no idea of the real structure of this part of the mouth, and omits the paraglossæ or lacinie of the lingua.

ticos impressione parva longitudinali obliqua instructum. Subtus genæ utrinque porrectæ, fossulas duas pro receptione antennarum formantes. *Oculi* haud detecti, vel in fossulis duabus longitudinalibus disci reconditi. *Antennæ* brevissimæ geniculatæ, sub marginem lateralem capitis insertæ et in canali, genis utrinque formato, insidentes, clavatæ, 11-articulatæ, articulo basali magno elongato ovali, 2do parvo breviter ovali, 3tio ad 9um brevissimis transversis, duobus apicalibus magnis conjunctim coarctate applicatis, clavam subsolidam biarticulatam ovalem formantibus. *Labrum* sub clypeo absconditum transversum, angulis anticis rotundatis ciliatum. *Mandibulæ* breves, crassæ, corneæ, subtriangulares, sub apicem incisæ, et inde bidentatæ. *Maxillæ* parvæ, extus tuberculo porrecto (basin palporum defendente) armatæ, intus ad apicem lobis duobus distinctis longe ciliatis instructæ. *Palpi* maxillares lobis longiores in tuberculo parvum insidentes, articulis duobus intermediis brevibus latis, 4to multo longiori et subovali. *Mentum* subquadratum, basi parum angustatum, lateribus in medio emarginato-incisis. *Labium* breve, mento multo angustius, angulis lateralibus anticis ciliatis. *Palpi* labiales minuti in scapos duos crassos breves, cum facie externa labii connatos, insidentes; articulis 1 et 2 minutis, 3tio longiori, apice subacuminato. *Prothorax* transversus antice paullo angustior, lateribus parum rotundatis et recurvis, dorso in medio longitudinaliter elevato, carinisque tribus gracilibus utrinque notato. *Prosternum* breve elevatum subcuspidatum. *Scutellum* haud visibile. *Elytra* ovalia, depressa, lateribus acutis elevatis, medio elevato, singulo carinis tribus carinis prothoracis continuis lineaque altera tenuissima submarginale instructo. *Alæ* nullæ. *Metasternum* brevissimum. *Abdomen* utrinque marginibus inflexis elytrorum circumcinctum, 5-articulatum, segmentis sensim longitudine decrescentibus. *Pedes* brevissimi, valde compressi. *Femora* lata elongata ovalia. *Tibiæ* angustiores in femora subtus, quiescentes, replicatæ, calcaria minuta. *Tarsi* breves, subtus setosi, anticis 5-(vel 4?) articulati, intermedii 4-(vel 5?), postici 4-articulati, articulo penultimo præcedenti vix minori.

This is altogether one of the most anomalous genera hitherto described among Coleopterous insects. At first sight it possesses so strong a resemblance to the heteromerous genus *Cossyphus*, that it was for a time regarded merely as a minute species of that genus, for the outline of the head and pronotum are nearly continuous, so that it was not until a more careful examination was made that the ordinary exposed condition of the head and its divi-

sion from the prothorax was observed. The tarsi are not, however heteromerous.* The structure of the antennæ, moreover, at once removes this genus from the whole of the *Heteromera*, since they are elbowed at the extremity of the large first joint, and have a nearly solid 2-jointed terminal club. It is, I apprehend, among the genera originally placed by Latreille among the *Xylophaga* (but separated therefrom by Mac Leay, by whom they were introduced among the *Necrophaga*), that we must look for the true relations of this insect, some of which are already known to exhibit various numerical peculiarities in respect to the joints of their tarsi, often varying in the sexes in this respect. *Biphyllus*, as the name implies, has a 2-jointed clava to the antennæ, and some of the species of *Cerylon* have similarly polished bodies. *Bitoma* has also a biarticulate club to the antennæ, as well as a carinated pronotum and elytra. This last-named genus, in fact, notwithstanding the various very striking points of disagreement with *Cossyphodes*, may perhaps be regarded as most nearly allied to it of any known genus; indeed the parts of the mouth of *Bitoma*, as figured by Mr. Curtis (Brit. Ent. pl. 283), present a strong general conformity with those of *Cossyphodes*.

Sp. unica. *Cossyphodes Wollastonii*, Westw. (Pl. XIII., fig. 2, and details.)

C. totus castaneus, immaculatus, lævis, subnitidus; antennis, palpis pedibusque concoloribus.

Long. corp. lin. $1\frac{1}{2}$.

Habitat sub lapidem ad littus insulæ Maderæ. D. Wollaston.

The head has a small transverse slightly raised space near the anterior margin, beneath which the mouth is inserted. I have been unable to detect any traces of the eyes, although there is on each side of the disc of the head, extending to the front of the pronotum, an impressed line, in which the eyes may be concealed. The outline of the head, prothorax, and elytra is nearly continuous, as are also the three delicate carinæ on each side of the raised middle longitudinal line of the prothorax and elytra.

A single specimen of this most remarkable insect was discovered by T. Vernon Wollaston, Esq., under a stone on the shore of the

* Strictly speaking the tarsi are heteromerous, that is, they do not consist of the same number of joints in all the legs; but in the true *Heteromera* the four anterior tarsi are 5-jointed, and the two posterior tarsi are 4-jointed; but in the genus before us four of the tarsi are 4-jointed, and only one pair 5-jointed. I am unfortunately unable to state whether it is the anterior or intermediate pair of tarsi which are 5-jointed, having detached the legs, but the hind pair are certainly 4-jointed.

island of Madeira during his first visit. The species must however be extremely rare or very local, as he failed to detect it again during his second visit, although he repeatedly searched the adjoining neighbourhood with that object in view.

CHÆTOSOMA, Westw. Gen. nov.

Corpus oblongum, angustum, parallelum, subcylindricum, dorso subdepressum, punctatum, longe setosum. *Caput* porrectum, subquadratum, latitudine pronoto æquale. *Clypeus* transversus, brevis. *Labrum* breve, angulis anticis lateralibus rotundatis, medio antice submarginatum. *Mandibulæ* magnæ, corneæ, exsertæ, elongato-trigonæ, apice subhamato, intus dentibus duobus obtusis armatæ. *Maxillæ* e lobis duobus setosis latis obtusis formatae, interno haud spina armato. *Palpi* maxillares maxillis fere duplo longiores, articulo basali minuto; 2do et 3tio æqualibus, apice parum crassioribus, 4to præcedenti paullo longiori et crassiori, sensim incrassato, apice obtuso. *Mentum* breve transversum, in scapum corneum juguli insertum, lateribus rotundatis, medio late emarginatum. *Labium* porrectum, profunde emarginatum vel fere bifidum, margine antico setoso. *Palpi* labiales in scapos duos latos insidentes, articulo basali breve, secundo fere triplo longiori, 3tio longitudine 2di, subovali, apice oblique truncato. *Antennæ* subfiliformes, fere longitudine capitis et pronoti, longe setosæ, articulo 1mo brevi subrotundato, 2ndo brevissimo, 3tio ad 10mum fere æqualibus basi singulatim angustato, 11mo præcedenti vix longiori subovali. *Pronotum* subquadratum, lateribus fere rectis, dorso rude punctatum, elytris paullo angustius. *Elytra* oblonga, basi truncata, apice rotundata, angulis humeralibus acute prominentibus. *Pedes* longitudine mediocres, femoribus crassis, tibiis e basi ad apicem sensim incrassatis subtriquetris. *Tarsi* omnes 5-articulati, articulis 4 basalibus brevibus infra setosis integris, 5to multo longiori clavato. *Ungues* basi intus dilatato, vix dentato. *Pulvillus* brevis bisetosus.

This genus, in its general form, porrected mandibles, filiform antennæ, and rather elongated legs, with their five-jointed tarsi, might at first sight be almost mistaken for some of the narrow *Harpalidæ* or *Scaritidæ*, but an inspection of the parts of the mouth (those most excellent guides in determining the relations of the families of insects in general, and *Coleoptera* in particular), is sufficient to prove that the insect must be referred to the great group to which Mr. MacLeay has applied the name of *Necrophaga*,

and it is I apprehend amongst these, in the neighbourhood of *Trogosita*, *Cucujus* and *Passandra*, that we must look for the natural situation of the genus before us. From *Trogosita* it is, however, distinguished by the bilobed maxilla, the elongated lobes of the labium, the filiform antennæ, and the 5-jointed tarsi. In several of these respects it approaches much nearer to the *Cucujidæ*.

The remarkably long setæ with which the sides of this insect are furnished seem to indicate some peculiarity in its habits with which we are unacquainted. Such setæ appear in some groups, especially the Geodephagous *Coleoptera* and Fossorial *Hymenoptera*, to be accompanied by very predaceous habits, and, judging from the powerful mandibles of the insect before us, I should not be surprised if such are the habits of this insect.

Chætosoma Scaritides, Westw. (Plate XIII., fig. 3, and details.)

Nigra, nitida, punctata, longe setosa; elytrorum basi late, apiceque cum pedibus rufis.

Long corp. lin. $4\frac{1}{2}$.

Habitat in Nova Zelandia. In Mus. Westwood.

Lævis, nitida, supra rude et irregulariter punctata, tota nigra; elytrorum basi et apice pedibusque rufis exceptis. Caput antice magis punctatum, ibique prope clypeum in canali sinuato transversim impressum. Pronotum canali tenuissimo longitudinale medio, hujus lateribusque pronoti magis punctatis, spatio utrinque longitudinali lævi relicto, margine postice impressionibus duabus sat profundis, versus angulos posticos alteraque media marginem posticum haud attingente. Elytra rude et vage punctata, setis longis lateralibus porrectis instructis.

DESCRIPTION OF THE FIGURES.

PLATE XIII.

- Fig. 1. *Paromia Dorcoides*, mag. nat. 1 a, head and mandibles, seen from above; 1 b, head, with the instrumenta labialia, antenna and mandibles, seen from beneath; 1 c, maxilla; 1 d, instrumenta labialia, seen from within the mouth, with one of the maxilla in situ; 1 e, underside of the thorax and abdomen; 1 f, 1 g, posterior tarsus in different positions.
- Fig. 2. *Cossyphodes Wollastoni* magnified. 2 a, labrum; 2 b, 2 c, mandibles; 2 d, maxilla; 2 e, instrumenta labialia, seen from the outside of the mouth; 2 f, antenna; 2 g, head and prothorax, seen from below; 2 h, meso- and meta-sterna and abdomen, seen from below; 2 i, hind leg; 2 k, anterior (or middle) leg; 2 l, middle (or anterior) tarsus.
- Fig. 3. *Chætosoma Scaritides* magnified. 3 a, head and antenna, seen from above; 3 b, head, seen from below; 3 c, front of head, seen from above; 3 d, maxilla and instrumenta labialia from beneath; 3 f, fore leg; 3 g, angues and pulvillus.

XX. *On the Papilio Telamon of Donovan, with Descriptions of two other Eastern Butterflies.* By J. O. WESTWOOD, F.L.S.

[Read 3rd March, 1851.]

THE *Papilio Telamon*, figured by Donovan in his "Insects of China," has up to the present time continued to be known only by the figures in that work, no specimen existing in any Continental or British Cabinet. Specimens of the insect having however been recently sent from Shanghai, in China, by R. Fortune, Esq., of which both sexes have been obtained for the British Museum Collection, I have been enabled to examine the species, and find that it belongs to a genus distinct from *Papilio*, and the other genera of *Papilionidæ*, differing at once from *Papilio* in its elongated palpi. It approaches very near to *Thais Cerisyi* in general form, but in that insect the antennæ are much more clavate, with more numerous articulations, the space between the second and third branches of the post-costal vein of the fore wings is much more elongated, the palpi much more hairy, the hind wings without the small prediscal cell, and not furnished with a single elongated tail. The female is destitute of the abdominal pouch of *Doritis*. In the arrangement of the veins of its wings it is nearly similar to *Teinopalpus*; the middle discocellular vein in that genus is however nearly straight, and not angulated, the hind wings in both genera have the small prediscal cell, but the upper disco-cellular vein in *Teinopalpus* is much more transverse, and the lower one is short, oblique, and almost continuous with the space between the second and third branches of the median vein; whereas in *Telamon* the upper disco-cellular vein in these wings is very oblique, and the lower one nearly transverse. The antennæ of *Teinopalpus* also differ considerably from those of *Telamon*, the basal portion being quite cylindrical, so that the joints are not distinct (as they are in *Telamon*, each being slightly thickened at the tip); the clava of the antennæ is very distinct in *Teinopalpus*, and the front of its head is produced into a thick conical hairy tuft. The following are the characters of the new genus which is accordingly required for the reception of *P. Telamon*.

SERICINUS, Westw.

Genus novum, e familia *Papilionidarum*.

Teinopalpo et *Thaidi* affine.

Caput mediocre, antice hirsutum, palpi labiales capite fere duplo longiores, subhorizontaliter porrecti, hirti nec setis longis, ut

in *Thaide*, instructi. *Antennæ* vix clavatæ, articulis circiter 30, sensim incrassatis, articulis 10 ultimis paullo brevioribus. *Alæ* anticæ triangulariter ovatæ, apice rotundatæ; vena post-costali 4-ramosa ramis simplicibus, 1mo et 2do ante apicem areæ discoidalis emissis, 3tio ad ejus apicem emissa, 4to in medio spatii inter apicem areæ discoidalis et apicem alæ; vena disco-cellulari supera brevissima; media multo longiori in medio angulata, angulo versus basin alarum spectanti; vena disco-cellulari infera breviori, cum apice venæ medianæ fere continua, et spatio inter hujus ramos 2dum et 3tium longitudine fere æquali. *Alæ* posticæ subovales, margine externo vix repando, ramo tertio venæ medianæ in caudam longissimam, et valde angustam producto; vena pre-costali apice furcata; venæ costalis basi, cum basi venæ postcostalis connexa, cellulam parvam prediscoidalem efficiente. *Abdomen* fœminæ absque lobis membranaceis *Doritidum*.

Typus *Papilio Telamon*, Donovan, Ins. of China, Pl. 26, fig. 1, 1a; Boisduval, Sp. Gen. Lepidop. 1, p. 250, n. 74.

Hab. China, Shanghai. (D. Fortune.)

In Mus. Britann. et Westw.

Thaumantis Honqua, Westw.

T. alis supra fulvis, omnibus serie subapicali lunularum nigrarum valde curvatarum; maculis hastiformibus nigris, in alis posticis majoribus, antice adjectis; alis infra luteo-fulvis, strigis duabus obliquis irregulariter sinuatis, 1ma ante et 2nda pone medium alarum anticarum, illa ante et hac per medium posticarum, extensis, externa e costa fere ad angulum analem ducta ubi recurvat; nubila recta obliqua fusca submedia ad angulum analem extensa, macula grisea terminata; alis anticis ocellis tribus, posticis quinque rufis, pupilla alba iride tenui nigra strigisque duabus parallelis vix angulatis prope marginem apicalem. (Mas.)

Expans. alar. antic. unc. 5.

Habitat Shanghai, China. (D. Fortune.)

In Mus. Britann.

At first sight this butterfly might be regarded as the female of *Thaumantis Nourmahal*, Westw. Gen. Diurn. Lep. p. 337, but it proves to be of the same sex as Mr. W. W. Saunders's unique male of that species. It is difficult without figures to describe

the distinctions between the markings of these two species and *T. Camadeva*, but the following are their chief differences:—

	<i>Howqua.</i>	<i>Camadeva.</i>	<i>Nourmahat.</i>
UPPER SIDE.	—	—	—
The marginal row of lunules	much angulated	moderately arched	nearly straight
The marks preceding the marginal lunules	diamond-shaped	diamond-shaped	V-shaped
UNDER SIDE.			
The anterior transverse striga of discoidal cell	dentate	very dentate	slightly waved
The posterior striga, in the middle of the fore wings	deeply multi-sinuated	multisinuated	nearly straight
The two subapical parallel strigæ	slightly multi-arcuate in fore wings, nearly straight in hind wings	nearly straight	strongly dentate

Drusilla Mylæcha, Westw.

D. alis niveis, omnium utrinque costa nigricanti, posticis subtus ocellis duobus magnis, æqualibus, nigris, pupilla minima alba circulo latiori fulvo, alteroque tenui nigro circumcinctis, capite thoraceque subtus nigris, palpis fulvis, abdomine lutescenti. (Mas et fœm.)

Expans. alar. antic. unc. 4.

Habitat in Insulis Louissiadis, Maris Indici (*D. Mac Gillivray*.)
In Mus. Britann.

This is one of the fine additions to the National Museum collected by John Mac Gillivray, Esq., naturalist of the Rattlesnake exploring ship, by whom it was found flying in great abundance in the woods of the south-eastern island of the Louissade Archipelago.

The wings in both sexes are of a very pure silky-white, the costa of the fore wings on both sides rather narrowly brownish-black, bearing in the male a very slender white line, running quite close to the costal edge; in this sex, also, the two discoidal veins are also black. The hind wings in both sexes have a brownish-black costa, the dark colour extending to the large ocellus near the outer angle; near the base of the costa in the males, on the upper side, is a tuft of long yellowish hairs, and the fore wings above this tuft are rather dilated, and more transparent than elsewhere. In this sex, also, the anal margin is narrowly edged with

black, of which colour there is also a short longitudinal contiguous black streak. The inner margin of the fore wings in the male is emarginate in the middle. The wings are not nearly so long and narrow as in *D. Horsfieldii*, and they are slightly transparent, so that the large ocelli on the underside of the hind wings are slightly visible from above. The species is nearly allied to *D. Catops*, Bdv., D. W. & H. Gen. D. Lep. p. 335.

XXI. *On the Nest of Polistes Lanio, Fab. and a Parasite found therein, and on the Nest of a Social Wasp.* By F. SMITH, Esq.

[Read 7 April, 1851.]

JOHN MAC GILLIVRAY, Esq., Naturalist to Her Majesty's Ship Rattlesnake, lately presented to the British Museum the nest of a South American species of *Polistes*, which he says is very abundant at St. Salvador, where even in the streets it attaches its nest under the eaves of houses; the species is the *Polistes Lanio* of Fabricius, and in all probability the *Vespa Canadensis* of Linnæus; a specimen of the species is preserved in the Banksian Cabinet. On examining the nest, I found it consisted as usual of a single comb of cells, having in the centre at the back a short footstalk, by which the nests are attached in their position; the comb contained sixty-five cells, the outer ones being in an unfinished state, whilst twenty-two of the central ones had remains of exuviae in them, and one or two closed cells contained perfect insects ready to emerge; about half a dozen of the wasps had the anterior portion of their bodies buried in the cells, in the manner in which these insects are said to repose. In one cell I observed the head of an insect evidently of a different species, it being black and shining. On extricating it, I discovered it to be a species of *Trigonalys*; I subsequently carefully expanded the insect, and it proved to be the *Trigonalys bipustulatus*, described by myself in the Ann. and Mag. of Natural History, vol. vii., 2nd Series, 1851, from a specimen captured at Para by Mr. Bates, now in the possession of William Wilson Saunders, Esq. The insect was not enveloped in any pellicle, nor had the cell been closed in any way; the wings were crumpled up at its side, as is usual in Hymenopterous insects which have not expanded them, proving satisfactorily that it had never quitted the cell, and that *Trigonalys* is the parasite of *Polistes*.

This discovery is one of much interest, proving the relationship of the insect to be amongst the pupivora, to which family it had been previously assigned by Mr. Westwood, see Vol. III. Ent. Trans. p. 270. The specimen is seven lines in length, entirely black, the head shining, the thorax and abdomen opaque, and having two white maculæ touching the apical margin of the basal segment above; the wings are smoky, the antennæ broken off. Of one of them I found subsequently seventeen joints—the perfect insect in the possession of Mr. Saunders having twenty joints.

Another exceedingly interesting nest has also been lately presented to the British Museum; it is that of a species of social wasp, but unfortunately it did not contain any specimen of the insect. The peculiar interest attached to this nest arises from the nature of the material of which it is composed, it being constructed entirely of clay, or, more correctly probably, of sandy loam; in form it is somewhat egg-shaped, blunted at each end, the longest diameter being $10\frac{1}{4}$ inches, the shortest $8\frac{1}{4}$; at the upper end is an opening, through which the branch to which it was suspended has passed, and the shell at this part is three quarters of an inch thick, from which it becomes gradually thinner towards the bottom, where it is about the eighth of an inch in thickness: down one side is an oblong slit six inches in length and nearly a quarter wide, the margins of which are about half an inch in thickness; but it can be ascertained that it is not equally so all round, but merely so for the purpose of strengthening the entrance to the nest. The nest contains six combs, placed as usual horizontally, the cells being downwards; the backs of the combs are deeply concave, and have been apparently attached by their entire margins to the exterior shell, the oblong slit giving free ingress to each chamber. From the broken state of the nest a vast number of cells are visible, but I cannot detect any difference in the size of them, each being two lines in diameter from the two parallel sides of the hexagons. This would lead one to suppose that there can be little or no difference in the size of the sexes of the inhabitants, and that the species is one of those which are allied to the genus *Myrapetra* of White, and of which I myself possess about thirty distinct species, the sexes of which appear to differ but slightly in size. The cells, which are of the most regular and beautiful construction throughout, are continued beyond their margins, in some instances into the shell itself, but none of these are carried beyond a shallow excavation. There is no coating or glazing of

any kind either on the back of the combs or on the exterior of the shell itself; the latter is of so hard a consistency that it blunted a watch-saw, which was used by the gentleman who presented the nest in making an opening in one of the sides. The cells, although exceedingly thin and delicate in appearance, allow of the hand being passed with some degree of pressure over them without the slightest injury. The outer surface of the shell has a remarkable mottled appearance, caused by the different colour of small dabs of mud plastered on by the wasps. The surface is therefore rendered uneven by these small and countless additions; indeed one is lost in admiration of the untiring perseverance and the exquisite skill of the tiny architects.

One circumstance is very remarkable, and for which I can in no satisfactory way account. Although such an immense number of cells are exposed to view, I cannot detect in any of them the slightest vestige of exuviae or other matter bearing evidence of the nest having had inhabitants; all the cells are uniformly fresh in appearance and as clean as if they had never been occupied. Usually an old or recently commenced nest may be at once determined by such evidence; but here we have a nest apparently perfect, filled with combs, and not any trace left behind of the occupancy of its constructors; in all probability the economy of these wasps differs in some particulars from that of any species with which we are at present acquainted.

NOTE.—Since reading the above notice on the nest of *Polistes*, I have discovered that *Trigonalys bipustulatus* is described and figured by De Geer, in his *Mem. Hist. Ins.*, vol. 3, under the name of "*Sphex compressa*;" the specific name of *bipustulatus* will consequently fall.

XXII. *Notes on the Habits of Australian Hymenoptera.*

By F. SMITH, Esq.

[Read May 5th, 1851.]

ON THE HABITS OF *LESTIS BOMBYLANS*.

(NEW HOLLAND.)

MR. KER, a gentleman who resided some years in Australia, informed me that this insect is very common in all parts of the country. He found it inhabiting the hollow stem of a *Zamia*. It was at that time in a dormant state, it being the winter season. The entrance to the tube was rounded like the mouth of a flute. The stem of the *Zamia* or grass tree is straight and pithy, and easily excavated. The cells, about a dozen in number, were placed one above the other, separated by slight partitions.

I will embrace this opportunity to correct an error which has crept into all the works in which this genus is described or alluded to. Fabricius, in his *Entomologia Systematica*, describes under the genus *Apis* two bees from New Holland—*Apis bombylans* and *Apis muscaria*—both in the cabinet of Sir Joseph Banks. St. Fargeau, in the 10th vol. *Encycl. Meth.*, and also in his later work, the *Histoire Naturelle des Insectes*, has described the *Apis muscaria* as the female of his genus *Lestis*, and *A. bombylans* as the male. Now on examining the original specimens in the Banksian Cabinet, I find the *Apis muscaria* is a male, of the genus *Xylocopa*; and *A. bombylans* a female, of the genus *Lestis*. St. Fargeau has also committed another error by reversing the characteristics of the sexes; those given as the male belong to the female, and (vice versâ) both are however too general to aid much in discriminating the species. I will endeavour to remedy this insufficiency by giving more tangible characters, and by describing a second species of this genus.

Sp. 1. *Lestis bombylaus*.

Apis bombylans, Fab. Ent. Syst. 2, 338, 104, ♀.

Centris bombylans, Fab. Syst. Piez. 358, 19.

Female (length 6-7 lines), dark blue-green; the face and cheeks clothed with a thin silvery white pubescence; the thorax is strongly punctured, except the disk, which is smooth and shining; the wings dark fuscous, with a violet reflection; and the apex of the abdomen has a fringe of white pubescence. The pubescence on the legs is black.

Male (6-7 lines), brassy green: head; the clypeus has an oblong white stripe, broadest towards the base of the antennæ; also a narrow white line along the inner margin of the eyes, reaching their vertex. The thorax has two triangular patches of yellow pubescence, separated by a smooth space the exact width of the distance between the eyes; a patch of the same colour on the sides of the breast, and on the tubercles; the wings slightly fuscous; the anterior and intermediate tibia and tarsi have on their posterior margins a pale yellow fringe; that on the posterior legs is black. The apex of the abdomen has some long dark fuscous pubescence.

Sp. 2. *Lestis æratus*, new sp.

Female (7-8 lines), brassy green; the pubescence on the face pale yellow, the thorax punctured as in the preceding species; the wings slightly fuscous; the pubescence at the apex of the abdomen is pale yellow.

Male (7-8 lines), brassy; the face is marked as in the preceding species, but the colour, instead of being white, is yellow; the patches of pubescence are situated as in the preceding, but are much more dense, and of a bright yellow; wings hyaline, slightly fuscous; all the legs are fringed with bright yellow pubescence.

ON THE HABITS OF ABISPA, A SOLITARY AUSTRALIAN WASP.

Mr. Ker also informed me that this wasp constructs a nest of clay; it is thimble-shaped, about three inches in diameter, and three and three-quarters in height; the rounded end is upper-

most. About the centre of the bottom flat surface the wasp constructs a most beautiful, funnel-shaped entrance, the pipe of which is continued a short way within the shell of the nest; at the top a single layer of cells are constructed without regularity of form or disposal; only a single wasp was observed either building or furnishing the nest. Unluckily the nest, which Mr. Ker describes as being one of the most beautiful he ever saw, was broken on the voyage to this country.

The following passage, in Mitchell's Expedition into Eastern Australia (vol. i. p. 104), can hardly refer to this species, as it appears to have been some gregarious wasp by which the travellers were attacked.

"At seventeen miles we entered a plain, where grew trees of the *Acacia pendula*, and we traversed it in the most elongated direction, or to the south-west. On entering the wood beyond, a sudden extreme pain in my thigh made me shout, before I was aware of the cause. A large insect had fastened upon me, and on looking back I perceived Souter, 'the doctor,' defending himself from several insects of the same kind. He told me that I had passed near a tree from which their nest was suspended: and it appeared that this had been sufficient to provoke the attack of these saucy insects, who were provided with the largest stings I had ever seen. The pain I felt was extreme, and the effect so permanent, that when I alighted in the evening from my horse, on that leg, not thinking of the circumstance, I fell to the ground, the muscles having been generally affected. The wound was marked by a blue circular spot, as large as a sixpence, for several months."

EXPLANATION OF PLATE.

Plate XVI. fig. 1. *Polistes lanio*; 2. *Trigonalys compressa*; 3. Nest of a wasp formed of clay; 4. Clay nest of *Abispa*; 5. *Abispa ephippium*?

XXIII. *Description of a New Species of Lithocolletis.* By
R. F. LOGAN, Esq.

[Read March 3rd, 1851.]

Lithocolletis nigrescentella. (Pl. XV. fig. 9.)

Capite fusco, fronte palpisque albis. Alis anticis aureo-nigris, linea distincta media basi, fasciaque valde ante medium curvata, et leviter in exteriore producta; post hanc tribus punctis acutis ad costam, uno latiore ante angulum anale, et duobus obscurioribus adversus apicem, argenteis; ciliis cinereo-albidis. Alis posticis griseis, ciliis cinereis interne pallidioribus. Tarsis albidis, fusco-maculatis.

Exp. alar. 5 lin.

Somewhat allied to *Ulmifoliella*, but blacker, and the anterior wings longer and narrower towards the apex, much more the shape of the *Pomifoliella* group. The first dorsal spot is also much larger and more of an equilateral triangle, and the first costal spot points towards the centre of the fascia, which is much further from the middle of the wing than in *Ulmifoliella*, considerably bent, and slightly produced on its outer edge, so as nearly to form with the first costal spot a γ shaped figure.* The basal streak is nearly equidistant from the costa and inner margin, (in *Ulmifoliella* it is nearer the costa,) somewhat claviform, and margined distinctly with black, and there is a smaller streak of white on the inner margin near the base.

The hind wings are peculiar, the cilia being pale next the wing and darker externally. The antennæ are fuscous, with pale apices. Tarsi white, spotted with dark fuscous.

Taken near Morpeth in May.

* On the right wing of the specimen the connection is complete, but not on the left.

XXIV. On *Gracilaria*, a Genus of Tineidæ. By H. T. STANTON, Esq.

(Continued from page 133.)

Sp. 16. *Omissella* (Douglas), Stainton. (Pl. XV. fig. 1.)

Alis anticis griseo-brunneis, strigulis costæ quinque, dorsique tribus niveis, basim versus fusco-marginatis.

Omissella, Stainton, *Zoologist*, 2163.

Not closely allied to any known species; has perhaps most resemblance to *Coriscium substriga*, but from this its different palpi, smaller size, want of an apical hook, and differently coloured anterior wings, at once distinguish it.

Expansion of the wings 4 lines.

Head and face white; palpi white, a fuscous ring at the end of the second joint, and another a little before the end of the terminal joint; antennæ dirty whitish, with fuscous annulations; thorax fuscous; abdomen fuscous, whitish underneath posteriorly; the four anterior legs have the femora and tibiæ dark grey, and the tarsi white; the posterior legs have the femora and tibiæ white, the end of the latter grey, tarsi white, with the ends of the joints dark grey.

Anterior wings of a grey-brown, or ochreous, with five white streaks along the costa, nearly at equal distances, and three on the inner margin. The first costal streak lies not far from the base, is placed obliquely, and does not reach the middle of the wing; the second costal streak is placed similarly to the first, but is longer, reaching nearly to the fold; the third costal streak, placed similarly to the two preceding, but more attenuated, (a little expanded however on the costa,) is generally rather shorter than the second streak, but in one of my specimens it is continued right across the wing, forming with the third inner-marginal streak an uninterrupted fascia; the fourth costal streak is crescent-shaped, and reaches to the hinder margin; the fifth costal streak lies in the extreme apex. The first inner-marginal streak has its origin at the base, and is there very narrow, but expands into a triangular form opposite the end of the first costal streak, with which it forms an interrupted fascia; the second inner-marginal streak lies opposite the end of the second costal streak, forming with it an interrupted fascia; the third inner-marginal, situated at the anal angle, forms with the third costal streak an interrupted fascia, or else an entirely uninterrupted fascia. All these white markings

have dark margins, and are preceded by darker scales on the sides next the base. Cilia grey, with the white markings continued through them, and with two rows of dark spots round the apex.

Posterior wings grey, with grey cilia.

First discovered by Mr. Douglas at Charlton sand-pit, July 29th, 1847; in the following summer Mr. Douglas again met with it, and observed that it frequented the *Artemisia vulgaris*; on the 3rd July last year I observed the leaves of this plant, in a lane between Birch Wood and Dartford Heath, mined by some larva, and collected several of them; these I kept in a tin canister along with several other plants collected at the same time, and from the leaves thus mingled together I obtained two specimens of *Omissella*, but whether from the *Artemisia* leaves or not I cannot positively say.*

Sp. 17. *Scalariella*, Zeller.

“Thorace et capite cum palpis niveis, alis antice læte brunneis, vitta dorsali interne obtuse dentata nivea.”

Scalariella, Z. Ent. Ztg. 1850. S. 160.

“Larger than *Gr. ononidis*. Head rather shining, snow-white. Antennæ brownish, with a darker basal joint. Maxillary palpi small, thin, pointed, whitish; labial palpi longer than the thorax, rather slender, falcate, at the end of the second joint somewhat thickened beneath by loose hairs, white; the pointed terminal joint half the length of the palpi. Thorax snow-white, on the shoulders pale yellowish-brown. The four anterior legs have the femora grey-brown, the tibiæ black-brown, with the base white; the tibiæ of the middle pair have the base itself brown, on the light side (in front); tarsi silky-whitish, with a brown spot at the base of each joint on the shady side. Posterior legs shining, with the femora grey, the tibiæ brownish-grey, and the tarsi brownish-white, with grey-brown spots at the bases of the three first joints. Abdomen grey-brown, beneath whitish.

“Anterior wings rather narrow, pale yellowish-brown. On the costa, before the apex, is a white, black-margined hook, curved outwardly, and at some distance before it a white, black-margined costal spot (this is entirely wanting on the right wing); at the end of the cilia of the apex of the wing are two white, broader, approximating, marginal hooks, under which the ground-colour is continued to the end of the cilia as a long streak, beneath margined with white. At the base of the inner margin arises a streak,

* In July, 1851, I reared this species freely, from larvæ which mined the leaves of *Artemisia*.

sharply bordered internally by black scales; it has three broad blunt teeth, the second of which is confined on each side by a deep indentation, but the first is the shortest; the white streak is continued to the end of the cilia, and on them it encompasses the prolongation of the ground-colour. Cilia grey. Posterior wings narrow, pointed from the base, grey, with paler cilia."

Found by Herr Mann at the end of April, near Montenero, and at the beginning of May at Ardenza, sparingly.

Sp. 18. *Phasianipennella*, Hübner. (Pl. XV. fig. 2.)

Alis anticis nitidulis fuscis, gutta dorsi medii pallida distinctiore, intus nigro-marginata, tribus costæ obsoletissimis.

Phasianipennella, Hüb. Tin. 321; Tr. X. 2, S. 209, 13; X. 3, S. 298; Zell. Isis, 1838, S. 675, 100; Linn. Ent. ii. 350.

Readily recognized by the pale triangular mark on the inner margin of the anterior wings, the other spots being very faint, or not perceptible.

Head and face shining yellowish-brown; palpi dirty whitish, the terminal joint brown, with only the base and apex appearing in certain directions whitish; antennæ pale, with darker annulations; thorax yellowish-brown; abdomen brown-grey; the four anterior legs have the femora and tibiæ black-brown, tarsi brown, the bases of the joints white; hinder legs dirty whitish, the ends of the joints brownish.

Anterior wings broad, (appearing from the cilia broadest toward the hinder margin,) shining yellowish-brown, with a very slight violet-gloss. Near the middle of the inner margin is a small, triangular, faint yellowish, or whitish spot, the apex of which reaches beyond the fold of the wing, and has some dark brown scales round it; the base of this spot is sometimes prolonged along the inner margin, to near the base of the wing, as a narrow white streak; on the costa, just before the apex, are two faint, small, yellowish spots, and a little before the middle of the costa a still fainter spot may sometimes be perceived, with slightly darker margins; on the hinder margin are two still more evanescent paler margins, which are only perceptible in very fine specimens; the apical cilia are brown, with a darker line before their ends, and the ends also darker; inner marginal cilia grey.

Posterior wings shining grey, with grey cilia.

Not rare on the Continent, but its late period of flight, October, has probably caused it to be overlooked here. Hybernated specimens will occur in the spring, as of most of the other *Graciliaricæ*.

The only British specimen I have yet seen was taken near Gosport, last December, by Mr. Wing.

I annex Zeller's account of the mode of feeding of the larva, which will probably lead to its detection by some of the provincial collectors.

“ The larva feeds on *Polygonum hydropiper*, most usually in shady alderwoods, also often in more open situations. The plants, on an ordinary examination, only appear to want broad strips on the margins of the leaves. This might also have happened by the ravages of a *Noctua* larva; but if one examines the plants sideways, one easily perceives at the end of the gaps in the leaves, on the underside, the cones which the larva of *Phasianipennella* rolls up out of the strips of the leaves. Some plants nourish as many as a dozen, but generally only from one to three. The larva is already to be found in the middle of August. It then lives as a miner between the skins of the leaf, the parenchyma of which it devours; the discoloured patches on the leaves betray its whereabouts. The mined patches have no regular form, and occur in the most different positions, but generally at the basal half of the leaf. The larvæ attain maturity at very different times. When it leaves off mining the leaf it manufactures the cone—at what period of its life it begins this work is still to be observed. It begins the cone at the margin of the leaf, which it bites off in a curved line, and thus cuts off a strip which still hangs by its broadest end to the leaf; this strip it rolls up into a blunt cone, the base of which it fastens to the leaf with white silk. Generally the strip of leaf is rolled from the base of the leaf towards the apex, rarely in a contrary direction. The older the larva is, the larger is the cone, since the larva cuts the strips continually broader; it only works across the midrib of the leaf, when it is young and tender. The upperside of the leaf is turned externally at the cone, which hangs perpendicularly on the under side of the leaf. The larva lives inside the cone, and feeds on the lower part of the walls of its dwelling; when its abode no longer suits, the larva leaves it, and makes a new one on another leaf.

“ It undergoes its transformation to the pupa state within this conical habitation, in a tight-fitting, rather transparent cocoon, which is suspended to the apex of the cone by a thick, snow-white cord, about a fifth of the length of the cocoon.

“ The perfect insect appears about three weeks after the transformation to the pupa state. Collectors wishing to obtain the pupæ should cut off those leaves which have the largest cones.”

Sp. 19. *Auroguttella*, Stephens.

[Plate XV., figs. 3 and 4.]

Alis anticis nitidulis, violaceo-fuscescentibus, maculis quatuor alternatim oppositis aureolis ; antennis fuscis, apice albo.

Auroguttella, Steph. Illust. iv. 274.

Stipella, Haw. L. B. 568 (non St. Ill. iv. 265).

Lacertella (F. v. R.), Zell. Isis, 1839, s. 209 ; Linn. Ent. ii. 347.

Allied to *Quadruplella*, *Quadrisignella*, and *Bucculatrix aurimaculella*.

Distinguished from *Quadruplella* and *Quadrisignella* by the less sharply margined spots of the anterior wings being of a golden-yellow, not whitish-yellow, by the first costal spot being slightly removed from the costa, and by the first inner-marginal spot extending to the base of the wing.

Distinguished from *Bucculatrix aurimaculella* by the smooth head, by the palpi, by the antennæ without eye-caps, by the first costal spot not being placed on the costa, and by the first inner-marginal spot extending along the inner margin to the base of the wing (in *Aurimaculella* it is continued along the fold).

Expansion of the wings, 4-5 lines.

Head and face shining bronze-grey ; palpi brown-grey, the apex white ; antennæ blackish-grey, the apex white (I believe in all fine specimens, but Zeller gives the typical insect with unicolorous antennæ, and only his var. β with the apex white) ; thorax violet-grey, beneath yellow ; abdomen grey, spotted with yellow beneath ; the four anterior legs have the femora and tibiæ violet-grey, tarsi white, with the ends of the joints brown ; the posterior legs have the femora at the base yellow, then pale grey, tibiæ pale grey, tarsi dirty whitish, the ends of the joints darker.

Anterior wings dark violet-grey, rather shiny, with four golden yellow spots ; an oblong, rather large one on the inner margin, beginning at the base of the wing, and ceasing just opposite the commencement of the first costal spot (in some specimens it is prolonged a little further) ; the second inner-marginal spot is triangular, and lies just before the commencement of the cilia ; the first costal spot does not touch the costa, is oval, and lies before the middle of the wing ; the second costal spot lies near the apex, posterior to the second inner-marginal spot, is somewhat triangular ; none of these spots have dark margins. In very fine specimens there are some yellow or whitish scales in the apex of the wing. Cilia violet-grey.

Posterior wings rather broad, brown-grey, with paler cilia.

Pretty generally distributed throughout the country, and not uncommon, but easily overlooked from its small size and dark colour. It occurs in many parts of the Continent.

The larva feeds in June and October on the *Hypericum perforatum*; when very young, it mines the leaves (Pl. XV. fig. 4a), but afterwards it rolls them up into a form resembling two short cones (Pl. XV. fig. 4b), united by their bases: in these rolled up leaves it feeds on the inner epidermis, thus discolouring the cones, which soon assume a rust coloured appearance. The larva, which has six legs and eight prolegs, is very pale yellowish; the head is slightly darker, and a darker middle streak is faintly indicated along the back. Unlike *Phasianipennella*, the larva of this species does not undergo its transformation inside the cone, but when full grown it leaves the cone and proceeds to another leaf, which it rolls up longitudinally in the form of a cigar (Pl. XV. fig. 4c), and then, spinning a white cocoon, turns to a brown pupa. The period for collecting the pupæ is the beginning of July, and from the end of October to April. The perfect insect appears in April and May, and in July and August.

The *Gracilaria plumbella*, figured by Duponchel, Supp., pl. 89, fig. 13, is not improbably intended for this species.

The oldest name applied to this insect is undoubtedly *Stipella*, Haworth; but as in Haworth's description the first spot on the inner margin is entirely omitted, and the description is only explained by his "exemplarium unicum" being in the possession of the Entomological Society, I have not thought it desirable to retain this name.

Sp. 20. *Quadruplella*, Zeller. (Pl. XV. fig. 5.)

Alis anticis nitidulis fuscis, guttis quatuor oblongis obliquis sulphureis alternatim oppositis; pectore sulphureo-maculato.

Quadruplella, Z. Isis, 1839, S. 209; Linn. Ent. ii. 355.

Auroguttella, Steph. Illust. iv. 363.

Allied to the preceding, and also to *Quadrisignella*; from *Auroguttella* it is distinguished by the sulphur yellow (not golden yellow) spots being very sharply defined, the first costal spot touches the costa, and the first dorsal spot is not continued to the base; *Quadrisignella*, which it resembles in the two last particulars, has the spots broad and placed nearly perpendicularly to the margins, whereas in *Quadruplella* the spots are narrow, and placed obliquely to the margins.

Expansion of the wings 4—5 lines.

Head shining yellowish-brown ; face paler, more or less yellowish ; palpi yellowish-brown, the base of the terminal joint and the apex whitish ; antennæ brown, with grey annulations ; thorax yellowish-brown, beneath spotted with sulphur ; abdomen grey, beneath whitish. The four anterior legs have the femora and tibiæ dark brown, the tarsi at the base snow-white, otherwise brown, and the end joints with the brown prevailing more over the white ; the posterior legs have the femora at the base externally sulphur yellow, otherwise brownish, tibiæ and tarsi grey, with the basal halves of the joints white.

Anterior wings rather pale yellowish-brown, with hardly the slightest tinge of lilac colour. The markings consist of four sulphur yellow spots, margined with dark brown. The first costal spot is before the middle, and is narrow, rounded, obliquely placed, and reaching half across the wing ; the second costal spot before the apex is shorter, and is less obliquely placed ; beyond the apex there appears in the cilia a very faint, pale spot. The first spot on the inner margin lies nearer the base than the first costal spot ; it forms a blunt triangle, and has its longest side on the margin. The second lies near the anal angle, almost midway between the first and second costal spots ; it is triangular pointed, and with its apex rather turned towards the hinder margin. The cilia round the apex of the wing are traversed by several dark shady-lines, and have the ends brown, those of the inner margin are grey.

Posterior wings rather broad, pointed, not long-pointed, grey, with paler cilia.

The above description is compiled from that of Zeller, in the *Linnæa*.

The only British specimen yet known is that in Mr. Stephens's extensive collection, found by Mr. Stephens "in June, 1827, at Ripley."

Zeller says that it "occurs in Bohemia, near Reichstadt ; in Silesia, near Glogau ; and in Livonia, near Kokenhusen ; everywhere scarce. I have hitherto only taken five specimens ; one of these on the 18th June, amongst mixed bushes, towards sunset. I found a dead male, in a box in which I had furnished the larva of *Tortrix Wahlbomiana*, with a leaf of *Cirsium lanceolatum* ; whether the larva had lived on it I know not, since the leaf had already been thrown away before I observed the dead *Gracilaria*. Madame Lienig took the species in May, on the margins of fir woods."

As Mr. Stephens and Herr Zeller concur in giving June as the

period of flight, it seems probable that, as in the case of *Ononidis*, there is only a single brood in a year; yet it is possible, on the other hand, that there may occur a second brood at the end of autumn. The larva of the June brood should, at any rate, feed in May, at which time particular search should be made for rolled cones or mined leaves, in the hope of discovering the larva of this beautiful species.

Sp. 21. *Quadrisignella*, Zeller. (Pl. XV. fig. 6.)

Alis anticis fuscis, lilacino-nitidulis, guttis quatuor majusculis sulphureis alternatim oppositis; pectore sulphureo-maculato; antennarum apice albo.

Quadrisignella, Z. *Isis*, 1839, S. 209; *Linn. Ent.* ii. 375, pl. 2, fig. 17.

Very easily recognised by the large, sulphur-coloured, triangular spots of the anterior wings.

Expansion of the wings 4—5 lines.

Head and face brown; palpi brown, the terminal joint whitish at the upper side of the base and at the apex; antennæ brown, with paler annulations, the last fourth quite white; thorax brown, with a violet tint; abdomen grey, paler beneath. The four anterior legs have the femora and tibiæ dark violet-brown; tarsi snow-white, with the ends of the joints brown. The posterior legs have the femora at the base sulphur coloured, the remainder brownish; tibiæ brownish; tarsi, first joint brownish, four last joints white, with brown ends.

Anterior wings rather broad, brown with a lilac tint, with four large sulphur coloured, sharply defined, marginal spots. The margins of these spots appear in certain lights orange. The first spot is on the inner margin, near the base, and is triangular, with the apex round; the second spot is on the costa, before the middle, is smaller and more rounded; the third spot is on the inner margin, before the anal angle, and is the largest, it is triangular, with its apex prolonged beyond the middle of the wing; the fourth spot is on the costa, before the apex, is narrower, triangular, and its apex reaches half across the wing; cilia brownish grey.

Posterior wings unusually broad at the base, grey, with paler cilia.

Zeller observes, that "this pretty species has hitherto only been found near Glogau, where it is very scarce. I took both sexes in May, on hedges near leafy woods; once, on the 8th May, I took

three specimens, along a hedge amongst *Rhamnus frangula*, after a short, warm shower."

From its appearing so early in May, it is probably, like *Auroguttella*, double-brooded.

Sp. 22. *Ononidis*, Zeller. (Plate XV. fig. 7.)

Alis anticis fuscis, guttulis costæ quatuor, dorsi quatuor, apicis una argenteis; epistomio argenteo, palpis albis.

Ononidis, Z. Isis, 1839, S. 209; Linn. Ent. ii. 358.

Argentipunctella, Stainton. Zool. 2163.

Moniliella, Tengström. Fjäril. Fauna, p. 147.

Readily distinguished in this genus, by the silver spots on the brown anterior wings. Tengström, not having seen the insect alive, had fallen into the very natural error of taking it for an *Elachista*, and compared it with *Elachista pomposella*, with which it has a slight resemblance.

Expansion of the wings $3\frac{1}{2}$ lines.

Head brown; face silvery; palpi white, the base of the second joint brownish; antennæ brown, annulated with whitish; thorax brown; abdomen greyish-brown. The four anterior legs have the femora and tibiæ brown, the tarsi white, with the ends of the joints brown. The posterior legs have the femora greyish-brown; tibiæ brown, with the base whitish, and the extreme end white; tarsi brown, with the ends of the joints white.

Anterior wings brown, with nine silvery spots; four of which are situated on the costa, four along the inner margin, and one at the apex; all these spots have dark margins. The first of these silvery spots is situated near the inner margin, not far from the base, and is round; beyond it, on the costa, lies the second, which is very small; hardly separated from this by the ground colour is the third, which is narrow, and extends in an oblique direction to the fold of the wing, and then drops perpendicularly upon the inner margin; the fourth spot is on the costa, about the middle, it is narrow, obliquely placed, and reaches half across the wing, pointing to the fifth spot; this latter lies on the inner margin, is very small, and has its apex turned rather towards the hinder margin; the sixth spot lies on the costa, as far beyond the fourth as that is beyond the second spot, it is slightly curved and pointed, and almost unites with the seventh spot, which is situated on the inner margin, at the anal angle; the eighth spot lies on the costa, a little before the apex, and is prolonged on the costal cilia, it is somewhat curved; the ninth spot lies at the apex of the wing,

immediately before the commencement of the cilia, it is small and round; the cilia round it are brown, with two darker curved lines, formed by the end of the scales.

Posterior wings narrow, gradually pointed, grey, with paler cilia.

First found in this country by Mr. Weir, in July, 1847, near Tunbridge Wells, among *Genista tinctoria*. Mr. Weir informs me that where he meets with it there is no *Ononis* at all, and he presumes that it feeds there on the *Genista*.

Zeller says that "its chief resort at Glogau is a fir plantation, on a loamy hill, in a patch thickly grown with *Ononis spinosa*. Here I first took the small, and easily overlooked, moths from the middle of June to July. They can only be brought to fly during the day by trampling down the plants, but on still evenings they fly more readily, and are not hard to catch. They sit as the other *Graciliaria*."

"The larva, which is pale, greenish-yellow, with a honey-yellow head, mines the lower, older leaves of the *Ononis spinosa*; it loosens the upper epidermis for the greater part of the leaf, and devours the parenchyma; it leaves the lower skin of the leaf quite uninjured, wherefore the leaves seen from below appear quite sound. Towards the base or apex of the mined place or on both are found collections of black excrement. The larva also appears to go into fresh leaves, since I have sometimes found an entire leaf mined, and the larva only in one leaflet. It crawls rather slowly and spins a thread. At the end of May the larva crept out of the dried leaves to seek a place suitable for spinning up, often going far away. The white cocoon is placed in a corner; it is twice the size of the larva, and is pointed on both sides. On the 14th of June the first moth appeared."

"The species does not appear to be double-brooded."

Sp. 23. *Pavoniella* (Metzner), Zeller.

"*Alis anticis subcaudulatis aureis, strigulis quatuor costæ, tribus dorsi lineolaque ex media basi argenteis, fusco-marginatis, puncto apicis atro, pupilla argentea.*"

Pavoniella, Z. Linn. Ent. ii. 362.

"Most nearly allied to the preceding, easily recognized by the hook in the cilia, the paler gold yellow ground colour of the anterior wing and the silver marginal streaks directed obliquely to one another. It reminds one most of the genus *Lithocolletis*.

"Rather larger than the preceding. Thorax golden-yellow.

Head and palpi white. Antennæ brownish, hardly perceptibly annulated. Maxillary palpi rather short, with loose hairs; labial palpi shorter than the thorax, recurved, filiform, with somewhat projecting hairs on the underside, especially at the beginning of the third joint, but without a tufted prolongation. The four anterior femora yellowish-brown; tibiæ and tarsi, as well as the whole of the posterior legs, snow-white, spotted with brown, the former colour prevailing in the tarsi, the latter in the tibiæ. Abdomen grey, with yellowish anal tuft (in the ♂ white beneath), and beneath with whitish margins of the segments.

“Anterior wings broad, golden-yellow, slightly shining. Of the four costal streaks, the three first have the apices obliquely directed outwards, but the fourth has its apex directed inwards. The first at the commencement of the second third of the wing is prolonged in a fine costal line nearly to the base; its apex, as well as that of the second streak, is abruptly cut off. The third is thin and pointed. The fourth lies rather farther from the third than the three preceding from one another, has the broadest base and curves inwards (with its concavity directed outwards) till before the black spot with a silvery white pupil, at the apex of the wing. The short streak arising from the base of the wing is near the inner margin; it curves upward beyond the fold of the wing, and is thickened before its apex. The two first dorsal streaks are shorter and rather thinner than the costal streaks, and lie alternately with them; the first is placed rather more obliquely. The third is a triangular spot, with the apex directed towards the third costal streak, with which (on the left wing of the male) it forms an acute fascia. Beyond the apex of the wing, the ground colour is divided on the cilia into two streaks enclosing a white triangle, the upper streak has at its end a very short hook. Beneath, the cilia are whitish, towards the anal angle grey.

“The posterior wings are long-pointed, grey, with paler cilia.

“Occurs near Vienna, whence the pair described from Metzner’s Collection come.”

This beautiful little species yet remains undetected in this country.

Sp. 24. *Kollariella* (F. v. R.), Zeller. (Pl. XV. fig. 8.)

Alis anticis caudulatis brunneis, dorso, strigulis quinque costalibus niveis.

Kollariella, Z. Isis, 1839, S. 209; Linn. Ent. ii. 363; Dup. Supp. 78, 3.

Not likely to be confounded with any known species.

Expansion of the wings $4-4\frac{1}{2}$ lines.

Head and face white; palpi white; antennæ brown; thorax white, with the sides brown; abdomen greyish. The four anterior legs have the femora brown, tibiæ and tarsi brown, spotted with white; the posterior legs have the femora and tibiæ whitish, the tarsi white, with the bases of the joints brown.

Anterior wings brown, inclining to black, along the inner margin extends a narrow streak of white uninterruptedly to the anal angle; on the costa are five white streaks: the first begins a little before the middle, is placed very obliquely, and reaches, with its attenuated and rather curved apex, to the commencement of the last third of the wing; the second streak, which immediately follows the first, is much shorter, and does not reach as far as the first; the third streak, following at a little distance from the second, is placed less obliquely, points towards the anal angle, and reaches half across the wing; the fourth streak is slightly curved, its apex almost touching the apex of the preceding, it reaches half across the wing, but there appears an indistinct continuation of it to the anal angle; the fifth streak, which is small, is on the costa, immediately before the apex. Below the apex of the first costal streak lies a small white streak on the disk. At the apex of the wing is a black ocellus, from the end of which springs the black hook. Cilia at first brownish, then white, with black tips.

Posterior wings narrow, gradually pointed, grey, with paler cilia.

“Occurs near Vienna, and at Pisa, in the beginning of May, singly, among ash trees in the marshes.”*

Like the preceding, this still remains to be discovered in this country.

* Ent. Ztg. 1850, S. 161.

XXV. *On the Effects of certain Agents on Insects, in a Letter addressed to WILLIAM SPENCE, Esq., F.R.S., &c., by JOHN DAVY, Esq., M.D., F.R.S.*

[Read 5th May, 1851.]

MY DEAR SIR,

IN a letter which I had the honour to address to you last year relative to the effects of change of temperature on insect life, in a very limited way, I expressed the hope of being able to continue the experiments and extend them to other agencies on the same class of beings. This I have in some measure accomplished, and I propose now to make known to you the results, which be pleased to use in any way you may think proper.

The inquiry was entered on in the last week of November, and owing to the extraordinary mildness of the winter months has been continued almost uninterruptedly to the present time, viz. the middle of March. During the whole of this period the thermometer here has never for twenty-four hours been below the freezing point; it has oftener, by day, been above 40° of Fahrenheit than below that degree. This mildness of atmosphere has been accompanied with unusual humidity, and an extraordinary fall of rain: in November the amount of rain here was 13·26 inches, in December 5·46 inches, in January 19·54 inches, as measured by the pluviometer; and scarcely a day has passed during the whole of the period that insects of several kinds have not been seen on the wing or abroad in the open air.

For the sake of order, and to be better able to compare the results, I shall first notice those experiments which I have made on the effects of temperature on insects; next, of gases; and lastly, of vapours. Should my account of the trials be found tedious, I trust it will be borne with, as without some minuteness of detail, accuracy on such a subject is hardly attainable. For the names of the species, when they are assigned, you know that I am indebted to an able Entomologist, Francis Walker, Esq., who at your request was so obliging as to examine most of the individuals, the subjects of the experiments, and to return them labelled.

1. *On the Effect of Changes of Temperature on certain Insects.*

I shall first notice the effect of reduced temperature, that is, of a reduction of many degrees below the annual mean, and also below the freezing point.

On the 28th of November exposed a bee (*Bombus hortorum*), in a languid state as to activity, in a room, the temperature of which was 54° , to the open air of the temperature 32° ; it immediately became more active, endeavouring to get from under the glass which confined it, even spreading its wings and attempting flight. How long it remained thus active I did not stop to watch. Left over night, it was found the following morning quite torpid as if dead. A register thermometer, placed beside it on the grass, indicated 25° as the minimum. After having been brought into a room, of the temperature 52° , in about half an hour it revived, and, when touched, feebly moved its legs and walked. The same bee, on the morning of the 30th, at a temperature of 48° , moved its limbs slowly when touched. Exposed to the open air at 22° , rising in the course of the day to 28° , it soon became completely torpid, moving no part when touched. It revived as before, at a temperature of 56° .

A fly (*Musca vomitoria*), on the 8th December, was active, flying about within doors, at a temperature of 52° ; it became dull and averse from motion at 40° , and more so at 33° , at which temperature it did not move till touched, and then sluggishly; even at 28° it was not torpid, and that after exposure during the night to a temperature of 23° , as indicated by a register thermometer. On the following day it was exposed under the same circumstances, in company with a bee (a *Bombus*), to the open air at 28° ; the bee presently became torpid, the fly not,—moving its legs languidly when touched. The bee, in this its torpid state, bore a temperature of 22° : it remained motionless at 30° : for two hours it did not revive at 54° : when placed on the warm hand and breathed upon, it presently began to move one of its legs, and shortly after another, and in less than a minute it was walking on the hand; removed from the hand, in a few seconds it became motionless, showing no signs of life even when touched, and this at 54° ; replaced on the hand, it again became active, but not so soon as before, its hind legs first moved; the movement was that of passing the one over the other, as in the act of cleaning them; next the fore legs were moved in the same manner, the wings remaining motionless. Removed from the hand, a state of torpor was induced in a few seconds.

A fly (*Musca stabulans*), found within doors on the 13th December, exposed to the open air at 41° , became motionless, except when touched, when it was tolerably active: even at 54° it appeared to be in the same state, not torpid, moving only when touched, and excited to motion by the gentlest touch. At 31° it

became quite torpid, so that when roughly moved it showed no signs of life. It was exposed to a temperature of 22° , without fatal effect.

A small fly (*Piophilica casci*), pretty active in a window at 44° on the 19th December, did not become torpid at 38° , moving its legs when touched, nor at 33° : but at 31° torpor was produced, and it bore without fatal effect a reduction of temperature to 22° . After this it was active at 36° , and flew away when let into the open air in the shade.

On the 23rd February exposed a fly (*Anthomyia mitis*) to a night temperature of 25° (the lowest); the following morning at 9 A.M. it was languid at 26° , moving its legs sluggishly when touched. On the following night it was again exposed to a temperature of 22° . When taken out of the tube, which was covered with hoar frost, it was motionless for several seconds; but in a minute or two it moved its legs when touched, and, brought into a warm room, it soon became active.

A honey bee (*Apis mellifica*), active in the open air in sunshine on the 9th March, became motionless at 40° in the shade. In a room at 55° it moved its legs and wings languidly; some hours later at night, at 51° , it was found torpid; breathed on, a languid movement of its wings was reproduced; placed where the temperature was 65° it presently became active. The following morning at 50° it was found motionless; breathed on, on the warm hand, a feeble revival was indicated by a slight motion of one of its antennæ, and occasionally of one of its legs: in this state, as it were between life and death, it continued during five days, at a temperature between 50° and 60° , at the end of which it ceased to give any sign of vitality, the same means being employed to excite it.

These are all the trials I have made on the influence of reduction of temperature: they are smaller in number than I could have wished, owing to the want of opportunities from the extreme mildness of the season, as already adverted to; and even in the few instances in which the reduction of temperature was below the freezing point it may be worthy of remark, that it was owing not so much to the coldness of the atmosphere as to that of the surface, the effect of radiation from the grass plat on which the insects were placed during clear and calm nights, of which for the time of the year there were unusually few.

On the effect of elevation of temperature, to which I shall now proceed, I have also a few results to describe.

On the 19th January exposed a fly (*Anthomyia mitis*) in a tube

of thin glass to a temperature of 120° ; in two or three minutes it became motionless and was found to be dead. The same effect, in as short a time, was produced on another fly of the same kind by a temperature of 113° . On the 28th January exposed another also of the same kind to a temperature gradually rising (the tube being immersed in water) to 96° . After about an hour the fly that was at first active was found lying at the bottom of the tube, seemingly incapable of standing; in another minute it ceased to move, and did not revive on exposure to the air of the room. Another of the same kind bore well a temperature between 80° and 90° for two hours; after exposure to a temperature between 90° and 100° less than an hour, it was found dead.

A fly (*Musca laniö*) on the 30th January was exposed to a temperature between 80° and 90° , and 90° and 100° , for several hours; so long as the air in the tube was below 100° the fly did not appear to suffer; above 100° , it showed a tendency to become torpid; at 105° , after a very few minutes, it became motionless, and did not revive on exposure to the air of the room.

On the 16th March, a honey bee,—just taken from the open air at 45° , when in sunshine actively on the wing,—was exposed to a gradually increasing temperature. Its activity was not apparently diminished at 80° ; at 90° the sound of its wings had ceased: it was at rest at the bottom of the tube, but in nowise torpid; after a few minutes, at 96° , it became motionless; then taken out, and exposed to the air of the room at 55° , it did not revive; no part of it afterwards moved.

What is known of the habitats of insects in relation to climate, I need hardly remark, amply proves the vast range of temperature at which different species can exist,—each probably restricted to a certain range,—and consequently that a very large number of trials on different species would be required to arrive at any satisfactory conclusion on the influence of temperature on insects generally. One remark I beg to make, in which I think I am warranted by my limited experience,—as to the effect of change of temperature,—viz. that on insects it is different from what it is on the hybernating mammalia; not, as in them, producing a quick transition from active to torpid life, but more commonly a graduated one from great activity to diminished, till motion is altogether lost; and this gradation, whether in becoming torpid from cold, or in recovering from a state of torpor on elevation of temperature.

2. On the Effect of certain Gases.

Carbonic Acid Gas.—On the 19th December placed a fly (*Musca stabulans*) in a tube in which this gas was in process of being rapidly generated by the action of dilute nitric acid on fragments of limestone. The fly was supported by a perforated diaphragm, so as to be kept above the fluid, and the tube was corked, but not so tight as to prevent entirely the escape of gas, and immersed in water. In a few seconds the fly became motionless: taken out after two hours, it seemed dead, it did not move even when placed on the warm hand, and breathed on for a minute or two; soon after, the breathing on it being continued, a slight tremulous motion was perceived in its feet, and in a few minutes more decided animation was restored, and it moved when touched, and walked.

December 21st, put a fly (*Heteromyza buccata*) into a tube full of carbonic acid gas. It became instantly motionless. Kept in the gas about two minutes, it revived in about five minutes after being taken out, and seemed not less active than before. Replaced in the gas after an interval of twenty-four hours, in a few seconds it became motionless; left in the gas another twenty-four hours, it was found dead when taken out.

On the same day, a small fly (an *Anthomyia*), confined in a wine glass inverted on a plate of glass, was so active (the temperature of the room 56°) as to fly from side to side. Introduced a bit of limestone, and added a little nitric acid; the fly at the time was standing on the side of the glass; in two or three seconds, without making any efforts to escape, it lost its hold, and fell into the effervescing fluid, where it was motionless. Taken out after about two minutes, in two or three minutes more it began to move its legs, and shortly was tolerably active, considering its clogged state from its wet wings and legs.

On the 25th December, put a fly (*Musca lanio*) in an active state at the temperature of the room into the tube, with carbonic acid gas. It immediately became motionless; taken out after twenty-four hours, it was found to be dead.

On the same day put into the gas a small fly of the gnat kind. In two or three seconds it became motionless; after about three or four hours exposure to the gas, on being taken out, and placed on the warm hand and breathed upon, a slight motion of the legs was perceived, but this only for a minute or two, when all marks of life ceased.

On the 26th December, placed two flies, both of them pretty active, (a *Heteromyza buccata* and a *Musca lanio*), in carbonic acid

gas. They became motionless in a few seconds; left in about an hour, the former did not revive immediately on being taken out, nor even when placed on the warm hand and breathed upon; yet in half an hour it was nearly as active as before. The other fly, similarly treated when taken out, revived in less than a minute on the warm hand. Again immersed in the gas, and now left there about twenty hours, both were found to be dead when taken out.

On the 29th December, repeated the experiments on two flies similar to the preceding, with a like immediate result, they becoming motionless in two or three seconds. Taken out after two hours, they did not revive immediately, even when placed on the warm hand and breathed upon; in ten minutes they had revived, and were much in the same state as to activity as before immersion: the one alert (the *Heteromyza*), the other sluggish. Thrown again into the gas, they instantly became motionless,—not the slightest movement, even of the legs, could be perceived; had the air in the tube been common air, they would have been excited by the fall; taken out instantly they presently revived. Returned into the gas on the following day, and taken out after three hours, both were found motionless; the *Heteromyza*, after six hours, was found active; the other fly then was motionless, not moving even when touched; nine hours later it was revived, and active.

On the 9th March placed two honey bees, rather languid at 55° , in the tube, in which carbonic acid gas was in the act of being disengaged; common air was mixed with the gas. They at first became excited and active, used their wings, as if trying to escape; gradually, and pretty rapidly, their activity diminished; and in less than a minute they both dropped down on the diaphragm motionless. Taken out, after remaining in about a quarter of an hour, they remained motionless about an hour and a quarter; now breathed on, they began to move, and shortly, at a temperature of 65° , to which they were transferred from one of 51° , they became active.

Hydrogen Gas.—On the 30th December immersed the same flies, which had revived after exposure to carbonic acid gas on the preceding day, to hydrogen whilst in the act of being generated by means of zinc and dilute muriatic acid. They did not become instantly motionless, but they were so in less than a minute. Taken out after being two hours in the gas, the *Heteromyza* revived in about a quarter of an hour; the other remained motionless about three hours, then, when touched, it moved freely.

On the 10th March made a similar experiment on a honey bee. As the hydrogen, from the expulsion of common air from the tube,

became concentrated, the bee became restless; in two or three minutes it fell down, and after a tremulous movement of its limbs for a few seconds, it became motionless. Taken out after being in five minutes, it exhibited, in a few seconds, marks of reviving, its limbs moving in the same tremulous manner as that observed previously to its becoming torpid. On the following day it was alive and tolerably active at 55° , as if nowise injured by the action, on it, of the gas.

Azote.—Put a fly (*Heteromyza buccata*) into this gas, obtained from common air by the removal of the oxygen by phosphorus, after which removal it was allowed to stand twenty-four hours over water. The fly, in coming in contact with the azote, immediately fell from the side of the tube, and, except a slight motion of one of its legs, it appeared to have been rendered instantly torpid. Taken out after two hours, it revived in about ten minutes, its activity nowise impaired.

Common Air.—Put a fly of the same kind as the preceding into a tube, with common air, confined by a little cotton wool, in a room where all the indoor experiments were made, varying in temperature between 52° and 60° . From the 5th February, when it was introduced, till the 26th, it seemed little affected; on the 28th it was found dead.

Put a fly (*Musca laniö*) in a tube, with a small quantity of air, a few times its own volume. This was on the 4th of January; on the 5th the fly was languid; on the 16th it was motionless. About two hours after being taken out it showed marks of vitality, and was soon tolerably active. Hardly an appreciable quantity of oxygen, by the test of phosphorus, was found in the residual air; most of it had been converted into carbonic acid.

On the 19th January put three flies of the same kind as the last-mentioned, pretty active at 45° , into a tube full of water, and inverted it in water; a little air adhered to their wings. Shortly after they were found motionless, the temperature of the room 56° . In about ten minutes after being taken out they revived, and, when dry, they appeared to be as active as before.

Oxygen.—Introduced a fly of the same kind into this gas, over water obtained from the decomposition of chlorate of potash. Though swimming with its feet and part of its body immersed in the water, for twenty-four hours, its activity was nowise impaired:—a few hours later it was found under the water and motionless; on exposure to the air of the room it did not recover. On the 27th January introduced another fly of the same kind into

oxygen. Twenty-four hours after it was standing dry on the side of the tube, as if in common air, and in like manner on the 31st. On the 1st February it was found swimming on the water; by inclining the tube it got out of the water, attaching itself to the side of the glass; on the following day it was found motionless, and it did not revive on being taken out. There was a slight diminution of the volume of the oxygen, many times the bulk of the fly.

Coal Gas.—Put a fly (*Heteromyza buccata*) into a tube half-full of water, above which was common air, and introduced a little coal gas as it was generated by the action of heat: no sooner had a few bubbles come in contact with the fly floating on the surface of the water, than from a state of activity it became motionless. Taken out without loss of time, and exposed to the air, it revived in about ten minutes. The same fly, exposed to the action of the gas nearly pure, became motionless in two or three seconds. Taken out after about a minute, it gave no signs of life for half an hour; three hours later, a feeble movement of its legs was perceptible, soon terminating in death.

Sulphuretted Hydrogen.—On the 31st December immersed the same flies, that had been exposed to the action of hydrogen on the preceding day, in sulphuretted hydrogen, as it was slowly disengaged in a tube by the action of dilute muriatic acid on sulphuret of iron. After a few seconds both flies were motionless; and they did not revive when taken out, and that immediately. The effect was the same on another (*Heteromyza buccata*), and as rapidly.

On the 1st January immersed a fly (*Musca hortorum*) in a mixture of sulphuretted hydrogen and common air: in a few seconds it became motionless, and though instantly taken out it did not revive. On the same day repeated the experiment on a *Heteromyza*, and with like effect: the air in the tube consisted of about two parts common air and one sulphuretted hydrogen. On the same day introduced into the tube in which the gas was in process of being generated, two flies (*Trichocera hiemalis*, very active, *Musca vomitoria*, less so). After about an hour both were motionless; nor did they revive when taken out. So small was the proportion of sulphuretted hydrogen, that, when an attempt was made to ascertain it, it was hardly appreciable.

On the 20th March introduced an active honey bee, just taken, into a mixture of sulphuretted hydrogen and atmospheric air. The very instant it entered it dropt motionless; and not the

slightest motion of any part was seen afterwards. Taken out, after having been in the tube ten minutes, it did not revive on exposure to the air. The same day repeated the experiment on another honey bee: after a few minutes of restlessness it fell down motionless. Taken out, after about eight minutes, and exposed to the air, in about half an hour a languid motion of the abdomen was visible, and the same was occasionally seen to occur for about thirty hours, soon after which time it was found motionless and dead. The proportion of sulphuretted hydrogen mixed with the atmospheric air in this instance was very minute. The experiment repeated under the same circumstances with another active honey bee. The result was similar,—the state of torpor, the effect of the very dilute gas, was, on exposure to the air, followed by slight signs of revival, soon terminating in death.

Sulphurous Acid Gas.—On the 24th of January exposed a fly (*Heteromyza buccata*) to this gas, very much diluted, by kindling a minute portion of sulphur under a wine glass, in which the fly was confined. In a few seconds it tottered and fell, and in a few more became motionless; it did not recover on exposure to the air.

Chlorine.—On the 22nd January exposed a fly of the same kind as the last to this gas, as disengaged in the tube by the action of dilute sulphuric acid on a mixture of common salt and black oxide of manganese. In less than two minutes the fly became motionless. Taken out immediately and exposed to the air, it did not revive.

3. *On the Action of Vapours.*

Ammonia.—On the 3rd January put a fly (*Heteromyza buccata*) into a tube, with a few drops of strong *aqua ammoniacæ*. At first it was active and restless; in about half a minute it fell down, moving its legs; in another half-minute it was motionless. It had not come in contact with the fluid. Taken out it did not revive.

Exposed another fly (*Musca laniò*) in the same manner to the ammoniacal vapour; it presently exhibited convulsive movements; in less than a minute it was motionless, and it remained so, for several hours, after exposure to the air; the following morning, it was found revived and active.

Muriatic Acid.—Exposed a fly of the same kind to the vapour of strong muriatic acid: during the first half-hour the fly was active, it gradually became less so; after about two hours it was found motionless. Taken out of the tube, after showing no signs

of life for an hour or two, it revived, and recovered its activity. Replaced, and kept exposed to the acid vapour for twenty-four hours, it was found dead when taken out.

A fly (*Piophilila casei*) was put under a small wine glass, on a glass support, and with it a portion of cotton wool moistened with the acid. In less than a minute the gait of the fly became tottering; and in less than five minutes it was motionless. It was immediately taken out, but it did not revive. A similar experiment was made on another fly (*Heteromyza*?), somewhat larger and more vigorous. After about a quarter of an hour it became motionless. Then taken out, in a few minutes it became pretty active.

Nitric Acid.—The results of two trials with the vapour of this acid, one on a *Piophilila*, the other a *Heteromyza*, differed chiefly from those last mentioned in being, in each instance, fatal, exhibiting, after deprivation of motion, no sign of revival, though taken out immediately.

Alcohol.—Put a fly (*Musca lanio*) into a tube with a little alcohol of Sp. Gr. .84 underneath, and raised its temperature to 74°. For a few minutes the fly showed increased activity; in a few more it became nearly motionless; after about a quarter of an hour it appeared to be torpid. Now, exposed to the air of the room, in a few minutes a slight motion of its feet was seen; after a couple of hours it was nearly as active as before the experiment; two hours later it was found dead.

On the 8th of January, temperature of the room about 58°, placed two small flies (*Sciara vitripennis*, *Psychoda nervosa*) under a wine glass, on a glass support, with a portion of cotton-wool moistened with alcohol. The first effect was an increase of activity; after a few minutes their irregular movements and occasional falls suggested an inebriated state. A drop of alcohol poured on them rendered them motionless instantly, and proved fatal to them.

On the 11th January a similar trial was made on another fly (*Heteromyza buccata*), at a raised temperature of 70°. The excitement first produced, marked by increased activity, was soon followed by feebleness, irregular movements, and death. Similar effects were produced by the vapour of alcohol on another fly of the same kind, at the temperature of the room 57°, but not quite so rapidly.

Ether.—On the 12th January placed a fly (*Musca lanio*) in a tube with a little sulphuric ether, at the temperature of the room

56°. It immediately became motionless. Taken out after a few minutes it soon revived, and seemed as active as before. Replaced in the tube after an interval of two hours, it did not become torpid so soon as at first, two or three minutes elapsing; it revived in about a quarter of an hour after being taken out.

Repeated the experiment on another fly (*Heteromyza buccata*) at a temperature of about 54°. In a few seconds the fly dropped from the side of the glass motionless; so it continued till taken out. Taken out, after ten minutes, it did not revive. Repeated, on another fly of the same kind, the immediate effect was the same. Taken out, in less than a minute, in about an hour it revived and was active as before.

Chloroform.—On the 14th January, at the temperature of the air of the room, placed a fly of the same kind as the last under a wine glass, with a portion of cotton-wool moistened with chloroform. For a second or two the insect was active; then it suddenly became motionless. Taken out, it was tolerably revived in an hour. Repeated the experiment on a small gnat, with a like effect in every respect. Repeated it on the fly and the gnat, keeping them in the vapour about eight minutes; they soon became motionless as at first, but they did not revive on exposure to the air.

Camphor.—A fly (*Heteromyza buccata*) put under a wine glass at the temperature of the room, with a piece of camphor, became torpid in about half an hour; after exposure to the air for about the same time it revived, moving sluggishly. Replaced, and left over night under the glass, with the camphor, on the following morning it was found dead. Repeated the experiment with another fly of the same kind. In rather less than half an hour its activity was diminished; some five hours later it was motionless; it did not revive on exposure to the air.

Oil of Turpentine.—On the 20th January placed two flies, of the same kind as the last, under a wine glass, with a portion of cotton wool moistened with this volatile oil. In a minute or two they walked unsteadily, as if intoxicated; in less than a quarter of an hour they were found motionless, they had become smeared with the oil; they did not revive on exposure to the air. Another fly, of the same kind, placed in a tube with a portion of oil, separated by a diaphragm, pervious to the vapour, at a temperature of about 75°, soon became motionless, and did not recover when taken out. Repeated the experiment on another fly of the same

kind at the temperature of 54° ; the immediate effect was the same, in a few seconds it had lost the power of walking on the perpendicular side of the glass tube, and was more restless than before; accidentally a small portion of its surface came in contact with the oil, in less than half a minute it became motionless: immediately taken out it did not revive. The experiment repeated on another fly of the same kind, not allowed to come in contact with the oil; it became motionless in a minute, after having been instantly affected in the same manner as the preceding; taken out, after about two minutes, it did not revive. Repeated the experiment on a small fly.

Strong Acetic Acid.—A fly (*Heteromyza buccata*), exposed to the vapour of this acid at about 56° , was not immediately apparently affected, nor after five hours; after ten hours it was found motionless; it did not revive when taken out. The trial was repeated on another fly of the same kind, with a like result, and also on a gnat; in about five minutes it became motionless; taken out, after about two hours, it was found to be dead. Repeated it on another fly (*Heteromyza buccata*), in about half an hour it ceased to move; allowed to remain in about two hours, it did not revive when taken out.

Attar of Roses.—Placed a fly (*Heteromyza buccata*) under a wine glass, with a portion of paper on which a drop of this essential oil had been let fall; temperature of the room 54° . At first the fly did not appear to be affected; in about an hour it had become dull, moving languidly; five hours after it was found motionless. Taken out it showed marks of revival in about half an hour; after three hours it had recovered its activity. Repeated the experiment on a small fly—a gnat; after an exposure of about two hours it was found motionless; taken out it did not revive.

Musk.—Placed a fly (*Heteromyza buccata*) under a wine glass with a portion of this substance, adding a few drops of water to favour the rise of the odorous effluvia. After twelve hours no appreciable effect was produced; the activity of the insect was not impaired. Repeated the experiment on a gnat and another fly, the species of which was not determined, and with a similar result; one was exposed to the odour for twelve hours, the other, the latter, for twenty-four: this insect, on lifting up the glass, took wing and escaped.

Iodine.—Exposed a fly (*Musca domestica*) to the vapour of this substance at 70° ; the air in the tube was only just perceptibly

coloured. During the first half hour the fly was active, and seemed little affected; after another half hour it was found motionless; whether it revived or not is not mentioned in the note of the experiment. The experiment was repeated at the temperature of the air of the room, 55°, on two flies (*Heteromyza buccata*); one, which was feeble when put into the tube, became motionless in about a quarter of an hour; the other, in the same time, excepting that it had become dull, seemed but little affected; in about an hour its gait was unsteady, as if its muscles were no longer under control; after four hours it was found motionless; neither of them revived.

On the results described in the two last sections I beg to offer in conclusion a few remarks.

Comparing the effects of the several agents no two seem to have acted precisely in the same manner; and probably were a larger number of experiments made, and with minute attention, each agent would be found to possess some peculiarity in its influences. Those most fatal to life appear to have been sulphuretted hydrogen, ammonia, chlorine, nitric acid, iodine, camphor, oil of turpentine, each varying in degrees of rapidity of effect, but so far analogous that no perfect revival ensued on exposure to the air, after a motionless state had once been induced. Those less fatal to life appear to have been azote, hydrogen, carbonic acid, coal gas, muriatic acid vapour, ether, chloroform,—all of them producing immobility, and probably insensibility, with different degrees of rapidity, but not commonly terminating in death, revival in most instances following. Whether oxygen belongs to either is more than doubtful; it seems to stand alone, as regards its effects on the functions of life, throughout all classes of animals. That death sooner occurred in the trial with it than in that with atmospheric air, may have been owing to exhaustion connected with increased vital action of the insect, unsupported by nourishing food.

How the effects of the several agents are produced, it may be difficult to explain in the present state of our knowledge. Some of them probably act chemically, such as the strong acid vapour, chlorine, iodine: some probably, chiefly, in suspending respiration, or in preventing the due aëration of the fluids, such as azote, hydrogen, carbonic acid; and others, it may be, in a more complicated manner, and in part through their action on the nervous as well as the respiratory system, such as sulphuretted hydrogen, ether, chloroform, alcohol, oil of turpentine, camphor.

It is worthy of remark, that most of the substances, which, even

in minute portions mixed with common air, prevent the slow combustion of phosphorus, as indicated by its shining in the dark, have the effect, on the insects on which they were tried, of suspending animation.

The revival which occurred in so many instances after suspended animation, may probably be connected with that tenacity of life and long enduring excitability for which insects are remarkable: thus, even when decapitated, the common house fly, or the flesh fly, will not unfrequently move its limbs twenty-four hours after the loss of the head on being touched, and commonly can be excited to action beyond twelve hours after such a mutilation.

Some of the results may not be undeserving notice for practical purposes,—as those in the instances of sulphuretted hydrogen, oil of turpentine, and camphor, in relation to the destruction of parasitical insects, whether infesting plants or minerals, or to the preservation of substances from the attacks of insects. To be applicable to the preservation of plants, of course it is necessary that the agents to be used should not exercise on them any material injurious effects. This must be determined by experiments made expressly for the purpose. The few trials I have yet made on seeds seem to show, that the steeping them in a solution in water of sulphuretted hydrogen has not prevented their germination. The seeds tried were mignonette, cress seed, and that of a *Nemophila*: analogy, viz. that of steeping the seed of the *Cerealia* in a solution of the white oxide of arsenic, is in favour of the same conclusion. Further, for the preservation of articles, whether of clothing or furniture, it is hardly less necessary that the substances to be employed should have no offensive odour. Judging from the effects of attar of roses, and from what we know of scented woods not being liable to be attacked by insects, the probability is that any volatile oil of agreeable perfume will answer the purpose required, and prove a true instance of the *utile et dulce* combined.

As carbonic acid gas, and some of the other agents mentioned, produce merely a temporary torpor, it may be a question whether this gas, or simple immersion in water, may not be advantageously substituted for the fumes of burning sulphur, destructive of life, at the yearly gathering of honey; the former, indeed, may be said to be in use in the Levant, where the smoke of the fire of leaves, in which the carbonic acid generated may be considered as chiefly operative, is employed to stupify the bees preparatory to the spoiling of their hives.

The tenacity of life in insects, as exemplified in their suspended animation, whether from want of free air,—as when immersed in water, or buried in the earth, or surrounded by azote or carbonic acid, may serve a useful purpose in the economy of nature. They are the favourite food of many birds and fishes; and in their torpid state, with just sufficient life to preserve them from decomposition, they are most easily obtained, and that at a time when such a supply is peculiarly wanted; and even their quitting their state of torpor in temperate weather in winter, when they themselves appear to exist without food, may conduce to the same end,—the affording of food to other animals higher in the scale of organization, and especially such as are roused from a like state of torpor by elevation of temperature.

I am, my dear Sir,

Yours very truly,

Lesketh How, Ambleside,
March 19th, 1851.

J. DAVY.

TO WILLIAM SPENCE, Esq.
F.R.S., &c.

P. S.—In the note with which you have favoured me of the 15th of April, you have called my attention to the effects of the vapour arising from the bruised leaves of the common laurel on insects, and also to that of prussic acid. Before describing the experiments I have made in consequence, I shall, with your permission, quote your words:—"There is," you remark, "one vapour, on which, though now employed to kill insects, we want more exact facts—that of the prussic acid let loose from the bruised leaves of the common laurel. Entomologists find that insects introduced into a wide mouthed phial, having a few of these bruised leaves at the bottom, die almost instantly; but there is this inconvenience in employing them, that the watery vapour, which they also give out, condenses on the side of the phial, and injures the wings of the flies, &c., put into it." You add: "It would be desirable to know how small a quantity of the vapour of prussic acid suffices to kill an insect of medium size; whether some insects (as beetles) are less affected than others (as flies, &c.), and whether the size of the insect has any thing to do with the result."

Preparatory to making any trials with the prussic or hydrocyanic acid, I thought it right to institute one or two with the bruised leaves of the laurel.

Two leaves just gathered, torn into small pieces, and bruised in

a mortar, were put under an inverted glass in which were confined a honey bee and two small insects of the knat kind. In about five minutes they had all been rendered motionless; one of the small flies did not revive; the other and the bee recovered in a few hours, symptoms of revival appearing even before they were taken from beneath the glass into the open air. Probably had the experiment been made at another season, in summer or autumn, the effect would have been different; be this as it may, the result was not of a kind to induce me to make at the time any further trials of the leaves, especially after instituting some with the hydrocyanic acid, the fatal agency of which exceeded my expectations.

With a view to answer your inquiries respecting this acid, I paid attention to quantities. Two glass tubes, each closed at one end, a small and a larger one, were selected for the experiments; the larger of three cubic inches and a half capacity, and seven-tenths of an inch wide, the smaller only one-tenth of an inch in width, and little more than an inch long. The small tube, charged with three-tenths of a grain of prussic acid, was introduced into the larger, in which had just before been placed three flies.

The tube was finally closed with a cork. In less than two minutes one of the smaller flies, and also the larger, dropt down, and, after a few convulsive movements, became motionless, as did the other in about half a minute more (it was further removed from the acid), but without convulsive action. Taken out in less than half a minute, and exposed to the air of the room at 55° Fahrenheit, they did not revive. The small tube, immediately weighed, had not sustained any appreciable loss.

Repeated the experiment, using the same portion of acid on another fly (a *Heteromyza*). It became motionless in as short a time, but it revived when exposed to the open air. Placed again in confinement, with only .04 grains of prussic acid in the small tube, in five minutes it became motionless. Immediately taken out, it was found revived after an hour, and so active that it escaped by taking flight.

Placed a honey bee just caught in the garden at noon, under a wine glass inverted, of about four cubic inches capacity, with the small tube charged with .16 grains of prussic acid. In about two minutes the bee fell down and was convulsed in its legs and abdomen; all motion ceased in about eight minutes. Taken out immediately, symptoms of revival appeared in about three hours; soon after it was standing on its legs, but not active: the following morning it was found dead.

Placed the small tube containing the prussic acid instantly after the experiment on the bee under another wine glass, in which was confined a *Bombus* (*B. hortorum*), just caught, and very active. During the first minute or two its wings were in constant motion; during the next four or five it moved about in an irregular manner, its legs alone acting; in about ten minutes motion ceased, except a slight tremulous one of the legs;—now several parasitical insects (*Acarus*—?) dropt from it, deprived of motion themselves; in about twenty minutes it was altogether motionless. The tube taken out and weighed was found to have sustained no appreciable loss; it was replaced under the wine glass. In about three hours, though still confined under the wine glass, the humble bee began to revive, and the following morning it was pretty active; none of the parasitical insects revived excepting one.

Placed another *Bombus* under a wine glass, with the small tube charged with .08 grains of prussic acid. In less than a minute it was motionless, as were also two or three of the parasitic insects (the same kind as the preceding), which fell from it when the poison began to take effect. In less than two hours it had tolerably revived. Now added a single drop of the acid, in about ten minutes the humble bee, after being slightly convulsed, became motionless. On the following morning it was found alive, moving its feet feebly.

Substituted for the small tube one a little larger, its mouth two-tenths of an inch in diameter, its capacity one-tenth of a cubic inch. After pouring into it 7 grains of prussic acid, it was suspended by a thread in the larger tube, and so used in the following trials.

Introduced a large vigorous beetle (*Geotrupes stercorarius*), and closed the receiving tube with a cork so as to prevent the escape of the vapour of the dilute acid. In about a minute the beetle became motionless. Taken out after two hours and a quarter it was found dead.

Next introduced an active *Bombus*. In a few seconds it became motionless—entirely motionless. Taken out after an hour it exhibited no signs of revival; it was dead.

Introduced another active *Bombus*. It too in a few seconds was rendered motionless. Taken out after about a minute, it showed no signs of revival for many hours; but the following morning it was found tolerably revived. Replaced in the tube with the acid, and left there three hours, it did not recover when taken out. The tube, now weighed, was not found to have sus-

tained any appreciable loss,—a circumstance which perhaps might have been anticipated, considering that the prussic acid used was the dilute hydrocyanic acid of the London Pharmacopœia, which contains 2 per cent. only of real acid.

These few experiments may perhaps suffice to show the great efficacy of the acid, the intensity of its action, and the very minute quantity requisite to occasion death, and that in a few seconds (at least a motionless state terminating in death, exposure to the acid vapour being prolonged), of such powerful and comparatively large insects as the *Bombus hortorum* and *Geotrupes stercorarius*; and, further, in conjunction with the qualities of the acid, especially its great volatility, the boiling point of the pure acid being only 79° Fahrenheit, the manner in which it should be used when employed for the purposes of the Entomologist.

As to precautions, the poison being so volatile, it need hardly be remarked, that a close tube (one made air tight, by a good cork, will be best) ought to be used for confining the insects to be acted on; and, on the same account, that the receiving tube should not be very capacious, nor the small tube or bottle to be included in it, charged with the acid, one of narrow or contracted aperture. The dimensions of the two duly proportioned, the effects, deprivation of life, even from a few grains of the acid, should be almost instantaneous and quite certain, and this at the ordinary temperatures of our rooms, supposing them to range throughout the year between 50° and 70°. As to bad effect from moisture, there appears to be no ground for apprehension, inso-much as in the short time the effect is being produced, even should the insect be allowed to remain in the tube more than an hour, there will be no appreciable loss from the ascent of aqueous vapour; and, even if there were, it would be most easy to counteract its influence by the introduction in another small tube of a few drops of strong sulphuric acid, or grains of chloride of calcium. As, in the instance of the *Bombus*, the prussic acid proved destructive to the parasitic insects infesting it, it is not improbable that it may be equally fatal to parasitic animals generally, and their ova and larvæ. If so, would not this be an additional inducement to employ it, and no small advantage?

J. D.

April 19, 1851.

XXVI. *Descriptions of some new Species of exotic Hymenoptera belonging to Evania and the allied Genera, being a Supplement to a Memoir on those Insects published in the Third Volume of the Transactions of the Entomological Society.* By J. O. WESTWOOD, Esq., F.L.S.

[Read June 2nd, 1851.]

SINCE the publication of the Memoir above referred to, various new species of the genera there described having come to my hands, and others having been described by recent authors, I have thought it might be considered useful to publish these additions by way of supplement to my Memoir; more especially as several of the species now described possess characters of considerable interest, and the synonymy of some of the species contained in my former Memoir requires further observation.

Genus EVANIA.

Evania appendigaster, Linn.; et *lævigata*, Oliv. Westw. Trans. Ent. Soc. vol. iii. p. 241.

Admitting the distinction between these two species (although adopting the nomenclature of the Marquis Spinola relative to the former species), M. Guérin-Méneville (*Revue Zoologique*, 1843, p. 334,) states, that, having examined many individuals of *E. lævigata*, he invariably found the radial cell to be triangular, whilst in *E. appendigaster* it is semi-oval, as described by Latreille, and figured by Jurine, pl. 2, ord. 2, gen. 1, and pl. 7. In *E. appendigaster*, moreover, the head is more convex in front, and the antennæ are inserted much lower in the face, nearly level with the lower extremity of the eyes, whence their scapes are longer. In *E. lævigata* the front of the head is much less prominent, and the antennæ are inserted on a line running between the eyes, scarcely below their middle.

Evania fuscipes, Nees von Esenb., Illig., Westw. Trans. Ent. Soc. vol. iii. p. 241.

M. Guérin-Méneville introduces this insect as the female of *E. appendigaster*.

Evania Cubæ, Guérin. Westw. Trans. Ent. Soc. vol. iii. p. 242.

M. Guérin-Méneville (Iconogr. du Règne Animal, Texte, p. 405) states, that "on ne doit pas la distinguer de l'*Evania lævigata* décrite par Olivier dans l'Encyclopédie Méthodique."

Evania Desjardinsii, Blanchard. Westw. Trans. Ent. Soc.
vol. iii. p. 242.

According to M. Guérin-Méneville (Revue Zoologique, 1843, p. 334), this supposed species is the male of *Evania lævigata*, the *Evania appendigaster* of Blanchard being the female of the same *E. lævigata*.

Evania rufipes, Fabricius. Westw. Trans. Ent. Soc. vol. iii.
p. 245.

The *Evania thoracica*, Blanchard, Hist. Nat. Ins. (ed. Dumesnil, iv. p. 299), from Carolina, is stated by M. Guérin-Méneville (Rev. Zool. 1843, p. 334) to be identical with this Fabrician species, which is a native of South America; but by a note subsequently published by M. Guérin (Rev. Zool. 1844, p. 39) it appears that the two species are distinct, the *thoracica* of M. Blanchard being only two lines long, and not having the four fore-legs red, as described by Fabricius. The description given by M. Blanchard, "toute la partie supérieure du thorax est d'un rouge de brique," also removes it from my *Evania bicolor*, Trans. Ent. Soc. vol. iii. p. 246, which has the thorax entirely ferruginous. It will, therefore, be necessary to reinstate M. Blanchard's species under the name of

Evania dorsalis,

in order to avoid confusion with the two other species to which the name of *thoracica* had been applied by Drs. Klug and Leach.

Evania (Hyptia) Poeyi, Guérin-Méneville, in Rev. Zool. 1843,
p. 335.

This species is closely allied to *E. petiolata*, Fab., but is larger, and the scutellum is not black. The fore wings have the cells obliterated, those at the base of the wings being open and incomplete, whereas in *E. minuta* the latter are complete and closed. The metasternum is not furcate. It is a native of Cuba, and measures 9 millimetres in the expanse of its fore wings.

Evania (Hyptia) Servillei, Guérin-Méneville, in Revue Zool. 1843, p. 335; Brullé, Hist. Nat. Ins. Hym. iv. p. 529.

This species is black, with the head and thorax strongly rugose. The antennæ thick, scarcely so long as the head and thorax, blackish, with the first joint fulvous. The four fore legs are fulvous, with the middle of the thighs and tibiæ brownish. Hind legs thick, short, blackish, with the joints subfulvous; wings transparent, short. It measures 8 millimetres in the expanse of the fore wings.

Inhabits St. Domingo. Coll. Serville.

Evania sericans, Westw. nov. sp.

Nigra, valde sericea, thorace rufo, mesosterno in medio nigro, metasterno vix furcato; antennis pedibusque longis nigris, tibiis tarsisque anticis piceis.

Long corp. lin. $3\frac{1}{2}$. Exp. alar. lin. 6.

Habitat in Australia, King George's Sound.

In Mus. Westwood.

Caput nigrum, antice convexum, pro receptione scapi antennarum haud impressum, rugosum, facie lateribusque pone oculos sericeis. Antennæ vix subtus medium oculorum insertæ, longæ (fere longitudini totius corporis æquales), omnino nigræ, scapo brevi. Palpi lutei. Thorax ferrugineus, mesosterno tantum in medio nigro, valde scaber, metathoracis lateribus areolatis, lateribus parteque postica (pro receptione pedunculi abdominalis canaliculata) sericeis. Metasternum minimum, apice fisso. Petiolus abdominis piceus, oblique striatus. Abdomen parvum, compressissimum, elongato-ovale, articulo basali subtus in angulum producto, lateribus versus dorsum sericeis. Alæ hyalinæ, venis distinctis, areola marginali subsemi-ovali, apice infero curvato nec angulato. Pedes longi, nigri; tibiæ et tarsi antici picei.

Evania nobilis, Westw.

Ferruginea, grosse punctata; capite nigro punctato, carina tenuissima faciei, antennis et abdomine nigris, pedibus anticis piceo-castaneis, posticis nigris.

Long. corp. lin. 5. Expans. alar. antic. lin. 9.

Habitat in Brasilia. In Mus. Britann.

Clypeus lævis, linea tenui curvata impressa (e latere interno antennarum ad os ducta) e genis separatus. Antennæ longæ,

crassæ, 13-articulatæ, articulis 3 et 4 subtus piceo-rufis. Mandibulæ nigræ; palpi lutei. Thorax ferrugineus, punctatus, metanoto areolato. Abdomen nigrum, lateribus pedunculi rugosis; valde compressum, supra curvatum, subtus angulatum. Pedes 2 antici lutescenti-rufescentes, coxis omnibus lutescentibus; femoribus intermediis pedibusque posticis nigris. Venæ alarum ut in *E. principe* dispositæ.

Evania perfida, Westw.

Nigra, punctata, metanoto valde declivi, areolato, et profunde impresso; pedibus fulvis, tarsis omnibus tibiisque duabus posticis nigris.

Long. corp. lin. $2\frac{3}{4}$.

Habitat in Terra Van Diemenii. In Mus. Britann.

Tota nigra, capite et thorace valde punctatis, metanoto areolato. Pedunculus brevis, punctatus. Abdomen dorso arcuato, ventre recto, basi truncato, apice obliquo. Antennæ in medio faciei inter medium oculorum positæ. Alæ mihi desunt.

Evania Brullei, West.

Syn. *Brachygaster rufipes*, Brullé, Hist. Nat. Ins. Hym. iv. p. 528; nec *E. rufipes*, Fab. An *E. fulvipes*, Curtis, var.

“Niger, dense punctatus, alis hyalinis, nervis et stigmatibus rufis, pedibus 4 anterioribus fere totis, posterioribus 2 geniculis rufis, antennis incrassatis.”

Long. 0,005.

Habitat “environs de Paris.”

Genus *MONOMACHUS*.

Monomachus ruficeps, Brullé, Hist. Nat. Ins. Hym. iv. p. 535.

“Supra fuscus, subtus et lateribus obscure rufis, pedibus fuscis, femoribus obscure rufis, capite ferrugineo, metathorace rugoso” ♀.

Long. 0,020.

Habitat Brasil. Prov. de St. Paul. Coll. Mus. Hist. Nat. Paris.

Monomachus gladiator? Klug.

Brullé, Hist. Nat. Ins. Hym. iv. p. 535.

“Rufus, antennis, abdomine fere toto, pedibus posterioribus 2

supra nigris; facie, fronte et metathorace punctatis; alis anterioribus apice fuscis" ♀.

Long. 0,020.

Habitat Cayenne. Coll. Serville.

Obs.—The late Dr. Erichson considered the genera *Monomachus* and *Pelecinius* as belonging to the *Proctotrupidæ*.

Genus FÆNUS.

M. Guérin-Méneville (Iconogr. Règne An., Texte, p. 406 et seq.) has added the seven following species to this genus. M. Blanchard has published the description of another species from Brazil, and seven additional species from the collections of the British Museum, &c. are also here described.

Fœnus Pyrenaicus, Guér.-Mén. op. cit. p. 406.

Black, with the posterior half of the first segment, the whole of the second, and a small patch on each side of the third, fulvous red. Legs black, with a small yellow ring at the base of the tibiæ; oviduct nearly as long as the abdomen, its lateral fillets entirely black; wings transparent.

Long. corp. 14, exp. alar. 15 mill.

Habitat Tarascon (Pyrenees) [Berlin, Dr. Klug].

Intermediate between *F. jaculator* and *assectator*.

Fœnus Caucasicus, Guér.-Mén. op. cit. p. 406.

Black; thorax transversely striated. Abdomen very long, compressed, very slightly thickened at the tip, with the hind edge of the first and second segments of the abdomen slightly spotted with yellow at the sides. Oviduct much longer than the whole body, with the tips of the lateral fillets yellow. Four fore legs, with the articulations, fulvous brown; base of the tibiæ whitish, tarsi fulvous. Hind legs black, with the base of the tibiæ and the first joint of the tarsi (except at the base) yellow. Wings transparent.

Long. 14, exp. alar. 14, length of ovipositor 16 mill.

Habitat Caucasus.

Nearly allied to *F. jaculator*.

Fœnus rubricans, Guér.-Mén. op. cit. p. 407.

Fulvous; thorax rugose; neck, a large spot in front of the thorax, a small spot above the insertion of each wing and the scutel-

lum, black. Abdomen very compressed, short, suddenly thickened at the tip, black at the base, and annulated with black and red beyond the middle. Oviduct very short, about one third of the length of the abdomen, with the lateral fillets black. Legs fulvous, with the coxæ and trochanters of the middle and hind pairs black, middle of the hind thighs and tibiæ brown; antennæ brown. Wings transparent, with brown veins.

Long. 10, exp. alar. 10 mill.

Habitat France. Dauphiny, [Germany, Italy].

Fœnus Hollandiæ, Guér.-Mén. op. cit. p. 407.

Black; underside of the head and thorax sericeous. Abdomen very long, gradually widened to the tip, compressed, especially at the base, with the ovipositor short, not half the length of the abdomen; lateral filaments black, with the tips white. Four fore legs fulvous, with the middle of the tibiæ and two last joints of the tarsi blackish. Hind legs entirely black, with the tarsi yellow, except the base of the first and tip of the last joints, which are black. Wings transparent, veins black.

Long. 16, exp. alar. 17½ mill.

Habitat New Holland.

Fœnus flavitarsis, Guér.-Mén. op. cit. p. 407.

Like the last, but larger, with the oviduct nearly half as long again as the whole body; lateral filaments terminated with white. Legs black, with the front of the fore and middle tibiæ and their tarsi yellow, the latter black at the tip. Posterior tarsi yellow, with the base of the first joint and the last joint black.

Long. 22, exp. alar. 20, long. ovipos. 30 mill.

Habitat Swan River, New Holland.

Fœnus thoracicus, Guér.-Mén. op. cit. p. 437.

Black, with a long streak of fulvous yellow on each side of the thorax, not extending to the fore margin. Legs black, with the underside of the thighs, and the base and tips of the tibiæ and of the tarsi fulvous, sides of the thorax beneath the wings with large fulvous spots. Head and thorax finely rugose. Abdomen black, spotted with fulvous beneath.

Long. 17, exp. alar. 16 mill. (male.)

Habitat New Holland.

Fœnus Capensis, Guér.-Mén. op. cit. p. 405. Brullé, Hist. Nat. Ins. Hym. iv. p. 531.

Black, with the antennæ (except at the base), four fore legs, underside of the femora, base of the tibiæ and tarsi of the hind legs, fulvous; first segment of the abdomen, and a large spot on each side of the second and third segments, fulvous: oviduct of the length of the abdomen. Wings transparent, with blackish veins.

Long. 14, exp. alar. 14 mill.

Habitat Cape of Good Hope.

Fœnus Brasiliensis, Blanchard. Westw. Trans. Ent. Soc. vol. iii. p. 260.

Niger, thoracis et abdominis lateribus rufo-ferrugineis, pedibus nigro, ferrugineo, et flavo variis, thorace punctato (fem.)

Long. 0,020. Expans. alar. 0,016.

Brullé, Hist. Nat. Ins. Hym. iv. p. 530.

Fœnus rufipectus. Westw.

Gracillimus, niger; capite obconico, vertice convexo polito, facie argentea, ore rufo; antennis piceis, apice magis rufescentibus, collo valde elongato nigro, thorace nigro, punctato, pectore, lateribus, metanoto pone abdominis insertionem rufis; abdomine valde elongato, nigro, subtus piceo; pedibus piceis, coxis pedum 4 anticorum rufis, tibiis basi apiceque albidis, tarsis 2 anticis albis, intermediis duobus fuscis basi albis; pedibus 2 posticis piceis, basi tibiæ subtus apiceque articuli basalis tarsorum albidis; alis hyalinis, purpureo viridique nitidissime fulgentibus, terebra longitudini abdominis æqualis. ♂ ♀.

Long. corp. lin. 6 (oviduct. exclus.) Expans. alar. antic. lin. 6.

Habitat in insula St. Vincentii. In Mus. Brit.

Affinis *F. gracillimo*, at gracilior et aliter coloratus.

Fœnus Kirbii, Barnston, MS.

F. assectatori proximus, niger, subopacus; thorace variolosopunctatissimus; antennis piceis, extus rufescentibus extremo apice nigro, mandibularum apice rufo; pedibus 4 anticis piceo-rufis, coxis nigris, femoribus subtus nigris, pedibus 2 posticis cum coxis nigrescentibus, geniculis rufis; tarsis brevibus, rufo-piceis; abdomine nigro nitido, rufo-bifasciato;

terebra vix quartam partem abdominis æquante; alis parum infumatis, stigmate nigro.

Long. corp. lin. $5\frac{1}{2}$. Expans. alar. antic. lin. $6\frac{1}{2}$.

Habitat Hudson's Bay, Amer. septr. D. Barnston. In Mus. Brit.

Fœnus Barnstoni, Westw.

F. jaculatori proximus, niger, facie utrinque lateribusque thoracis parum argentatis, mandibulis et antennis nigris; capite obconico lævi, collo elongato, thoracis dorso in medio transverse striato, metanoto sub abdominis insertionem rugoso; pedibus 4 anticis gracilibus, piceis, coxis omnibus nigris, tibiis basi albidis, pedibus 2 posticis nigris, coxis transverse striatis, tibiis annulo subbasali albido, tarsis albidis, extremo apice nigricanti; abdomine nigro, rufo-bifasciato; terebra corporis toti longitudine, valvulis apice albis; alis fere hyalinis, stigmate piceo.

Long. corp. (oviduct. excl.) lin. 8. Expans. alar. antic. lin. 8.

Habitat Hudson's Bay, Amer. septentr. D. Barnston. In Mus. Brit.

Fœnus varipes, West.

Elongatus, niger, abdomine piceo-nigro, lateribus et parte infera mesothoracis obscure rufis, pedum 4 anticorum basi et apice tibiatarum basique tarsorum, et basi tibiatarum 2 posticarum albidis; alis infumatis, stigmate venisque anticarum nigris; antennis subbreuibus nigris, capite postice elongato, vertice convexo lævi, antice et postice, albido parum sericanti, thoracis dorso rugosulo ♂.

Long. corp. (oviduct. excl.) lin. $7\frac{1}{2}$. Expans. alar. antic. lin. $7\frac{1}{2}$.

Habitat in China. In Mus. Brit.

Fœnus Raphidioides, West.

Pergracilis, capite magno plano obconico-cordato, collari thoracis longitudine, tibiis posticis valde clavatis; niger, thoracis lateribus anticis et metanoto rufis ♀.

Long. corp. lin. $4\frac{1}{2}$; oviduct. vix lin. 1. Expans. alar. lin. $4\frac{3}{4}$.

Habitat in Australia Australiori (Adelaida?). In Mus. Westwood.

Species parva sed singularis. Caput magnum, obconico-ovale, thorace latius, basi angusto truncato, subconvexo, fere lævi, parum nitido. Ocelli fere ad marginem posticum capitis

inserti. Antennæ prope os nigræ, breves. Mandibulæ pallide-testaceæ, dente basali transverso acuto, alio parvo acuto subapicali. Collare valde elongatum, antice sensim attenuatum læve, striola media longitudinali supera impressum. Thorax supra lævis, parvus, lateribus anticis et metanoto rufis. Pedes 4 antici nigri, geniculis rufis, postici 2 nigri, tibiis valde clavatis, basi subtus et basi articuli 1mi tarsorum albis. Alæ hyalinæ, venis gracillimis, stigmatè angusto nigro, cellula discoidali minima. Abdomen nigrum, membrana laterali segmentorum testacea. Oviductus perbrevis, vaginarum apice extremo albo.

Fænus spinitarsis, Westw.

Brevis, robustus; capite transverso rotundato, collari brevissimo; rufus; antennis (articulo basali rufo excepto) tarsisque piceis, tarsorum posticorum articulis basalibus supra acute productis ♂.

Long. corp. lin. 5. Expans. alar. $6\frac{1}{4}$.

Habitat Gold Coast, Africæ occident. tropicalis. In Mus. Westwood.

Species satis robustus, subnitidus, capite et thoracis dorso parum punctatis, hoc antice et postice transverse striolato. Caput valde convexum, transverse rotundatum. Ocelli inter oculos inserti. Mandibulæ magnæ rufæ, extus et apicibus nigris, dente valido subbasali, alteris duobus ante apicem acutum et falcatum. Thorax brevis, metanoto valde declivi. Pedes 4 antici satis graciles, 2-postici crassi, tibiis mediocriter clavatis, tarsorum articulis duobus basalibus extus in spinam acutam productis. Alæ luteo parum tinctæ, stigmatè magno nigro.

Fænus patellatus, Westw.

Niger, capite et lateribus thoracis argenteo-sericeis, mesonoto scabro, lateribus et scutello magis rufescentibus; coxis posticis castaneis, tarsorum posticorum articulis duobus basalibus dilatatis albis ♂.

Long. corp. lin. 7. Expans. alar. lin. 9.

Habitat in Nova Hollandia. In Mus. Smith.

Caput fere rotundatum, sublæve, facie inter antennis carinata, argenteo-sericans, postice emarginatum. Mandibulæ nigræ, apice piceæ. Collare parum elongatum. Thorax supra scaber, antice vix transversim striolatus, lateribus thoracis et meta-

noto (subtus basin abdominis) magis rufescentibus et valde sericantibus. Abdomen nigrum, lateraliter magis piceum. Pedes 4 antici nigri, geniculis piceis, 2 postici coxis læte castaneis; femoribus in medio obscure rufis; tibiis nigris, parum clavatis, tarsorum articulis duobus basalibus dilatatis depressis albis, 1mi basi nigro, tertio mediocri, nigro basi albo. Alæ hyalinæ, venis nigris, stigmatæ fusco.

Fœnus rufus, Westw. Monogr. Sp. 15.

Individua duo fœminea hujus speciei, ut videtur, vidi, mesonotum macula parva media notatum habentia, nec non striolam nigram dorsalem abdominalem, oviductum e quarta parte abdomine brevior, antennis graciles ejusdem longitudinis, faciem sericantem in medio parum carinatam, et tibiae posticæ mediocriter clavatas.

Long. corp. lin. $7\frac{1}{2}$, oviduct. lin. 4. Expans. alar. antic. lin. 9. Habitat prope Adelaida, Australasia. In Mus. Smith and Westwood.

Genus AULACUS.

M. Brullé (Hist. Nat. Inst. Hym. iv. 343) states that he has found the ungues of the tarsi small and simple in both sexes of *A. striatus*, with the pulvillus large, whilst they are large and pectinated in *A. Latrellianus* (female=*A. Patrati*), and with the pulvillus small.

Aulacus Guerinii, Westw.

Syn. *Aulacus ater*, Guérin, Mon. Icon. R. An. Texte, p. 408.

Entirely black, shining. Head large, with the crown very elevated behind. Neck slender, elongated, received in a deep impression of the head. Thorax elevated, with the anterior lobe strongly striated, transversely emarginated in the middle, the remainder of the surface rugose and striated. Abdomen smooth, a little compressed, much thickened, and a little curved at the tip, terminated by an ovipositor, nearly as long as the abdomen, with the lateral filaments black. Legs moderately elongated, slender, shining, posterior tarsi with the hinder half of the first joint and all the second yellow. Wings transparent, with black veins, the tip of the fore wings slightly stained with brown. Antennæ long, slender and black.

Long. corp. 13, expans. alar. 21 mill.

Habitat Rio Janeiro.

Aulacus hæmorrhoidalis, Westw.

Niger, thoracis dorso valde rugoso, antice bicornuto; antennis gracilibus nigris, medio testaceis; pedibus nigris, anticorum tibiis et basi tiliarum, nec non dimidio apicali abdominis, rufis ♀.

Long. corp. lin. 6; oviductus lin. 6. Expans. alar. ant. lin. 9. Habitat in Brasilia (Para). In Mus. Britann. et Westw.

Species gracilis. Caput fere rotundatum, sublæve, antice prope antennis punctis minutis instructum, genis ad basin mandibularum angulatis. Mandibulæ breves, nigræ. Antennæ graciles, nigræ, articulis 5°, 6°, 7°, 8°, et basi 9^a testaceis. Collare mediocriter elongatum. Thorax niger, antice et ad latera griseo-subhirsutus, supra irregulariter et transversim striolatus, præsertim versus marginem anticum, hujus angulis anticis porrectis acutis cornutis, lateribusque ante alas subangulatis. Mesonotum irregulariter areolatum. Pedes graciles, nigri, anticorum tibiis et basi tarsorum testaceis; intermediorum geniculis piceis, posticis cum valvulis oviductus nigris. Alæ hyalinæ, stigmatibus nigro, apice nubila parva nigricanti. Abdomen longitudini capitis et thoracis æquale, basi angusto nigro, apice clavato rufo.

Aulacus flavo-guttatus, Westw.

Niger, capite (vertice excepto), antennis pedibusque fulvis, thorace et abdomine pallide flavescenti guttatis, alarum apice extremo fusco.

Long. corp. ♂, lin. 6; oviduct. lin. 3. Expans. alar. antic. lin. 11.

Habitat in Australia Australiori. In Mus. Saunders et Westw.

Caput subrotundatum, læve, fulvum, verticis macula magna rotundata nigra. Antennæ maris corporis toti longitudine, fulvæ, articulis 9-11 sensim obscurioribus, apicalibus duobus albidis; foeminae breviores fulvæ, articulis 10-13 albidis, apicali nigro. Mandibulæ breves, apice piceæ. Thoracis dorsum striolatum, striolis ad partem anticam multo profundioribus, angulis anticis rotundatis et parum elevatis; albedo-marginatis, lateribus anticis guttis tribus albidis in triangulum dispositis; dorso guttis novem ejusdem coloris (2 inter alas anticæ, 2 inter posticæ, 3 pone alas et 2 ad angulos

posticos. Pedes graciles, fulvi, coxis omnibus nigris. Abdomen glaberrimum, nitidum, nigrum, segmento singulo utrinque striola parva albida. Valvulæ oviductûs nigræ.

Aulacus ruficeps, Westw. (Pl. VII. fig. 3.)

Niger, nitidus, pilis argenteo-griseis vestitus, capite castaneo-rufo, glaberrimo et convexo; antennarum articulo basali obscure castaneo; alis limpidis, stigmatate venisque nigris; valvulis terebræ ante apicem albo-fasciatis.

Long. corp. lin. $4\frac{1}{2}$; oviductûs long. 3. Expans. alar. antic. lin. 8.

Habitat in Para Brasiliæ. In Mus. Britann.

Caput glaberrimum, convexum, vertice lævi; facie punctis minutis paucis impressum, postice late emarginatum; castaneo-rufum. Antennæ nigræ, capite et thorace vix longiores, articulo basali obscure castaneo, articulis 7°, 8°, 9°, et basi 10ⁱ albidis. Thorax niger, nitidus, valde rugosus et striolatus, angulis anticis rotundatis acute elevatis, et in spinam parvam recurvam elevatis (fig. 3 a); metanoto irregulariter areolato. Abdomen nigrum, nitidum, clavatum. Valvulæ oviductûs nigræ, fascia alba ante apicem. Alæ hyalinæ, valde iridescentes, stigmatate et venis nigris; nubila parva sub stigmatate apiceque alarum fusco.

Aulacus Resutorivorus, Barnston, MS.

Niger, tenuissime punctatissimus; capite fere lævi, griseo sericeo, abdomine elongato ovali nigro nitido, segmento basali utrinque macula magna rufa; antennis nigris, pedibus 4 anticis rufo-piceis, tarsis obscurioribus, pedibus posticis nigris, femoribus tibiisque apice extremo rufescentibus; alis infuscatis, apice clarioribus, costa maculaque quadrata sub stigmatate nigro-fuscis, oviductu longitudine thoracis et abdominis.

Long. corp. lin. 9; long. oviductûs lin. 7. Expans. alar. antic. lin. 15.

Habitat in America Boreali, Hudson's Bay.

Larvæ *Monochami resutoris* parasita. D. Barnston.

GENUS CAPITONIUS, Brullé, Hist. Nat. Ins. Hym. iv. p. 544.

This new genus differs from *Aulacus* in having the third discoidal cell not closed, the head nearly cubical, with a deep frontal

impression to receive the antennæ; face wide. Abdomen depressed, oval, affixed on the hind upper extremity of the metathorax, which is suddenly truncate behind. Prothorax forming a long neck. Antennæ filiform, shorter than the body, first joint long and cylindric, second short and globular, and eleven (twelve?) joints, slightly diminishing in length. Fore wings with a rather large radial cell not extending to the tip of the wings; three cubital cells, the outer one very long; two discoidal closed, and the third very long, extending to the tip of the wing; hence there is only one recurrent vein, and a single posterior marginal cell. Legs rather long; ungues with a strong tooth at the base.

Capitonius bifasciatus, Brullé, op. cit. p. 545.

Nigro rufo et flavo varius, alis flavis, anterioribus fasciis 2 posterioribus, fascia unica fuscis, metathorace rugoso.

Long. 0.010.

Habitat Pará, Brazil.

Upper side of head and antennæ black; lower part of head and mouth yellow. Prothorax yellowish red. Metathorax [mesothorax?] yellow. Upper side of the metathorax blackish-brown, with the scutellar region yellowish red; the sides of the mesothorax and of the breast black; the three basal segments of the abdomen bright red, the remainder black; fore legs reddish-yellow, hind legs black. Abdomen depressed and shining, first segment nearly flat and triangular, rather longer than broad.

Genus MEGALYRA.

Megalyna rufipes, Erichson, Beitrag zur Insecten Fauna von Vandiemen's Land, p. 258.

"Nigra, pedibus rufis, alis anticis fascia fusca.

Long. corp. $5\frac{1}{2}$; acul. 18 lin.

"Nigra. Antennæ tenues, 14-articulatæ, articulo 1mo crassiusculo nigrae, articulo tertio infra ferrugineo. Caput punctatissimum, albido-puberulum. Thorax punctatissimus, albido-puberulus, prothorace vittis duabus, mesothorace plaga media obsoletis sanguineis. Abdomen læve, parcius albido-puberulum, aculeus corpore plus triplo longior. Pedes albo-puberuli, rufi, coxis trochanteribusque nigris. Alæ hyalinæ, apice infuscatæ, anticæ fascia transversali fusca."

This species seems to me scarcely to differ from *M. fasciipennis*.

Megalyra Shuckardi, Desvignes, MS. Pl. VII. fig. 2.

Niger, metanoto truncato, angulis porrectis, alis nigricantibus, plaga pallidiori pone medium notatis ♀.

Long. corp. fere unc. 1; oviduct. unc. $3\frac{1}{2}$. Expans. alar. antic. unc. $1\frac{7}{12}$.

Habitat in Nova Hollandia. In Mus. Britan., Jard. des Plantes, Paris, et Smith.

Corpus robustum, subcylindricum, lateribus capitis, thoracis et abdominis argenteo-griseo parum sericantibus. Caput et thorax valde et rugose punctata. Antennæ pergraciles, 14-articulatæ, articulo 4to præcedenti dimidio longiori, 5to et sequentibus sensim abbreviatis, ultimo brevissimo. Caput transversum, antice rotundatum, angulisque posticis rotundatis. Collare minus rugose-punctatum quam in *M. fasciipenne*. Metanotum in medio canaliculatum, canali profundiori (præsertim postice) quam in specie prædicta; angulis posticis porrectis. Abdomen magis ovale, segmento primo nitido; reliquis sub lente punctis minutis valde contiguis impressis. Pedes, præsertim versus apicem tibiarum posticarum, argenteo-sericei. Alæ obscure fusco-nigricantes, plaga subovali pallidiori pone medium notatæ. Oviductus longissimus, corpore fere quadruplo longior.

Megalyra mutilis, Westw. (Plate VII. fig. 1.)

Niger, capite et thorace valde rugosis, illo globoso, hoc elongato obconico truncato; abdomine elongato ovali glaberrimo, alis perbrevibus nigris.

Long. corp. lin. 11. Expans. alar. anticar. lin. 8.

Habitat apud Adelaidam Australasiæ. In Mus. Westwood.

Insectum persingulare. Caput fere globosum, valde rugosum, punctis irregularibus profundis contiguis omnino impressum. Antennæ perbreves, gracillimæ, prope os insertæ. Mandibulæ breves, nigræ. Thorax subcylindricus, oblongo-obconicus, antice et postice truncatus, lateribus argenteo-griseo setosis. Mesonotum magnum, rugosum, punctis profundis irregulariter confluentibus impressum. Scutellum punctis ovalibus lineaque media parum profunda impressum. Metanotum irregulariter areolatum, carinisque elevatis gracillimis semicircularibus instructum. Alæ parvæ, vix capite

longiores, nigræ, venis ut in congeneribus dispositis. Pedes breves, nigri, tibiis et tarsis pedum posticorum setis griseis dense vestitis. Abdomen elongato-ovale, glabrum, nitidum, nigrum, lateraliter punctis parvis impressum; segmento basali læve, reliquis sub lente delicatissime granulatis.

Genus STEPHANUS.

M. Brullé (Hist. Nat. Ins. Hym. iv. p. 536) confines this genus to the European *Stephanus serrator* of Fabricius, on account of its possessing five joints in the hind tarsi, the fourth being short, oblique, and prolonged beneath the following joint. This structure, however, also exists in the male of the following species.

Stephanus Brasiliensis, Westw. in Griffith, Animal Kingdom.
pl. 66, f. 3, ♂.

The figure above referred to correctly represents the hind tarsi as five-jointed. The hind femora are furnished beneath with two strong teeth, having a smaller one between them and several slight serratures.

Genus MEGISCHUS, Brullé, Hist. Nat. Ins. Hym. iv. p. 537.

This genus consists of such species of *Stephanus* as possess only three joints in the posterior tarsi, the middle joint being prolonged beneath the terminal joint, and the two posterior femora are armed beneath with a row of small teeth, two of which are larger than the rest, whereas in *Stephanus* the hind femora are armed with three large teeth, and destitute of the smaller denticulations. I believe, however, that this character is merely a sexual one, and that it is peculiar to the females alone.

Megischus coronator, Fabricius. Westw. Trans. Ent. Soc. iii. p. 276 (*Stephanus cor.*); Brullé, Hist. Nat. Inst. Hym. iv. p. 538.

M. Brullé gives, as the habitat of this species, the East Indies, collected by Messieurs Diard and Duvaucel, and New Guinea (Dorey), captured during the expedition of Capt. D'Urville, the specimen from the latter locality having the colour of the wings rather more dusky.

Megischus annulator, Brullé, Hist. Nat. Ins. Hym. iv. p. 539.
pl. 40, fig. 5.

Niger, alis subhyalinis, abdominis segmento 2do toto lævigato, terebræ valvulis ante apicem annulo albo.

Long. corp. 0,040; long. oviduct. 0,055.

Habitat unknown. Coll. Mus. Hist. Nat. Paris.

The cheeks of this species are marked with a red spot; the mandibles in part ferruginous, as well as the anterior part of the prothorax. The scutellar region is entirely smooth; the metathorax marked with some large punctures, transversely strigose behind, and slightly so in the middle; the first segment of the abdomen is very finely strigose transversely, the remainder are smooth, the second alone presenting one or two strigæ at the base. The figure of this species is very unsatisfactory, not representing the white bar of the valves of the ovipositor, and giving four joints to the posterior tarsi.

Megischus furcatus, Serv. and St. Fargeau. Westw. Trans. Ent. Soc. iii. p. 276 (*Stephanus f.*); Brullé, Hist. Nat. Ins. Hym. iv. p. 539?

I have been obliged to add a query to the last citation, as M. Brullé describes the insect thus: "Niger, alis fere fuscis, abdominis segmento 2do lævigato, valvulis terebræ nigris. Long. corp. 0,030; long. ovid. 0,040. Cette espèce ressemble beaucoup à la précédente. Elle n'en diffère, pour ainsi dire, que par sa taille moindre, par la couleur plus foncée de ses ailes, et par les valves de sa tarière, qui sont plus grêles, sans anneau blanc, et dont l'extrémité n'est pas lanceolée comme dans le *M. annulator*." In the original description in the Encyclopédie Méthodique, as well as in Guérin's figure, the valves of the terebra are however marked with a white bar near the tip, so that either M. Brullé has described another distinct species, (which seems improbable, as he refers to M. Serville's cabinet,) or the specimen must have had the extremity of the valves of the terebra broken off, and this seems the more probable from what M. Brullé says respecting their tips not being lanceolate. M. Brullé also describes the cheeks as being marked with a red spot, and the mandibles as ferruginous at the base.

Megischus acutus, St. Farg. and Serville. Westw. Trans. Ent. Soc. iii. p. 276 (*Stephanus ac.*); Brullé, Hist. Nat. Ins. Hym. iv. p. 540.

M. Brullé has added several particulars to the original descrip-

tion in the Encyclopédie of this small species, the body of which is 0,016 millemetres long, and the ovipositor 0,017, derived from M. Serville's original specimen.

Megischus ducalis, Westw.

Niger, capite punctato rufo, vertice semicirculariter striato, antice tuberculis quinque acutis nigris frontalibus; antennis nigris, articulo basali rufo; mandibulis rufis porrectis, apice nigris; palpis maxillaribus castaneis, articulo basali rufo; thorace nigro, nitido, irregulariter punctato; metanoti medio canaliculato, circulisque numerosis impressis punctato; hujus lateribus dilatatis; abdominis pedunculo longitudine capitis et thoracis, transversim striato, e basi sensim fere ad medium incassato, et exinde ad apicem sensim attenuato; segmentis reliquis clavam conjunctim formantibus et pedunculo brevioribus, glaberrimis; terebra corpore toto parum longiori, valvulis fascia lata ante apicem alba; pedibus nigris, longe hirtis, femoribus posticis crassis, dente parvo ante, altero pone medium, denticulis tribus adjectis; alis limpidis, fulvido parum tinctis, venis distinctis, posticis venis duabus abbreviatis subapicalibus.

Long. corp. (oviductu excluso) unc. $1\frac{5}{12}$; oviduct. $1\frac{1}{2}$ unc.

Exp. alar. antic. unc. $1\frac{3}{4}$.

Habitat in India Orientali. In Mus. Britann.

Megischus maculipennis, Westw.

M. gracillimus, niger, capite rufo, antennarum articulis tribus basalibus basi que palporum rufis, horum apicibus fuscis; alis sublimpidis, anticis nubila media fusca, tibiaram posticarum apice tarsisque rufo-piccis; capite supra irregulariter punctato et transverse strigoso, vertice denticulis quinque nigris inter oculos, mandibulis apice nigris, pronoto fortiter transverse sulcato, mesonoto in medio lævi, metanoto oblongo punctis rotundatis vix contiguis, thoracis lateribus obsolete punctatis, albo-sericantibus; pedunculo abdominis tenuissimo transverse striatulo, ante medium utrinque dente minimo instructo, abdomine glaberrimo; oviductus valvulis ante apicem fascia alba, spatium inter fasciam et apicem latitudini fasciæ æquali; femoribus posticis dentibus duobus denticulis nonnullis adjectis armatis.

Long. corp. fere unc. 1; oviduct. unc. $1\frac{1}{2}$. Exp. alar. antic. unc. $1\frac{1}{6}$.

Habitat Parâ, Brasiliæ. In Mus. Brit.

Megischus submaculatus, Westw.

Niger, capite rufo, pedibus nigris, articulo basali rufo, alis subhyalinis, oviductûs valvulis fascia alba fere apicali, pedibus nigris.

Long. corp. unc. $1\frac{1}{2}$; oviduct. unc. $1\frac{1}{3}$. Exp. alar. antic. unc. $1\frac{1}{6}$.

Habitat Pará, Braisilæ. In Mus. Brit.

Præcedenti valde affinis. Differt statura paullo crassiori, alis in medio tantum parum obscurioribus, palpis fuscis, pedibus nigris, femoribus crassioribus, pronoto et collari vix transversim striato, meso- et metanoto punctis multo paucioribus, hoc breviori, pedunculo abdominis transverse striato, tuberculis duobus majoribus lateralibus ante medium armato.

Megischus cylindricus.

Niger, pergracilis, capite et antennarum basi rufis; alis hyalinis, oviductûs valvulis paullo ante apicem albo-fasciatis, petiolo abdominis nigro cylindrico tenuissime striato, utrinque carinis tenuissimis longitudinalibus paullo elevatis instructo; capite ruguloso, vertice denticulis quinque rufis obtusis, mandibulis rufis, apice nigris, palpis fuscis, pronoto transversim sulcato, meso- et metanoto mediocriter punctatis; abdominis segmento secundo spatio parvo dorsali, versus marginem posticum, segmento 2^{do} supra fere omnino subopacis, lineis tenuissimis striatis sub lente distinctis; pedibus nigris, tarsis posticis piceis, femoribus posticis dentibus duobus fortibus denticulisque nonnullis adjectis.

Habitat Pará, Brasiliæ. In Mus. Brit. et Westw.

Long. corp. unc. $\frac{5}{8}$; oviduct. unc. $\frac{2}{3}$. Exp. alar. antic. unc. $\frac{2}{3}$.

Obs. Individuum ♀ possideo, cujus corpus unc. $\frac{3}{4}$ longitudinem habet et oviductus unc. $1\frac{1}{4}$.

Megischus Indicus.

Niger, capite fulvo, vertice piceo; denticulis quinque nigris, labro mandibulisque fulvis, horum apice nigro; antennis piceis, articulis basalibus fulvis, palpis similiter coloratis; pedibus 4 anticis fulvis, femoribus magis castaneis, posticis nigris, dentibus duobus crassis denticulisque nonnullis adjectis armatis, tarsis posticis piceo-fulvis; pronoto tenuissime transverse striatulo, metanoto rudè punctato.

Long. corp. lin. $5\frac{1}{2}$. Exp. alar. antic. lin. $5\frac{1}{2}$.

Habitat in Insulis Philippinensibus. In Mus. Brit.

Genus TRIGONALYS, Westwood.

Syn. *Sphex p.*, De Geer; *Cælius*, Serville, olim; *Seminota*, Spinola; *Abastus*, St. Fargeau, olim; *Trigonalys et Lycogaster*, Shuckard.

Sp. 3. *Trigonalys depressa*.

Sphex depressa, De Geer. (Vid. Monogr. Trans. Ent. Soc. iii. p. 273.)*

Trigonalys obscura, West. op. cit.

Trigonalys bipustulata, Smith, in Annals of Nat. Hist., 2nd series, vol. vii. p. 28.

Trigonalys compressa, Smith, in Trans. Ent. Soc. New Series, vol. i. p. 178, pl. xvi. fig. 2.

The parasitic connexion of this species with *Polistes lanio* has been determined by Mr. F. Smith, in the present volume of the Transactions of our Society. In addition to the specimens in the Collections of the British and Berlin Museums, and that of W. W. Saunders, Esq., I possess a specimen presented to me by J. A. Turner, Esq., of Manchester, the antennæ of which are composed of twenty-three joints. Mr. Smith states that Mr. Saunders's individual possesses only twenty. The examination of these different specimens has convinced me that that contained in the Berlin Museum is only a variety of De Geer's species.

Sp. 7. *Trigonalys maculata*, Smith. (Plate VII. fig. 4.)

Nigra, capite et thorace flavo-maculatis, abdomine flavo fasciato; antennis fuscis, medio ferrugineis; pedibus castaneis; alis fusco parum tinctis, costa lata anticarum obscuriori.

Long. corp. lin. 5. Exp. alar. antic. lin. 8.

Habitat Moreton Bay, Australasia. In Mus. Britann. and Westw. Communicavit D. Parry.

Trigonalys maculata, Smith, in Annals of Nat. Hist. 2nd series, vol. vii. p. 28.

Caput, thorax et abdomen punctis minutis numerosissimis undique notatum. Caput rotundatum, subdepressum, nigrum, macula elongata ad marginem internum, alteraque ad marginem posticum oculorum; maculis duabus parvis clypei et duabus ad basin antennarum striolaque in medio interrupta

* "*Sphex (depressa)*, nigra, capite lato depresso; alis exterius fuscis, abdomine gibbo; petiolo depresso, maculis binis flavis."—*De Geer*.

versus marginem posticum capitis, omnibus flavis. Antennæ piceæ, articulis 4 et quinque sequentibus magis castaneis. Mandibulæ flavæ, dentibus nigris, dextera dentibus 4 æqualibus acutis, sinistra dente subapicali latiori, denteque præcedenti lato truncato (fig. 4 *a*, mandibulis vero reversis). Palpi maxillares 6-articulati (fig. 4 *b*); palpi labiales articulo ultimo securiformi (fig. 4 *c*). Antennæ graciles, 25-articulatæ. Thorax niger, dorso antice maculis duabus obliquis flavis, punctis minutis distantibus scutelli alterisque duabus postscutelli apiceque metanoti duabus flavis. Abdomen nigrum, flavo-fasciatum, fasciis posticis interruptis, apice valde incurvo, segmentum 2dum subtus productum fere attigente (fig. 4 *d*). Pedes fulvi, trochanteribus albidis, femoribus basi obscurioribus. Alæ parum fuscescentes, costâ late castaneo-fuscâ.

The discovery of a species of this genus in New Holland is of considerable geographical interest, the species hitherto known being natives of North and South America, and Europe. The species also is the most elegant yet discovered. The only individuals hitherto known were obtained in a collection from Moreton Bay by Captain Parry, F. L. S., to whom I am indebted for my specimen.

I take this opportunity of describing a new genus of Hymenopterous insects collected in the East Indies by Captain Boys, belonging to a family hitherto known only as inhabitants of South America and New Holland, but differing from the species already described in several generic particulars. Unfortunately, only a single specimen of the male sex has been hitherto observed, and I am only able, by analogy, to infer that the female when discovered will be a wingless insect, considerably smaller than the male.

Family THYNNIDÆ.

Genus ISWARA, Westw.

Characteres masculini. *Corpus* subcylindricum, fere læve, pallidum. *Caput* (fig. 5 *a*) mediocre, longitudine latius, lateribus rotundatis. *Oculi* magni, laterales, margine interno fere recto, vix emarginato. *Clypeus* parum porrectus, parvus, in lobos duos subacutos divisus. *Labrum* clypeo absconditum. *Mandibulæ* graciles, falcatæ, apice acutæ, intus versus apicem

dente parvo tuberculiformi instructæ. *Maxillæ* (fig. 5 *b*) parvæ, lobo apicali ovali simplici membranacea paullo ciliata. *Palpi* maxillares minuti, ut videtur 3-articulati, articulo basali brevissimo, 2^{do} longiori, apice paullo crassiori, 3^{tio} brevi subconico, apice bisetigero. *Mentum* (fig. 5 *c*) elongato-obconicum, apice recte truncato, bisetosum. *Palpi* labiales ad angulos ejus anticos laterales inserti, minimi, 3-articulati, articulis fere æqualibus, ultimo subacuto, seta terminali. *Ocelli* 3 magni in impressione occipitali positi. *Antennæ* subelongatæ subrectæ, apice haud convolutæ; in tubercula dua faciei insidentes, 13-articulatæ, articulo basali brevi, reliquis parum crassiori, 2^{do} minimo in apice præcedentis fere omnino recepto; reliquis sensim sed parum attenuatis singuloque ad apicem paullo curvato. *Thorax* oblongus subcylindricus, postice paullo attenuatus. *Collare* transversum, usque ad tegulas lateraliter utrinque extensum, striola transversa per medium ut videtur supra divisum. *Scutellum* fere quadratum, convexum. *Postscutellum* transversum. *Metathorax* rotundatus, dorso utrinque parum impressus. *Alæ* mediocres, stigmatum magno: cellula unica marginali, apice appendiculato; cellulis tribus submarginalibus; 1^{ma}, ut videtur, cum cellula antica discoidali confluenti, venula obliqua ordinaria illas separante, fere oblitterata (in figura 5^{ta} omissa); cellula 2^{nda} submarginali subtriangulari, (angulis vero 6 instructa, antica basi stigmatum opposita, ubi vena suboblittera supra dicta e cellula emittitur), venam primam recurrentem accipiente; cellula 3^{tia} submarginali subquadrata, venam secundam recurrentem accipiente; et ad angulum ejus venam fere indistinctam versus marginem apicalem alæ emittente. *Pedes* mediocres, setis acutis instructi, tarsis posticis reliquis multo longioribus; unguibus minutis (fig. 5 *f*), versus apicem subtus dente acuto minimo instructis. *Abdomen* ovale, setosum, segmentis 2^{do} et reliquis supra impressione semicirculari recurva utrinque notatis; genitalia mascula lobis duobus magnis compressis spinaque acuta media infera recurva armata. (Fig. 5 *e* lateraliter, 5 *d* infra visa.)

Iswara luteus, Westw. (Plate VII. fig. 5 and details.)

Albido-luteus, collari, scutello et pedibus magis albidis; nitidus; capite nigro, antennis, clypeo et mandibulis (apice excepto) luteis; alis subhyalinis.

Long. corp. lin. 4½. Expans. alar. lin. 7.

Habitat in India Orientali (D. Boys). In Mus. Westwood.

Caput nitidum, parum punctatum. Thorax fere lævis, collari antice magis punctato. Abdomen sub lente punctis delicatissimis undique impressum. Alæ apice parum obscuriores, stigmate luteo-fusco, postice magis fusco.
Fœmina ignota, forsan aptera et mare multo minor.

XXVII. *Remarks on the Psychidæ, by Professor C. Th. v. SIEBOLD, published in the Silesian "Bericht über die Arbeiten der Entomologischen Sektion im Jahre 1850."*
Translated by H. T. Stainton, Esq.

[Read October 6th, 1851.]

I HAVE already endeavoured, in the first year (1849) of the "Zeitschrift für wissenschaftliche Zoologie," to direct the attention of Physiologists and Entomologists to the extremely interesting mode of propagation of the *Psychidæ*, when I maintained that the assertion, that the female individuals of the *Psychidæ* could propagate without the introduction of the semen of the male, was founded on mistake and error.

The whole of the peculiar behaviour of these moths in the business of copulation, as well as when laying their eggs, may easily contribute to lead the observer into error, as may be perceived from the following. The females of many of these case-bearers, after copulation, lay their eggs in the deserted pupa-shell which remains in the case, and fill it with them tightly from top to bottom, so that if these cases are collected and preserved, one may easily fall into the belief they were the cases in which the females had not yet escaped from the pupa. Consequently, when young larvæ afterward crawl out of such cases, one erroneously concludes, that in this instance a female which had been obtained whilst in the pupa state, and therefore had not been impregnated, had *sine concubitu* produced young. But this only concerns the two genera of *Psychidæ*, *Psyche* and *Fumea*, and is not the case with the genus *Talæporia*. I have now arrived at the conviction that the females of the genus *Talæporia*, which formerly I had not learnt to distinguish strictly from the females of the genus *Fumea*, can under certain conditions propagate without male intercourse.

But this occurrence can not be considered as an exception to those physiological laws, according to which all true eggs, in order

to attain their development, must previously be fecundated by the semen of the male; but this phenomenon, observed in *Talæporia*, must be added to those widely spread occurrences in the lower orders of animals which we have but recently learnt to estimate correctly, and now know under the designation of alternation of generation. We should therefore no longer consider the individuals capable of propagation without intercourse with the male, as females endowed with ovaries, but as sexless individuals quite different from females in their organisation. These individuals, sexless, yet capable of propagation, as we have now learned to know them so plentifully among the invertebrata, have been designated *Nurses* by Steenstrup, who first paid attention to the change of generation. These *nurses* can propagate by longitudinal or transverse section, by external or internal formation of germs, or by a germ-stock. This germ-stock supplies the place of an ovary, and renders the presence and influence of a testicle unnecessary. Such a germ-stock produces in consequence no eggs, but germs (germ-grains or germ-balls).

According to this physiological law, only recently recognised, the long known wonderful phenomenon among the *Aphides* is estimated quite differently from what it has hitherto been. There do not occur in them, in the course of a summer, generations and generations of exclusively female individuals one after another without any traces of male individuals, till at last there appears a brood of male and oviparous female *Aphides*, which must copulate and be *impregnated*; but we shall have to consider these viviparous female individuals as sexless nurses provided with germ-stocks. That these *Aphis* nurses, in reference to their organs of propagation, have a truly different organisation from the oviparous *Aphis* females, I have already demonstrated in the year 1839 (see "Froriep's Neue Notizen, Band XII. p. 307). The sexless viviparous *Aphides* want not only the *receptaculum seminis*, which the sexual oviparous *Aphides* possess, but also the germ-stocks of these *Aphis* nurses show an entirely different form and structure to the ovaries of the female *Aphides*. I have already mentioned my suspicion (see my "Lehrbuch der vergleichenden Anatomie der wirbellosen Thiere," p. 634), that the occurrence of sexless nurses among insects was not confined to the single family of the *Aphides*, and that probably also among the species of *Cynips* and *Psyche* similar nurse formations might occur. In the *Psychidæ* this is now certainly the case, since the *Talæporiæ* are subject to such a change of generation. The account of Lepidopterologists (constantly repeated, and from different quarters), that the females

of certain species of *Psyche* had produced young without previous copulation (*sine lucina*) has compelled me to examine these communications more rigorously; and I chose for investigation *Psyche Graminella* and *Fumea nitidella*.

I soon convinced myself by investigation, that most of the assertions that the *Psychidæ* could propagate *sine concubitu* originated in delusions. I have further explained the errors lying at the bottom of these delusions in the "Zeitschrift für wissenschaftliche Zoologie" (Bd. I. 1849, p. 93).

After I had made known my opinion upon this point, I again continually received, from various quarters, intimations that in certain *Psychidæ*, which were collected as larvæ and taken care of, a propagation *sine lucina* must have taken place, since from such larvæ, after they had gone into pupæ, only females had emerged which had laid eggs, from which afterwards larvæ had certainly come.

These communications, however, mostly referred to *Talæporia lichenella*, Zell., and I now turned my whole attention to the *Talæporiæ*, for which the abundant occurrence of the *Tal. lichenella* at Freiburg in Breisgau, my former abode, was very useful. Unfortunately I was interrupted in these investigations by my removal from Freiburg to Breslau; yet I had prevailed on Herr Reutti, who had undertaken these investigations in company with me at Freiburg, to pursue our observations further. He has faithfully communicated to me the further success of these observations, and so I am now in a condition to announce with certainty, that the *Talæporia lichenella*, Zell., is subject to a change of generation, or rather, that the *Talæporia lichenella*, Zell., is a *sexless nurse*, since the larvæ of this case-bearer produce *nothing* but females, and *always* only again females, which, *sine concubitu*, lay eggs, from which afterwards larvæ actually escape. Apparently these wingless individuals of *Tal. lichenella* with ovipositors do not correspond to females, but to the sexless nurses of a species of *Talæporia*, subject to alternation of generation. How many generations of these nurses follow one another, till at last a sexual generation occurs, has not yet been ascertained.

We must, in the first place, endeavour to find out the sexual form of this *Talæp. lichenella*, since although Zeller (see *Isis*, 1838, p. 718, 1839, p. 182 and 302) quotes as a synonyme to this case-bearer the *Psyche triquetrella* of Fischer von Röslerstamm, it is not yet ascertained whether both the forms truly belong to the same species. I know the male and female of this *Talæporia*

triquetrella, F. v. R., from my own inspection—for I have often bred it at Freiburg from its three-sided cases, and thereby obtained females and males in tolerable plenty. At any rate the cases of the sexual *Talæporia triquetrella*, F. v. R., and the sexless *Talæporia lichenella*, Z., although the cases of both species appear three-sided, are very different from one another. This difference probably does not originate from the different materials, which these case-bearing larvæ use for the composition of their cases, though, indeed I have always found the larvæ of *Talæporia lichenella*, Z., on old fences, whereas *Talæporia triquetrella*, F. v. R., probably remains, while in the larva state, on low grass plants, and to undergo transformation crawls up on to the stems of trees, and sides of rocks. The former is rarely found but in the neighbourhood of gardens and houses; the latter, on the contrary, occurs at a distance from these, as in woods. The cases of *Talæp. lichenella*, Z., are constantly smaller and darker than those of *Talæp. triquetrella*, F. v. R. Since the cases of these *Talæporia* nurses are probably differently constructed from those of the sexual *Talæporia* individuals, since besides it may be assumed that nurse-forms will also occur in other species of *Talæporia*, and that we had hitherto altogether disregarded the alternation of generation of these moths, it cannot fail that the separation of species among the genus *Talæporia*, which by these complicated circumstances is rendered very difficult, must have fallen into the worst confusion.

It is now a problem for Lepidopterologists to investigate further the extremely interesting circumstances of living of the *Talæporia*, in order that the many still unresolved questions, which are associated therewith, may speedily receive a decided answer.

For all those who wish to make the observation and investigation of the *Psychidæ* their task, I will besides suggest the following. It should be sufficient for the present to distinguish only three genera of *Psychidæ*; *Psyche*, *Fumea* and *Talæporia*. *Psyche* and *Talæporia* form the extremes of this family, and *Fumea* stands as a connecting link midway between the two.

1. *Psyche*. The male has pectinated antennæ; it can elongate its abdomen more or less, and during copulation thrusts it deep into the case where the female remains concealed.

The wingless female is vermiform, possesses neither legs, antennæ nor eyes, and likewise wants an ovipositor. It remains concealed in the case, after its escape from the pupa shell, till copulation has taken place; it then creeps backwards into the deserted pupa-skin and lays it completely full of eggs, when, being quite shrivelled up, it dies.

2. *Fumea*. The male is provided with pectinated antennæ. It can generally stretch its abdomen lengthways. Copulation with the female takes place outside the case of the latter.

The wingless female possesses properly developed legs, antennæ and eyes. The antennæ are moniliform and short, their apices not reaching to the hinder end of the thorax; the abdomen terminates with a telescopic ovipositor (capable of being drawn out and in), the base of which is clothed with many woolly hairs. The female, after its escape from the pupa skin, creeps out of the case, and, firmly attached thereto, waits the approach of the male. After copulation the female, by means of its ovipositor, lays its eggs in the empty pupa-skin which remains in the case, and fills it with eggs and woolly hair; after which, being shrivelled up, it falls off the case.

3. *Talceporia*. The male possesses long, simple, filiform antennæ. It can not elongate its abdomen. Copulation with the female takes place outside the case.

The wingless female is quite similar to the female of a *Fumea*; legs, antennæ, and eyes are developed; the woolly hairs at the end of the abdomen, and the ovipositor, capable of being drawn out and in, are present. The only difference lies in the form of the antennæ. The filiform antennæ are here always longer than in the females of *Fumea*; they either reach to the hinder end of the thorax or extend beyond it. The female on its exclusion creeps out of the case, with the pupa skin attached to it, which falls off when it has completely quitted it; and then the female, having copulated outside the case to which it is firmly fixed, lays its eggs, by means of its ovipositor, in the cavity of the empty case.

On the Spiral Case of the Larva of a Psyche.

This case-bearer, which occurs near Freiburg in Breisgau on stone walls, and has also been found by Kollar on a brick wall at Vienna, must in every respect attract the attention of Entomologists and Physiologists. From most of those which were sent me from Vienna through Kollar's kindness, a *Chalcis* made its escape, which proved to be a new species, and has received from Kollar the name *Chalcis unicolor*. From very few pupæ only have I hitherto bred vermiform females without ovipositors, males having never made their appearance. My attention was first called to the occurrence of the *Psyche* near Freiburg by Herr v. Heyden. I had provisionally named it *Psyche Helix*, but ascertained afterwards that Herrich-Schäffer had already described and figured (Systematische Bearbeitung der Schmetterlinge von Europa, Bd.

II. Fig. 108—109, with case) a male as *Psyche Helicinella*, from specimens sent by Mann, but of which the latter had only suspected that they might have escaped from spiral cases, which he had found in Sicily in the vicinity of their capture. Reaumur (*Mémoires pour servir à l'Histoire Naturelle des Insectes*, tom. iii. part i. 12o. pag. 249, Pl. 15, f. 20-22) had also already known and described these singular cases, and had bred the *Chalcis* from them, at least we must consider as that the "petite mouches noire et à quatre ailes," which he obtained from these spiral cases. Zeller, in his critical review of the *Lepidoptera* described by Reaumur, has omitted to explain these case-bearers (*Isis*, 1838, p. 718), but he has expressed his opinion to me in a letter that these spiral cases could belong to no *Psyche*, since the larvæ living therein fed in the way of the larvæ of *Coleophora*. The latter fact has Reutti also communicated to me from Freiburg. I had on my removal from Freiburg specially recommended to him the further observation of these extremely interesting case-bearers. But hitherto no *Coleophora* has been produced from these cases. In short, up to the present time no Entomologist, who has had opportunity to observe the case-bearers, has had the good fortune to breed from them winged *Lepidoptera*. Neither Reaumur nor I, and just as little (according to oral and written communications) Kollar, Mann, Zeller or Reutti can boast of it. This is most extraordinary, and must especially stimulate our interest in these case-bearers. I therefore beg of Entomologists to devote all their attention and care to this extremely interesting subject. Any notice thereon I will receive most thankfully.

The discovery of these spiral cases will probably happen in the North of Germany, and even here in the province of Silesia, since according to a written notice, for which I am indebted to Herr Zeller, he has found these cases generally distributed (and also near Glogau). In Italy he had met with them abundantly on the olive trees; he had also observed them on *Anthyllis vulneraria*, *Lotus corniculatus* and *Gnaphalium arenarium*, which plants the larvæ really fed on. Near Vienna I collected these case-bearers, in the pupa state, only on a wall much exposed to the sun, in the immediate vicinity of which grew *Atriplex laciniata*, on which plant, according to Kollar's assertion, these case-bearers feed in the larva state. I may here incidentally observe, that at the same place I met with the pupæ of *Coleophora auroguttella*, the case-bearing larva of which likewise feeds on *Atriplex laciniata*.

From Reutti I afterwards learnt that he had ascertained that the *Artemisia vulgaris*, which grew in the vicinity of the head quarters of the spiral cases, on the castle-hill at Freiburg, was the food of the larvæ belonging to these cases.

From all that has hitherto been ascertained of these case-bearers I am inclined to suspect that the vermiform insects, so like the females of *Psyche*, which escape from the pupæ of these case-bearers, are not truly females, but correspond to sexless nurses, as in *Talæporia lichenella*, Zell., which, *sine concubitu*, can produce young.

I have long cherished this suspicion, since I had observed, partly in Freiburg and partly here, several hundred cases, which never produced a single male moth, but either a *Chalcis*, *Pteromalina*, or a vermiform female. Each case which I collected spun-up, and afterwards opened, I had become certain beforehand that it contained a female pupa or the remains of one. Many pupæ appeared empty or dried up; some were filled with eggs, or, to my astonishment, with hexapod larvæ.

It follows from this, that on the exclusion of the so-called female of *Psyche helix*, the pupa skin remains in the case, and that the female understands to lay its eggs in the empty pupa-skin, wherein the animal reminds one of *Psyche* and *Fumea*. From a later communication received from Reutti I perceived that he has observed the same thing; indeed that from such cases, of which he had isolated the larvæ and allowed them to undergo their transformations, he had afterwards found the pupa-skins filled with young larvæ, from which it becomes a certainty that these case-bearers with spiral cases furnish nurse-formed beings, the sexual individuals of which have not yet been discovered.

XXVIII. *On the British Species of the Genus Gelechia of Zeller.* By J. W. DOUGLAS, Esq. (continued from p. 108.)

[Read 5th January, 1852.]

Sp. 91. *Fumosella*.

G. fumosella, H. Doubl. (in litt.)

Alæ anticæ fusco-nigræ, punctis tribus (2—1) elevatis atris, ciliis fusciscentibus. Alæ posticæ latæ, griseo-fuscæ.

Expansion of wings $10\frac{1}{2}$ lines.

Head, palpi, antennæ and thorax concolorous with the anterior wings, which are fuscous-black; before the middle are two large raised black spots, placed close together, one above the other, and one other beyond the middle; cilia greyish brown, with a black line extending through the centre, from the apex to the posterior angle of the wing. Posterior wings broad, with obtuse apices; cilia greyish fuscous.

Closely allied to *G. Æthiops*, but apparently distinct, being in every way larger, the upper wings being brown-black, instead of jet-black, and the posterior darker than in that species.

A single specimen taken in 1851, in Perthshire, by Mr. Weaver, is in the collection of Mr. Doubleday.

Sp. 92. *Politella*.

G. politella, (Doug.) Sta. (Cat. Supp. p. 4.)

Alæ anticæ nitentes, olivaceo-brunneæ, punctis tribus discoidilibus nigris. Alæ posticæ latæ, griseo-brunneæ. Exp. alar. 6 lin. Mas.

Alæ anticæ angustæ, ochraceæ, capite palpisque concoloribus. Exp. alar. 5 lin. Fœm.

Head, palpi and antennæ concolorous with the anterior wings. Anterior wings shining, light olive-brown, three very small black dots on the disk, as in *G. terrella*, and a row of black dots round the apex. Posterior wings greyish brown. Male.

Head, thorax and palpi concolorous with the anterior wings; antennæ annulated brown and ochreous alternately. Anterior wings ochreous, marked as in the male, but shorter and narrower. (In one of the two females I have before me, the anterior wings are contracted on the costa beyond the middle, expanding again towards the apex.) Posterior wings greyish brown, with an ochreous tinge, especially on the cilia. Female.

Closely allied to *G. terrella*, of which, indeed, it might pass for a variety, only that the female differs so conspicuously.

Found rather common in June, 1846, among heather, at the foot of Skiddaw, by Mr. Stainton.

Sp. 93. *Cuneatella*.

Lita cuneatella, F. v. R. (MSS.) Z. (in litt.)

Alæ anticæ fusco-griseæ, vitta longa centrali albido interrupta, punctis duobus costalibus, et infra apicem fascia acutè angulata, nigris. Alæ posticæ griseo-fuscæ.

Expansion of wings 7 lines.

Head and thorax concolorous with anterior wings, palpi cinereous, terminal joint black; antennæ fuscous. Anterior wings brownish grey, in the centre a long black dash, interrupted about the middle by a whitish oval spot, opposite to which, on the costa, is a small black spot, and another similar costal spot lies beyond the termination of the central dash; within the apex, and not touching its margin, a row of contiguous black dots forms an acutely-angled fascia, which in some lights appears a wedge-shaped mark; round the apex are some black dots. Posterior wings grey fuscous, the cilia in certain lights with a brownish tinge. Abdomen grey brown, the basal segments ferruginous. Posterior legs clothed with ochreous hairs, the tarsi fuscous, lightly annulated with ochreous.

A single specimen, which Herr Zeller has seen and pronounces to be this species, was taken by Mr. Bedell in London, in a house in Great Tower Street, into which it had probably been brought in the larva or pupa state. Herr Zeller observes the wedge-shaped mark varies in different specimens.

Sp. 94. *Acuminatella*.

G. acuminatella, Sircom, (Zoologist, 1850, App. lxxii.)

G. Cirsietta (Doug.), Sta. (Cat. Supp. 4.)

Alæ anticæ acuminatæ, murinæ, fascia indistincta postica angulata. Alæ posticæ cineræ.

“Exp. $\frac{1}{2}$ inch. Anterior wings ashy brown, acutely terminated, with a very indistinct angulated fascia towards the apex; posterior wings and cilia ashy; head and palpi rather paler; antennæ dark brown; hind legs ashy, with dark spots.”

“July 28th, Brislington, two specimens.” Sircom, l. c.

I would add to Mr. Sircom's description, that the ground colour of the anterior wings is ochreous, more or less covered with

brown scales in different specimens, and that the fascia sometimes becomes quite obsolete.

I bred this species in 1850 and 1851, from larvæ found at Charlton, mining the leaves of a thistle (*Cirsium lanceolatum*), in July; the moths appeared early in August. Mr. Sircom has identified one of them as his species.

Sp. 95. *Pulliginella*.

G. pulliginella, Sircom, (Zoologist, 1850, App. lxxii.)

“Exp. $4\frac{2}{3}$ lines. Anterior wings of an uniform dark brown, with a row of deeper-coloured spots round the apical margin, and a second round the middle of the fringe; posterior wings ashy; cilia brown; head ashy; antennæ dark brown; hind legs ashy. July, Durham Down. Two specimens.” Sircom, l. c.

I have not seen this species, and therefore can add nothing to the above.

Sp. 96. *Celerella*.

G. celerella (Doug.), Sta. (Cat. Supp. p. 5.)

Alæ anticæ ochreo-griseæ, macula magna triangulari ante, altera irregulari pone medium apiceque, nigris, fascia postica ciliisque ochraceis. Alæ posticæ fusco-griseæ.

Expansion of wings 6— $6\frac{1}{2}$ lines.

Head grey brown, with a metallic lustre; palpi griseous, terminal joint black outwardly, grey and black inwardly, the extreme tip ochreous; antennæ dark brown, very faintly annulated with ashy. Thorax grey brown. Anterior wings ochreous-grey, more ochreous at the base; before the middle is a large triangular brown-black patch, another irregular patch or cloud of the same colour, beyond the middle, quite across the wing, touching an ochreous fascia, beyond which is the dark apex; cilia ochreous, sprinkled with dark scales. A black dot lies in the groove, forming the point of the triangular patch; another black dot is in the triangle, close to the outward edge, and a third is at the inner edge of the irregular patch; to all these dots are attached some white scales.

Posterior wings cloudy grey.

I have one specimen taken at Liscard, near new Brighton, in September, by Mr. C. S. Gregson, who says it is one of the most active little creatures he ever saw. Mr. Doubleday also has a specimen from Mr. N. Cooke.

This species may possibly prove to be identical with my *G. vicinella* (p. 102), of which the specimens were not fine.

It resembles in many respects *G. distinctella*, but it has narrower and more distinctly marked anterior wings, and narrower posterior wings, with more acute apices. In size, and the triangular patch on the anterior wings, it resembles *G. costella* and *G. contigua*, but in other respects it does not agree.

Sp. 97. *Nigricostella*.

**Lita nigricostella* (F. v. R.). D. (Supp. pl. 74, 9.)

Expansion of wings 5—5½ lines.

Head and thorax concolorous with the anterior wings; palpi rather paler, the second joint fuscous outwardly and at the upper end, the third joint with two broad fuscous rings, leaving the base, middle and apex yellow; antennæ annulated brown and yellow. Anterior wings egg-yellow on the disk, with a posterior outwardly-curving fascia of the same colour; the costa is broadly fuscous as far as the fascia, beyond which the apex is also fuscous; the inferior margin has on it two fuscous marks, one long and narrow, proceeding from the base, the other rounded and joining the yellow fascia; on the disk are three black dots; the first small, near the base, the second larger, before the middle, both on the inner margin of the dark costal streak, and the third just touching the rounded dark patch on the inner margin; cilia ochreous, dusted with fuscous. Posterior wings pale grey, the apices well defined.

This pretty species, closely allied to *G. dimidiella*, was first taken in this country by Mr. Edwin Shepherd, in Wicken Fen, Cambridgeshire, at the end of June, 1851, flying at dusk.

Sp. 98. *Brizella*.

G. Brizella, Z.

Lita Brizella (Tis.), Tr., D. 306, 5.

Expansion of wings 6 lines.

Head and thorax concolorous with anterior wings; the second and third joints of the palpi annulated brown and white; antennæ annulated brown and white. Anterior wings rich light brown, merging gradually from the costa to the inner margin into ochreous; on the costa three equidistant longish silvery spots, sloping towards the hinder margin, before the apex a curved silvery fascia, broadest on the costa, and on the disk, beyond the middle, two black dots, one before the other; cilia brown. Posterior wings and cilia fuscous.

A single specimen taken by Mr. Grant, in 1851, at Southend, Essex.

The larva, according to Zeller (*in litt.*), feeds on *Statice armeria*.

Sp. 99. *Carlinella*.

G. Carlinella (Doug.), Sta. (Cat. Supp. p. 5.)

G. Lappella, var. β , Z.

Alæ anticæ angustæ, fulvo-ochraceæ, apice saturatori, fascia postica valdè obliqua pallidè ochracea. Alæ posticæ fusco-griseæ, ciliis ochraceis.

Expansion of wings 6—7 $\frac{1}{2}$ lines.

Head and thorax ochreous; palpi darker; antennæ brown, very faintly annulated with ochreous. Anterior wings spotless, ochreous suffused with fulvous, lightest on the inner margin, beyond the middle a very oblique light ochreous fascia, somewhat curved; apex dark. Posterior wings fuscous grey, long, linear, and with the apex produced; cilia ochreous in certain lights.

This species is very close to *G. Lappella*, from which it may be distinguished by its less average expansion, narrower anterior wings, which are also of a brighter, almost fulvous, yellow, and spotless; the palpi shorter and thinner, the terminal joint especially being much finer. The posterior wings are lighter than in *G. Lappella*.

Bred abundantly in July and August, 1850, from seed heads of the Carline thistle (*Carlina vulgaris*), gathered at Folkestone, during the preceding winter.

Sp. 100. *Galbanella*.

G. Galbanella (F. v. R.), Z.

Expansion of wings 6 lines.

Head, thorax and antennæ concolorous with the anterior wings; palpi pale ochreous. Anterior wings of an indistinct greyish brown, with a light angulated posterior fascia, three black dots on the disk, two before and one beyond the middle, and attached to these some light spots or lines; the apex distinctly margined with black dots. Posterior wings light fuscous.

Somewhat like *G. boreella* in the marking, but very different in colour. The blackness of the discoidal spots, and the paleness of the palpi, are characters by which this species may be at once distinguished.

A single specimen has been sent to me by Mr. Weaver, by whom it was taken, he believes, in Scotland. In Germany it is abundant in fir woods.

POSTSCRIPT.

- Vol. v. page 175, No. 2. *G. lobella*. Add to synonyms *T. lugubrella*, D.
- Vol. v. page 175, No. 3. *G. cinerella*. Add to synonyms *T. Ardeliella*, H. 437.
- „ „ 195, „ 21. *G. rufescens*. Add to synonyms *G. diaphanella* (Lien.), Z. (Isis, 1846.)
- „ „ 196, „ 25. *G. contigua*. This, I now think, is most probably the *Re. tricolorella* of Haworth; and if this point can be established, we must adopt the name, as it was published prior to *contigua*. But there is no reference to Haworth's specimen, as in that case, and I doubt the sufficiency of the description alone of *tricolorella*.
- „ „ 197, „ 27. *G. maculella*, F. Zeller writes to me that he thinks this name is improperly applied to this *Gelechia*, and that Fabricius's description much better suits our *Æcophora Curtisella*. I agree with this opinion, and adopt for our *Gelechia* the name *blandella* (F. v. R.), Z. Mr. Stainton has reared this species from larvæ which fed in the capsules of *Stellaria holostea*.
- „ „ 198, „ 30. *G. sequax*. Mr. Logan has reared this species from larvæ found on *Helianthemum vulgare*.
- „ „ „ „ 33. *G. lentiginosella*. Mr. Weir has reared this species from larvæ found on *Genista tinctoria*.
- „ „ 199, „ 34. *G. distinctella*. Add to synonyms *An. serricornis*, West. and Humph. vol. ii. p. 187, pl. 104, fig. 19.
- „ „ 200, „ 38. *G. subocellea*. The larvæ, which are case-bearers, feed on *Origanum vulgare*. (Proceed. p. 117.)

- Vol. i. n.s., p. 14, No. 42. *G. paucipunctella*. Zeller has found his first opinion that this species was identical with *paucipunctella*, Metz. was erroneous; he had founded it on seeing a specimen, not in the finest condition, which I had sent to him. I have accordingly called it *Metzneriella*. (Sta. Cat. Supp.)
- „ „ 16, „ 46. *G. Æthiops*. Mr. Edleston informs me this species has nothing to do with poplars, as I supposed, but that it is taken on Chat moss in black places that have been burned, of which it is exactly the colour.
- „ „ 17, „ 49. *G. affinis*. I have some specimens of which I am in doubt whether they should be referred to this species or not, and I therefore reserve them for another opportunity.
- „ „ 18, „ 54. *G. nigrovittella*. This is the *Tinea gemmella* of the Linnean cabinet, and it also agrees with the description in the “Fauna Suecica.” I am indebted to Mr. Stainton for calling my attention to the Linnean specimen. Linné appends to his description the observation—“Hab. intra quercûs folia, subcutanea,” which may now lead to the finding of the larva.
- „ „ 19, „ 57. *G. costella*. Mr. Stainton found the larvæ of this species on *Solanum Dulcamara*, feeding on and in the leaves, fruit and stems. (Proceed. p. 114.)
- „ „ 21, „ 60. *G. Walkeriella*. I find this name must drop, Mr. Westwood having, in 1845 (Humph. B. Moths, ii. 192), described this species under the name of “*Anacampsis fuscipennis*, Haw. MSS.” Mr. Westwood’s remark, that “the species appears to approach *Cleodora Cytisella*,” induced me to

think it was distinct from that species, but I find that he has omitted *C. Cytisella*, Curt., from his list altogether, and re-described it under the name of "*fuscipennis*."

- Vol. i. n.s., p. 61, No. 63. *G. næviferella*. The larvæ mine the leaves of *Chenopodium album*.
- „ „ 64, „ 72. *G. pernigrella*. Herr Zeller has sent me one of the specimens he had before him when he described *G. temerella*; there is just visible the very faint lighter line outside the dark fascia mentioned by him, and which I neither could nor can see in the British specimens which I have described under the name of *pernigrella*. But this is all the difference I can find between the insects of the two countries, and I am convinced that our moth is *G. temerella* (Lien.), Z.
- „ „ 68, „ 80. *G. senectella*. The heads of some recent specimens are ochreous, and the anterior wings of others have an ochreous tinge.
- “ „ 100, „ 81. *G. fraternella*. Bred by Mr. Stainton and myself from larvæ which rolled up the young terminal leaves of *Stellaria uliginosa*.

I have now enumerated all the British species of this genus that are known to me. I intended to have added here some remarks on the structure of the species, associated under the generic name *Gelechia*, but want of time to make the necessary examinations compels me to postpone them. I have, however, thought it desirable to complete the enumeration of the species in this volume; and to satisfy the demands of many friends, a provisional arrangement thereof will be found in the "Journal of Proceedings," p. cxxx.

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XXIX. *On the Genus Mantispa, with Descriptions of various New Species.* By J. O. WESTWOOD, Esq. F.L.S. &c.

[Read 2nd February, 1852.]

MANTISPA is one of those remarkable genera which, belonging to one family of insects, put on the general appearance of the species of another, or occasionally of several other families, to which they possess but little, if any, real relationship. By Stoll, De Geer, Pallas and Fabricius, the species were arranged in the genus *Mantis*, belonging to the order *Orthoptera*; and Latreille, in his earlier works, adopted the same view, by uniting them with the family *Mantidæ*. By Linnæus, however, the species known to him was regarded as a *Raphidia*; and Latreille, who never appears to have dissected an insect of the genus (his characters in the "Genera Crustaceorum," &c. iii. p. 93, being entirely derived from the external parts of the insect), relying upon the elongated form of the prothorax, in his later works (commencing with the "Considérations Générales," p. 276) has introduced it into the *Neuroptera*, placing it (Fam. Nat. p. 436, &c.) in the family of which *Raphidia* is the type.

In the "Considérations" we find the only observations hitherto published relative to the larvæ of these curious insects, which appear to resemble those of the *Raphidiæ*. "Ces derniers insectes, ainsi que les *Mantispes*, se trouvent sur les chênes; leurs habitudes, et probablement leurs métamorphoses, sont identiques. M. Bourgeois, entomologiste très-zélé, et qui a trouvé fréquemment, aux environs de Lyons, la *Mantispe* villageoise, m'a donné une larve conforme à celles des *Raphidies*, mais beaucoup plus grande, et que je ne peux rapporter qu'à cette *Mantispe*." (Cons. Gén. p. 69.) How far Latreille's conjecture be correct has never yet been ascertained; the greater affinity of *Mantispa* with *Hemerobius* than with *Raphidia*, and the diversity in the condition of the pupa state of the two last named groups, lead me however to question its correctness. The late T. Say gave an account of the manner in which these insects capture their prey, consisting of living flies, with their fore legs, in the same manner as the *Mantidæ*. (Amer. Entomology, ii. pl. 25.)

As regards their relation with the *Mantidæ*, we find the wings of *Mantispa* constructed on the Neuropterous type; the maxillæ are also destitute of a dentated inner lobe, and the lower lip is entire instead of being bi- or 4-partite; whilst as regards the structure of *Raphidia*, we find the abdomen of the females of *Mantispa* destitute of the long exserted ovipositor, and the tarsi with the third

and fourth joints of equal shape and size, whereas in *Raphidia* the third joint is deeply bilobed, concealing the fourth minute joint in the incision. The parts of the mouth are also less like those of *Raphidia* than they are of those of *Hemerobius*. Hence in my Introduction, I separated *Mantispa* from the *Raphidiidæ*, and formed it into a distinct family, *Mantispidæ*. I am now also enabled, by the observations of Messrs. Fortnum and Wilson on Australian species of the genus, to corroborate the propriety of this separation by the knowledge of the mode in which the eggs are deposited by the female *Mantispæ*, which is exactly in the same manner as in the *Hemerobii*, namely, by attaching each egg at the extremity of a long and very delicate footstalk. How far this circumstance will render necessary the junction of *Mantispa* with *Hemerobius*, and the suppression of my family *Mantispidæ*, is a subject which a knowledge of the real larva and of the pupa state of the *Mantispæ* will alone enable us to determine. In the mean time, it appears to me far more advisable to retain the family as proposed in my Introduction, and which has been done by M. Rambur, in his volume on *Neuroptera* in the Suites à Buffon (Neur. p. 431).

Like *Gryllotalpa* and several other equally anomalous genera, *Mantispa* is found in every quarter of the globe, including New Holland. The latter country is denied to the genus by Messrs. Swainson and Shuckard, in their volume on Insects in Lardner's Cabinet Cyclopædia, p. 344; but it will be seen by the present paper that a number of species have now been received from different parts of Australasia.

Dr. Erichson, in his Monograph in the first volume of Germar's "Zeitschrift für die Entomologie," published descriptions of twenty-four species, fourteen of which are from the New World, six from Africa, two from Europe, one from Asia, and one of doubtful locality. As Dr. Erichson's Latin characters are very short, it will be serviceable to give them in this paper, in order to concentrate our knowledge of the genus up to the present time.

1. *M. semihyalina**: obscure cærulea, antennis pedibusque anticis basi testaceis. Long. 8—10 lin. *Brazil and Surinam.*
2. *M. brunnea* (Say, Am. Ent. ii. pl. 25): brunnea, alis antice

* In consequence of the confusion in the nomenclature of the larger insects of the genus, the name and synonymy of this species will stand as follows:—

Mantispa semihyalina.

Mantispa semihyalina, Serville and St. Fargeau, Enc. Méth. x. p. 270; Rambur, H. Nat. Ins. Neur. p. 434, pl. 10, fig. 5.

Mantispa chalybea, Erichson in Germar's Zeitschr. f. d. Ent. i. 160.

Mantispa grandis, Burmeister, Hand. d. Ent. ii. 967 (nec *M. grandis*, Guérin, nec *M. grandis*, Erichs.). *Brazil.*

- concoloribus, postice præter basin hyalinis. Long. 9 lin. *North America.*
3. *M. varia*: castanea, nigro flavoque variegata, alis antice fulvis, margine postico fulvescente. Long. 6—7 lin. Var. corpore pedibusque unicoloribus, brunneo-rufis. *Mexico.*
4. *M. ambusta*: nigra, abdominis segmentis margine tibiisque flavis, alis hyalinis margine anteriore apiceque brunneis. Long. 7 lin. *Monte Video.*
5. *M. irrorata*: fusco-grisea, capitis thoracisque dorso flavescens, alis fusco-irroratis. Long. 9 lin. *Brazil.*
6. *M. decorata*: flava, fusco-variegata, alis hyalinis brunneo-maculatis. Erich. tab. 11, fig. 5. Long. 5—10 lin. *Brazil.*
7. *M. prolixa*: flavo brunneoque varia, alis stigmatibus maculatis apicali brunneis. Long. 7½ lin. *South Brazil.*
8. *M. Erichsonii**: brunnea, prothorace cinereo, alis hyalinis, costa maculaque apicali brunneis. Long. 11 lin. *South Africa.*
9. *M. costalis*: fusca, prothorace abdomineque luteis, alis hyalinis, costa lutea. Long. 8 lin. *Brazil.*
10. *M. pusilla* (Pallas, Latr., *brevicornis*, De Geer): fusca, flavo-variegata, prothorace tenuiter flavo-lineato, alis flavicanti-hyalinis, costa fusca. Long. 4—6 lin. *Cape of Good Hope.*
11. *Styriaca* (Poda, *R. Mantispa*, Scop. Linn. *M. pagana*, Fabr. Panz. Latr. *M. pusilla*, Schrank nec Pallas): flava, brunneo-varia, antennis ferrugineis, alis hyalinis, costa flava, stigmatibus brunneo. Long. 4—7 lin. *South Europe.*
12. *M. perla*† (Pallas, *M. Christiana*, Charp.): flava, brunneo-variegata, antennis nigris, alis flavicanti-hyalinis, costa testacea. Long. 6 lin. *South-Eastern Europe.*
13. *M. flaveola*: flava, brunneo-varia, alis hyalinis, costa stigmatibus flavis. Long. 5 lin. *Para.*
14. *M. dorsalis*: atra, prothorace toto corporisque dorso flavis, alis hyalinis, costa fusca. Long. 6 lin. *Caffraria.*
15. *M. fuscipennis*: fusca, pectore pedibusque testaceis, alis fuscis nitidis. Long. 5 lin. *Caffraria.*

* In consequence of the confusion in the nomenclature of the larger insects of the genus, the name and synonymy of this species will stand as follows:—

Mantispa Erichsonii.

Mantispa Erichsonii, Guérin, Iconogr. R. An. Ins. p. 391.

Mantispa grandis, Erichson in Germar's Zeitsch. f. d. Ent. i. p. 164 (nec *M. grandis*, Guérin, nec *grandis*, Burm.). Southern Africa (Port Natal).

† Syn. *Mantispa Victorii*, Guérin-Ménéville, Iconogr. R. An. Ins. p. 391.

16. *M. tenella*: flava, abdomine fusco-variegato, prothorace æquali subtiliter granulato, alis hyalinis, costa pallida, stigmatæ brunneo. Long $4\frac{1}{2}$ —5 lin. *Cape of Good Hope*.
17. *M. nana*: pallida, abdomine fusco-variegato, prothorace æquali subtiliter granulato, alis hyalinis, stigmatæ subfusco. Long. 4 lin. *Dongola*.
18. *M. gracilis*: fusca, capite, prothorace, pedibusque flavescens, prothorace æquali lævi, alis hyalinis, costa flava, stigmatæ brunneo. Long. 5 lin. *Brazil*.
19. *M. viridula*: pallide viridis, alis albo-hyalinis, costa stigmatæque corpori concoloribus. Long. $4\frac{1}{2}$ lin. *Brazil*.
20. *M. Notha*: picca, pilosa, prothorace brevi, abdomine supra lobato, tibiis posticis compressis, alis inæqualibus, fusco-maculatis. Tab. 2, f. 6. Long. $3\frac{1}{2}$ lin. *Brazil*.
21. *M. interrupta* (Say, Amer. Ent. ii. pl. 25): pallida, abdomine linea dorsali incisuris nigris, alis hyalinis, costa ferruginea ante apicem interrupta. Long. $6\frac{1}{2}$ lin. *North America*.
22. *M. minuta* (Fabr.* Syst. Ent. 278, 21): *M.* capite thoraceque cylindrico flavescens; elytris alisque hyalinis, costa flavescens, s. virescens, abdomine virescens dorso flavescens, pedibus virescentibus. Hab. —? In Mus. Banks.
23. *M. flavo-maculata* (Latr. *Mantis Liliputiana*, Oliv. Encycl.): flava, capite pedibusque posterioribus viridibus, prothorace lateribus fusco, abdomine pedibusque anticis ferrugineis, alis virescenti-hyalinis. *Surinam*.
24. *M. rufescens* (Latr. Stoll. pl. 4, fig. 15, *M. Nabota*, Oliv. Encycl.): brunnea, antennis brunneis filiformibus, alis flavescens, stigmatæ brunneo. *Coromandel*.

The following additional species have been described since the publication of Erichson's Monograph:—

25. *M. Guerinii*: † atro-fusca, femoribus anterioribus latis, trans-

* The type specimen is still preserved in the Banksian Cabinet. The subsequent description in the Ent. Syst. ii. 24, 50—'Elytra—puncto medio parvo albo; alæ rufescentes, apice hyalinæ margineque interiori nigricantes'—seems to have been added from some small *Mantidean*.

† In consequence of the confusion in the nomenclature of the larger insects of the genus, the name and synonymy of this species will stand as follows:—

2. *Mantispa Guerinii*, Westw.

Mantispa grandis, Guérin in Duperrey's Voy. Coquille; Atlas, Ins. pl. x. fig. 4, texte 11, part 2, p. 196. (Nec *M. grandis*, Erichson; nec *M. grandis*, Burm.)

- verse rugosis, spinis tiliarum et tarsorum castaneis, antennis obscurioribus; alis angustatis, perlucidis, antice rutilis, apice obscurioribus. Long. 20 mill. Enverg. 49 mill. *Amboyna*.
26. *M. auriventris* (Guérin, Mag. Zool. 1838, Ins. pl. 202): rufo-castanea, fronte luteo, abdomine flavo, fasciis quatuor anoque brunneis; alis hyalinis, anterioribus et margine inferioribus luteis, anticis macula exigua apicali obscura. Long. 18 mill. Enverg. 42 mill. *Egypt*.
27. *M. nodosa* (Westwood, Cab. Orient. Ent. p. 70, pl. 34, fig. 7): nigra, capite, antennis prothorace et pedibus anticis ferrugineis; abdominis dorso in medio obscure fulvo; alis subhyalinis, dimidio costali fulvo; basi fusco strigaeque obliqua ante medium fusco, in posticis fere oblitteratis; prothorace brevi nodoso, antennis 48-articulatis.* Exp. alar. antic. fere 24 lin. *Assam*.
28. *M. Cora* (Newman, Ent. Mag. 5, 401): fusca, antennarum basi, facie, prothoracis lateribus (lineâ obliquâ interruptâ) mesothoracis scutello, tuberculis ad alarum basin, metathoracis scutello abdominisque incisuris flavis, pedibus variis. Long. $\frac{4}{10}$ unc. Exp. al. $\frac{8.5}{100}$ unc. *Malabar*.
29. *M. virescens* (Rambur, H. n. Ins. Neur. p. 433): entièrement d'un jaune verdâtre pâle. Antennes un peu plus longues que chez la *pagana*, roussâtres, obscures vers l'extrémité; prothorax un peu moins grêle, tibias antérieures plus courtes, plus larges, non obscurcis; ailes transparentes, un peu blanchâtres; les nervures et le réseau ciliés d'un jaune verdâtre pâle; pterostigma de la même couleur, très allongé, un peu velu sur sa surface, rangée longitudinale médiane d'aréoles ayant leurs nervures latérales très sinuées. De la taille des petits individus de la *pagana*. *Patrie inconnu*. [North America? An *M. viridula*, No. 19? an *M. viridis*, Newm. MS. in Mus. Brit.? Americæ borealis incola.]
30. *M. gracilis* † (Rambur, H. n. Ins. Neur. p. 433): d'un roussâtre un peu obscur; tête ayant les yeux plus gros que ceux de la *pagana*, beaucoup plus rapprochés antérieurement,

* Antennarum articuli hujus speciei breve transversi, articulis tertio quartoque fere æqualibus; alæ anticæ cellulis 12 discoidalibus, cellula singula venulas duas rectas, haud furcatas, ad marginem posticum emittenti; tarsorum ungues lati, apice 4-denticulati; prothorax in lobos tres divisus.

† Syn. ? *Mantispa iridipennis* (Guérin, Icon. R. An. Ins. p. 392): entièrement jaune; extrémité des antennes brunes; yeux d'un gris métallique; pattes toutes jaunes; ailes transparentes à nervures et stigmatte jaunes, offrant des reflets irisés très-vifs et très-brillants. Long. 11; env. 21 mill. *Colombia*.

plus excavée derrière les antennes, avec le milieu plus saillant, une ligne noire sur la face; antennes noirâtres, plus pâles à la base; prothorax pas plus long, plus grêle, plus bossue, moins dilaté antérieurement où la petite saillie supérieure est plus sensible, les autres pièces du thorax obscures en dessus; abdomen d'un brun cendré, un peu nuancé de jaune; pattes blanchâtres; tibias antérieures un peu roussâtres, plus courts, finement et irrégulièrement striés antérieurement, avec une marque obscure à leur face interne; ailes transparentes, nervures et réseau jaunâtres, ce dernier un peu varié de brun; pterostigma presque comme chez la *pagana*, un peu plus étroit. De la taille de *pagana*. *Columbia*.

31. *M. apicalis* (Loew in Germar's Zeitschr. iv. 433): brunnea; hypostomate, abdominis basi supra, tribusque cingulis pone medium utrinque flavis; alis subæqualibus, anticis dilute flavo-brunneis, extremo apice fuscis, posticis limpidis, ad marginem exteriorem dilute flavo-brunneis. Long. lin. 7. *Rhodus insula*.

32. *M. vittata* (Guérin-Ménéville, Voy. Coquille, Insectes, texte, p. 196): fusca, capite supra carinato, antennis pallidis, apice nigricantibus; abdomine flavo, vittis lateralibus latis duabus aliaque media angusta supra et infra brunneis; pedibus flavis, femoribus anticis apice intus nigris, prima spina flava, apice nigra; alis hyalinis, stigmatibus fulvis. Long. 10 mill. Enverg. 26 mill. *Port Jackson*. Tab. nostr. 17, fig. 1.

Being enabled to add several new Australian species, it will be serviceable to describe this and *M. Australasica*, Guérin, in greater detail.

The general colour is dark brown-orange, varied with yellow. The head has a deep impression on each side, above the insertion of the antennæ, leaving an elevated central carina on the forehead; the lower part of the face, below the antennæ, is pale yellow, which colour also runs upwards along the inner margin of the eyes; there is also a very slender brown line down the middle of the face. The antennæ are slender, about twice the length of the head, 26-jointed, brown, about one-third towards the base reddish, the two basal joints yellow beneath; the basal joint is large and subglobose, the second smaller, the third larger than the second or fourth; the fourth and following submoniliform, each nearly as long as broad, very slightly setose; terminal joint

ovate, rather longer but not thicker than the preceding. The prothorax is rather more than three times the length of the head, very slender, widened in front, the dilated part separated from the narrow part by two lateral tubercles, finely transversely striated on the upper surface, and finely granulose, each granule emitting a very short black hair: the upper side is orange-brown, with a narrow dorsal line of yellow dilated in front, the dilated pale part bearing a very narrow V like brown mark, the anterior part of which extends to the fore margin; the under side is pale yellow. The meso- and metathorax are yellow beneath, brown-orange above, with two dorsal yellow longitudinal lines converging behind upon the metascutellum. The abdomen is brown-orange coloured above, with a row of brown spots down the middle of the back (one in each segment), and a broad lateral band of dark brown; the under side yellow, with a longitudinal median dark line. The coxæ of the fore legs are yellow, with a streak of orange-brown on the outside; the femora are orange-yellow outside, the outer half of the inside marked with a large dark brown spot. The tibiæ are yellowish orange, rather darker in the middle. The four hind legs are pale yellow; the tarsi have the terminal joint dilated, the ungues being simple. The wings are scarcely tinged with yellowish; the veins are uniformly brown, except the costal, subcostal and radial, which are pale brownish yellow; the stigma is very long and orange red. There are only seven longitudinal oblique discoidal cells dependent upon the sector radii tertius of the fore wings and upon the sector radii secundus of the hind wings, the veins which separate these cells from each other being very much curved.

Inhabits Van Diemen's Land, Port Jackson, Adelaide.

In Mus. Soc. Ent. London, Hope (D. Fortnum), Saunders and Westwood.

This species varies from three to four lines in length, and from six to ten lines in expanse. The smaller specimens have fewer (one in my Collection has only five) oblique discoidal cells, in the fore wings dependent upon the sector radii tertius. The dark spot on the fore femora is also occasionally enlarged.

33. *M. Australasiæ* (Guérin-Ménéville, Icon. R. An. Ins. p. 392). D'un brun, tirant un peu sur le fauve, avec le dessous de la tête et du thorax presque fauves. Devant de la tête et bord des yeux jaunes; une petite carène longitudinale au milieu du vertex. Antennes brunes, avec le premier article plus gros, globuleux et jaune en avant seulement. Ailes trans-

parentes, très faiblement teintées de jaunâtre, à nervures et stygmate d'un brun rougeâtre assez vif. Abdomen noirâtre en dessus, avec une bande étroite jaune de chaque côté, jaune en dessous avec une bande médiane brune. Pattes d'un jaune fauve. Long. 17 mill. ; enverg. 34 mill. *New Holland*. Tab. nostr. 17, fig. 2.

The head is dark chesnut on the crown, with two rather deep impressions behind the antennæ, leaving a slender central carina ; the face below the antennæ is yellow, with a short raised dark line in the centre, close below the insertion of the antennæ ; the labrum is chesnut in the middle, and the mandibles dark at the tip ; the eyes are narrowly margined on the inside with yellow. The antennæ are scarcely more than twice the length of the head, thick, becoming gradually, but slightly, more slender towards the tip ; they are 36-jointed, chesnut coloured, darker towards the tip, the first joint beneath yellow, large and globose ; second joint much smaller ; third, rather longer and slenderer ; fourth, and following, short and transverse ; last joint small, oval, and apparently divided into two joints. The prothorax is but little more than twice the length of the head, dilated in front, transversely rugose, and very granulose, with a large tubercle on each side, about one-third of the length from the head ; it is of a greyish chesnut colour above, much paler beneath : the meso- and metathorax are chesnut coloured above, paler at the sides and beneath. The abdomen is dark chesnut above, with a pale and very narrow, followed by a broader dark brown lateral stripe ; beneath dirty buff, sometimes with a dark central stripe. The fore legs are entirely of an orange yellow, except that the inner face of the femora is more chesnut coloured. The hind legs are also orange yellow, with simple ungues. The wings are slightly stained yellow, the chief veins reddish yellow, the rest brown, the stigma long and bright red, the general number of oblique longitudinal cells, dependent upon the sector radii tertius of the fore wings, and sector radii secundus of the hind wings, appears to be eleven ; the veins separating the cells being less curved than in the preceding species.

Inhabits Van Diemen's Land and Adelaide.

Mus. Hope (D. Fortnum), Saunders and Westwood (D. Wilson).

The species varies considerably in size.

The following species are now, for the first time, described.

34. *M. strigipes*, Westw. Castanea, facie flava, linea media nigra, vertice flavo vario, prothorace supra punctis nonnullis lineaque tenui media flavis ; femoribus anticis extus linea media

nigra; antennis brevibus, 25-articulatis; alis cellulis obliquis discoidalibus 7. Tab. nostr. 17, fig. 3.

Long. corp. lin. $5\frac{1}{2}$; expans. alar. lin. $12\frac{1}{2}$.

Habitat Adelaidam Australasiæ. In Mus. Saunders.

Head chesnut, above glossy; inner margin of eyes, a narrow transverse line on the crown, and a small central spot just above the insertion of the antennæ yellow, the front with two slight impressions above the antennæ, leaving an ill-defined central carina; face yellow, with a black central line; antennæ short, scarcely more than twice the length of the head, rather robust; 25-jointed, the basal joint moderately thick, 2nd small, 3rd rather longer than the 4th, which, with the following, is transverse; terminal joints slightly attenuated. Prothorax about two and a half times the length of the head, considerably dilated in front, but not so broad as the head, rather glossy, the middle portion strongly striated transversely. Two small dots near the front margin, a third in the central line rather behind the former, and the two small tubercles (separating the dilated front part from the cylindrical middle part), yellow, and arranged thus $\cdot \cdot \cdot$; there is also a slender line down the middle of the cylindrical part, the sides of which are also yellow, with a slender dark line running along the middle of the yellow stripe. The meso- and metathorax are chesnut above, the former with the anterior margin and the sides slightly varied with yellow, beneath and sides dark brown, varied with yellow. Abdomen chesnut, with the sides yellow; beneath chesnut, with the base of the middle segments broadly yellow; fore coxæ yellowish brown behind, pale luteous in front, with a slender black line running their whole length; femora within and above dark chesnut, outside luteous yellow, with a dark brown line running above the teeth, tibia and tarsus dirty yellow, with the fore edge dark; middle coxæ with a yellow patch in front and another at the sides; hind coxæ entirely dark brown; four hind legs dark luteous yellow; femora with a dark longitudinal stripe beneath; wings slightly stained yellow, principal longitudinal veins yellowish brown; stigma long and bright red; longitudinal oblique veins dependent on the 3rd sector radii of the fore wings, and on the second of the hind wings, seven in number.

35. *M. scutellaris*, Westw. Luteo-flava, capite magis castaneo, meso-thorace supra lineis duabus nigris convergentibus, scutellis magis elevatis, abdominis segmentis fascia apicali nigra in medio interrupta, antennis brevibus brunneis, 32-articulatis. Tab. nostr. 17, fig. 4.

Long. corp. lin. 7; expans. alar. lin. 15.

Habitat in Nova Hollandia. Mus. W. W. Saunders.

Head entirely chesnut, smooth, with a slight impression on each side behind the antennæ, which are short, about twice the length of the head, 32-jointed, rather slender; basal joint large, oval, 2nd small, third longer, but rather slenderer than the 4th, which is transverse and short, as are the following joints, except near the tip, where they become slightly more slender, the terminal joint acute at the tip; prothorax about $2\frac{1}{2}$ times the length of the head, slender, dilated in front, glabrous, the cylindrical part with transverse elevated lines, and with two tubercles at the anterior part: glabrous, not granulose, entirely dirty-luteous orange, with a slender dark line at each side; mesothorax orange yellow, with a short oblique black line, extending from the anterior angles; scutellum very convex and prominent, yellow; metathorax coloured like the mesothorax, but with the black marks less conspicuous, beneath and sides of the meso- and metathorax yellow, with black lines; abdomen yellow, with a black ring at the extremity of each segment, interrupted in the middle; segments beneath less strongly marked with black; fore legs orange-chesnut; femora with a black dash above the row of teeth; four hind legs entirely orange yellow; ungues of the tarsi with several long teeth on the under-side; wings coloured as in the last species; with eight longitudinal oblique discoidal cells, dependent upon the 3rd sector of the radius of the fore wings, and upon the 2nd sector of the radius of the hind wings.

36. *M. delicatula*, Westw. Picea, capite flavo vario, abdominis lateribus flavo-punctatis, antennis longis, gracilibus, 44-articulatis; pedibus anticis elongatis, gracilibus, piceis, luteo-striatis; alis elongatis, stigmatate griseo, fusco-tincto, cellulis 10 sectoris 3tii radialis anticearum. Tab. nostr. 17, fig. 5.

Long. corp. lin. 4—7; expans. alar. lin. 10—15.

Habitat apud Adelaidam. D. Fortnum. In Mus. Hope.

The head is broad; the crown quite convex, with only a very slight impression on each side behind the antennæ; the eyes with a slender yellow margin on the inner edge; the face below the antennæ is luteous yellow, with a dark lateral irregular slender line extending from the lateral angles of the clypeus to the vertex. Below the antennæ are three small triangular pitchy-coloured spots placed in a triangle; the clypeus and labrum are also dark in the centre; the mandibles are dark at the tips; a very slender short yellow line extends upwards from between the antennæ, and there are two yellow spots on the crown between the middle of

the eyes. Antennæ pitchy black, about three times the length of the head, very slender and filiform, 44-jointed; first joint moderate sized, oval, yellow beneath; second much smaller, rounded; third still more slender, scarcely longer than the second, but rather longer than the fourth, which, as well as the following joints, is small and cup-shaped; terminal joints rather more attenuated. The prothorax pitchy, opaque, granulose and setose, with an obscure paler longitudinal line down the back. It is about $2\frac{3}{4}$ times longer than the head. Mesothorax pitchy, with the anterior angles and two oblique spots on the disc obscure orange-coloured; front of the metathorax chesnut-coloured. Abdomen black, each segment with two small bright yellow spots placed longitudinally on each side, as well as a slender longitudinal yellow streak; beneath black, with a broad irregular pale stripe down the middle. Fore legs slender and elongated, the femur not thicker than the coxa; front of coxa pale luteous, behind pitchy; femur both outside and inside pitchy, with the upper edge and half of the lower edge pale luteous; spines pitchy, with the base pale; tibiæ pitchy, with the upper edge dirty luteous; obtuse at the tip; tarsi 5-jointed, terminated by two distinct slender curved acute ungues and a moderate sized pulvillus; four hind legs dirty luteous, with pitchy setæ; middle pair very short; femora pitchy outside, tibiæ with a dusky ring, about one-third of the length from the base; terminal joint of the tarsi pitchy; ungues strong, acute, much bent, furnished with a single very minute tooth on the outer edge, at some distance from the tip. Wings almost colourless; principal veins pale brown; stigma very pale greyish luteous; apical half stained with brown. All the wings with ten oblique discoidal cells dependent upon the ordinary radial sectors, slightly curved towards the costa of the wings; fore wings with a dark spot on the hinder margin, close to the base.

Varies in having the coloured markings less decided, and the general appearance more uniform; and there are specimens of this kind in the British Museum Collection, which have the cells of the wings rather more numerous.

37. *Mantispa discolor*, Westw. Fulvo-lutescens, prothorace opaco granuloso et setoso, meso- et meta-noti lateribus fuscis, femoribus anticis intus macula elongata fusca, spinis nigris basi albidis, alis elongatis, tarsis anticis biunguiculatis; alis elongatis, stigmatate fusco, cellulis obliquis 13. Tab. 17, fig. 6.

Long. corp. lin. $10\frac{1}{2}$; expans. alar. lin. 23.

Habitat in Australasia. In Mus. Britann.

Head luteous, opaque; crown very convex; two small brown dots behind the antennæ; labrum with a pitchy spot in the centre; mandibles black at the tips; two basal joints of the antennæ luteous beneath, brown above; prothorax luteous, opaque, granulose and setose, scarcely more than twice the length of the head; two tubercles before the middle scarcely distinct, hinder portion with strong transverse raised lines; meso- and metanotum with a large dark patch on the sides of each, leaving the centre brighter coloured. Abdomen luteous above, each segment with a pitchy spot in the middle, and with a narrow brown line on each side; under side of the abdomen with a whitish longitudinal stripe down the middle, and a broad black stripe along each side. Fore legs long and slender; outside dirty brownish luteous, within the femora marked with a large black patch extending above the spines, which are also black, but white at the base; the first and largest spine at about one-fourth of the length from the base, and three shorter spines half way between the former and the tip, and with a number of minute spines, all white at the base, with the tips black; fore tarsi terminated by two distinct curved ungues and a moderate sized pulvillus. Four hind legs dirty luteous; femora of the two hind legs blackish; tarsi of the four hind legs dusky at tip, and terminated by bifid ungues; wings slightly stained dirty yellow; principal veins dirty luteous; stigma rather long and chesnut brown. In the fore wings the oblique veinlets are pale, but the points of their juncture with the radial sector are black.

38. *M. biseriata*, West. Lutea, verticis linea tenuissima media fusca, lateribus prothoracis brunneis; antennis gracillimis, 40-articulatis, alarum venis albidis nigro-punctatis, cellulis discoidalibus in medio vena transversa in duplici serie divisis.

Long. corp. lin. 8; expans. alar. antic. lin. 19. Tab. 17, fig. 7. Habitat in Australia, Moreton Bay. D. Mossman. Mus. Westw.

This species differs from all the rest of the genus in having a double series of oblique discoidal cells, and in the veins being very pale and dotted with black; the antennæ are also extremely slender and filiform; the general colour is luteous buff. The head is very convex on the crown, with a slender black central line; on each of the lower parts of the face, near the clypeus, is a small rather deep impression. The labrum is broadly cordate and flat. The tips of the mandibles and the last joint of the palpi are black. The antennæ are about three times the length of the head,

extremely slender and filiform, 40-jointed; the first and second joints large; the third and following very small, rather longer than wide; terminal joint oval, not larger than the preceding joint. Prothorax about $2\frac{1}{2}$ times the length of the head; sides brownish chesnut, transversely very rugose, except in the anterior dilated part; remainder of the thorax and abdomen slightly varied with brown; beneath luteous. Fore legs luteous buff; spines of the femora very short and black, except the first large one, which is buff, and placed near the base; tarsi terminated by two minute, distinct, curved, simple ungues, and a moderate sized pulvillus. Four hind legs luteous buff; tarsi terminated by large, simple, very acute curved ungues; pulvillus broad. Wings broad, almost colourless; stigma brunneous; veins pale buff, dotted with black, each wing with eleven oblique, nearly straight, greatly elongated cells dependent on the ordinary radial sectors; nearly every cell divided in the middle by a transverse veinlet, forming a double row of cells.

39. *M. 4-tuberculata*, West. Brunneo-fulva, flavo nigroque varia, antennis brevissimis, 32-articulatis, pronoto carina transversa ante alteraque pone medium alarum, stigmatibus venisque subcostalibus fulvis, nubilaque apicali fusca. Tab. 18, fig. 1.

Long. corp. lin. 5—9; expans. alar. antic. 11—17.

Habitat Northern India. Mus. W. W. Saunders.

This is a very elegant species, nearly allied to *M. auriventris* of Guérin-Ménéville. The head is bright yellow, nearly flat on the crown, slightly impressed on each side at the base of the antennæ; the clypeus and a transverse line beneath the base of the antennæ black, and a transverse brown bar across the top of the head; labrum nearly circular; palpi fulvous; antennæ scarcely more than one and a half times the length of the head, thick, fulvous, basal joint yellow, moderate sized; second joint small, scarcely larger than the third; remaining joints, especially beyond the middle, very short and transverse. Prothorax dark fulvous, deeply transversely sulcated, forming a more strongly-marked carina before and another behind the middle; anterior part semicircularly dilated in front, yellow, with the anterior margin black, and a brunneous transverse fascia at its hinder part; meso- and metathorax dark fulvous, with the scutella yellow. Abdomen above with the basal half dark fulvous, the remaining half bright yellow; the second and third joints with a broad black hind margin; sides of the abdomen yellow; the three terminal segments blackish; beneath dark fulvous; fore legs dark fulvous; femur yellow on the outside, dark brown on the inside; large spine yellow, placed

nearly in the middle of the thigh; four hind legs fulvous; tibiæ paler, with a dusky broad ring near the base; ungues short, broad, terminated by four or five sharp teeth; pulvillus broad; wings narrow; principal veins fulvous; stigma long, orange brown; fore wings suffused at the base, and all the wings with an apical cloud of fulvous brown; all the wings with from nine to eleven oblique discoidal cells dependent on the ordinary radial sectors, the veinlets dividing the cells slightly curved.

40. *M. tropica*. Westw. Brunneo-picea, flavo-varia, prothorace subelongato, lineis duabus obliquis flavis; scutellis marginæ postico segmentorum abdominalium tenuissime flavis, femoribus anticis intus et extus brunneis, margine tenui pallido, antennis gracilibus, 29-articulatis. Tab. 18, fig. 2.

Long. corp. lin. $4\frac{1}{2}$ — $5\frac{1}{2}$; expans. alar. antic. lin. 9—11.

Habitat Africa tropicali occidentali, Gambia. Mus. Westwood.

Allied to *M. Cora*, Newman. Head bright yellow; clypeus and a broad bar across the place of insertion of the antennæ black; crown of the head with a transverse brunneous fascia; palpi fulvous; antennæ slender, about $2\frac{1}{4}$ lines longer than the head, 28 or 29-jointed, fulvous, basal joint yellow, moderate sized, 2nd small, 3rd slightly longer than the fourth, which, with the following, is short and transverse; prothorax pitchy brown, rather long and slender, dilated in front, the fore margin not wider than the hind part of the eyes, with two tubercles separating the dilated from the cylindrical part, which is but moderately transversely rugose; the tubercles are yellow, and from each of them extends backwards a slender oblique yellow line; meso- and metathorax pitchy brown, with the scutella yellow; abdomen pitchy brown, the anterior segments slenderly margined with yellow, the hinder segments yellow above, sides pitchy brown; fore legs dark chesnut, upper and lower edge of the femur paler; tibiæ with a dark longitudinal line on each side; tarsi terminated by a very minute single claw; four hind legs fulvous-buff, femora and base of the tibiæ dusky; ungues moderately long, curved, armed with several teeth at the tips; wings nearly colourless, principal veins brown, stigma long dark red, tips of the wing with a minute brown cloud, disc with eleven oblique cells dependent on the ordinary radial sectors, the veinlets separating the cells being considerably curved, fore wings also slightly stained with brown at the base.

41. *M. areolaris*. Westw. Fusca, flavo-varia, facie nigra, flavo-marginata; prothorace elongato angustato, parum transversè

rugoso, mesonoti angulis anticis scutelloque flavis; antennis gracilibus, 34-articulatis; alis hyalinis, cellulis obliquis discoidalibus ordinariis 15 vel 16. Tab. 18, fig. 3.

Long. corp. lin. 10; expans. alar. antic. lin. 23.

Habitat in Brasilia. Mus. Hope.

This is one of the largest species in the genus, and is distinguished by the great number of the narrow discoidal cells of the wings. The face is black; the labrum and a narrow line on each side yellow, reaching from the clypeus to the back of the head, uniting with a transverse yellow line on the crown, which is considerably depressed behind the antennæ, a slender carina extending along the hind part of the crown, which is of a dark brown colour. The mandibles are black, with the tips dark chesnut, the palpi fulvous. Antennæ black, two basal joints yellow beneath, terminal joints orange, slender, about twice the length of the head, 34-jointed, the basal joint strong, the 2nd small, nearly rounded, 3rd longer than the 2nd, 3rd and following very short, transverse, terminal joint conical. Prothorax rather elongated and slender, opaque, very slightly transversely rugose in its cylindrical part, moderately dilated in front, with the two ordinary tubercles very small. A semi-circular slender yellow line extends across the dilated anterior part from one anterior angle to the other; the under side is yellow, and there extends a yellow branch from the side obliquely upwards and forwards, and gradually becoming lost in the dark ground colour; the extremity of the upper side is black, preceded by a yellow lunule. Meso- and meta-nota black above, the anterior angles of the former, and a small dot on each side of both, together with the scutella, yellow; beneath and at the sides yellow, with slender black lines. Abdomen brown above, segments broadly black at the margin, beneath orange, with a slender marginal black line to each segment. Fore legs with the coxæ outwardly dusky, the upper and lower edges paler; within yellowish, with a dark line forming a transverse ring about one-third from the base; femora externally dark fulvous, with an angulated dusky line extending from near the base to the apex, internally dark chesnut, varied with orange colour; tibiæ black, with a slender yellow line on the upper edge; tarsi with the basal joint elongate-conic, hairy beneath; four terminal joints very slender, terminated by a very minute single unguis; four hind legs long, slender, fulvous; femora with the extremity and tibiæ with the base dusky; unguis short, broad, terminated by six acute teeth; pulvillus broad, each side dilated into a pseudo-pulvillus. Wings long, nearly hyaline and colourless, principal veins elongated;

stigmata and base of the fore wing brownish yellow coloured, each wing with fifteen or sixteen elongated, discoidal, oblique ordinary cells, the veinlets separating them being but slightly curved.

42. *M. Javanica*. Westw. Nigra, flavo-varia, faciei maculis tribus, labro, fasciaque transversa occipitali flavis; prothorace flavo, lineis duabus latis dorsalibus nigris; pedibus anticis flavis, femoribus extus et intus striga abbreviata basali nigra, alis hyalinis, stigmatate sanguineo.

Long. corp. lin. 8; expans. alar. antic. lin. 16.

Habitat in insula Java. In Mus. East India House.

Head black, with a transverse yellow fascia between the eyes on the crown; antennæ black, slender, two basal joints slightly marked with red beneath; face with three spots of yellow beneath the base of the antennæ; labrum and palpi yellow, mandibles black. Prothorax long, slender, slightly transversely rugose, yellow, with two black lines down the back, leaving only a slender yellow dorsal longitudinal line. Meso-thorax pale brown, the anterior-lateral angles prominent and black; both scutella yellow. Abdomen pale greyish brown, with darker marks on the sides. Fore legs yellow, coxæ externally marked with a broadish black bar; femora yellow outside, with a slender black mark extending from near the base to the middle, interrupted in the middle; inside having a wider dark mark extending from the base to the middle, where it is forked; tibiæ with the terminal half black, tarsi paler; femoral spines darker, brownish red. Four hind legs yellow, tibiæ dark at the base above, extremity of the ungues and pulvilli black. Wings colourless, veins black, except the subcostal and radial, which are fulvous; stigma dark blood red; disc with ten longitudinal oblique cells dependent on the ordinary radial sectors.

43. *M. lineolata*. Westw. Flava, nigro-variegata, facie flava, macula angulata subtus alteraque majori ad antennarum basin, labro nigro, maculaque parva triangulari verticali; prothorace fere lævi elongato, strigis tribus longitudinalibus nigris; antennis gracilibus, nigris, alarum stigmatate nigro. Tab. 18, fig. 4.

Long. corp. lin. 6; expans. alar. antic. lin. 13.

Habitat in Nepalia (D. Hardwicke.) In Mus. Britann.

Head yellow, with a small black diamond-shaped patch on the face beneath the antennæ; labrum with a smaller black patch, a larger one between and behind the base of the antennæ, and a smaller triangular one on the back of the crown of the head; palpi yellow; antennæ with 27 joints, slender, black, the basal joint moderate sized, the 2nd small, the remainder still smaller, the two

basal joints yellow beneath. Prothorax yellow, slender, elongated, almost smooth, with scarcely any transverse wrinkles, the fore margin and three longitudinal lines black, the middle one extending from the front margin nearly to the hind one, dilated in front and behind; the two side ones not extending to the fore margin. Mesothorax yellow, with a transverse black mark in front, dented on its hinder edge, but not extending so far back as the scutellum; metathorax yellow. Abdomen yellow, with the base black above, the terminal segments dark at the sides, and with a triangular black patch on the hinder margin of each, on the upper side. Fore legs yellow; coxæ very slender; femora on the outside yellow, on the inside the terminal half is black; spines brown; tibiæ yellow, with the inside black; four hind legs entirely yellow. Wings very slightly stained with yellow, submarginal and radial veins and the elongated stigma black; all the wings with only six oblique discoidal cells dependent on the ordinary radial sectors.

44. *M. Indica* (Westw.) Fulva, facie linea fusca, media longitudinali, verticeque striga transversa brunnea; prothorace flavo, antice lineis duabus lunatis lateralibus, lateribusque posticis fuscis, femoribus anticis intus nigricantibus; alis hyalinis, stigmatate sanguineo. Tab. 18, fig. 5.

Long. corp. lin. 5—6; expans. alar. antic. lin. 12.

Habitat in India orientali, Calcutta, Nepalia. (D. Hardwicke, &c.) In Mus. Britann., Westwood.

Head fulvous yellow; labrum blackish brown, a line of brown between the antennæ, extending nearly to the labrum, dilated behind the base of the antennæ; a red brown bar extends across the crown of the head; antennæ black, yellow at the base. Prothorax elongated and rather slender, yellow, anterior part dilated, with the anterior margin (except in the middle) and a curved line on each side of blackish brown, leaving the middle clear; the two ordinary tubercles rather more prominent than usual; hinder cylindrical part only slightly transversely wrinkled, with a more distinct impression on each side, at about one-third from the hind margin; sides of this part brownish black; remainder of the thorax fulvous yellow, with slender dark lines separating the several portions. Abdomen varied with fulvous yellow and black. Fore legs fulvous on the outside, femora with a small black spot at the tip; on the inside the femora are blackish brown; inferior edge fulvous; spines fulvous. Four hind legs fulvous, with black unguis, terminated by three or four minute teeth. Wings very slightly stained with brown; veins slender and black; postcostal and radial veins yellow, stigma

elongate and blood red; all the wings with seven or eight oblique discoidal cells, arising from the ordinary radial sectors.

45. *M. Mozambica* (Westw.) Luteo-fulva, prothorace magis rufescente, facie macula lunari, fasciaque transversa verticali nigris, pronoto antice linea abbreviata nigra; femoribus anticis luteis, intus linea tenui fere circulari notatis; alis parum areolatis, stigmatibus nigro. Tab. 18, fig. 6.

Long. corp. lin. $4\frac{1}{2}$; exp. alar. antic. lin. 8.

Habitat in Mozambica. In Mus. D. Miers.

Luteo-fulvous. Head with a lunate mark between the antennæ, and an abbreviated transverse fascia on the forehead black. Antennæ about two and a half times the length of the head, rather slender, black, basal joints pitchy, beneath luteous, mouth luteous. Prothorax moderately elongated, not or scarcely transversely wrinkled; luteous, having the fore margin and a short longitudinal median line black, behind which are the two ordinary tubercles, fulvous; meso- and metathorax dark in the middle. Abdomen paler luteous, with a brown line down each side, terminated by two short fulvous brown curved hirsute filaments; legs pale luteous; anterior femora with their spines externally concolorous, marked on the inside with a dark brown horse-shoe like mark; the large spine on this side is luteous, the remainder black. Anterior tibiæ outwardly luteous yellow, with the inner edge black; inwardly black, with the upper edge yellow; tarsi yellowish, terminated by a single curved acute minute claw; four posterior femora with a very thin black line beneath; wings hyaline and colourless; veins and stigma black; the postcostal vein pale luteous brown; disc of all the wings with only four oblique veins dependent on the ordinary radial sectors.

46. *Mantispa (Trichoscelia) Fenella* (Westw.) Fulva; capite, antennis, tibiis posticis dilatatis, fascia pone medium alarum anticarum (in medio interrupta) stigmatibus posticarum nigricantibus; antennis longis, gracilibus, 46-articulatis; alis anticis ovalibus, posticis minoribus. Tab. 18, fig. 7.

Long. corp. lin. $3\frac{1}{2}$; expans. alar. antic. lin. 8.

Habitat in Brasilia, Para. (D. Bates). In Mus. Britann.

This is one of the most remarkable species in the genus, agreeing with *D. Notha*, Er., in the broad form and unequal size of the wings, the dilated hairy hind tibiæ, and in the short simple formed prothorax. These characters, together with the modification in the position of the veins of the wings dependent on their broad oval form, warrant the separation of these two species as a

distinct subgenus, to which the name of *Trichoscelia*,* in allusion to the hirsute tibiæ, may be applied.

Head wide, crown very convex, blackish. Antennæ longer than the head and prothorax, slender, hirsute, 46-jointed; basal joint robust, nearly rounded; second joint short, thick; third longer than the second; fourth and following joints very short, growing rather longer towards the middle, where they are cup-shaped. Maxillary palpi very slender, acute at the tips; labial palpi thick, terminal joint subulated. Prothorax not twice the length of the head, not so wide in front as the hind part of the eyes, not transversely wrinkled, subdepressed, rather widened in front, fulvous, meso- and metathorax much widened, fulvous. Abdomen slender, brown above, dirty fulvous at the sides. Fore legs fulvous; femora with a row of equal sized minute teeth; tarsi with the basal joint produced in a long acute point, terminal joints set on at the side of the preceding, very slender, terminated by two minute simple acute ungues and a small pulvillus. Middle legs fulvous; tibia rather dilated; hind legs with the femora slender, fulvous; tibiæ dilated, hirsute and black; tarsi dark fulvous; ungues of all the four hind legs very slender, simple and acute. Fore wings large, wide, ovate, nearly colourless; principal veins, especially towards the base of the wing, fulvous; stigma of all the wings blackish; fore wings with a rather broad, transverse, blackish fascia beyond the middle, interrupted in its centre; veins longitudinal, scarcely oblique, the discoidal cells dependent on the ordinary radial sectors, not more than five in number. The margin of the wing is composed of a series of very minute black globular tubercles, each emitting one or more fine hairs.

NOTE.—Each figure is accompanied by details representing portions of the antennæ and extremities of the legs.

P.S.—The genus *Hoplophora*, Perty (Delect. an. art. Bras. 126), *Chaetessa*, Burmeister (Handb. d. Ent. ii. 527), MANTOIDA, Newman (Ent. Mag. v. 179), placed by Perty in the *Neuroptera* near *Mantispa*, and by Newman in "Natural Order——?" belongs to the *Mantidæ*, as proved by the dentate inner lobe of the maxillæ and the divided labium. A specimen is in the cabinet of W. W. Saunders, Esq., F.L.S.

* Schneider (Monogr. Raphid.) suggests this separation, with the name of *Anisoptera*. There is, however, a genus of *Geometridæ* named *Anisopteryx*, and the termination *ptera* must be restricted to the names of the orders, and not used for genera.

XXX. *Remarks on the Synonymes of the GENUS ACANTHOSOMA, as regards the British Species.* By JOHN CURTIS, Esq., F.L.S., &c.

[Read 2nd February, 1852.]

WHEN the Second Edition of the First Volume of my British Entomology was called for, I revised my genus *Acanthosoma*,* giving short descriptions, and adding the localities, &c., of the species, which I then believed to amount to five, in consequence of Mr. Davis having found a specimen, apparently different to *A. agathina*, Fab., but which probably was a variety only of that species. Mr. Dallas does not appear to have seen this reprint of my genus at the time his "Note on the British Species"† was published, and as I differ from him and M. Amyot, especially regarding one of the species, I wish to call attention to this singular genus of *Hemiptera*.

According to my views the nomenclature stands thus:—

1. *Acanthosoma hemorrhoidale*, Linn., Fab. &c.; *Acanthosoma*, Amyot.
2. *Acanthosoma dentatum*, De Geer, Dallas; *liturata*, Fab., Curt.; *Hæmatogaster*, Amyot.
3. *Acanthosoma pictipenne*, Newm.; *picta*, Newm., Curt.; *lituratum*, Dall.; *Saranus*, Amyot.
4. *Acanthosoma griseum*, Linn., Curt., Dall.; *agathina*, Fab., Curt.; *Mearus*, Amyot.

Of *A. liturata*, Fabricius says, "*C. viridis fusco-irroratus*, thorace fascia elytris litura sanguineis,"‡ and again, "Thorax et elytra viridia punctis numerosissimis impressis fuscis, thorace fascia postica, elytris litura sanguineis. Abdomen supra atrum, subtus flavescens utrinque linea punctorum nigrorum." Fabricius takes no notice of the length of the basal joint of the antennæ, and therefore it is presuming a fact not established, when M. Amyot places *A. lituratus*, Fab. in the Section 10, "characterized by the basal joint of the antennæ not extending beyond the extremity of the head."§ Now the head, thorax and elytra are thickly sprinkled with fuscous punctures in *A. dentatum*, but they are not visible to the naked eye in *A. pictipenne* from their being green,

* Curtis's Brit. Ent. fol. and pl. 28.

† Trans. Ent. Soc. New Series, vol. i. p. 109.

‡ Ent. Syst. vol. iv. p. 114

§ Ann. de la Soc. Ent. de France, Second Series, vol. iii. p. 458.

or of the general colour of the insect. A portion only of the body above is black, the apex being green or ochreous to a considerable extent; and whilst the rows of black dots beneath are distinct enough in *A. dentatum*, they are not to be found in *A. pictipenne* in my specimens. If this view of the species be correct, one of Mr. Newman's names must be retained; and as *picta* has been employed by Fabricius for another insect, I have restored the name of *pictipenne*.

Our species, *Acanthosoma griseum*, Linn., agrees well with the description in the *Fauna Suecica*, "Abdomen lateribus albo nigroque variis, alis nebulosis,"* but it is far otherwise with his *C. intricatus*, of which he says, "Abdominis lateribus rubro nigroque variis, alis albidis;" and in his more ample description he again says, "Alæ albæ diaphanæ," alluding no doubt to the membrane of the elytra. And what follows shows that it must be a different species from ours, namely, "Color dorsi sub alis ruber (quo manifeste a precedente (*C. grisea*) differt, qui niger et viridis), versus basin nigra lata macula, versusque anum lineis transversis nigris, præsertim ad abdominis latera."

I have never seen a specimen of *A. griseum* partaking of such characters. And the "ano rosea" of Fabricius's *C. agathinus* but ill accords with the Linnean *A. grisea*; nevertheless I believe it is intended for that species.

The confusion occasioned by Fabricius's careless references to figures, together with the incorrect nomenclature of Wolff and Panzer, has created such obstacles to a uniformity of names, that it is not surprising if even those well versed in such matters should often be at fault; but this very defect has led to greater precision, and if we only adhere to that just and sound principle in nomenclature, *the right of priority*, with the tact and energy which are now manifest in discussing this most important branch of natural history, the day, it is to be hoped, is not far distant, when, instead of our pages being encumbered with synonymes and doubts, we shall see every family as readily recognized by individual names as are our *Papilionidæ*.†

* *Fauna Suec.* p. 248, No. 926.

† Ten years after the genus *Acanthosoma* had been characterized and figured, and after it had been adopted by Laporte and Burmeister, Hahn published it with the name of *Clinocoris*, and represented the tarsi as *triarticulate*!

PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY OF LONDON.

January 7, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

Mr. Busk, who was present as a visitor, exhibited two kinds of silken web, forwarded to him by Mr. Kincaid, an extract of a letter from whom was read, stating that "they were the production of a species of silkworm found in the mountains near Merida, Maracaybo: the insects spin, or rather weave, it from tree to tree, sometimes to the extent of several feet in length and breadth." This production appears to have been hitherto quite unknown in this country. Mr. Busk also presented two specimens of it, mounted on glass slides, for the microscope.

A portrait of the late Edward Doubleday, by Maguire, was presented by George Ransome, Esq., accompanied by a letter from Mr. Bowerbank, stating that copies at 5s. each would be furnished to subscribers. Mr. Douglas then read the following memoir:—

"The death of my lamented coadjutor, Mr. Edward Doubleday, affords a melancholy opportunity, which I trust I may be permitted to use, of placing upon our minutes a brief testimony to his worth. Educated in the midst of woodland scenery, the love of Nature—in him strongly innate—grew with his growth and increased with his strength, and led to an intimate acquaintance with the Natural History of his native district. In course of time his enthusiasm led him to North America, and he spent two years in visiting its magnificent scenery and collecting objects of Natural History, chiefly insects, of which he brought home immense quantities. Subsequently he became attached to the British Museum, where, up to the time of his illness, he laboured most assiduously, as the present state of the Lepidoptera in that Institution abundantly testifies. He also contributed largely to the entomological literature of the day, but, most of all, his name will be remembered in connexion with the 'Genera of Diurnal Lepidoptera,' a work which for beauty and accuracy has no equal, though, unfortunately for us, he has not lived to see it completed. Above all we have reason to deplore his loss as a man. Doubtless he had his failings, for, as our great poet says,

'You, Gods, will give us
Some faults to make us men;'

but these were cast into the shade by his better nature; and besides those who had the pleasure of knowing intimately his good qualities and his great and varied attainments, many others will ever lament that they have been thus suddenly deprived of his friendship."

The President stated that he had no doubt but that all present who had known Mr. E. Doubleday would fully concur in the remarks of the Secretary, and proposed that, as a tribute of respect to his memory, all further business should be adjourned.

January 28, 1850. (Anniversary Meeting).

G. R. WATERHOUSE, Esq., President, in the chair.

The Auditor's Report of the Treasurer's Account was read, from which it appeared that the Society was now in a much better financial condition than at the corresponding period of last year.

Messrs. W. S. Dallas, E. W. Janson, J. F. Parry and J. O. Westwood, were elected members of the Council in the room of Messrs. W. F. Evans, J. Walton, J. J. Weir and the late Mr. E. Doubleday; and the following were elected to the respective offices for 1850: G. R. Waterhouse, Esq., President; W. Yarrell, Esq., Treasurer; and Messrs. J. W. Douglas and H. T. Stainton, Secretaries.

The President then delivered an address on the state and prospects of the Society, for which a vote of thanks was passed, and he was requested to allow it to be printed. Votes of thanks were then passed to the Treasurer, Secretary, and retiring members of the Council.

The Secretary announced that part 2 of vol. v. of the Society's Transactions, containing, among other matter, a general index to the five volumes, and completing vol. v., was on the table.

February 4, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The President appointed as Vice-Presidents for the ensuing year, Messrs. Spence, Stephens and Westwood.

The following donations were announced, and thanks ordered to be given to the respective donors: 'A Synonymic List of British Lepidoptera,' by Henry Doubleday, and the 'Zoologist' for January and February; presented by E. Newman, Esq. 'Mémoires de l'Académie Royale de Belgique,' tome xxiii.; 'Bulletins de l'Académie Royale de Belgique,' tome xv. 2me partie, et tome xvi. 1re partie; 'Annuaire de l'Académie Royale de Belgique,' tome xvi. 1re partie; 'Mémoire de Fertilisation des Landes de la Campine et des Dunes,' par A. Eenens; 'Observations des Phénomènes Periodiques;' all presented by the Academy. Two Almanacs of the Art Union of London; presented by the Art Union. 'Literary and Scientific Register and Almanac for 1850:' presented by J. W. G. Gutch, Esq., the author. 'Descriptions and

Figures of some New Lepidoptera from Nepal;’ by G. R. Gray, Esq., F.L.S. ‘Notice Biographique sur M. C. J. Schönherr,’ par M. le Comte Mannerheim; presented by the author. ‘Journal of the Royal Agricultural Society,’ vol. x. part 2; by the Society. ‘The Athenæum’ for September, October, November and December, 1849; by the Editor. A collection of British Lepidoptera; presented by Mr. Bond.

Mr. Weir brought for exhibition a box of Micro-Lepidoptera, showing his method of mounting whole series of a species on pieces of cork of an oblong shape.

Mr. Douglas exhibited a new species of Tortrix, allied to *Stigmonota redimitana*, *Guenée*, which he proposed to call *Weirana*, in honour of the indefatigable Lepidopterist (he wished he could have said Lepidopterologist) of that name: he also exhibited two specimens of a new British Tinea, the *Cosmopteryx Pinicolella* of Zeller, which he had taken from fir trees, at Wickham and Mickleham, at the end of June.

Mr. S. Stevens exhibited a very fine specimen of *Eurycantha horrida* from the South Seas: he also exhibited some beautiful new Lepidoptera, which he had received from Mr. Bates, from Parà; and he exhibited, still living, the specimen of *Lamia textor* which had been exhibited at the October meeting.

Mr. Stephens exhibited two specimens of a new British Noctua, which appeared to be the *ruticilla* of Esper, and which Boisduval places in the genus *Orthosia*: of these specimens one had been sent to Mr. Shepherd by Mr. Edleston, and the other, which was extremely wasted, was taken by Mr. Stainton, at Sheffield, in June, 1847.

Mr. Stainton then read a paper on the genus *Micropteryx* of Zeller, in which he described all the known British species, and an abstract of which is given below.

This interesting and very distinct group of insects is sadly in want of investigation, and the metamorphoses of none of the species are known. Several of the known species appear very early in the season,—for instance, *purpurella* in February, and *unimaculella* and *semipurpurella* in March,—and it is exceedingly probable that other equally early species lurk undetected. From the affinities of the group to the *Adelæ*, the larvæ of which are known to be case-bearers feeding on various plants, there is little doubt that the larvæ of these insects feed in a similar way; and if those collectors who take *Calthella* in plenty would devote a little of their time to the furtherance of science, by searching for the larvæ and pupæ of that insect, though they might not enrich their collections by so doing, they would have a better claim to the title of *entomologists*.

A. *Head ferruginous.*

1. *Calthella*, Linn. Anterior wings golden, with the base entirely purple.
Frequents *Caltha palustris*, in May.
2. *Aruncella*, Scopoli. ♀ Anterior wings golden, with the base purple on the costa;
♂ with two fasciæ and a spot silvery.
Not scarce, in June and July.
3. *Allionella*, Fabr. Anterior wings purple, with two golden fasciæ, and a golden spot towards the apex reaching neither margin.
Scarce, in May and June.
4. *Subammanella*, Stainton, Catal. Tin. p. 9.
5. *Rubrifusciella*, Haw. Anterior wings greenish golden, with a reddish spot on the costa at the base, a reddish fascia before the middle, and another bifurcate beyond the middle.

B. *Head not ferruginous.*a. *Head cinereous.*

6. *Subpurpurella*, Haw. Anterior wings greenish golden, with a faint paler spot towards the anal angle.
Common, on oaks, in May.
7. *Semipurpurella*, Steph. Anterior wings purple, irrorated with pale golden; antennæ more than half the length of the anterior wings.
Common, on birches, in March and April.
8. *Sparmannella*, Fabr. Anterior wings golden, with numerous transverse purple fasciæ.
Scarce, on birches, in May.
- β. *Head dark fuscous; antennæ less than half the length of the anterior wings.*
9. *Purpurella*, Haw. Anterior wings golden, with numerous irregular purple fasciæ, and the veins purple.
Common, on birches, in February and March.
10. *Unimaculella*, Zetterstedt. Anterior wings golden purple, with a conspicuous whitish spot at the anal angle.
Scarce, in March and April.

The difficulties in the genus commence with *semipurpurella*, which in my Catalogue I have lumped together with *purpurella* and *unimaculella* as one species: these are, however, truly distinct, and with fine specimens they are easily separated, though in the ordinary run of specimens found in collections it is no easy matter to say to which they should be referred. One main reason for our specimens being so poor is that we do not collect them soon enough: they should be sought for in March; by delaying to collect them till April the specimens become wasted. I have no doubt many might be met with in February in forward seasons. Haworth distinctly states that Mr. Hatchett took two specimens of *purpurella*, *in copulâ*, in February.

A conversation followed upon the notes which had appeared in the 'Gardener's Chronicle,' on the danger to be apprehended by horticulturists from the attacks on pears by the larvæ of *Ditula angustiorana*, which in some instances referred to were reported to have done some damage to this fruit. Several members concurred in saying that there was but little ground for this opinion, as, except in the instances quoted, this insect had not been observed to have attacked fruit trees, and in fact it was seldom seen in gardens, although its larvæ were polyphagous, but that the perfect insect was found in the greatest abundance in firs and yews, often far from gardens. *Tortrix lævigana*, on the other hand, was known to be very destructive to fruit trees, both foliage and young fruit, and it was supposed some of the ravages attributed to *D. angustiorana* may have been the work of this species.

March 4, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the several donors: A bound copy of Mr. H. Doubleday's 'Synonymic List of British Lepidoptera,' with written notes by Mr. Stainton of the several dates of publication on each page; 'Berichte des Lepidopterologischen Tauschvereins,' Jena, 1842-7; 'Annals and Magazine of Natural History,' February, 1850; all presented by Mr. H. T. Stainton. 'Entomologische Zeitung,' August, September and October, 1849; by the Entomological Society of Stettin. 'Transactions of the Linnean Society,' 1847-8, pp. 341—401, and 1848, pp. 1—48; 'Charter and By-laws of the Linnean Society;' 'List of Members of the Linnean Society, 1849;' all presented by the Linnean Society. 'Leeds Philosophical and Literary Society's Annual Reports,' 1847-8 and 1848-9; by the Society. A box of insects, from G. Dalton, Esq., of George Town, Demerara.

The following gentlemen were balloted for, and elected subscribers: Joseph S. Baly and James Shepherd, Esqrs.

Mr. Bond exhibited a portion of the stem of a young ash tree, from near Whittlesford, Cambridgeshire, covered with the pupa-cases of a *Galeruca?*, each being enclosed in the shrivelled spiny skin of the larva, which had a longitudinal slit down the back, after the manner of *Tiresias* serra.

Mr. Bond also exhibited some silken production, like felt, supposed to be formed by the larvæ of *Galleria colonella*, which he had found between two planks of wood.

Mr. Wilkinson exhibited some cocoons of *Plutella harpella*, found in crevices of the bark of a lime tree. Mr. Bond stated that he had found the larvæ of this insect on roses and dogwood: it had been reported to feed on the honeysuckle only.

Mr. S. Stevens exhibited specimens of *Agrotis suffusa* and *saucia* from Venezuela, identical with our British species; and a living specimen of *Ceropacha flavicornis* which he had taken the preceding day.

Mr. H. T. Stainton exhibited some specimens of Micro-Lepidoptera which he had recently bred from leaves gathered the preceding autumn, viz., *Lithocolletis Pomifoliella* from hawthorn, and *L. Viminiella* and *Salicicolella* from sallow; also one of *Gracilaria auroguttella*, from a cone formed by the larva on a leaf of *Hypericum pulchrum*.

Mr. Stainton also exhibited a fine series of *Æcophora senescens*, taken by Mr. Douglas, at Mickleham, in June; and six new species of British Tineidæ, of which he read the following brief descriptions:—

Micropteryx mansuetella, Z. "Similar to, and size of, *M. Calthella*, black-headed, with faint pale fasciæ on the anterior wings. Near Glogau, in an alder-brake, at the same time as *Calthella*, on the bloom of *Sorbus Aucuparia*, in plenty; more rarely on *Spiræa Ulmaria* and reed-blossoms." (Schlesisch. Tauschbericht, 1844, p. 16). This species has some resemblance to *Calthella*, but has on the anterior wings some faint indications of purple fasciæ, as in *rubrifasciella*: from both these species it is readily distinguished by its deep black (blue-black) head. Two specimens taken by Mr. Douglas; locality unknown.

Æchmia Stanneella, F-v-R. (p. 248). "Rather smaller than *Æ. metallicella*, of a pale silvery gray, inclining to a yellowish colour, very glossy: the duller posterior wings have besides a very faint violet tint. Before the anal angle of the anterior wings is a whitish spot, but it is so lost in the pale ground colour that it only becomes perceptible when the sun shines on it." A single specimen taken by Mr. Douglas, in company with *sericiella*, May 4, 1849, at Coomb Wood.

Myelois Artemisiella, Steph. MSS. Not closely allied to any species I am acquainted with. Exp. alar. 7—9 lines. Head, thorax and anterior wings pale dirty ochreous, the latter with a paler sinuous hinder fascia, followed by a dark cloud on the costa, and preceded by a similar dark cloud a little removed from the costa, which is continued as a dark streak along the middle of the wing to the base: near the costa, a little before the hinder fascia, is a black spot; and a row of dark spots on the hinder margin: posterior wings pale cinereous. This species has been bred by Mr. Simmons from larvæ, feeding within the stems of *Artemisia campestris*.

Bucculatrix cristatella, F-v-R. A single specimen, the locality of which is unknown, is in Mr. Douglas's collection. A note of the distinctive characters of this species appears in the Society's Transactions, vol. v. p. 128.

Gracilaria? *Ocnorostomella*. Exp. alar. 4—5 lines. Last joint of palpi stout and not pointed: head, thorax, antennæ and anterior wings concolorous, gray, sometimes with a slight ochreous tinge: the wings are entirely destitute of markings, which readily distinguishes it from any known *Gracilaria*, whilst the longer palpi immediately separate it from *Ocnorostoma*; and the smooth head, long posterior legs, and long cilia at the anal angle of the anterior wings, at once remove it from *Argyresthia*. I exhibited an imperfect specimen of this species to the Society in November last, as *Argyresthia Amiantella*?, imagining the hairs on the crown of the head to have been rubbed off: the sight of several fine specimens, taken by Mr. Douglas, at Mickleham, in June, 1848, has convinced me that it is not *Amiantella*, and not even an *Argyresthia*; but from the thickness of the last joint of the palpi it ill accords with any known *Gracilaria*.

Crambus uliginosellus, Z. in litt. Distinguished from *C. pascuellus*, with which it has hitherto been confounded, by its shorter and less pointed anterior wings, the white streak on which is less gradually pointed; the posterior wings are whiter, and the palpi and thorax are likewise whiter. One specimen taken at Lewisham, at light, June 21st, 1848.

Mr. Westwood exhibited a specimen of *Ophion undulatum*, taken in this country.

April 1, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors: 'Entomologische Zeitung,' November and December, 1849; 'Linnæa Entomologica,' vol. iv.; by the Entomological Society of Stettin. 'The Zoologist' for March and April; by the Editor. 'Biographical Notice of the late Edward Double-

day;' by J. O. Westwood, Esq., the author (from the 'Gardener's Chronicle'). 'Monograph of the larger African Species of Nocturnal Lepidoptera, belonging or allied to the Genus Saturnia,' with four plates; by J. O. Westwood, Esq., the author.

The following gentlemen were balloted for and elected Corresponding Members of the Society: Herr M. Bach, Boppard, on the Rhine; H. G. Dalton, Esq., George Town, Demerara.

Mr. Westwood exhibited a specimen and drawing of *Cholovocera Maderæ*, a new Colcopterous insect, remarkable for having the faceted eyes at the posterior angles of the head, replaced on each side by six small, semiglobose, pellucid ocelli, precisely similar to the ocelli at the sides of the head of many larvæ, being the only species throughout the whole of the metamorphic winged insects in which this peculiarity had been observed to exist.

Mr. Westwood exhibited two insects mounted on gelatine, which he considered was preferable to talc, as it was more transparent, and the insects were more firmly secured, for the gum by which they were fastened was not so liable to scale off.

Mr. Westwood also stated that the pupa-cases exhibited at the last meeting by Mr. Bond, and then supposed to be those of a species of *Galeruca*, belonged to a species of *Chilocoris*, and had been noticed by De Geer.

Mr. Stainton exhibited a British species of *Micropteryx* which he had previously overlooked, though it was described by Mr. Stephens under the name of *concinella*. It appeared that this species was the true *Aruncella* of Scopoli, and that the insect described under that name by Mr. Stainton, in his monograph of the genus, must now resume the name of *Seppella*, *Fab.* The females of both species, being destitute of markings, would probably be very difficult to distinguish from each other.

Mr. S. Stevens exhibited some beautiful new species of butterflies he had recently received from Mr. Wallace, by whom they were captured, at Santarem, on the Amazon river: among them he had been able to identify *Callithea Godartii*, *Feisthamel* (male and female), and *C. Lepreurii*, *Feisth.* He also read an extract of a letter from Mr. Wallace, stating that the males of *C. Godartii* frequent the higher parts of trees, and are very difficult to capture.

Mr. Douglas exhibited an empty pupa, apparently of some *Noctua*, in a thistle-stem of last year, and some living larvæ, found the preceding week, at Darenth Wood, on broom. These larvæ, which did not seem to be scarce, drew together several of the smaller twigs of the broom, forming a covering, in which they appeared to have hibernated, and in which they fed on the bark: they resembled in appearance and habit the larvæ of *Depressaria assimilella*, as described by Fischer-von-Rösler-stamm.

Mr. Douglas exhibited a new species of *Elachista*, which he proposed to name *occultella*, and of which he read the following description:—

Family TINEIDÆ.

ELACHISTA OCCULTELLA.

Caput fuscum; antennæ nigrae; thorax niger; alæ anticæ nigrae griseo irroratæ, medio fasciâ lævi obscurâ, maculis duabus oppositis griseis, apicibus ratione ciliorum rotundatis. Alæ posticæ nigrae, ciliis fuscis.

Expansio alarum $3\frac{1}{2}$ lin.

Head fuscous; antennæ and thorax black; anterior wings black, dusted throughout with minute griseous atoms, in the centre a slight obscure fascia, towards the apex on either margin a small obscure griseous spot, and the cilia long. Posterior wings black, with fuscous cilia.

Very like *E. obscurella*, *St.*, but smaller and darker, the anterior wings more rounded on the costa, drawn more suddenly to a point, and by reason of the long cilia the ends appear rounder.

He found this species May 25th, 1848, flying above long grass under trees, in a damp part of West Wickham Wood.

He also read the following description of a moth he had exhibited at the meeting in February:—

Family TORTRICIDÆ.

GRAPHOLITHA (STIGMONOTA, *Guen.*) WEIRANA.

Caput fusco-nigrum, fronte palisque albidis. Alæ anticæ obtusæ, fusco-nigræ, fasciâ mediâ curvatâ obscurâ subplumbæ, punctis sex costalibus albidis, ciliis subplumbeis, micantibus. Alæ posticæ cinereo-fuscæ, ciliis concoloribus. Subtùs omninò cinereo-fusca.

Exp. alar. $5\frac{1}{2}$ lin.

Head fuscous black; face and palpi whitish. Anterior wings obtuse, rounded, soot-black, with an obscure curved medial fascia, and six whitish costal spots, in pairs, of which the first is at the middle and the other two towards the apex; cilia lead-coloured, shining. Posterior wings cinereous-fuscous, with concolorous cilia. Underneath, the wings, body and legs are all of an uniform cinereous fuscous hue.

This species is most closely allied to *Stigmonota redimitana*, *Guen.*, from which it differs chiefly in being larger, of a lighter colour and less glossy, and the fascia less distinct: underneath, also, the fore legs and breast are not white.

Taken at the end of May, flying in sunshine round beech-trees, at Mickleham. He had great pleasure in dedicating this species to him in whose company he captured it, Mr. Weir, who is well known as one of our most acute and industrious entomologists.

Mr. Stainton exhibited some small Lepidopterous larvæ mining in leaves of *Helianthemum vulgare*, which plant was not hitherto known to afford nourishment to any species of *Tineæ*.

A paper by Mr. S. S. Saunders was read, entitled "Descriptions of two New Strepsipterous Insects from Albania, parasitical on the Genus *Hylæus*, with some account of their Habits and Metamorphoses," of which the following is an epitome:—

Order STREPSIPTERA, *Kirby*.

Genus HYLECTHRUS.*

Caput magnum, transversum. Oculi ingentes. Antennæ 5-articulatæ; articulo basali brevi; secundo parvo, truncato; tertio longissimo, spatulato, totâ ferè

* *Hylæus*, ἐχθρὸς, hostis.

latitudine subæquali, quartumque basin versus latere externo ferenti; hoc parvo, annuloso; extimo (5to) tertio simillimo, simul productis, adsistentibus. Palpi parvi, articulo basali crassiori, apice obliquo; apicali graciliori, setoso. Thorax anticè constrictus, disco gibboso, capiti latitudine subæquali; scutello maximo, elongato-triangulari, margine antico sinuato, lateribus rectis, angulo postico acuto porrecto. Pseudoelytra parva, apice valdè dilatato, crassiori, subconcauo. Alæ, costâ dimidio basali inspissatâ, seu potiùs venâ subcostali abbreviatâ quasi conjunctâ; primâ discoidali prope basin furcatâ, ramo antico ejus cum costâ parallelo, ultra medium alæ evanescenti, ramo postico ejusdem longitudinis, recto, deflexo: prope apicem alæ incrassatio exstat, cujus basis, venaque duplex tenuissima de margine externo sinuatè producta, intra furcam retrò extendent: venis reliquis rectis, deflexis; quarum una gracilis, margini attingens; duæ subapproximatæ, margini interno propiores, basi robustiores; altera (?) analis ferè obliterata. Abdomen valdè constrictum. Pedes longitudine mediocres, posteriorum tibiis dilatatis, compressis, genubus constrictis; tarsorum articulis quatuor, apicali integro. Mas.

Femina (cui, modo congenerarum, alæ, pedes, antennæ, necnon oculi desunt) vermiformis; cephalothoracem complanatum, supra subconvexum, infrâ subconcauum, e dorso apicis educantis tantum modò emittens.

Sp. 1. HYLECTHRUS RUBI.

Niger, gibbosus; pedibus luteis; alis lacteis, nervis saturatè piceis. Mas.

Long. corp. $\frac{1}{2}$ — $\frac{2}{3}$ lin. Expans. alar. ferè $1\frac{1}{2}$ lin.

Femina, cephalothorace pallido, disco utrinque vittâ brunneâ, quandoque basin versus punctis obscuris duabus, seu lineolis transversis, signato.

Habitat in Epiro, intra corpora Hylæi versicoloris parasiticus.

Sp. 2. HYLECTHRUS QUERCUS.

Differt magnitudine duplò majori, alis parùm obscurioribus, nervisque magis nigricantibus. Mas.

Long. corp. $\frac{2}{3}$ —1 lin. Expans. alar. ferè $1\frac{3}{4}$ lin.

Individuis mutilatis tantum vidi.

Habitat in Epiro, Hylæi gibbi parasitus.

Order HYMENOPTERA.

Section MELLIFERA, Latr.

Family ANDRENIDÆ, Latr.

Genus HYLÆUS, Latr. (PROSOPIS, Jurine).

Sp. 1. HYLÆUS RUBICOLA.

Niger; genis, clypeique puncto, luteis, vel albicantibus, vel denique omninò nigris; antennis subtùs ferrugineis; prothoracis lineolâ sæpe interruptâ, humeris, squamâque alarum, flavescens; tibiis tarsisque plus minusve ferrugineis vel pallidis; abdominis segmento primo omninò, secundo nonnunquam ad basin, rufo-fulvis, reliquis nigro-piceis, marginibus posticis pallidioribus; alis subhyalinis, nervis piceis. Femina.

Long. corp. $\frac{5}{8}$ unc. Exp. alar. $\frac{7}{8}$ unc.

Mas differt, genis clypeoque albidis; thorace, abdomine, squamâque alarum, nigris.

Habitat in Epiro rubis exsiccatis circum Ambracicum sinum.

Sp. 2. *HYLÆUS VERSICOLOR*.

Niger; genis, clypei lineâ, prothoracis lineâ interruptâ, humeris, squamâque alarum, flavescens; antennis subtus ferrugineis; tibiis tarsisque anterioribus ferè omninò, intermediis posterioribusque basin versus, pallidioribus; abdomine vel toto vel parte majori pallidè flavo; alis subhyalinis, nervis piceis. Femina.

Long. corp. $\frac{5}{24}$ unc. Exp. alar. $\frac{7}{24}$ unc.

Variat genis luteis, clypei puncto concolori, vel disco omninò nigro.

Habitat in Epiro rubis exsiccatis cum præcedentibus. (An species distincta?)

The dissimilarity in appearance between this and the preceding species is so striking, that, although he inclined to consider the difference as resulting from parasitical attack, it would perhaps be hazardous to assert this without further proof of their identity. It is, however, remarkable that all the male parasites which he has obtained were derived from these pale-coloured specimens, whereas the apterous females were restricted to the former,—a circumstance not unworthy of attention, as connected with the physiology of sexual development.

Sp. 3. *HYLÆUS GIBBUS*.

Niger, gibbosus; genis, tibiisque anterioribus anticè, luteis; posterioribus ad basin, intermediis vix, tarsorumque quatuor posteriorum articulo primo, albicantibus; antennis subtus ferrugineis; prothoracis lineolâ interruptâ tenui, humeris, alarumque squamâ, flavescens; abdomine nigro; alis fuscentibus, nervis piceis. Femina.

Long. corp. 3 lin. Expans. alar. $4\frac{1}{2}$ lin.

Habitat in Epiro, quercibus prope Sinum Ambracicum.

The *Hylecthrus quercûs* was obtained from this species, the abdomen exhibiting irregular rufous patches in some specimens parasitically affected.

Having reared two new species from the bodies of bees of the genus *Hylæus*, Mr. Saunders availed himself of the opportunity to offer some remarks on these parasites, and certain particulars which had come under his notice. The first species he obtained from oak-galls, which he had placed in a box and forgotten till some months afterwards, when he found—on some *Hylæi* which had been produced and died—abdominal protuberances caused by the presence of Strepsiptera, still in their pupa envelopes, having perished *in situ* after attaining the imago state. The following year he could find no more *Hylæi* in oak-galls; but knowing that the larvæ of these bees nidificated in briars, he collected some briar-snags, and on the 28th of May selected from their occupants five already-formed pupæ, the remainder being still in the larva state: of these, three completed their transformations within two days, when he saw the usual parasitic phenomena, not previously apparent; and the next morning, on placing them in the sun, two winged parasites—smaller than those previously obtained from the *Hylæus* of the gall—speedily came forth. The remaining selected pupæ never attained the imago state. From the ample stock of larvæ and briars re-

maining he expected to have reared numbers of the parasite, but in this he was mistaken, the gestation of the parasite apparently rendering the *Hylæus* precocious, for none of the bees that came out late produced any parasite: yet although the bees which produced parasites have always been observed to assume the imago state before others not parasitically affected, their appearance has varied according to the season, from the middle of May to the middle of June. The parasitic pupæ have almost invariably shown themselves contemporaneously with the imago bee (never sooner), whose contortions in wriggling itself out of the pupa-envelope may not impossibly assist the parasite in driving the prominent dentate apex of the male pupa, or the subcuspidate cephalothorax of the female, through the abdominal folds; though it may indeed also be assumed that this is accomplished, as Dr. Siebold seems to think, by the larva. Among another lot of larvæ and pupæ of *Hylæi*, set apart and carefully watched, no symptom of Strepsipterous distension could be discovered in either of those stages: however, he at length observed in two pupæ, on the right side only, the dark markings usually preceding the development of the bee, and found, on the pupa-pellicles being discarded the next day, Strepsipterous parasites ready to burst forth had become conspicuously prominent on the opposite side. So long as the *Hylæi* remained in the dark, the parasites made no attempt to leave their pupæ, as an incentive to which light appears essential; for in one instance, some *Hylæi* having become mature in a closed box, where they remained some time, none of the parasitic skull-caps were removed; so that it seems that unless aroused, after assuming the imago state, by the stimulus of light, they die without emerging from the pupa-case. Adverting to the observations of Mr. Westwood and Dr. Siebold on the hexapod larvæ of the Strepsiptera, and those of Mr. Newport on the whole series of changes which take place in the ovum within the body of the female *Stylops*, herself contained within that of the bee, he said that they did not affect the origin of these ova, nor did it appear that their presence had been detected in any larviform Strepsipterous insect obtained from a bee not taken at large, whereby the possibility of extraneous oviposition would be absolutely negated: but the circumstantial evidence affecting the relations of these hexapods with the Strepsiptera is so convincing, and the conditions essential to their future maintenance and propagation—involved in the exploded theory of their hyper-parasitic character—have been so nearly reduced to an *argumentum ad absurdum* by Mr. Westwood, that no reasonable doubt can be entertained upon this point. The male pupæ, as Dr. Siebold affirms, always appearing towards the commencement of summer, but never surviving the winter, it follows that the hexapod larvæ produced in the spring must, by a speedy transition, assume the pupa state at the time when the first pupæ of the males are observed; which well accords with the habits and equally rapid metamorphoses of the *Polistes*, while offering a remarkable contrast to the tardy development of the larvæ of other Strepsipterous genera, which, like *Stylops*, *Halictophagus*, and these parasites on *Hylæus*, are associated with bees long retaining their immature condition, and enjoying comparatively but a brief existence after quitting their cells in the imago state. It is therefore to be regretted that Dr. Siebold, by collectively embodying under one category results derived from the *Stylops* and *Xenos*, and by simply setting forth the deductions so obtained, should have afforded no opportunity of classifying the evidence for the purpose of comparison; whereby its bearing upon other points might be correctly ascertained, and a consistent series of well-assorted facts more accurately propounded.

With regard to the genus to which these parasites upon the *Hylæi* may belong, the general conformation of the antennæ and tarsi might tend to associate them with *Xenos*, yet their habits, consorting with the *Mellifera*, bring them into close relation with *Stylops* and *Halictophagus*, so that they seem to supply a connecting link between *Xenos* and *Stylops*, coinciding with the position which the *Hylæi* themselves occupy between the *Vespidæ* and the *Mellifera*, thus constituting a new genus, for which he would propose the name of *Hylecthrus*, readily distinguished at first sight by the broad laminæ of the antennæ, which are nearly of equal width throughout, whereas in *Xenos* they gradually taper from the middle to the apex; the palpi in the former being less conspicuous, and the thorax less, considerably more gibbous, as well as wider and shorter in proportion. With regard to an opinion which has long prevailed, that the larvæ of the *Hylæi* are parasitical feeders upon the stores of other *Mellifera*, it does not appear to be borne out in those which he has reared; for having obtained many specimens from cells adapted to the size of the larvæ, and constructed in appropriate channels through the pith, the peculiar transparent tapestry of the *Hylæi* being continued throughout each series of cells in uninterrupted succession, he could not but infer that these are no casual intruders or predatory usurpers, but lineal descendants of the original constructors and purveyors. On more than one occasion he had reared *Hylæi* from briars wherein a species of *Osmia* was also met with, but the cells of the one were perfectly distinct from those of the other; the *Hylæus* having simply availed itself of an excavated briar after the *Osmia* had completed its labours, a deposit of acidulous honey being found intermediate between the two sets of cells. Whence could this honey have proceeded, and for what purpose could it have been collected? Can this be the nature of the food upon which the *Hylæus* larvæ subsist, and could it have found its way hither by exuding from the cells of the *Osmia*? This is a problem involving many points difficult to explain, the solution of which—as defining the habits and economy of the *Hylæi*—offers an interesting subject of inquiry. On one occasion he found some pupæ of *Hylæus* in a mud-cased briar containing the deserted cells of an *Odynerus*, the *Hylæi* in this instance being arranged obliquely: it will, however, scarcely be contended that the *Hylæi* were parasitical feeders upon the store laid up for the zoophagous *Odynerus* larvæ, nor was there any trace of subsequent occupation by an *Osmia*. In another instance he found, in an excavated briar, the lower part tenanted by three larvæ of *Cemonus*, and the upper portion by several larvæ of *Hylæus*: in this case, the time for the appearance of the perfect *Cemoni* being prior to that of the *Hylæi*, the latter were destroyed by the former while making their exit. The memoir concluded by saying that the specimens illustrative thereof were now presented to the Society.

Referring to Mr. Saunders's Memoir, Mr. Westwood observed that he had thought the *Hylæi* were parasitic; and Mr. Smith said that he did not believe they were parasitic, for he had seen individuals excavating bramble-sticks for their cells.

Copies of the President's Address at the Anniversary Meeting, and of Part i. vol. i. of the new series of the Society's Transactions, were laid on the table.

May 6, 1850.

J. F. STEPHENS, Esq., V.P., in the chair.

The following donations were announced, and thanks ordered to be given to the donors: 'Isis von Oken,' Heft 3, 4, 8, 9 and 10; presented by Herr Zeller, Honorary Member. 'Entomologische Zeitung' for March; presented by the Entomological Society of Stettin. Specimens of *Scleroderma cylindrica*, Westw., and *S. pedunculata*, Westw.; also pupæ of an *Odynerus*, from Briars, and of *Hylæus*, by Mr. S. S. Saunders, in illustration of his memoir read at the last meeting.

The following gentlemen were balloted for and elected Members of the Society: Francis Walker, Esq.; Samuel Waring, Esq., of Norwood; and Alexander Murray, Esq., of Shenley, Herts. And the following were balloted for and elected Subscribers to the Society: Dr. Lowe, of Balgreen, Slateford, N. B.; Samuel Nevill Ward, Esq., of the Hon. E. I. C. Civil Service, Madras.

Mr. Shepherd exhibited two specimens of *Lobophora polycommata*, W. V., and an extensive series of *Micropteryx purpurella*, Haw., and *semipurpurella*, St., recently taken at Darenth Wood. Among the *semipurpurella* was one remarkable *albino* variety.

Mr. Stainton exhibited specimens of *Micropteryx purpurella*, *semipurpurella* and *unimaculella*, taken at West Wickham; he also exhibited nine species of *Ornix*, forming the *Meleagripennella* group of that genus,—six of these were British, including one new species he had taken the preceding week in Devonshire; he also exhibited a specimen of *Bedellia Orpheella*, taken by Mr. H. Cooke, of Brighton, and stated that the specific name of this insect must sink, as it had been previously described by Zeller under the name of *Opostega somnulentella*; and he had likewise brought for exhibition a specimen of *Aleucis pictaria*, taken by Mr. Ellman near Lewes.

Mr. S. S. Saunders exhibited a female *Stylops* extracted from the abdomen of *Andrena Trimmerana*, after the death of the bee; also two male specimens of the same bee, one with a female *Stylops* in the abdomen, and the other with the exuviae of a male visible.

Mr. J. F. Stephens exhibited three new species of British Micro-Lepidoptera, viz., *Stigmonota dorsana*, from Scotland, *Tinea Caprimulgella*, Von Heyden, and a *Depressaria*.

Mr. Adam White exhibited a new Coleopterous insect, forming a new sub-genus of the family *Languriadæ*, for which he proposed the name *Doubledaya viator*, in honour of the late Edward Doubleday, and read a description of it, of which the following is an abstract.

"Head decumbent in front, at the base of the jaws expanded and wider than the thorax. Thorax as wide as long, margined on the sides, bisinuate at the base, grooved down the middle. Legs very long, the two first pairs somewhat the longest, the femora and tibiæ compressed; tarsi very widely dilated, flat, all the joints wider than long.

"Head and thorax highly polished, ferruginous, the elytra of a pale ochreous red, and with from eight to nine thickly punctured longitudinal parallel striæ.

"This insect is a native of Madras, in the East Indies: the specimen described is unique in the collection of the East India Company."

Mr. Fortnum exhibited two species of *Locusta* captured near Frankfort, from one of which a *Gordius* had extruded, and from the other a dipterous larva, both of which he also exhibited.

The following description, by Mr. Newman, of *Panorpa ruficeps*, a new species from New Holland, was then read.

PANORPA RUFICEPS.

Nigra, capite femoribusque ferrugineis; alis fusciscentibus immaculatis. (Alarum latitudo 1·4 unc. Corporis longitudo, 6 unc.)

Antennæ much longer than the body, slender, gradually tapering to the apex, 57-jointed, the basal joint stout, its length and breadth nearly equal; the second, half as large as the first, its length and breadth also equal; the third, longer than the second and much narrower; the basal, second, and half the third joint are ferruginous, the remainder black: every joint, from the third to the fifty-sixth inclusive, has a short apical bristle on each side, and all of them are clothed with a short velvety down: the head, including the rostrum, is ferruginous excepting the eyes, a triangular spot which encloses the ocelli and the apex of the palpi, all of which are black. Thorax, abdomen, tibiæ and tarsi, black: coxæ and femora ferruginous, except the apices of the latter which are blackish. Wings immaculate, hyaline, suffused uniformly with brown, which is slightly darker on the nervures and stigmata.

Inhabits New Holland. The only specimen I have seen was taken at Port Philip, by Edmund Thomas Higgins, Esq., to whom I am indebted for the opportunity of describing it. The specimen will be deposited in the British Museum.

Some remarks by Mr. S. S. Saunders were then read, on the sense in which Dr. Siebold had used the words "banchseite" and "rückenseite," in his observations on the larvæ of *Stylopidæ*.

Mr. Douglas then read the following description of a new species of *Tineidæ*.

YPSOLOPHUS? PALUSTRELLUS.

Alæ anticæ luteo-albidæ, lineis ad margines radiatis punctisque duobus pone medium nigris. Alæ posticæ griseæ, ciliis lutescentibus.

Expansion of wings 9 lines.

Head and thorax ashy, with a black line continued on the centre of each; palpi ashy, second joint fuscous beneath, terminal joint faintly darker at the apex; antennæ fuscous. Anterior wings yellowish white, covered with black lines which radiate from the centre to the costa and inferior margin, and two black dots beyond the middle. Posterior wings griseous with luteous cilia.

This appears to be a species oscillant between *Ypsolophus* and *Gelechia*; by its palpi, however, the second joint of which is clothed with long porrected scales, it seems to be more related to the former than the latter genus.

Two specimens taken at Yaxley, one in Mr. Doubleday's, the other in Mr. Allis's collection.

He also read a continuation of his memoir on the British species of the genus *Gelechia*, including the following species, viz., *mulinella*, *Tis.* (*R. interrupta*, *Haw.*, non *H.*); *næviferella*, *Z.* (*Tinea* *Knockeella*, *Haw.*), *T. miscella*, *Haw.* (*Microsetia* *aurofasciella*, *St.*); *fugitivella*, *Z.* (*fugacella*, *Sta.*, non *Z.*); *ligulella*, *W. V.* (*albistrigella*, *St.?*); *vorticella*, *Z.*, a species closely allied to *ligulella*; *Hubneri*, *Haw.* (non *granelle*, *H.*); *senectella*, *Z.*, a small dark species somewhat resembling

terrella; Inulella (Aphelosetia), *C.*; Gerronella, *Z.*; divisella, *Doug.* (allied to *mulinella*); Desertella, *Edleston* (allied to *terrella*); Coronillella, *Tischer* (allied to *Anthyllidella*, but larger); suffusella, *Doug.*; Mundella, *Doug.*; pernigrella, *Sta.* (reared by Mr. Gregson from larvæ, off *sallow*); inornatella, *Doug.*; littorella, *Doug.*; immaculatella, *Doug.*; fumatella, *Doug.*; bifractella, *Mann*: the twelve last species were hitherto unrecorded as British.

June 3, 1850.

G. R. WATERHOUSE, Esq., President in the chair.

The following donations were announced, and thanks ordered to be given to the donors: 'Entomologische Zeitung,' for April; by the Entomological Society of Stettin. 'Descriptions of three new Coleopterous Insects, by Messrs. Mulsant, Cl. Rey and Wachanru;' by M. Mulsant. 'Directions for Collecting and Preserving Specimens of Natural History in Tropical Climates;' by the author, Mr. S. Stevens.

The following gentlemen were balloted for and elected Subscribers: Mr. R. W. Meade, Bradford; Mr. C. R. Bree, Stowmarket; and Mr. John Dashwood, Barton-under-Needwood, Lichfield.

Mr. Bedell exhibited *Depressaria assimilella*, reared from larvæ found on broom; *Lithocolletis hortella* and *Tinea Zinckenii*, from West Wickham wood; *Ctenostoma Laburnella?* from fences near Beckenham; and *Coccyx Strobilella*, reared from cones of spruce-fir.

Mr. J. F. Stephens exhibited a shoot of *Ribes sanguineum* which had been quite killed by *Coccus Serpuleformis*, numbers of which were on the bark; he also stated that branches of apple-trees, in his garden, were killed by *Coccus Mytilliformis*.

Mr. Shepherd exhibited a specimen of *Cloantha conspicillaris* recently caught flying at Darenth Wood.

Mr. Westwood exhibited the male and female of *Lyda fasciata*, one of our rarest Hymenoptera; also a shoot of a pear-tree on which the larvæ of this species had fed, showing the damage done by them. He observed, that he had taken them emerging from the earth, under the surface of which they had undergone their final change. He also exhibited leaves of a pear-tree attacked by a Lepidopterous case-making larvæ, probably *Coleophora Hemerobiella*; and he made some observations on the peculiar mode adopted by these curious larvæ to obtain the parenchyma of the leaves, on which alone they subsisted; and as some damage might accrue to the trees from their attack, he thought it desirable that it should be discovered when and where the eggs were deposited.

Mr. S. S. Saunders exhibited pupa-cases of *Rhopalum tibiale*, from a raspberry snag, from which the perfect insects had issued towards the end of May.

Mr. Stainton exhibited specimens of *Lithocolletis tenella*, hitherto one of our rarest species, but which he found abundant on hornbeam, at Wanstead, in May; also a species of the same genus, found at the same time and place, which was the *Ilicifoliella* of his catalogue, and which he now proposed to call *Carpinicolella*; also three specimens of *Micropteryx mansuetella*, recently taken by Mr. C. R. Bree, in company with M. Calthella, at Northfield Wood, near Stowmarket, on *Mercurialis perennis*.

Mr. S. Stevens exhibited *Dryophila Anobioides* and *Hylastes rhododactylus*, also the stump of broom from Plumstead Wood, from which he had obtained them. He also exhibited a new species of *Dorytomus*, allied to *D. tæniatus*, from Wimbledon Common; *Pogonus Burrellii*, found in soft mud on the shore at Sheerness; splendidly coloured specimens of *Lixus bicolor*, from Deal, and *Psyche retiella*, from Southend; the last insect he thought was attached to *Plantago maritima*.

Mr. W. W. Saunders exhibited some insects set up as specimens of the method of preserving and displaying used by Mr. Ernard, who was about to proceed to Surinam on a collecting expedition. With them were some spiders, of which the form and colour were beautifully retained. He also stated that the collection of insects belonging to M. Saville, containing types of all the species described by him, was offered for sale. Mr. Saunders also exhibited some leaves of *Rhododendrons* greatly attacked by *Otiorhynchus sulcatus*; also two different kinds of pupæ enclosed in net-like cases, and an anomalous pedunculated little bag which appeared to be full of eggs of an insect, this receptacle being in the centre of a much larger bladder-like formation; all collected at Santarem, by Mr. Wallace.

Mr. Weir exhibited a singular Lepidopterous insect recently captured, more like an *Argyresthia* than any other genus, but not agreeing with any known species.

Mr. Smith, on the part of Mr. Gould, exhibited four different species of *Bombi* found impaled on thorns, and stated that it was Mr. Gould's opinion that they were not so fixed by shrikes as commonly believed. Mr. Smith also exhibited a quantity of the eggs of *Meloe*, and said that another batch, deposited by a female on the 7th of April, had hatched on the 2nd of June. On the 27th of April he took eleven specimens of *Pediculus Melittæ* from the bodies of *Melœta punctata*, which was much earlier than any larvæ of *Melœ* were ever known to be hatched; and this fact tended more strongly than ever to confirm his opinion that *Pediculus Melittæ* of Kirby, was not the larva of a *Melœ*. He mentioned as a curious fact, that all bred specimens of Hymenoptera were larger than those captured at large. He then exhibited a new British species of *Nomada*, a new British species of *Crabro*, and a new species of *Chrysis*, taken near Bristol; all from the collection of Mr. Hewitson.

Mr. Stainton, on behalf of Mr. Logan, exhibited some small Lepidopterous larvæ, which drew up the tops of *Helianthemum vulgare*, at Arthur's Seat, near Edinburgh; and he stated that from the leaves of *Helianthemum*, exhibited at the April meeting, he had reared *Elachista Staintoni*.

The following descriptions of some new Aculeate Hymenoptera from Epirus, by Mr. S. S. Saunders, were then read, accompanied by some observations on their structure and habits:—

Family MUTILLIDÆ, *Leach*.

Genus MYRMOSA, *Latr.*

MYRMOSA NIGRICEPS.

Niger, thorace rufo, antice rectè truncato, angulis acutis; abdominis segmentibus pilis albidis fimbriatis; alis obscuris; antennis pedibusque nigris. Mas. Long. corp. $\frac{7}{12}$ — $\frac{3}{8}$ unc. Exp. alar. 1 unc.

Family SCOLIADÆ, *Leach*.

Genus PARAMERIA, *Savigny*.

PARAMERIA GRÆCA.

Castanea, pilis albidis densè vestita; femoribus, tibiis, mandibulorum apice,

costaque alarum piceis; abdominis segmentis quatuor basalibus (præter petiolum) nigris; secundo tertioque fasciâ apicali medio interruptâ, utrinque emarginatâ, lateribus haud attingenti albâ notatis; alis obscuris; oculis nigris. Femina.

Long. corp. $\frac{5}{12}$ unc. Exp. $\frac{5}{12}$ alar. $\frac{1}{3}$ unc.

Family EUMENIDÆ, *Westwood.*

Genus RAPHIGLOSSA, *Saunders.*

Caput magnum subrotundum, subtus obliquè complanatum, thoraci ferè latitudine cœquale. Oculi internè emarginati. Mandibulæ obtusæ, apice transversè serrato. Labium longissimum, intra coxas acuforme retrorsum, cum maxillis vix brevioribus, productum. Clypeus anticè excavatus, labium porrectum ad recipiendum et dirigendum. Thorax truncato-convexus, medio vix dilatatus subtus canaliculatus. Antennæ, thoraci ferè longitudine cœquales. Alæ anticæ cellulis cubitalibus quatuor, quarum secunda et tertia singulatim venam recurrentem accipiunt, primâ magnâ, basi ampliori; secundâ parvâ subtriangulari, lateribus anticè valdè approximatis, venam recurrentem recipiente; tertiâ subquadratâ, externè latiori, secundum recurrentem accipienti; apicali clausâ.

Sp. 1. RAPHIGLOSSA EUMENOIDES.

Elongata, nigra, flavo-notata, antennis pedibusque testaceis, abdomine flavo-fasciato.

Long. corp. $\frac{2}{3}$ — $\frac{3}{4}$ unc. Exp. alar., 1 unc.

Habitat in Epiro, in rubis exsiccatis prope Sinum Ambracicum nidificans.

Sp. 2. RAPHIGLOSSA ODYNEROIDES.

Nigra, flavo-notata, labio usque pectoris medium producto; pedibus flavis, basi nigris; abdomine flavo-fasciato; *maribus*, antennis nigris subtus flavescens; *feminis*, capite maximo, antennis flavescens, prope apicem obscuris.

Long. corp. 6—7 lin. ♂, 8½ lin. ♀. Exp. alar. 10½ lin. ♂—1 unc. ♀.

Habitat in Epiro cum præcedentibus.

This paper was accompanied by two plates of illustrations, presented by the author.

Mr. Yarrell read a letter addressed to him by Dr. Lukis, of Guernsey, containing some observations on the natural history of the Channel Islands, and stating, among other things, that each island had to a certain extent a fauna of its own, as certain reptiles, quadrupeds and insects found in one were not found in another, although the distance between them was not more than eight miles in one case, and twenty miles in another. Mr. Yarrell mentioned as a fact within his own knowledge, that although the water in the canal at Stockbridge, Hants, was always one degree colder than in the adjoining river Test, yet the May-flies invariably appeared from the canal some days sooner than from the river.

July 1, 1850.

WILLIAM SPENCE, Esq., V. P., in the chair.

The following donations were announced, and thanks ordered to be given to the donors: 'Annals of Lyceum of Nat. Hist. New York,' Sept. 1848; by the Lyceum. 'Entomologische Zeitung,' for May; by the Entomological Society of Stettin. 'Statuten und Namen der Mitglieder des Munchener Vereins für Naturkunde, and Isis, 1850, No. 1;' by the Munich Natural History Society. 'On the Pselaphidæ of the United States' and a 'Synopsis of the Cleridæ of the United States;' by the author, Dr. John L. Le Conte.

Four impaled Bombi (exhibited at the preceding meeting); by Mr. Gould. Specimens of Apion Sedi and Pogonus Burrellii; by Mr. S. Stevens. A collection of Lepidoptera; by Mr. Douglas.

John Lubbock, Esq., of High Elms, near Farnborough, and the Rev. Hamlet Clark, of Northampton, were elected members of, and John Walker, Esq., of Chesterfield, was elected a subscriber to the Society.

The President announced that the prize offered for the best monograph of a genus of Tortrices, had been awarded and sent to Mr. Logan for a monograph of the genus *Penthina*.

The President also announced that the Council had appointed Mr. E. W. Janson, Curator to the Society.

Mr. S. Stevens exhibited living specimens of *Gracilia minuta*, with the willow basket-lid in which they had bred; also *Sericoris littorana* reared from thrift (*Statice armeria*) growing below Gravesend, and *Elachista rufocinerea* and *E. cerusella* taken in copulâ. He also exhibited a *Psecadia funerella*, taken early in June, near Kirkby Stephen, Westmoreland, by Mr. Hewitson.

Mr. Bond exhibited several *Psecadia funerella* from Whittlesea Mere; also *Chilo mucronellus*, *Nascia cilialis*, *Eupithecia sparsata*, and *Zeuzera arundinis*, from the same locality.

Mr. J. F. Stephens exhibited pupa-cases of *Zeuzera arundinis* protruding from reeds in which the larvæ had fed; and Mr. Bond stated that the pupæ, although possessing but small spines, moved up and down the inside of the reeds with as much rapidity as the larvæ. Mr. Westwood said that he had seen cases of a Dipterous insect, probably a *Cecidomyia*, sticking out of reeds just in the same manner as these *Zeuzera*: they would probably prove to be those of a new species, as this economy was quite new in the history of the genus.

Mr. F. Smith said that having in former years found *Baris laticollis* at the roots of *Sisymbrium officinale*, he searched for it again this season; but found, instead of those insects, some larvæ which he supposed to be those of *Leiosoma punctata*. He also stated that he had observed attached to the posterior segments of the abdomen of a common *Hydrobius* a receptacle containing eggs, one of which he had examined microscopically, and found in it a living larva.

Mr. White read part of a biographical notice of Dr. Leach; and also a letter from Mrs. Hamilton, in which the capture of a *Curculio*, probably *Acanthothorax longicornis*, in India, was recorded.

Mr. Westwood exhibited drawings of the larva and pupa-case of *Psyche nigricans*,

found by Mr. Weaver in the New Forest; and stated that Mr. Weaver had taken two other species of *Psyche* new to Britain,—and in Scotland *Cetonia ænea* and *Pytho depressus*.

Mr. Westwood exhibited larvæ of *Lymexylon navale* in wood from Pembroke dock-yard, where it had proved very destructive to Italian oak which had been lying there since 1846: it had been suggested that the wood should be placed in the steam-kiln in order to effect the destruction of these larvæ, and this plan was to be tried.

Mr. Westwood read a portion of a paper entitled 'Notes on Strepsiptera,' and exhibited drawings in illustration.

Mr. Stainton read a description of *Micropteryx Aruncella*, *Scopoli*, as an addition to his monograph of the genus.

The following is an abstract of Mr. Stainton's paper. "In my monograph of the genus *Micropteryx* I have incorrectly described as *Aruncella* of *Scopoli*, a distinct, but closely-allied species; the name to be retained for the insect there described (see p. 30) is *Seppella*, *Fab.* In the male *Aruncella* the fascia is more slender, straighter, and nearer the base than in *Seppella*; the entire absence of the silver spot towards the apex in *Aruncella* hardly forming so decided a character, as in many specimens of *Seppella* it is scarcely visible. Mr. Stephens has specimens from Darenth Wood, and Mr. Thomson once met with it on the grassy bank between Sydenham and Penge."

August 5, 1850.

G. R. WATERHOUSE, Esq., President in the chair.

Mr. F. Smith was balloted for and elected a Member of the Society.

The following letter from Mr. Spence was then read:—

"18, Lower Seymour Street, Portman Square, July 20, 1850.

"My dear sir,—My attendance at the meeting of the British Association at Edinburgh, on the 31st instant, will prevent my being present at the next meeting of the Entomological Society, but I cannot refrain from offering to you and our members, my sincere condolence on the irreparable loss which we have all sustained by the death, since we last assembled, of our revered and beloved Honorary President, and the father of Entomology, the Rev. William Kirby, M.A., who died at Barham, near Ipswich, where he had resided sixty-eight years, on Thursday the 4th of this month, in the ninety-first year of his age.

"I need not expatiate on the vast debt of gratitude which this Society owes to our departed Honorary President, for the deep interest he has always taken in its prosperity, and for the precious gift which he made to it some years since, of his entire collection of insects; invaluable, as being the depository of his Entomological discoveries during a long life, and of the precise individual species referred to in the descriptions of his papers in the Linnean Transactions, and of his general works on the science.

"Nor is it necessary to point out to you and our members, who so justly appreciate

his merits, what important services he has rendered to Entomology. You will all agree with me, that had he published no other work than his 'Monographia Apum Angliæ,' his first separate one, which appeared in 1802, he would have ranked as one of the first Entomologists of the age: a title which was at once assigned to him by every student of the science, foreign as well as British, capable of estimating the unwearied perseverance with which he had collected his materials, the value of his new observations on the anatomy of bees, and the large and philosophical grasp with which he had arranged them, under the families (or, as they are now considered, genera) into which he distributed them. Nothing can show more strikingly the ardour of his zeal for the science, than the fact that he took lessons in the art of etching, to enable him to give from his own hand, sketches of the parts of the mouth, on which his family characters mainly depended. But when to this great work we add his 'Monograph of Apion,' 'Century of Insects,' memoir 'on the order Strepsiptera,' and other valuable papers in the 'Transactions of the Linnean Society;' the 'Introduction to Entomology,' written in conjunction with myself; the Entomological portion of his 'Bridgewater Treatise,' 'On the History, Habits and Instincts of Animals;' and the 'Description of the Insects of the northern parts of British America,' occupying a quarto volume of Sir John Richardson's 'Fauna Boreali-Americana,' it will be evident how extensively and successfully he has cultivated our favourite science, and how deeply it is indebted to him.

"It will always be to me a source of self-gratulation, that about the year 1808, when we were in active correspondence respecting British insects, the idea occurred to me of proposing to my excellent friend that we should write an Introduction to Entomology together, and that further consideration led me (as explained in our preface, which, on that account, Mr. Kirby would have me write*) to advise our giving it a popular form, as it was this form which enabled him to interweave in it, under their respective heads, the great number of detached observations from his note-book, collected during many years, on the economy and habits of insects, which would otherwise, in all probability, have been lost to the world, and which, independently of its scientific merit, of which, I need not say, that by far the largest share belongs to my revered coadjutor, stamped it with an originality, that elementary works can rarely claim.

"I should be negligent of the interest of the rising race of Entomologists if I omitted to mention for their imitation, one of the peculiar features of Mr. Kirby's investigations of insects, deeply impressed on my recollection, during my long intercourse with him as a visitor at Barham, often for months together, in several years, when we were engaged in the preparation of our work, namely, the patient and minute examination which he always gave to the subject in hand, and the slow and cautious way in which he drew his conclusions, which on this account were almost always correct.

"One concluding remark I must make with reference to the vast amount of additional enjoyment which our revered friend derived from the study of Entomology. Simply as a pious country-clergyman, conscientiously fulfilling all the duties of his office, and beloved by his parishioners of every class, and as one of the most friendly,

* The paragraphs towards the middle, relative to the religious bearing of our work, were added by Mr. Kirby.

simple-minded and kind-hearted of men, he would have led a happy life ; but his happiness was largely increased by his love of Entomology, which supplied him with interesting objects of observation in every walk, and of investigation for every leisure hour, when within doors, yielding him constant delight from the new facts and discoveries that were almost daily rewarding his researches, while at the same time he was extending his friendships with all the first naturalists of this country and of Europe, and his fame was so widely spread, that long before the close of his career, his name would have been a sufficient passport for his claiming acquaintance with the men of science of every large town of Europe and America. In short, if

“ Honour, love, obedience, troops of friends ”

would have attended his old age without Entomology, with it, these consolations were heaped on him tenfold, and in all probability, greatly contributed to his long life ; and we may all congratulate ourselves on having had the honour and privilege of being so long presided over by one, who has so conclusively proved the value of our science, both as largely multiplying the enjoyments of those who cultivate it, and as promoting the best interests of science and mankind.”

“ I am, my dear sir, yours very truly,

“ W. SPENCE.”

“ G. R. WATERHOUSE, Esq., President of the
Entomological Society.”

Mr. Westwood moved, and Mr. Stephens seconded, and it was unanimously agreed to request that Mr. Spence would draw up for publication in the Transactions, a biographical and bibliographical memoir of Mr. Kirby, in which the substance of this letter should be incorporated, and also that he would allow a portrait of Mr. Kirby, in his possession, to be lithographed and added.* The President then

* Mr. Spence not wishing to interfere with a memoir of Mr. Kirby's Life, now in preparation by a relative well qualified for the task, has preferred adding here, to the scientific notices of Mr. Kirby in the above letter, a short account of his ancestry, early life, &c., chiefly from an article furnished to the ‘ Literary Gazette ’ of July the 20th, by the same gentleman who purposes publishing a more extended memoir. Mr. Westwood has kindly added a complete list of Mr. Kirby's Entomological Works and papers ; and Mr. Spence has much pleasure in complying with the Society's request, by furnishing lithographed copies of a pencil-sketch of his revered friend, taken by his eldest son, Mr. W. B. Spence, at Barham, two years ago, which presents a faithful and characteristic profile-likeness of him at that period.

Mr. Kirby is descended from a family deserving honourable mention, from its connexion with literature.

“ Mr. Kirby's grandfather, John Kirby, born in the year 1690, was the author of ‘ The Suffolk Traveller ; ’ a work of no mean reputation in its day. Mr. Kirby's uncle, Joshua Kirby, was the author of Dr. Brook Taylor's ‘ Perspective made Easy ; ’ he was an intimate acquaintance of Gainsborough, and frequently his adviser ; and such was Gainsborough's regard for his friend, that he made a special request in his will that he might be buried by his side ; a desire which was carried into effect. This Joshua

submitted to the meeting, that out of respect to the memory of Mr. Kirby, all scientific business should be adjourned, which was unanimously agreed to.

Kirby afterwards became a great favourite with his majesty George III., and received, through his patronage, the office of comptroller of the works at Kew. The celebrated Mrs. Trimmer was his daughter, and consequently first-cousin to the subject of this memoir.

“Mr. Kirby was born in the year 1759, at Winesham Hall, in the county of Suffolk, the residence of his father, who was by profession a solicitor; he was educated at the Grammar School in Ipswich, whence he removed, in his 17th year, to Caius College, Cambridge. Here he pursued his studies with diligence, and laid so good a foundation, that he subsequently earned the reputation of being a sound and accurate scholar. In the year 1781, he took the degree of B.A.; in the year 1782 he was admitted into Holy orders, having been nominated by the Rev. Nicholas Bacon to the joint curacies of Barham and Coddendam. By his exemplary conduct in the discharge of his parochial duties, he so gained the esteem of Mr. Bacon, that he left him by his will the next presentation to the rectory of Barham; to this he was inducted in the year 1796, so that for sixty-eight years he exercised his ministry in the same charge, residing also in the same parsonage-house.”

Mr. Kirby's first taste for Natural History was excited, as he told Mr. Spence (see address to the Entomological Society, January 22nd, 1849, p. 10), by his mother having been accustomed to lend him, when a child, occasionally as a treat, some of the foreign shells in her cabinet to look at and admire. This early admiration of the works of creation led him, soon after he entered on his curacy at Barham, to direct his attention to Botany, and he closely studied and made a collection of all the phænogamous plants in his neighbourhood. When these were exhausted, his attention was turned to Entomology, as he has himself so interestingly related (Introd. to Ent. Vol. II., p. 227), by the circumstance of observing on his window, a yellow cow-lady (*Coccinella 22-punctata*), his admiration of which, led him to collect other insects, and as great events often arise from trifling causes, the whole of his Entomological career probably depended on his having been struck by this insect.

“The energies of his powerful mind were with equal diligence directed to the study of Theology. In the year 1829, he published a volume of Sermons, partly (to use his own language) to show that while he devoted so much of his time to the study of God's works, he had not been negligent of his word. Mr. Kirby was appointed to write one of the ‘Bridgewater Treatises,’ which he published in the year 1835. The manner in which he executed this task, although in his 76th year, is too well known to need any comment; his earnest desire was to see God in all things here, his fervent hope was ‘to see all things in God hereafter.’”

Mr. Kirby was twice married, but left no issue. Besides being Honorary President of this Society, Mr. Kirby was President of the Ipswich Museum, Fellow of the Royal, Linnean, Zoological and Geological Societies, and Honorary Member of several foreign societies. “He was interred on Thursday (the 11th), in the chancel of Barham Church. The funeral, in compliance with his expressed wish, was as private as possible, but a great number of friends, nearly the whole of his own, and many of the adjoining parishes, attended to pay the last tribute of respect to deserving worth.”

Mr. Kirby's Entomological and other scientific publications, of which a complete list has been kindly supplied by J. O. Westwood, Esq., are as under :—

1. 'Descriptions of Three New Species of Hirudo, with a Note by G. Shaw.' *Linn. Trans.* ii. p. 316, 1793.
2. 'A History of Three Species of Cassida.' *Linn. Trans.* iii. pp. 7—11. Read January 7th, 1794.

In this memoir, the necessity for investigating the preparatory stages of each particular insect in order to form a complete system of Entomology is insisted upon; the general characters of the larva and pupa of the genus *Cassida* are described, as well as the three states of the three following species:—1. *C. liriophora*, *K.* = *C. Vibex*, *Linn.*, the larva of which feeds on *Serratula arvensis*. 2. *C. viridis*, *K.* = *C. equestris*, *Fab.*, the larva of which feeds on the same plant. 3. *C. maculata*, *K.*, *Linn.* = *C. Murraea*, var. *Linn.*, the larva of which feeds on *Inula dysenterica*.

3. 'Letter to Mr. Marsham, containing observations on the Insects that infested the Corn in the year 1795.' *Linn. Trans.* iii. pp. 246—249.

In this letter, Mr. Kirby notices and describes the different states of several species of Thrips found by him on the wheat, as well as the citron-coloured larva (subsequently found to be that) of *Cecidomyia Tritici*.

4. 'Ammophila, a new Genus of Insects in the class Hymenoptera, including the *Sphex sabulosa* of Linnæus.' *Linn. Trans.* iv. pp. 195—212. Read December 5th, 1797.

The examination of the parts of the mouth and especially of the tongue and the valves which inclose it (or speaking in modern terms, the labium, its lacinia and the terminal lobes of the maxillæ), led Mr. Kirby to separate the *Sphex sabulosa* and its immediate allies from the other Linnean Spheges; the former of which, on account of the structure of these parts of the mouth, Mr. Kirby says that he would place between *Vespa* and *Apis*. He follows Linnæus and Fabricius in giving in detail the *character naturalis*, as well as the more concise *character essentialis* of the genus, which is followed by a *synopsis specierum*, and full descriptions with synonyms of 1. *A. vulgaris* = *Sphex sabulosa*, *Linn.* 2. *A. affinis*, n. sp. 3. *A. hirsuta*, *Scop.* = *arenaria*, *Fab.* 4. *A. argentea*, n. sp. = *hirsuta*, male. It is remarkable, that notwithstanding the care with which the characters of these insects were examined, the author should have had no idea of the sexual distinctions afforded by the number of joints of the antennæ, or the structure of the fore-legs, and that the arrangement of the veins of the wings should have been overlooked, although Harris had previously employed this character in his work on 'English Insects.' The paper is accompanied by a plate executed by the author himself, containing figures of the details of the characters of *Ammophila* and the allied genera.

5. 'History of *Tipula Tritici* and *Ichneumon Tipulæ*, with some observations upon other Insects that attend the wheat,' in a Letter to Thomas Marsham, Esq., Sec. Linn. Soc., *Linn. Trans.* iv. pp. 230—239. Read February 6th, 1798.

In this paper the natural history of the minute but very destructive *Cecidomyia*

Tritici, a new species of minute Tipulidæ is recorded, together with that of its parasite *Ichneumon Tipulæ*, a species belonging to Latreille's genus *Platygaster*.

6. 'A Continuation of the History of *Tipula Tritici*,' in a letter to Thomas Marsham, Esq., Treas. Linn. Soc. *Linn. Trans.* v. pp. 96—111. Read February 5th, 1799.

The economy and transformations of *Cecidomyia Tritici* are here further elucidated (although the male still remained unobserved), and descriptions are added of three parasites which keep it in check, namely, 1. *Ichneumon inserens* (*Encyrtus* sp.?) 2. *I. Tipulæ* (*Platygaster Tipulæ*), and 3. *I. penetrans* (*Macroglenes penetrans*, Westw. fam. *Chalcididæ*).

7. 'Observations upon certain Fungi which are parasites of the Wheat.' *Linn. Trans.* v. p. 112. Read February 5th, 1799.
8. 'Some Observations upon Insects that prey upon Timber, with a short History of the *Cerambyx violaceus* of Linnæus.' *Linn. Trans.* v. pp. 246—260. Read Nov. 5th, 1799.

The introductory part of this paper contains a summary of the habits of the xylophagous insects belonging to the different orders of insects (subsequently dilated into one of the most interesting chapters of the 'Introduction to Entomology'), which is followed by a more precise detail of the economy of the *Cerambyx* (*Callidium*) *violaceus*, *Linn.*, observed by Mr. James Trimmer of Old Brentford, in fir timber of English growth. Figures of the insect in its different states, and of the method of its attack upon timber are added.

9. 'Monographia Apum Angliæ; or an attempt to divide into the natural genera and families such species of the Linnæan genus *Apis* as have been discovered in England, with descriptions and observations. To which are prefixed some introductory remarks upon the class Hymenoptera, and a Synoptical Table of the nomenclature of the external parts of these insects, with plates.' 2 vols. 8vo., pp. xxii, 258 and 388. Ipswich, 1802.

The title page sufficiently explains the object of this treatise on the British species of bees, which may justly be said to be the most perfect monograph hitherto published on any extensive group of insects. The introductory portion of the first volume, comprises a general survey of the views entertained by preceding authors concerning these insects, both as regards their structure and classification, and a description of all the different parts of the body of the perfect insect. This is followed by a very elaborate account of the various "genera and families, or orders," or as we are now accustomed to term them, families, sub-families and genera, their structure and habits, with a description of the fourteen plates of outlines, etched by Mr. Kirby himself, illustrating the sectional characters of these groups (the last of which contains figures of the *Pediculus Melittæ* and *Stylops Melittæ*). The second volume is occupied with the description of the species of bees, namely, 111 *Melittæ* (*Andrenidæ*), and 110 *Apides* (*Apidæ*), and is illustrated with four plates of the perfect insects, containing fifty coloured figures.

It is very worthy of remark that precisely at the period when this work was published, Latreille was engaged upon a treatise upon the same insects, which ap-

peared in one of the supplementary memoirs appended to the 'Histoire naturelle des Fourmis,' published at Paris in 1802, the same year in which the 'Monographia Apum Angliæ' was published. To show that these two authors worked independently of each other, and that by following Truth as their guide they arrived, to a remarkable extent, at a similar result, it will be sufficient to refer to the remarks subsequently published by Latreille, in the third volume of his 'Histoire naturelle des Crustacés et des Insectes,' pp. 369—371, and by Kirby in the 'Linnean Transactions,' ix. p. 2. The recognition of each other's merits by these two "heroes scientific," at a time when England and France were engaged in deadly strife, is one of the most graceful testimonies to the tranquillising power of the study of nature which can well be conceived.

A condensed sketch of this work appeared in 'Illiger's Magazine,' vol. v. p. 28. 1806.

The fourteen plates of the first volume of this work were etched by Mr. Kirby himself, who had already in his paper on *Ammophila*, exercised his skill in this direction. The plates of the second volume were, I believe, engraved by Sowerby.

10. 'The genus *Apion* of Herbst's Natursystem considered, its characters laid down, and many of the species described.' *Linn. Trans.* ix. pp. 1—80. Read June 4th, 1805.

In the introductory observations, Mr. Kirby discusses at some length the various modes of distribution proposed for grouping or dividing the great Linnæan genus, *Curculio*, and adopts Herbst's genus *Apion*, of which he gives long descriptive "essential," "artificial" and "natural" characters; followed by descriptions, after the manner of the 'Monographia Apum Angliæ,' of the sixty species with which he was then acquainted, including several Swedish species which he had received from Major Gyllenhal. In this memoir, the great benefits resulting from the possession of the Linnæan cabinet of insects in this country were also exemplified, in the accurate determination and detailed descriptions of several of the Linnæan species. Of the sixty species described in this monograph, not fewer than twenty-eight were new, exclusive of the splendid *Apion Limonii*, described in the Addendum at the end of the memoir, and figures of twenty of the species were given in the accompanying plate.

11. 'Descriptions of Seven New Species of *Apion*.' *Linn. Trans.* x. pp. 347—354. Read Dec. 5, 1809.
'Additional Observations.' *Id.*, pp. 354—357.

We here find the first notice of 'an intended Introduction to Entomology,' by Mr. Kirby and his "learned and very ingenious friend and coadjutor, William Spence, Esq., F.L.S., whose eye nothing escapes, and who directed my attention to the trochanters (for, by this name, in the work above alluded to, we have agreed to distinguish what I formerly called the second or femoral joint of the apophysis), in *Apion*, as differently circumstanced from those of other Coleopterous genera." This peculiarity is then described, and in the additional remarks on the previously described species, attention is paid to the characters afforded by these basal parts of the legs.

12. 'Strepsiptera, a new order of Insects proposed; and the characters of the order, with those of its genera laid down.' *Linn. Trans.* xi. pp. 86—122. Read March 19th, 1811.

This is one of the most remarkable memoirs ever published. Mr. Kirby himself

had been so fortunate as to observe the development of the male of that strange insect, which he described in his 'Monographia Apum Angliæ' under the name of *Stylops Melittæ*. He had subsequently become acquainted with Rossi's description of the allied *Xenos Vesparum*, and had also received specimens of an American species of *Xenos* from Professor Peck. With these materials, aided by the inimitable pencil and microscope of F. Bauer, Mr. Kirby arrived at the conclusion, by a train of argument of the most instructive nature, that these insects constitute a distinct order, of which he laid down the characters derived from a most scrutinizing examination of every part of the insect, as well as a consideration of its preparatory states, so far as he was at that time acquainted with them. He also characterized in detail, the two genera *Stylops* and *Xenos*, the latter of which contained two species, *X. Rossi* (*X. Vesparum*, *Rossi*), and *X. Peckii*, the latter reared from *Polistes fuscata*, *Fabr.* Mr. Kirby likewise describes a new species of genuine *Vespa* (*V. concolor*), in which he had found the *exuvia* of a species of *Xenos*. It is greatly to be regretted that Mr. Kirby had not obtained a knowledge of the sexual distinctions of the *Strepsiptera*, and that Mr. Bauer's drawing, representing the *pseudelytra*, attached to the base of the fore legs, led Mr. Kirby, and subsequently other authors, into incorrect ideas of the relations of these curious appendages.

13. 'Addendum to *Strepsiptera*.' *Linn. Trans.* xi. pp. 233, 234. Read February 16th, 1813.

In this short paper, Mr. Kirby describes a new British species belonging to the order which he names *Stylops tenuicornis* (subsequently described by Mr. Curtis, under the name of *Elenchus Walkerii*), and likewise alludes to Frisch having been the first author, who (on the testimony of Latreille) is said to have used the reticulation of the wings for generic and secondary characters.

14. 'An Introduction to Entomology, or Elements of the Natural History of Insects, with Plates.' By W. Kirby and W. Spence. 4 vols., 8vo. London, 1815, &c.

The object of the authors in planning this work, was to supply an elementary work upon the subject of insects fuller and more complete than Curtis's translation of the 'Fundamenta Entomologiæ,' and Yeat's 'Institutions of Entomology,' and less expensive than Barbut's 'Genera Insectorum,' works now almost forgotten, but which were then the only introductory treatises published in this country. In order to render their work as instructive and entertaining as possible, they devoted the first two volumes to the interesting discoveries of Reaumur, De Geer, Bonnet, Lyonet, the Hubers, &c., as well as their own individual observations, arranged under distinct heads, a great portion of which were unknown to the English reader, no other similar generalization being then extant, except a slight attempt in Smellie's 'Philosophy of Natural History,' and a confessedly imperfect one in Latreille's 'Histoire naturelle des Crustacés et des Insectes.'

It is almost needless to give any detailed sketch of a work so well known as the one before us, which has passed through six English editions. The following summary will suffice.

- Vol. I.—Objections to the Study of Entomology answered; Metamorphosis of Insects; Injuries caused by insects to man, animals, plants, furniture, clothes, &c.; Benefits derived from insects; Affection of insects for their young;

Food of insects; Stratagems of insects; Habitations of solitary and social insects.

Vol. II.—Societies of insects (imperfect and perfect societies); Means by which insects defend themselves; Motions of insects; Noises produced by insects; Luminous insects; Hybernation of insects; Instinct of insects.

Vol. III.*—Definition of the term insect; Egg state; Larva state; Pupa state; Imago state; External anatomy of the head and its parts; Anatomy of the trunk and its parts and organs; Anatomy of the abdomen and its parts.

Vol. IV.—Internal anatomy and physiology of insects; Sensation; Respiration; Circulation; Digestion; Secretion; Reproduction; Motion; Diseases of insects; Senses of insects; Orismology, or explanation of terms; System [or classification] of insects; History of Entomology; Geographical and local distribution of insects; Seasons, &c.; Entomological instruments; Modes of collecting, breeding, preserving and investigating insects; List of authors, &c.

Vol. I., London, 1815; Id., 2nd edition, London, 1816; Id., 3rd edition, London, 1817.

Vol. II., London, 1817; Id., 2nd edition, London, 1818; Id., 3rd edition, London, 1822.

Vols. III. and IV., London, 1826.

Vols. I. II. III. and IV., 4th edition, London, 1828; Id., 5th edition, London, 1838.

Vols. I. and II., 6th edition, with much additional matter, London, 1843.

Index to 4th and 5th edition, London, 1838.

Translated into German by Oken, and published 1823, 24, 27 and 33.

Some of the chapters of the first and second volumes, also translated by Oken and published in the 'Isis,' and others translated into French, and published in Silbermann's 'Revue Entomologique.'

15. 'A Century of Insects, including several New Genera described from his cabinet.' *Linn. Trans.* xii. pp. 375—453. Read November 4th, 1817.

Previous to the commencement of the present century, very few insects from

* The third and fourth volumes of this work were not published until 1826, in consequence of the continued ill-health, at that period, of Mr. Spence, "which has devolved upon Mr. Kirby a considerable increase of labour, and demanded a greater expenditure of time than would otherwise have been required, for though Mr. Spence put every facility in Mr. Kirby's power, and had drawn up a rough copy of every letter belonging to his department: yet as most of them had been written several years ago, many curious facts and a great variety of interesting information subsequently derived from various sources, were necessarily to be inserted, and the whole prepared for the press."—*Advertisement*, vol. iii. It is subsequently stated, that the theory of instinct given in the second and fourth volumes, is from the pen of Mr. Spence. The above is, I believe, the only indication of individual authorship in these volumes which has hitherto been published.

Brazil had found their way to the collections of Europe. About the time, however, when this memoir was read, Latreille published the descriptions of a considerable number in Humboldt and Bonpland's great work, and Dr. Klug described many beautiful species in his several papers in the 'Nova Acta.' To complete the trio, Mr. Kirby, in the present paper, described a considerable number of Brazilian species, chiefly Coleoptera. The following new genera were described in this paper, *Pelæcium* (Carabidæ), *Anelastes* (Cebrioidæ), *Eurypus*, *Axina*, *Priocera* (Cleridæ), *Geniates*, *Apogonia* (Lamellicornia), *Psammodes*, *Oxura*, *Scotinus*, *Sphærotus*, *Strongylium*, *Eurynotus*, *Adelium* (Tenebrionidæ), *Spheniscus*, *Stenochia* (Helopidæ), *Gnathium* (Meloidæ), *Rhinotia*, *Eurbinus*, *Rhinaria* (Curculionidæ), *Lamprosoma* (Chrysomelidæ), *Choragus*, raised to the rank of a distinct family, *Choragidæ*, type *C. Sheppardi*, taken at Offton in Suffolk, by Mr. Sheppard (*streuve saltans*); one species of *Blatta*, one of *Mantis*, one of *Fulgora* and *Gonyleptes*, a new genus of *Phalangidæ*. It will be seen that Mr. Kirby here first adopts the uniform termination of idæ for his families, which correspond pretty nearly with the Linnæan genera. This paper is illustrated by two splendidly coloured plates by Mr. John Curtis, containing representations of thirty-two of the most interesting of the species.

Republished in Paris by M. Lequien, in 8vo., Paris, 1834, with 4 coloured plates.

16. 'A Description of several New Species of Insects, collected in New Holland, by Robert Brown, Esq. F.R.S., &c.' *Linn. Trans.* xii. pp. 454—478. Read February 17th, 1818.

Thirty-three species of Australian insects, chiefly Coleoptera, are described in this memoir, including eight species of *Buprestis*, and the following new genera, *Bolboceras* (allied to *Geotrupes*), *Distichocera* (Cerambycidæ), and *Achilius* (allied to *Fulgora*). A plate by Mr. John Curtis, contains coloured figures of thirteen of the most beautiful of the species.

17. 'The Characters of *Otiocerus* and *Anotia*, two New Genera of Hemipterous Insects belonging to the family Cicadiidæ; with a description of several species.' *Linn. Trans.* xiii. pp. 12—23. Read March 2nd, 1819.

These are two small but very curious genera of Homoptera, allied to *Fulgora* and *Delphax*; *Otiocerus* being remarkable for its long wings and for having the antennæ furnished with long tortuous appendages: eight species from Georgia, collected by Abbot, and sent to Francillon; and *Anotia* having the terminal joint of the antennæ much elongated: one species from Georgia.

18. 'An Account of the Animals seen by the late Northern Expedition whilst within the Arctic Circle.' London, 1821, 4to. Being a Supplement to the Appendix of Captain Parry's Voyage for the discovery of a North-west passage, in 1819-20. The insects described by the Rev. W. Kirby.

The only species captured during this voyage in the high latitudes are *Bombyx* (*Psychophora*) *Sabini*, *Bombus arcticus* = *Apis alpina*, *O. Fabr.*, *Ctenophora Parrii*, *Chironomus polaris*, a small caterpillar and a very small spider. [In the 'Introduction to Entomology,' iv. p. 448, a genuine *Culex* is mentioned as having been also brought from Melville Island by this expedition.]

19. 'A Description of some Insects which appear to exemplify Mr. W. S. Mac-

Leay's doctrine of Affinity and Analogy. *Linn. Trans.* xiv. pp. 93—110; also in the *Annals of Philosophy*, new series, 1823, vol. iv. pp. 417—426. Read December 17th, 1822.

In this paper are described various new species of insects, which although belonging to one family, exhibit little apparent resemblance with any of its members, but take the form of species belonging to other families, their affinity being with the former, whilst their relation with the latter is that of analogy. The species and genera here described are,

1. *Catascopus*, belonging to the Harpalidæ, but which "might be mistaken for a species of *Notiophilus* of Dumeril, or at least be regarded as belonging to a cognate genus."

2. *Pseudomorpha* (fam. Scolytidæ?). Although this genus might at first sight be regarded as a *Nitidula* or *Ips*, it possesses all the essential diagnostics of those Carabidæ, with notched fore tibiæ, but its precise place in that tribe is doubtful, although it is suggested that it approaches towards *Scolytus*, *Fabr.* [Omophon].

3. *Mimela* (fam. Melolonthidæ). This Chinese genus externally resembles the Brazilian *Areoda*, "wearing, as it were, its very habit," but most nearly allied in structure to *Euchlora*.

4. *Agrion* *Brightwelli*, apparently osculant between *Agrion* and *Lestes*. All these insects are represented in a plate, executed by Mr. John Curtis. It is to be noticed that the old Linnæan genera, transformed into families are here (in accordance with Mr. W. S. MacLeay's plan, adopted in the 'Horæ Entomologicæ') cut up into groups of smaller value, to which the patronymic termination 'idæ' is affixed.

20. 'Some account of a new species of *Eulophus*, *Geoffroy.*' *Linn. Trans.* xiv. pp. 111—113. Read December 17th, 1822.

This paper contains a careful description of both sexes of *Eulophus damicornis*, a beautiful little Hymenopterous parasite with branched antennæ in the males, reared from a caterpillar found on the hazel, which nearly, but not altogether, resembles that of *Bombyx camelina*.

21. 'On Animals receiving their Nutriment from Mineral Substances.' *Tilloch and Taylor, Philos. Mag. and Journ.* vol. lxi., 1823, Part I. pp. 3—4.

After alluding to the assertions of some writers that no mineral substances had afforded food to any species of animal, the writer mentions that the late Mr. Hunne- man had received four specimens of asbestos, from Bonelli, which upon examination were found to contain many larvæ of some insect that had perforated it in various direc- tions, and in it underwent their customary metamorphosis, and which proved to be *Dermestes vulpinus*. It was also mentioned as a proof that the insects had fed upon the asbestos, that the holes with which it was perforated were of different sizes, varying from $1\frac{1}{2}$ to 2 lines in diameter.

22. 'Introductory address explanatory of the views of the Zoological Club,* de- livered at its foundation, November 29th, 1823, by the Chairman, the Rev.

* This Club, which was at first a branch of the Linnæan Society, was subsequently developed into the Zoological Society.

W. Kirby. Tilloch and Taylor, *Philos. Mag.* vol. lxii. pp. 457—463, 1823, also in *Zool. Journ.* (No. 5, April, 1825), vol. ii. pp. 1—8.

In this address the author dwelt especially upon the vast number of new species of animals of all orders continually accumulating in our collections, and the necessity for an union of talent for their investigation, not only with the object of rendering them known, but also for studying the relations of affinity and analogy, their habits and structure, and he dwelt especially on the necessity of pursuing the branch of comparative anatomy.

23. 'A Description of such Genera and Species of Insects alluded to in the 'Introduction to Entomology' of Messrs. Kirby and Spence, as appear not to have been before sufficiently noticed or described.' Decade the first. *Linn. Trans.* xiv. pp. 503—572. Read December 21st, 1824.

The following are the new genera described in this paper:—1. Hexagonia (fam. Lebiadæ). 2. Megasoma (fam. Dynastidæ, type Scarabæus Actæon, &c.) 3. Archon (fam. Dynastidæ). 4. Genuchus (Cetoniadæ, allied to Cremastocheilus). 5. Schizorhina, type Cetonia atropunctata, *Kirby, Linn. Trans.* xii. Australia). 6. Gnathocera (allied to Cetonia, type Cetonia vitticollis, *Latr.*)

23. 'Some Remarks on the Nomenclature of the Gryllina of MacLeay, &c., with the Characters of a New Genus in that tribe.' *Zool. Journ.* vol. i. (No. 4, January, 1825), pp. 429—432.

This paper commences with some observations on the utility of uniform terminations for the primary divisions of Orders, and gives an account of the "havoc and confusion" which had been made in the nomenclature of the primary groups into which the Linnean genus had been divided, approving of Dr. Leach's restitution of the name *Locusta* to the real locusts of the ancients, but proposing in lieu of *Conocephalus*, by which Leach designated the *Locustæ* of Fabricius and Geoffroy, the names of *Acrida*, *Conocephalus* and *Pterophylla*. He adds a short generic and specific character of *Scaphura Vigorsii*, a new genus which connects these genera with the *Locustidæ* (*Gryllus, Fab.*), and proposes some alterations in the employment of the generic names *Cicada*, *Tettix* and *Tettigonia*.

25. 'Some further Remarks on the Nomenclature of Orthoptera, with a detailed Description of the Genus *Scaphura*.' *Zool. Journ.* (No. 5, April, 1825), vol. ii. pp. 9—11.

These remarks are very few, chiefly correcting the reference of his previous description to the tribe of *Locustina* of MacLeay, instead of his *Gryllina*. A full description is added of the *Scaphura Vigorsii*, from Brazil, illustrated by figures.

26. 'A brief Description of a Pair of Remarkable Horned Mandibles of an Insect.' *Zool. Journ.* (No. 5, April, 1825), vol. ii. p. 70.

These very large mandibles were taken from a string of beads and other trinkets, brought from New Zealand, and "appear to have belonged either to a *Lucanus* or a *Prionus*."

27. 'On the Structure of the Tarsus in the Tetramerous and Trimerous Coleoptera of the French Entomologists.' Tilloch and Taylor, *Philos. Mag.* and *Journ.* vol. lxxv. Part 1, March, 1825, p. 193.

In this paper, Mr. Kirby shows that Mr. Mac Leay's supposed discovery of the minute joint at the base of the claw joint in the Tetramera and Trimera, had been observed by De Geer, and was also mentioned in the 'Introduction to Entomology.'

28. 'A Letter from the Rev. W. Kirby in Explanation of his Remarks upon the Notice given in the 'Philosophical Magazine' of Mr. W. S. MacLeay's paper on the Tarsi of certain Insects.' Tilloch and Taylor, *Philos. Mag.* vol. lxx. p. 267, 1825.

In this short note, Mr. Kirby admits that he had too hastily assumed that Mr. MacLeay was not aware of De Geer's knowledge of the minute joint in question, and also that the reference to the 'Introduction to Entomology' ought to have stated that the volume of that work containing the passage above referred to, had not then been published. He further adds, that with De Geer he did not consider the joint in question as a primary, but as a secondary one.

29. 'A Description of Two New Species of Coleopterous Insects belonging to the Genera *Cremastocheilus* and *Priocera*.' *Zool. Journ.* (No. 8, 1826), vol. ii. pp. 516—518.

The species here described are *Cremastocheilus variolosus* (North America?), to which is added a detailed description of another species of the same genus, received from Dr. Harris, which Mr. Kirby considered as the real *C. castaneæ* of Knoch. The species of *Priocera* is named *P. pusilla*, and supposed to be also a native of North America.

- 29*. 'Introduction to Entomology,' vols. iii. and iv., 1826.

30. 'A Description of some New Genera and Species of *Petalocerous* Coleoptera.' *Zool. Journ.* No. 10, vol. iii. pp. 145—158, 1827.

The insects here described are *Cnemida* (a new genus belonging to the *Rutelidæ*) *C. Francilloni*, *Sparshalli* and *Curtisii*, from Brazil; *Cremastocheilus canaliculatus*, from Massachusetts, with figures of two other previously described species of the same genus, *Cymophorus* (n. g., near *Cremastocheilus*) *undatus*, *Campulipus* (n. g., allied to *Trichius*, type *Melolontha limbata*, *Oliv.*), *Acanthurus* (n. g., allied to *Trichius*, type *T. hemipterus*, *Fabr.*), *Trichius Bigsbii*, from Canada; together with a sketch of the distribution of the genus *Trichius* into seven sections, namely, 1. *Legitimi* (*T. fasciatus*, &c.); 2. *Trichini* (*T. viridulus*, *piger*, &c.); 3. *Tetropthalmi* (*T. suturalis*, *K.*, n. s., *Java*); 4. *Archimedii* (*T. Delta*); 5. *Euclidii* (*T. triangulum*); 6. *Aleurosticti* (*T. nobilis*, *8-punctatus*); 7. *Gymnodi* (*T. eremita*, &c.).

31. 'A Description of some Coleopterous Insects in the Collection of the Rev. F. W. Hope, F.L.S.' *Zool. Journ.* No. 12, 1828, vol. iii. pp. 520—526.

The species here described are *Scarabæus femoralis*, a gigantic species of sacred beetle, from *Nigritia* (*Soudan*), *Drepanocerus* (a new and curious genus, allied to *Oniticellus*), *D. Kirbii*, Hope MS., from the Cape of Good Hope, *Onitis ambigua*, from the same Cape, *Chrycina* (a new genus of *Rutelidæ*), *C. Peruviana*, *Emcephalus* (a new genus allied to *Helæus*), *E. gibbosus* and *Adelium Hopii*. Most of these insects are beautifully figured by Sowerby.

32. 'Some Account of the Hessian Fly.' Loudon's *Mag. of Nat. Hist.* No. 3, vol. i. pp. 227, 228. September, 1828.

Mr. Say's article upon the Hessian fly (*Cecidomyia destructor*, Say) in the 'Journal of the Academy of Natural Sciences of Philadelphia' for the year 1817, is here abstracted, and its habits contrasted with those of *C. Triticea* of Kirby.

33. 'An Outline and Description of *Centrotus Bennetii* and *Hardwickii*.' Loudon's *Mag. of Nat. Hist.* No. 6, vol. ii. pp. 20—22, 1829.

Descriptions and figures are here published of two very singular small Homopteroous insects, under the names of *Centrotus Bennetii*, from Choco in Colombia, and *C. Hardwickii*, from Nepal. Outline figures are added from Stoll, of several other equally remarkable species of the same genus.

34. 'Nidus on a Rush.' Loudon's *Mag. of Nat. Hist.* No. 9, vol. ii. p. 405, 1829.

This is a short answer in reply to a query in the same volume (p. 104), concerning a circular nidus found attached to a rush, and which Mr. Kirby states to be that of a spider, referring to De Geer, vol. vii. Plate xiii., and his own collection for similar specimens.

35. 'The Characters of *Clinidium*, a new genus of Insects in the Order Coleoptera, with a Description of *Clinidium Guildingii*.' *Zool. Journ.*, No. 17, 1830, vol. v. pp. 6—10.

This is a very curious genus of beetles, presenting the characters of several different and distant tribes, especially interesting from its want of reticulated eyes. Mr. Kirby considered it as most nearly allied to *Cucujus rufus*; it is, however, very close in its affinity to the genus *Rhysodes*, with which Mr. Kirby does not appear to have been acquainted. The species is a native of the Island of St. Vincent, in the West Indies: figures of the upper and under sides of the insect are given, but it is unfortunate that Mr. Kirby was unable to examine the structure of the chief parts of the mouth.

36. 'On the History, Habits and Instincts of Animals, being Treatise VII. of the Bridgwater Treatises.' London, 1835. 2 vols. 8vo., pp. 948, 17 plates.

The design of this work, as of all the 'Bridgwater Treatises,' is to prove and illustrate "the power, wisdom and goodness of God as manifested in the Creation." The animal kingdom was assigned to Mr. Kirby, and the habits and instincts, especially of the lower tribes of animals, have furnished much very interesting matter.

Translated into German by Fr. Oesterlen, under the title '*Die Thierwelt, als zeugniss für die Herrlichkeit des Schöpfers.*' 1838. 8vo.

37. 'Fauna Boreali-Americana, or the Zoology of the Northern parts of British America.' Part the Fourth and last. The Insects. 4to, pp. 325 and xxxix, Norwich, 1837. 8 Plates containing coloured figures of 66 of the most interesting genera and species with details.

This volume contains descriptions of the insects collected in the Northern Land Expedition, under command of Captain Sir John Franklin, R. N., by Sir John Richardson, Surgeon and Naturalist to the Expedition, which formed a very principal and interesting feature of the collections made during these expeditions, "not only on ac-

count of the number of individual species, which is considerable, but also on account of several new forms; some of them connecting tribes, before placed far asunder, and filling up many vacant places in a scientific arrangement of these animals; others exhibiting an eastern aspect, and the majority representing, as it were, known European types, and, though varying from them in characters of more or less importance, known European species: so that the American entomologists, for want of comparing one with the other, appear often to have confounded them." These insects were collected during the brief summers of the Arctic Regions, and Mr. Kirby has added to them descriptions of other species in his own collection, from Canada and Nova Scotia. In the introduction, Mr. Kirby notices the difficulties attending the primary distribution of the Coleoptera according to the views of Latreille, MacLeay and Stephens, and adds a tabular view of an arrangement of his own, in which the order is divided into thirteen primary groups of equal value (the majority of which are subdivided into other groups of minor value). These groups are, 1. Adepaga; 2. Brachelytra; 3. Entaphia (consisting of the single genus Necrophorus); 4. Necrophaga; 5. Philhyrida; 6. Lamellicornia; 7. Sternoxa; 8. Xylophaga (including the Xylophaga of Latreille, as well as the Ptini and Longicornia); 9. Rhynchophora; 10. Phytophaga; 11. Aphidiphaga; 12. Heteromera; 13. Malacoderma. Descriptions are given of 343 Coleoptera; 3 Orthoptera; 2 Neuroptera; 2 Trichoptera; 32 Hymenoptera; 17 Hemiptera; 1 Homoptera; 32 Lepidoptera; 15 Diptera. A List is also added of 103 other insects of the northern parts of America, described by Otho Fabricius, Curtis, Children and himself, in other works.

September 2, 1850.

J. F. STEPHENS, Esq., V. P., in the chair.

The following donations were announced, and thanks ordered to be given to the donors: the 'Zoologist' for August and September; by the Editor. The 'Transactions of the Royal Society, 1848,' parts 1 and 2; 1849, parts 1 and 2: 1850, part 1; List of Members, 1849, and Proceedings, No. 70 to 74; by the Royal Society. 'Entomologische Zeitung,' for June and July; by the Entomological Society of Stettin. 'Bulletin de la Société Imperiale des Naturalistes de Moscow,' 1847, Nos. 3 and 4; 1848, Nos. 1 to 4; 1849, Nos. 1 to 3. 'Specimen Faunæ Subterraneæ;' by J. C. Schiödte, Copenhagen, 1849; and 'Om en afvigende Slægt af Spindlernes Orden,' by J. C. Schiödte; both presented by the author. 'A Letter to Lord Brougham on the Scientific Exploration of Egypt and Ethiopia,' by John James Wild, Civil Engineer of Zurich; by the author. Specimens, male and female, of *Raphiglossa Eumenoides* and *R. Odyneroides*, and a male of *Myrmosa nigriceps*; by S. S. Saunders, Esq. These insects were described in a memoir read on the 3rd of July last.

Mr. Shepherd exhibited specimens of *Rhodaria sanguinalis* taken at New Brighton, by Mr. C. S. Gregson; also some black varieties of *Elachista Linneella*, taken near London.

Mr. S. Stevens exhibited a male and female of a beautiful variety of Ornithoptera

Priamus from Richmond River, New Holland; specimens of *Amphimalla verna*, *Meg.*? found by Captain Parry at Tenby, and of *Rhagium indagator*, *Callidium striatum*, *Cetonia ænea* and *Pytho depressus*, taken by Mr. Weaver in the Black Forest, Perthshire.

Mr. Douglas exhibited—

Odontia dentalis, found on *Echium vulgare* at Folkstone, in July.

Röslerstammia granitella, *Xanthosetia inopiana*, *Eupæcilia udana*? and *Sericoris fuligana*, *Haw.*, found on *Inula dysenterica*, also at Folkstone, in July.

Adela Dumerillella? *Tinea angusticostella*, *Pterophorus baliodactylus*, *Gelechia Coronillella* and *Argyresthia Sorbiella*, the latter on *Pyrus Sorbus* (*Service*), at Mick-leham, in July.

Penthina ———? in June, and *Gelechia peliella*, in August, at West Wickham.

Depressaria atomella, and *Catoptria* ———? in August, at Charlton Sandpit.

Gelechia Inulella, *Curtis*, and *G. bifractella*, *Mann*, bred in July and August from seed-heads of *Inula dysenterica*.

Gelechia Carlinella, n. s., bred in August, from seed-heads of *Carlina vulgaris*.

Gelechia, n. s., bred in August, from leaves of *Cirsium lanceolatum*, in which the larva mines, feeding on the parenchyma only.

Pterophorus lithodaactylus, bred from leaves of *Inula dysenterica*.

Mr. Westwood stated that in July, *Lymexylon navale* appeared from the oak-timber in Pembroke Dockyard in thousands, and he had learned that they did not continue in the perfect state longer than a fortnight, a circumstance he thought worthy of note, as if availed of, their destruction might be more easily accomplished. The experiment of placing the timber in the steam-tank for ten hours had been tried, and found perfectly effectual in destroying the larvæ. He was likewise informed that the timber affected was quite sound when received four years since. Mr. Westwood also stated that he had received specimens of *Apate Capucina*, a beetle that had done considerable damage in the same dockyard to oak timber received from Istria. Adverting to the case-making Lepidopterous larvæ from pear-trees in the Horticultural Society's Garden, exhibited at the meeting on the 3rd of June, Mr. Westwood said they proved to be of two kinds, one having produced *Coleophora nigricella*, and the other *C. Hemerobiella*.

Mr. White read the following note on the boring powers of *Monohammus Sutor*:—

Messrs. Kirby and Spence in their world-read Introduction, record a striking instance of the boring powers of another beetle of the Longicorn group, the *Callidium bajulum*. Sir Joseph Banks gave to these gentlemen a piece of a sheet of lead, which, though only eight inches long and four broad, was pierced with twelve oval holes, of some of which the longest diameter is a quarter of an inch.

In every case recorded, the lead has been over wood in which the larva or pupa of the insect has been enclosed, and as insects in their unerring instinct generally "go forward," the *imago* to get out to fulfil the object of its existence gnaws through anything in the way, that can be reduced by its jaws.

My friend Mr. Ainger lately had occasion to get a pipe repaired which had been damaged by an insect; the culprit is the *Monohammus Sutor*, and as Mr. Ainger describes the circumstances well, I add his letter.

"Dear Sir,—I send you the creature which perforated my leaden pipe, and the enclosed sketch will explain the position of the pipe in reference to the round hole

in the timber, where the animal was found, and from which it must have been trying to escape, when the pipe stopped its progress. The hole in the pipe had very much the appearance of a screw-hole in a common iron hinge, with the dishing or countersinking formed to receive the head of the screw. This countersinking was not uniform, being on one side oblique, and on the other nearly vertical to the surface of the pipe; the difference was evidently produced by the obliquity of the line of progress, and by the fact of the animal's working in something like a hemisphere, of which that line was the axis. I can give no indication of the time occupied except this; that the pipe was subjected to a high-service pressure seventy-two hours, before the water burst through the aperture in question. The creature when found was not quite dead, but very inanimate, having been exposed to a violent jet of water for above half-an-hour. I am, dear Sir, yours truly, ALFRED AINGER."

"What surprises me is, that these round holes in the timber are not more common. The coincidence of finding a leaden pipe at the surface of the timber may easily be very rare; but I never before saw such a hole formed in wood, and I suppose the animal is not uncommon?"

Mr. White, on the part of Mrs. Hamilton, exhibited a small but most interesting collection of insects of India, including the beetle referred to in her letter, read July 1, and a specimen of the butterfly *Danais Daos*.

He also exhibited a drawing by Mrs. Hamilton, of this butterfly, its larva and pupa, which, besides being highly flattering to that lady as an evidence of her skill in observing and delineating, was especially interesting as determining the relations of the species, and showing that Mr. E. Doubleday, with his usual accuracy, was correct in considering it to belong to the genus *Danais* rather than *Hestia*, with which it had been associated.

October 7, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors thereof: The 'Zoologist,' for October; presented by the Editor. 'Entomologische Zeitung,' for August and September; presented by the Entomological Society of Stettin. 'Annales de la Société Entomologique de France,' 1848, 'Troisième et Quatrième Trimestres,' and 1849, complete. 'Insecta Saundersiana, or Characters of Undescribed Insects in the Collection of W. W. Saunders, Esq.; Diptera, Part I., by Francis Walker, Esq.,' presented by W. W. Saunders, Esq. A small collection of Insects from Hong Kong; presented by J. C. Bowring, Esq., Corresponding M. E. S.

George Guyon, Esq., of Richmond and Ventnor, and Mr. Charles Potter, 6, Coleman Street, were elected subscribers.

Mr. S. Stevens exhibited some beautiful Lepidoptera, received from Mr. Bates, collected by him at Ega, Upper Amazons, including a new species of *Papilio*, *Hectera Andromeda*, a new species of *Castnia*, and a new *Callithea*; also some Homoptera and Diptera of curious form, and some conspicuous Staphylinidæ.

Mr. Shepherd exhibited three specimens of *Aphomia anella*, a species new to Britain, taken near Dover.

Mr. Bond exhibited a hermaphrodite specimen of *Arctia Caja*, reared from a larva which did not present any remarkable appearance. It was observed of this specimen that the female half was on the right side, it being usually in such cases found upon the left. Mr. Bond also exhibited a variety of *Sphinx Ligustri*, and a pale variety of *Charissa pullata*.

Mr. Westwood, on the part of Mr. Gould, exhibited two insects he had found in Scotland impaled on the spines of furze. In former instances of insects impaled on thorns, it had been suggested that they might have been so placed by shrikes, but this was scarcely probable in this case, as shrikes were not known in Scotland. One of the insects was *Coccinella 7-punctata*, which was alive when found; it had been suggested that it had impaled itself by flying against the spines, which was barely possible: in the other instance a suicide was still less likely to have occurred, the insect being the caterpillar of *Phragmatobia Menthrasti*. The subject of insects impaled on thorns required elucidation.

Mr. Westwood, on the part of Captain Parry, exhibited a specimen of *Goliathus Druræi* enclosed in its pupa-case, in which it was alive when received in England. Mr. Westwood observed that the cases of some *Lamellicorn* larvæ were formed by the parent insects, but he was inclined to believe that this was made by the larva itself, as in the instances of some *Noctuæ* and *Cetoniadæ*.

Mr. Westwood exhibited a larva of *Lymexylon navale* in spirit, received from Pembroke Dockyard. On seeing it, the president said he was now sure that he had once found a larva of this beetle in hard dead wood of an oak in Windsor Forest, close to the place where Mr. Griesbach had taken the perfect insect. At that time he was not certain that it was the larva of this species, though he strongly suspected it. Mr. Westwood also exhibited a larva of *Apate Capucina* in spirit; observing that it greatly resembled the larvæ of the *Ptinidæ* to which it was doubtless related.

Adverting to the butterfly received from Mrs. Hamilton and exhibited at the last meeting, Mr. Westwood said, that judging from the characters furnished by the larva it had then been referred to the genus *Danais*, but it appeared on a more careful examination of the butterfly, that notwithstanding these characters of the caterpillar, it did not belong to the genus, but was in reality a *Hestia*; showing at least that no one set of characters could be exclusively relied upon for separating subgenera.

Mr. Douglas exhibited a specimen of *Hypera Runicis*, of which he had found the pupa in its round, reticulated, diaphanous cocoon, attached to a blade of grass at Folkstone, in July. He had put it into a pill-box and watched it daily until the imago emerged, and when he then saw it not a vestige of the cocoon was visible, so that he had no doubt it had eaten up its former covering.

A letter was read from J. C. Bowring, Esq., corresponding member at Hong Kong, of which the following is an extract:—"July 30, 1850. In 1848, I exhibited to the Society a curious *Coccus*-like insect, parasitic upon *Fulgora candelaria*, which excited some attention, and gave rise to considerable discussion as to the order to which it belonged. On my return to China, towards the close of 1848, I endeavoured to rear this parasite, but without success until last month, owing chiefly to the difficulty of keeping the *Fulgoræ* alive in captivity. The young larvæ are found, varying from the size of a pin's head to half an inch in length, attached to the dorsal segments of the *Fulgoræ*, there being rarely more than one parasite on a *Fulgora*. When young, they are destitute of the cottony covering which gives them so great an appearance of *Cocci*, but as they grow larger this makes its appearance until they are

densely covered with it. Arrived at this stage they drop off from the Fulgoræ, and retire to some safe place, where they may undergo their transformation to the pupa state. I have not been able to discover in what way the insect spins its coating of cotton into a cocoon, but it is evident that it does do so, forming a comfortable looking, compact nidus, lined internally with strong and stiff material. The period during which the insect remains in the pupa state is very variable; in one instance it was nine days, in another, upwards of two months; the latter case was during the cool season, the former, last month. On attaining the perfect state the insect makes its escape from its nidus by an opening at one end, leaving the pupa-case protruding therefrom about half its length, like the Oiketici.

"The specimen labelled 'No. 2,' I consider particularly interesting. I had it in my box for some time, when one day a number of minute Hymenoptera issued from it, parasites on a parasite. I was unable, to my regret, to capture any of these, for they were so small that they escaped through the gauze covering of my breeding-cage, and I did not perceive them till it was too late."

Mr. Bowring adds that, although it will be deemed very extraordinary, he thinks the insect reared from the Coccus-like parasite is Lepidopterous. Unfortunately the insect he reared and forwarded became so broken on its journey that not sufficient remained to show to what order it belonged.

The following note by Mr. Newman was read, on

"*The way Bees open the Snapdragons.*—I have been much amused and instructed by watching wild bees of the genera *Bombus* and *Megachile* open the blossoms of the snapdragons, that is, the garden varieties of *Antirrhinum majus*. This species is so great a favourite with the bees, that the flowers are frequently destroyed by the assiduity of their visitors, and one variety in particular, the corolla of which is unusually delicate, rarely attains perfection unless enclosed by a covering of gauze or glass.

"I have remarked in the first place the truth of the assertion, which I fear I have too often condemned as merely poetic, that the same individual bee never tries the same flower a second time. Even though it shall have sipped at fifty of these little fountains of nectar between two visits to any particular flower, and though on the second visit, it shall approach that particular flower quite as eagerly as on the first, yet it is simply a visit of inquiry, as it invariably leaves the flower, without the slightest attempt to enter it a second time. Now how does the bee ascertain that the sweets of the flower have already been rifled by herself? What organ of sense aids her in making the discovery? Certainly the fact of the honey having been abstracted is not perceptible, for I watched a bee enter every one of six flowers on a plant, and in the space of a few minutes, another bee did the same; and then another, and another: as many as fifteen or twenty bees will occasionally come to an isolated plant within an hour, and the last comer will not appear aware of the previous visits; and yet the *same* bee never opens the *same* flower twice.

"In the second place there are four different modes, practised by as many species, in which the pollen or honey is obtained: these I will describe separately.

"1. *Megachile centuncularis* alights on the *upper* lip of the flower, and crawls into the mouth with its back downwards; and the hairy pollen-brush of its abdomen is closely appressed, by the elastic spring in the under lip of the flower to the hairy interior surface of the upper: by this means the pollen is brushed from the anthers and received by the pollen-brush of the bee, and also by the hairy interior surface of the upper lip of the flower: as this bee disappears within the corolla it is fair to assume it

sips honey from the nectary, as well as gathering pollen from the anthers, and thus accomplishing a double purpose in its visit.

“2. *Bombus* ——? invariably alights on the *lower* lip of the flower, which it enters in the ordinary position of its race, with the back upwards: the mesothoracic sections press the anthers against the hairy surface to which I have already alluded, and there remains on the mesothorax of the bee a yellow stripe of pollen, which, however, does not appear to be a desideratum, but on the contrary rather an annoyance, as the bee will often settle on a leaf, and passing its fore legs over its alary segments try to scrape or brush away the pollen which clings there. Although the mouth of the corolla is greatly distended as the bee enters, still the presence of the latter when entirely within the tube is not perceptible.

“3. *Bombus* ——? alights on the common flower-stalk, just below the flower, and with its sharp scissors-like mandibles cuts a hole in the corolla close to the nectary, which in the true *Antirrhinum*s is not elongated into a spur as in *Linaria vulgaris* and its congeners: cutting the aperture is scarcely the work of a second: when accomplished, the tongue or rather labial apparatus is immediately thrust through the aperture, and the delicious liquid abstracted: it frequently, indeed *most* frequently, happens, that the honey has been already consumed by one or other of the species already noticed, and the difference in the bearing of the bee is very remarkable: when disappointed, she immediately flies away with a sharp angry hum, as though out of temper: but when successful, she imbibes the nectar with much deliberation, and apparent satisfaction; and makes a kind of purring noise, probably with her wings, while engaged in the agreeable occupation: having finished the task, she strokes her head and antennæ with her fore feet, somewhat as a cat washes her face; and rests at least a minute before seeking another meal.

“4. *Bombus* ——? a very large bee, which alighting on the lower lip of the corolla opens the mouth of the flower, and whilst standing in this position, thrusts its enormous labial apparatus into the tube until it reaches the nectary. I believe this is the female of No. 2, all of which I found to be neuters, and I have so seldom had an opportunity of watching its operations that I should not have recorded them, had not Mr. Stainton informed me he had frequently observed the same habits in a large *Bombus* in Devonshire.”

Mr. Westwood observed, that it did not appear to have occurred to Mr. Newman that a bee might operate on a flower in different ways, guided thereto by its wants. If it required pollen it would enter with its back downward, in order, as Mr. Newman had observed, that it might place its abdomen in contact with the anthers; but if seeking honey, it would enter the flower in the ordinary manner.

It was announced that Part II. of Vol. I. new series of the Transactions was ready for delivery.

November 4, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The following donations were received, and thanks ordered to be given to the respective donors: The 'Zoologist' for November; presented by the Editor. 'Lecture on Blights,' by F. Plomley, Esq., M.D.; presented by the Author. 'Fauna Japonica, Auctore Ph. F. De Siebold; Crustacea, elaborante W. De Haan, 1850;' presented by Herr De Haan, Hon. For. M.E.S. 'Memoires de la Société des Sciences de l'Agriculture at des Arts de Lille, 1842—9;' presented by the Society. 'Enumération des Insectes qui Consomment les Tabacs,' by M. Guérin-Méneville; 'Essai sur les Maladies des Vers à Soie,' by M. Guérin-Méneville; 'Analyse des Expérimentens sur la Muscardine,' by M. Guérin-Méneville; all presented by the Author.

The Rev. Joseph Greene, Miss Stopford, and Mr. Thomas Thompson were balloted for and elected Subscribers of the Society.

Mr. Westwood mentioned that M. Guérin had observed that the structure of the blood in diseased silkworms, was found, when viewed under microscopes of high powers, to be considerably altered. The small granules, which in the healthy blood were found to be oval, or round; in the diseased blood became elongated, and then branched; thus, apparently turning from an animal into the vegetable substance known as muscardine.

Mr. Shepherd exhibited an Hermaphrodite *Nonagria Cannæ*, of which, however, both the antennæ were male.

Mr. S. Stevens exhibited some cocoons of a *Bombyx* from Columbia, in each of three of which he had found two pupæ. He also exhibited the four new species of Australian Coleoptera, *Clytus spinicornis*, *Saperda bilabilis*, *Cerambyx subserratus* and *Agasma semicrudum*, described by Mr. Newman in the 'Zoologist.'

Mr. Stevens also exhibited some specimens of insect economy, brought from South Australia by Mr. Mossman.

Mr. J. F. Stephens exhibited specimens from Scotland, of *Dictyopterus Aurora*, a beetle new to Britain, and *Tinea ochraceella*, of Tengström; the latter species had been found by Mr. Weaver in ants' nests.

Mr. Bond exhibited some rare Lepidoptera he had taken at Ventnor, in August, including *Agrotis lunigera*, *Catoptria pupillana*, *Depressaria caprella*, *rotundella*, *Douglasella*, *nanatella* and *pallorella*.

The President exhibited on behalf of Mr. G. Ransome, a very fine *Deilephila Celerio* recently taken at Ipswich.

Mr. W. F. Evans exhibited four specimens of a *Culex*, which had accidentally been enclosed in a letter received from Commander Pullen, dated Great Slave Lake, 28th June, 1850, in latitude 61 degrees. The great abundance and intolerable annoyance of these little pests in high latitudes, had been mentioned by Sir G. Back, in his account of the Arctic Land Expedition, in 1833; and by Sir John Franklin, in his account of his journey to the Polar Sea in 1819—22.

The President read a letter from M. Blisson, requesting from the members of the Society, information concerning certain British Coleoptera, to be incorporated in a work he was preparing on that order.

Mr. W. W. Saunders read a paper on Australian Longicorn beetles, of which the following is an abstract. The paper is accompanied by two coloured plates.

The author observed, that a great many interesting forms among the smaller Longicorns having, during the last few years, been brought to this country from our Australian colonies, he had thought that an account of them would be interesting to entomologists, particularly if he combined with them, figures and short descriptions of some of the interesting nearly allied forms, which had previously only been described, but wanted good portraits to point out their structure.

First Division. *Wings not abbreviated ; eyes rounded or ovate.*

Genus—ENCHOPTERA.

Nearly allied to *Macrones* of Newman, but differs in the longer thorax which is nearly smooth on the sides, and the longer and pointed snout.

Sp. 1. ENCHOPTERA APICALIS.

Dark chesnut-brown, with the forehead and apices of the femora black, the three terminal joints of the antennæ yellow, and the elytra yellowish brown.

Length $\frac{7}{10}$ inch.

From Van Diemen's Land.

Sp. 2. ENCHOPTERA NIGRICORNIS.

Head pale chesnut-brown : antennæ pitchy-brown inclining to black : elytra pale chesnut-brown, clothed with yellowish pubescence : legs pitchy-brown with the anterior and middle thighs yellowish brown.

Length $\frac{1}{2}$ inch.

From New South Wales.

Genus—MACRONES, *Newman*, *Entomologist*, p. 33.

Sp. 1. MACRONES EXILIS, *Newman*.

Black, with the sides of the thorax dark rufous brown : elytra yellowish brown, with four darker elevated ridges, and the posterior tarsi white.

Sp. 2. MACRONES RUFUS.

Rufous brown, with a broad ring of black on the first joint of the antennæ, and another of the same colour on the hind femora.

Length $1\frac{3}{10}$ inch.

From Hunter's River.

Genus—BRACHOPSIS.

Differs from *Macrones* in the less projecting head, unarmed thorax, and shorter and stronger legs, besides other characters.

Sp. 1. BRACHOPSIS CONCOLOR.

Dark chesnut-brown, with the tips of the first joint of the antennæ, forehead, face, and a longitudinal line along the thorax, black: elytra with four elevated ridges.

Length $\frac{1}{2}$ inch.

From Van Diemen's Land.

Genus—STENODERUS, *Dejean*.

Sp. 1. STENODERUS MACULICORNIS.

Dull orange, with the antennæ, except the fourth, fifth and sixth joints, black, the latter nearly white, tipped with black.

Length $\frac{4}{10}$ inch.

From the north and north-west coasts of New Holland.

Genus—PSILOMORPHA.

Having some resemblance to Mr. Shuckard's genus *Stephanops*, but abundantly distinct by the less projecting head, ovate eyes, and other characters.

Sp. 1. PSILOMORPHA TENUIPES.

Pale chesnut-brown, with the eyes, first joint, and tips of the other joints, of the antennæ, and legs black: elytra striate.

Length $\frac{4}{10}$ inch.

From New Holland.

Second Division. *Wings not abbreviated; eyes reniform.*

Genus—STEPHANOPS, *Shuckard*, Ent. Mag. v. 510.

Sp. 1. STEPHANOPS NASUTUS, *Shuckard*.

Genus—ORODERES.

Having a general resemblance to the *Macrones* group, but essentially differing in the shape of the eyes, structure of antennæ, &c.

Sp. 1. ORODERES HUMERALIS.

Black, with a purplish metallic tint, except the elytra, which are orange at the base, and the abdomen, which has a bright steel-blue tint.

Length $\frac{1}{2}$ inch.

From New South Wales.

Genus—HEPHESTION, *Newman*.Sp. 1. HEPHESTION OCREATUS, *Newman*, Entomologist, p. 10.Genus—BIMIA, *White*.

Sp. 1. BIMIA FEMORALIS.

Closely resembles *Bimia bicolor* of *White* (in the 'Illustrated Proceedings of the Zoological Society'), but will be found to differ in the narrow instead of broad black band on the thorax, and in the forehead and middle femora being ochraceous instead of black.

Genus—AKIPTERA.

Somewhat allied to *Newman's* genus *Brachytria*, but differing in the length and structure of the antennæ, and other important characters.

Sp. 1. AKIPTERA SEMIFLAVA.

Head and thorax hairy, yellow and black: elytra hairy, dull yellow, with the apical half black.

Length $\frac{7}{10}$ inch.

From Australia.

Genus—BRACHYTRIA, *Newman*.Sp. 1. BRACHYTRIA GULOSA, *Newman*, Annals Nat. Hist. v., p. 6.

This species varies much, the dorsal spot is sometimes wanting, and occasionally the three spots are united into one.

Third Division. *Wings much abbreviated.*Genus—HESTHESIS, *Newman*.

Sp. 1. HESTHESIS ORNATA.

The smallest species of the genus, and most nearly allied to *H. variegatus* of *Newman*, the *Molorchus variegatus* of *Fabricius*. Head and thorax black: elytra dark umber brown, with darker shoulders: legs and tarsi dull chestnut-brown.

Length $\frac{1}{2}$ inch.

From Hunter's River.

Genus—AGAPETE, *Newman*.Sp. 1. AGAPETE CARISSIMA, *Newman*, Zoologist, p. 1017.

The singular conformation of the antennæ, these organs being twelve-jointed, immediately distinguishes the genus from others of the *Molorchidæ*.

A paper by Mr. Hewitson was then read, containing descriptions of some new Papilionidæ, of which the following is an abstract. The paper is accompanied by two coloured Plates.

“Many of our true Papilios which have now separate names, will, I believe, if better known, prove to be only sexually and not specifically distinct.

“Papilio Tullus proves to be the female of *P. Sesostris*.

“*Papilio Proteus* and *Areas*, are male and female; and I have no doubt that *P. Pirithous* is the ♀ of *P. Lycophron*, and *P. Acamas* the ♀ of *P. Thersites*.”

PAPILIO BOLIVAR.

Allied to *P. Vertumnus*. Anterior wings deep black, with an irregular silvery green patch, from the inner margin to near the middle of the wing: posterior wings black, with a dark crimson patch at the lower half of the cell.

Exp. $3 \frac{3}{10}$ inches.

HAB. Amazons.

PAPILIO COLUMBUS.

Allied to *P. Dolicaon*. Anterior wings cream-colour, the outer margin and a large space at the apex black, and the costa at the base bordered with black: posterior wings dentated, with a narrow linear tail; cream-colour, with the outer margin black.

Exp. $3 \frac{3}{10}$ inches.

HAB. Amazons.

CALLITHEA BATESII.

Anterior wings deep purple, the base orange, apex and outer margin shining green: posterior wings deep purple, the base orange, and the submarginal line green.

Exp. $2 \frac{3}{10}$ inches.

HAB. Amazons.

LEPTALIS ACREOIDES.

Anterior wings dark brown, with three groups of spots: the first is at the base, orange, oblong-triangular, the second yellow, tinged with orange, runs obliquely across the middle, the third, half-way between the last and the tip of the wing, is formed by three oval, yellow spots: posterior wings orange, bordered by dark brown. The under side is like the upper but less distinct, and the posterior wings are without the brown margin.

Exp. $2 \frac{1}{10}$ inches.

HAB. Minas Geraes.

Mr. Westwood read the first part of a paper on the genus *Evania*, supplementary to his paper in the third volume of the Society's Transactions.

December 2, 1850.

G. R. WATERHOUSE, Esq., President, in the chair.

The following donations were announced and thanks ordered to be given to the respective donors; 'The Zoologist,' for December; presented by the Editor. 'Entomologische Zeitung,' for October and November; by the Entomological Society of Stettin. 'Separat-Abdruck der Zeitschrift der Entomologische Gesellschaft zu Breslau,' by Herr Zeller, Honorary Foreign Member. 'Abhandlungen de Zoologisch-Mineralogischen Vereins zu Regensburg,' by Dr. Herrich-Schäffer: and an 'Article on the Fulgorellæ;' by Dr. Schaum. Also five specimens of *Cheimatobia boreata*; presented by Nicholas Cooke, Esq.

John Gray, Esq., of Wheatfield House, near Bolton, and J. Newman Tweedy, Esq., of 47, Montagu Square, were balloted for, and elected Members of the Society.

The President announced that the requisite number of subscribers for the 'Insecta Britannica' being nearly obtained, the committee had decided to proceed with the publication of the series, and that the first volume would be published early in 1851.

Mr. Evans exhibited a *Lampyris* from Rio de Janeiro, and read the following extract of a letter, dated Rio de Janeiro, November 12th, 1849.

"I send you at last a specimen of the Rio firefly, which I certify to having captured myself while in the act of emitting light, and further, that having taken it home, I placed it under a tumbler in a dark room, and was enabled, by the light it emitted, to read letters printed on a paper on which the glass was put. P.S.—Near the caudal extremity underneath, is a white enamel-like spot, which emits the light.—*F. Pennelly.*"

Mr. Evans communicated an extract from the Sydney Morning Herald, of the 22nd of June last, announcing the establishment, in that city, of the Australian Society for the investigation of scientific subjects, and stating that at the first meeting, the attention of the Society was directed by the Rev. G. E. Turner, to a grub, which is found in vines, and excites some alarm among the vine-growers of the colony.

Mr. Evans exhibited a *Scelopendra electrica*, and Mr. Westwood referring to its luminous properties, stated as a fact that had come within his own observation, that *Lithobius forcipatus* also emitted light.

Mr. S. Stevens exhibited some fine specimens of the variety of *Ornithoptera Priamus*, from Richmond River, New Holland, and also that singular Lepidopterous insect, *Myrmecopsis Eumenides*, *Newm.*, which so resembles a Hymenopterous insect.

Mr. Stainton exhibited five new species of British *Tineidæ*: viz., *Coleophora parvitella*, *Z.*, *C. vulneraria*, *Z.*, *C. lithargyrinella*, *Z.*, *C. juncicolella*, *Sta.*, and *Elachista Treitschkeella*, *F-v-R.*, and read the following notice, by Mr. Jordan, of a small Lepidopterous larva (probably of the genus *Goniodoma*).

"During a short excursion in Kent, in the month of August last, I gathered and brought to town amongst other wild flowers, several specimens of *Origanum vulgare*. On the next day, as I was looking at the flowers, two buds from one of the heads of this plant seemed to be crawling about, and on closer examination, it proved that these two were in reality the tents of larvæ of some minute Lepidopterous insect. They so exactly resembled a single flower-bud of the *Origanum*, that it was difficult to distinguish them when at rest, from those in the head around them; the lower part of

the case bearing a complete resemblance to the calyx, and the upper portion to the unexpanded corolla both in colour and form; in fact these were the materials out of which the case was formed. Both larvæ unfortunately died in two or three days. The *Origanum* was gathered in a small chalk-pit, near Darenth Wood, where no doubt the larva may again be met with another season."

Mr. Douglas read a letter from Mr. E. Wilson, in which it was stated, that in the United States it was impossible to preserve a collection of insects of any extent; as in some years during the very hot weather, owing to a peculiar state of the atmosphere, everything that was closely shut up became covered with a white hoar, and that from this cause a pair of boots in a cupboard would become as white as snow; that in order to guard against these sudden attacks, the cases of birds at the Academy of Philadelphia, instead of being closed as they are in this country, have chimneys to cause an artificial draught, and every box of insects is required to be opened during the continuance of these attacks so as to expose them as much as possible to the air.

Mr. Westwood stated that M. Guérin-Ménéville, in his researches on insects destructive to tobacco, had found that many different species fed thereon. One of these, a new species, named *Catorama Tabaci*, he at first thought was allied to the genus *Ptinus*, but afterwards found it more nearly related to *Doreatoma*. In this latter genus he had been able to clear up the doubts as to the number of joints in the antennæ (which had been variously stated by different authors to be eight, nine, ten and eleven); having determined from the examination of two specimens that the real number was ten in the male and nine in the female. Another species detected by M. Guérin-Ménéville was *Xyletinus serricornis*. Mr. Westwood said that in a cigar forwarded to himself for examination, he had found the pupa of a beetle, the abdominal portion of which was encased in the skin of the larva, the skin itself, including the head, remaining perfect, and he thought probably that the species was *Xyletinus serricornis*. The cigar purported to be from Havannah, but if the insect should prove to be *X. serricornis*, this was very doubtful, as that beetle was North American, and the observations of M. Guérin went to show that the native country of tobacco might be ascertained by the insects found in it.

Mr. Wilkinson thought this idea of M. Guérin fallacious, as tobacco in this country coming from different places, was piled in the bonded warehouses often for a considerable time, and insects might easily travel from one package to another.

The President observed that many insects were found all over the world, instancing the species of *Dermestes* and *Trogosita Mauritanica*, and that it remained to be proved that the beetles referred to were peculiar to one country.

Mr. Saunders then read the following note:—

In a communication I have lately received from Mr. H. G. Harrington, dated at sea, the 7th of October last, in lat. 17 deg. S., long. 35 deg. W., he says, "I have taken two very beautiful moths decidedly exotic, one in lat. 27 deg. 36 min. N., long. 19 deg. 34 min. W.; the other in lat. 13 deg. 12 min. N., long. 24 deg. 32 min. W., and three beetles south of the line a few miles." Laying down these positions on a good chart, I find that the first is about eighty miles from land, nearly west of the Island of Tierso, one of the Canary group; and the second is about ninety miles from land, due south of Brova, one of the Cape de Verd Islands. The exact position where Mr. Harrington took the beetles is not so easy to determine; but looking to the route taken by the ship, Sir E. Parry, which may be very nearly ascertained from the positions given by

Mr. Harrington in his letter, it is evident that the distance from the nearest land, that of the small island of Fernana Noronha, was at least 240 miles, and from the coast of Brazil, 350 miles. The small island alluded to is only about two leagues in length, and is about seventy leagues distant from the mainland of Brazil. Facts so well authenticated as the foregoing on the flight of insects are very interesting, and it is well that they should be recorded, although at present, the names of the insects which have ventured out so far to sea, or have been driven by necessity to undertake a long flight over such an extent of water, cannot be ascertained. I hope hereafter to procure from Mr. Harrington more information on this point, which I shall have pleasure in communicating to the society.

The President observed that once when crossing the channel to Dublin in very calm weather, the vessel was surrounded the whole distance by insects of all kinds, of which as most conspicuous he had noticed the common white butterfly, which invariably flew close to the water.

Mr. Bond stated that the larvæ of *Acherontia Atropos* had been unusually common in Cambridgeshire this autumn, and that two had squeaked audibly while yet in the pupa state.

The President announced that Part 3, of Vol. i., new series, of the Transactions, was on the table.

January 6, 1851.

G. R. WATERHOUSE, Esq., President in the chair.

The following donations were announced, and thanks ordered to be given to the donors: The 'Zoologist' for January; presented by the Editor. The 'Journal of the Royal Agricultural Society of England,' vol. xi. part 2; presented by the Society. 'Annales de la Société Linnéenne de Lyon,' 1847-9; presented by the Society. 'Mémoires de l'Académie des Sciences, Belles-Lettres et Arts, de Lyon;' 'Classe des Lettres,' tom. i. et ii.; 'Classe des Sciences,' tom. i. et ii.; presented by the Society. 'Annales des Sciences Naturelles d'Agriculture et d'Industrie de Lyon,' tome xi. 1848, 1849 and 1850; presented by the Society. 'List of the Specimens of British Animals in the collection of the British Museum; Part v. Lepidoptera, by J. F. Stephens, Esq.?' presented by the Author. Six specimens of *Pterostichus oblongo-punctatus*; presented by the Rev. C. Kuper, from Trellich, Monmouthshire. Specimens of the rare *Formica cunicularia*, male; *Mononycus Pseudacori*, and *Vespa Crabro*, male and female; presented by F. Smith, Esq.

T. A. Preston, Esq., of Brampton Place, Bexley, was balloted for and elected a Subscriber.

Mr. Douglas, on the part of Mr. Allis, exhibited a specimen of the rare Neuropterous insect *Drepanopteryx Phalænoides*, taken by him at Bowness.

Mr. S. Stevens exhibited some fine specimens of *Dynastes Jupiter* or *Neptunus*, from Columbia; also a foreign *Bombyx*, with the case of the larva of a *Tinea*? attached to its head.

Mr. Douglas observed, in reference to the note of Mr. Jordan, read at the last meeting, that on looking at some dry flowers of *Origanum*, which he had gathered in October, near Dartford Heath, he found that two of the withered calyces, or rather combination of calyces, for two or three were joined together, were removed by their insect tenants from the bulk of the plant, and attached to the cage in which they were placed. Since then, Mr. Stainton and he had gathered some withered flowers of *Origanum* with living larvæ in them, one of which Mr. Stainton exhibited to the meeting.

Dr. Wallich read a translation which he had made from the Danish at the request of William Spence, Esq., V.P., of the elaborate memoir of J. C. Schiödte, entitled 'Specimen Faunæ Subterraneæ,' of which the following is an epitome.

In 1768, was discovered that singular blind reptile *Proteus anguinus* in the caves of Krain, and occasionally found since in the Magdalene cave, near Adelsberg, in Illyria. In 1840, Koch published a figure of a Crustacean, of the family of *Oniscus*, *Pherusa alba*, discovered in the cave of Adelsberg; and four years later was found in the Lueger cave, an insect of the Coleopterous family *Carabidæ*, *Anophthalmus Schmidtii*. It was not only their locality which attracted attention to these animals, though it was striking enough that animals should be found existing under conditions so unfavourable to animal life; but the fact that they had no eyes, organs so well developed in all other members of the respective groups to which they belong. In the *Proteus*, indeed, the eyes if not altogether wanting, are yet so little developed, that beyond the mere perception of light, they must be incapable of receiving impressions of images. It is very easy to perceive the connexion that exists between the want of light in the caves and the want of visual organs in their inhabitants. So long as only one form of animal was known to exist there, inhabiting, moreover, a running stream and not, therefore, exclusively doomed to darkness, this blindness was viewed as an exceptional phenomenon for which there were analogous instances. But on becoming acquainted with other occupants of these caves, not only blind, but in their structure belonging to peculiar forms, the idea arose that these animals stood related to each other, as links of one chain of a subterranean Fauna, whose common characteristic was blindness. On the other hand, F. Schmidt found in these caves some few animals not materially different from the usual forms. Erichson, in his 'Monography of the Staphylinidæ,' describes a new species of *Homalota*, under the name of *spelaca*, and quoted as an inhabitant of the cave at Adelsberg a species of *Carabidæ*, *Pristonychus Schreibersii*. Both these insects differ from allied species by their strikingly minute eyes.

In 1841, were found in the Mammoth cave at Kentucky, about a mile from the entrance, a fish and a Crustacean, both with eyes concealed under the skin, as in *Proteus*, concerning which, various communications have been made public. Telkämpf noticed these, and described some new *Articulata* and a fish in 1844.

In 1845, Schiödte examined three caves near Adelsberg and one near Trieste, in all of which he found the animals already known and several new ones. Of the latter were *Coleoptera* ——— *Silphidæ*, *viz.* —

Bathyscia (n. g. allied to *Choleva*, but differing chiefly in its want of eyes), two

species ; and *Stagobius* (n. g., so peculiar in its structure that it is unlike any other of the *Silphidæ*, and minutely described).

A *Thysanoura*, *Anurophorus Stillicidii*, on clusters of *Byssus fulvus*.

Two remarkable blind *Arachnidæ*, each the type of a new genus, *viz.*, *Staleta*, and another not named.

A Crustacean of the family *Amphipodes*, *Niphargus* (new genus).

The term, subterranean Fauna, may with propriety be applied collectively to those animals which exclusively inhabit caves, and are expressly constructed for such localities. They may with tolerable precision be arranged under the following heads :

Shade-animals ; extensive genera and species, inhabiting caverns near their entrance, and generally all cool, shady and moist localities.

Twilight-animals ; they belong to widely spread genera, but are peculiar to the caves, and distinguished by their small eyes. They are principally found near the entrances to the caves, but proceed deeper into the darkness than the shade-animals.

Cave-animals ; they form, at least in part, peculiar genera ; are wingless and colourless, and exist exclusively in total darkness. The terrestrial division is blind ; the aquatic has a perception of light.

Stalactite Cave-animals ; Insects, *Arachnidæ* and *Crustacea*, appertaining to peculiar genera ; wingless, blind, living in total darkness, peculiar to stalactite caves ; in part occupying the columns, and constructed accordingly.

The following papers were also read :

‘ Descriptions of Six New British Diptera,’ by F. Walker, Esq.

‘ On the Genus *Acanthosoma*,’ by W. S. Dallas, Esq.

‘ On the British Species of the Genus *Gelechia*’ (Fifth Part), by J. W. Douglas, Esq.

‘ On the Genus *Gracilaria*,’ by H. T. Stainton, Esq.

The President appointed Messrs. J. F. Stephens, W. W. Saunders, W. S. Dallas, S. J. Wilkinson, E. Shepherd and F. Smith, auditors of the Treasurer’s accounts, and gave notice that the Anniversary Meeting would be held on the 27th January.

January 27, 1851. (Anniversary Meeting).

G. R. WATERHOUSE, Esq., President, in the chair.

The Secretary having read the bye-law relative to the Annual General Meeting, the Auditors' Report of the Treasurer's account was read, from which it appeared that the financial condition of the Society had greatly improved during the past year.

The ballot then took place, when Messrs. E. Shepherd, F. Smith, S. Stevens and S. J. Wilkinson were elected members of the Council, in the room of Messrs. T. Desvignes, F. J. S. Parry, W. Spence and J. F. Stephens; J. O. Westwood, Esq., was elected President; W. Yarrell, Esq., Treasurer; and J. W. Douglas and H. T. Stainton, Secretaries.

The President delivered an address on the state and prospects of the Society, for which a vote of thanks was passed, and he was requested to allow it to be printed. Votes of thanks were also passed to the retiring President, for his services for the last two years; also to the Treasurer, Secretaries and retiring members of the Council.

THE PRESIDENT'S ADDRESS.

GENTLEMEN,

It is again my duty to address you on the subject of the progress of our Society, as well as to call your attention to the leading features indicative of the general advancement of our favourite branch of Natural History. The first part of my task is easily performed, but I must claim your indulgence for the imperfect manner in which the second part is executed. Having unexpectedly been obliged to leave London, on business, and to remain absent for nearly a fortnight, at a time which I intended to devote to the collecting of materials for completing this part of my address, will, I hope, plead as an excuse.

Firstly, allow me to congratulate the Society upon the state of its finances and publications, as well as upon the increase in the number of its members. Our Treasurer's Report, you will perceive, is more satisfactory than it has been for some years, and in connexion with this statement it may be observed that there has been no

decrease in the quantity of matter published. At the commencement of the session, the Council (always full of hope for the future) determined to issue four parts of the 'Transactions' during the year, and these, as you are aware, *have* appeared in the time contemplated. More than four parts of the 'Transactions' the Council do not anticipate they shall be able to publish annually, but it has been determined that these parts shall appear, if possible, at regular quarterly intervals, viz., on the first of each of the following months,—March, June, September, and December. Of course to accomplish this very desirable end, the Society must be furnished with an adequate number of papers worthy of publication, and I have great hope that this simple announcement of the Council's intentions will be sufficient to stimulate the members to the necessary exertions in preparing communications. That such communications may be made known with the least possible delay, an arrangement has been entered into with the Editor of the 'Zoologist,' which will insure their publication, in abstract, in that journal, for the month following that in which the paper was read.

The record of the loss sustained by the Society, in the death of certain of its members, forms a most melancholy part of my duties of this evening. Besides the decease of our excellent and amiable Honorary President, which has already been much dwelt upon in this room, it is my duty to announce the death of two other of our members, viz., H. F. Farr, Esq., a most zealous entomologist, who I learn died, in March last, of laryngial consumption, at Torquay, in his 28th year. Mr. Farr joined our Society in 1849, and is well-known to many of our members, whose collections have been enriched by his liberal donations of rare insects which he had the good fortune to capture. The third death I have to record is that of Captain Du Cane, a comparatively old member of the Society, he having been elected in 1839. Shortly before his decease, which took place last month, he published an interesting paper on the transformation of the Crustacea.

I am happy to state that our number has decreased but by one, through resignation, and that, on the other hand, as many as eight new members and thirteen subscribers have joined the Society during the past year. The principal communications during the same period have been by Mr. S. S. Saunders, on Strepsiptera and new aculeate Hymenoptera; by Mr. W. W. Saunders, on Australian Longicorn Beetles; by Mr. Stainton, on Micropteryx; and by Mr. Douglas, on the species of Gelechia. These papers have already appeared in our 'Transactions;' those which remain unpublished are

as follows: Mr. White, on Doubledaya viator; Mr. Hewitson, on new Papilionidæ; Mr. Walker, on new British Diptera; Mr. Dallas, on the genus Acanthosoma; Mr. Stainton, on Gracilaria; and lastly, Dr. Wallich's translation of M. Schiödte's elaborate memoir on the Subterranean Fauna of the Caves in Carniola, Trieste, &c., a most interesting paper, kindly communicated to us by Dr. Wallich, at our last meeting, and which, I am happy to state, will shortly be published in our 'Transactions.'

I will now call your attention to various Entomological works and memoirs published elsewhere; and with regard to these I have to observe, that I have not confined myself strictly to noticing only those which have appeared in the year 1850; some which have come under my observation during the past year for the first time bear the date of the preceding year, and are here noticed.

In the '*Proceedings of the Linnean Society*,' of last year, will be found "Further observations on the habits of *Monodontomerus*, with some account of a new *Acarus* (*Heteropus ventricosus*), a parasite on *Anthophora retusa*;" by Mr. Newport: and Mr. Westwood furnishes another contribution to the several papers on the Paussidæ, previously read before the Society, by describing two new species of that remarkable family of Coleoptera.

The '*Proceedings of the Zoological Society*' also contains papers on the branch of Natural History to which we are more particularly devoted, namely, two papers by Mr. Adam White, one of which is entitled "Descriptions of some apparently new species of Longicorn Coleoptera;" and the other, "Descriptions of some apparently new species of Aptaera from New Zealand." This latter paper will be found in the '*Proceedings*' for 1849, but was not noticed in my last year's Report: the same remark will apply to a paper, by Mr. Wing, containing characters of three new genera and species of Lepidoptera.

In the '*Annals and Magazine of Natural History*' for 1850, will be found the following papers on annulose animals, viz., several communications by Mr. Francis Walker, containing descriptions of Aphides. "Observations on the species of Termitidæ of West Africa, described by Smeathman as *Termes bellicosus*, and by Linnæus as *T. fatalis*;" by T. S. Savage.* "Notes upon the smaller British Moths, with descriptions of some nondescript or imperfectly characterized species;" by John Curtis. "Notes on Chalcidites, and

* From the '*Proceedings of the Academy of Natural Sciences of Philadelphia*,' vol. iv. No. 11.

descriptions of various new species;" by Francis Walker. "Metamorphosis of *Donacia sagittaria*;" by M. Perris: (from the 'Bibliothèque Universelle de Genève,' June, 1849). "On the Pathology of the Silkworm (*Bombyx mori*, L.)—Examination of the Blood;" by F. G. Guérin-Meneville: (from the 'Gazette des Hôpitaux,' Feb. 2, 1850). "Description of the Entomostraca of the Pleistocene Beds of Newbury, Copford, Clacton, and Grays;" by T. Rupert Jones. "On the Circulatory Apparatus and the Organs of Respiration in the Arachnida;" by M. Emile Blanchard. "Notes on Crustacea;" by C. Spencer Bate. "On the different modes of Aquatic Respiration in Insects;" by M. Léon Dufour: (from the 'Comptes Rendus,' vol. xix. p. 763). "On the effects produced by some Insects, &c. upon Plants;" by James Hardy. "On the Classification of Trilobites;" by M. Barrande, of Prague, in Bohemia. "On the Visual Organs of the Annelida;" by M. A. De Quatrefages: (from the 'Comptes Rendus,' Dec. 31, 1849). Descriptions of some newly-discovered species, and characters of a new genus of Araneidea;" by Mr. J. Blackwall. "Descriptions of some New Butterflies;" by Mr. W. C. Hewitson..

The '*Zoologist*,' as usual, contains numerous brief notices relating to insects, besides which, the following descriptive papers form contributions to this journal: "Characters of undescribed Diptera in the British Museum;" by Mr. F. Walker. "Descriptions of two New Species of Tineidæ;" by Mr. J. Sircom, Jun. "Description of a second Lepidopterous Insect of the genus *Psyche*, recently discovered in Britain; and proposed separation of a well-known European species under a new generic name;" by Mr. E. Newman. "Description of New British Aphides;" by Mr. F. Walker. "Descriptions of Lepidopterous Insects of the genera *Hypenodes*, *Eupithecia*, and *Spilonota*, recently discovered in Britain;" by Mr. Henry Doubleday. "Random Observations on the *Psychidæ*, in reference to Mr. Newman's paper on that family;" by Mr. J. F. Stephens. "Description of certain Longicorn Coleoptera from New Holland;" "Description of a Pentamerous Coleopterous Insect from New Holland;" "Description of three Coleopterous Insects from New Zealand;" "Description of an *Agrion* from the interior of South America;" "Description of an apparently New Lepidopterous Insect of the family *Glaucopidæ*, from the Upper Amazons;" "Descriptions of two New Coleopterous Insects from New Holland;" all by Mr. E. Newman.

I will now draw your attention to a few other contributions to Entomology which have appeared in this country during the year. The first on my list is an 8vo work, entitled "*Insecta Saundersiana*,

or Characters of undescribed Insects in the Collection of W. W. Saunders, Esq.," and contains Part I of the Diptera; by Mr. F. Walker.

Mr. Hardy has communicated a paper on New British Homoptera to the 'Transactions of the Tyneside Naturalists' Field Club;' and a second paper by the same author, "On an Acarus which attacks Grapes," was read at the Meeting of the British Association, and published in the 'North British Agriculturist,' vol. ii. No. 34, Aug. 1850.

Mr. Westwood's continuation of 'Doubleday and Hewitson's Genera of Diurnal Lepidoptera' may be here noticed; and the following articles, by the same author, are published in the '*Gardeners' Chronicle*,' viz., "On the History of *Cemonius unicolor*, *Myrmica domestica* (house-ant), *Sirex gigas*, eggs of the dog-flea, and *Tortrix Turionana*; together with articles on Rose-tree Insects, and other subjects connected with Horticulture and Agriculture; articles which are accompanied by figures. In the same work will be found a "Discussion conducted by Messrs. Curtis, Westwood, Graham, and H. Doubleday, relative to the habits of *Tortrix angustiorana*;" and likewise a paper, "On the Diseases of Plants, including those caused by the attacks of Insects." Mr. Dennistoun communicated a paper "On the Silk Tissue spun by Caterpillars" to the British Association Meeting at Edinburgh.

Vols. 2 and 3 of 'Episodes of Insect Life' have appeared in 1850.

The following works, relating to Entomology, have been published by order of the Trustees of the British Museum, viz., 'List of the Specimens of British Animals in the Collection of the British Museum. Part IV.—Crustacea;' by Mr. Adam White. 'List of the Homopterous Insects,' &c. Part I.; by Mr. Francis Walker. 'List of the British Micro-Lepidoptera,' &c.; by Mr. J. F. Stephens. 'List of the Diptera.' Part IV.; by Mr. F. Walker.

To the labours of our continental brothers in Entomological Science, I feel that I cannot do full justice, since several periodicals, Proceedings of Societies, &c., which usually contain Entomological papers, I have been unable to consult. The subjoined list of contributions to our Science (imperfect as it must be), however, *should* serve as a stimulant to increased activity on our part. Looking to our nearest neighbours first, I naturally turn to the

'*Annales de la Société Entomologique de France*,' for 1850, in which I find "Observations sur le *Theridion civicum*;" by M. Dumeril; followed by a Note on the same Memoir, by M. H. Lucas. "Note sur la prétendue poussière Cryptogamique qui couvre le Corps

de certaines Insectes ;” by M. Coquerel. “ Réponse à cette Note ;” by M. A. Laboulbène. “ Notice sur une production Cryptogamique observée sur le *Brachinus crepitans* ;” by M. A. Rouget. “ Note sur les Mœurs du *Coniatus chrysochlora* ;” by M. E. Perris. “ Observations sur ce Mémoire ;” by M. Lucas. “ Observations sur un nouveau genre de l’ordre des Coléoptères (genus *Stenomera*) qui habite les possessions Françaises du Nord de l’Afrique ;” by M. Lucas. “ Description d’un genre nouveau (*Chevolatia*) et de quelques espèces nouvelles (*Euæsthethus Lespesii* et *Stenus Guynemeri*) ;” by M. Jacquelin-Duval. “ Description d’un nouveau genre de Lucanide (*G. Streptocerus*) ;” by M. L. Fairmaire. “ Note sur le Classification parallélique des Orthoptères ;” by M. L. Brisout de Barneville. “ Description d’une nouvelle espèce de *Lystra* (*L. punctata*) ;” by M. V. Signoret. “ Description d’Hémiptères nouveaux provenant de la Guinée Portugaise (*G. Petascelis* et *Mictis cinctus*) ;” by M. V. Signoret. “ Observations sur les Lépidoptères d’Auvergne ;” by M. Bellier de la Chavignerie. “ Observations sur les Lépidoptères des genres *Papilio*, *Anthocharis*, *Cigarites*, et *Cerocala*, qui habitent les possessions Française du Nord de l’Afrique ;” by M. Lucas. “ Observations sur le genre *Thyatira*, et Réponse à la Note de M. Bruand, publié in 1849 ;” by M. Guenée. “ *Species Italicæ generis Eumeri observatæ et distinctæ a Camillo Rondani.*” “ Description et Iconographie de quelques Diptères d’Espagne ;” by M. L. Dufour. “ Mémoire sur plusieurs espèces de Myodaires—Entomobies ;” by M. Robineau-Desvoidy. “ Myodaires des Environs de Paris (suite Entomobies *Eramydes*) ;” by the same Author. “ *Nota sexta pro Dipterologia Italica de nova specie generis Ceriæ (C. Petronillæ), detecta et descripta à Camillo Rondani.*” “ Observations sur un nouveau genre de l’ordre des Décapodes Macroures appartenant à la tribu des Pénées (*Selenocera Philippii*) ;” by M. Lucas. “ Observations sur l’indigénéité des *Sphinx Nerii* et *Celerio* ;” by M. Donzel. “ Note sur la conformation du front dans plusieurs espèces de Noctuelles, et sur les divisions du genre *Cleophana* ;” by M. Guenée. “ Description d’un Lépidoptère nouveau de la tribu des Saturnides (*Saturnia Isabellæ*), appartenant à la Faune centrale de l’Espagne ;” by M. Graells. “ Description de quelques Lépidoptères Rhopalocères nouveaux, ou peu connus, provenant de la Cazamance (Afrique) ;” by M. Feisthamel. “ Mémoire sur les genres *Psalidognathus* et *Chiasognathus* ;” by M. Reiche. “ Monographie des espèces Européennes des genre *Cryptocephalus* (deuxième partie) ;” by M. Suffrian. “ Description de soixante Coléoptères appartenant à l’Europe et à l’Algérie ;” by M.

Ch. Aubé. "Note sur le mâle des *Vesperus Xatarti*, Mulsant;" by M. Jacquelin-Duval. "Notice Nécrologique sur M. Pierret;" by M. Doué. "Ichneumonologie provençale, ou Catalogue des Ichneumonides qui se trouvent aux environs d'Aix, et description des espèces inédites (Suite);" by M. Boyer de Fonscolombe. "Notice sur quelques Lépidoptères nouveaux (*Erebia Sthenyo*, *Heterogynis erotica*, &c.) trouvés dans les Pyrénées-Orientales;" by M. De Graslin. "Note relative à l'*Erebia Stenno*, de Graslin;" by M. Alexandre Pierret. "Nouvelles Observations des Diptères de l'Europe de la tribu des Tachinaires (Suite);" by M. Macquart.

In that excellent periodical, the '*Revue et Magazin de Zoologie*,' conducted by M. Guérin-Ménéville, I find the following memoirs and references to Entomological works which have, more or less, recently issued from the press:—"Essai sur les Coléoptères de la Polynésie;"—a continuation of a paper commenced in former parts of the '*Révue*,' containing descriptions of the *Xylophaga*, Longicorns, and *Chrysomelidæ*, &c.; by M. Léon Fairmaire. "De l'appareil circulatoire et des organes de la Respiration dans les Arachnides;" by M. E. Blanchard: a paper of which there will be found a translation in the '*Annals of Natural History*' for 1850, No. 31, vol. vi. (second series) p. 67. "Sur la Circulation dans les Insectes;" by M. Léon Dufour (from a small 8vo work of 40 pages, published at Bordeaux, in 1849). "Note sur le *Calymus abdominalis* (*Callidium abdominalis* Oliv.);" by M. Mulsant. "Memoir sur l'étude Microscopique de la cire appliquée à la recherche de cette substance chez les Animaux et les Végétaux;" by M. Dujardin. "Œufs de Lépidoptère éclos quoique leur mère n'est pas été fécondée;" by M. Popoff. The communication here referred to occurs in a note to M. Le Comte Mannerheim's paper on "New Coleoptera of Siberia," published in the '*Bulletin de la Société Impériale des Naturalistes de Moscou*,' No. 1 for 1849, p. 223. M. Guérin states that several observers had already called attention to the fact, that the eggs of certain Lepidopterous insects have been known to produce larvæ, notwithstanding that the eggs had not received the fecundating influence of the male; and that he had published in the '*Révue Zoologique*' for 1847, pp. 266—268, some Notes, by M. Bourcier, and a Report, by M. Dumeril, on this curious subject; whilst in the present notice would be found a new instance of the fact, and this coming from a person worthy of faith, and published by M. Le Comte Mannerheim. It is stated that the eggs from a female of the *Euprepia hololeuca*, itself reared from a larva, after having been laid from eight to ten days, gave birth to

a number of caterpillars, and that the parent insect had been kept quite isolated. That at the time the moth was in the breeding-cage, there was not only no male of the *Euprepia* present, but no male of any Lepidopterous insect. M. Speyer has published similar observations in the 'Stettiner Entomologische Zeitung' for 1847, p. 18, with respect to certain species of Psychidæ; whilst an analogous fact is noticed by Lacordaire, in his 'Introduction à l'Entomologie,' ii. 283. "Note sur la prétendue poussière Cryptogamique qui recouvre le Corps de certaine Insectes;" by M. Charles Coqueril. This paper is followed by another on the same subject, by M. A. Laboulbène. "Notes pour servir à l'histoire du *Cyrtonus rotundus*, suivies de la description de cette insecte et d'une espèce voisine;" by MM. E. Mulsant and A. Wachran. (Read before the Académie des Sciences, &c. de Lyon, July, 1849). "Catalogue des Carabiques recueillis par M. Bocandé dans le Guinée Portugaise, avec la description sommaire des espèces nouvelles;" by M. Laferté-Sénéctère. The commencement of this paper, which is published in several parts, will be found in the 'Révue' for 1849. "Description d'un genre nouveau et de quelques espèces du groupe des Tettigonides;" by M. Signoret. "Description d'un genre nouveau de l'ordre des Hémiptères Hétéroptères, et de la section des Hydrocoryses;" by the same author: both papers are accompanied by plates. "Enumeration des Insectes qui consomment les Tabacs;" by M. Guérin-Ménéville: with a plate. "Pathologie des vers à soie (*Bombyx mori*, L.) études sur le sang;" by M. A. Focillon: a paper which appeared originally in the 'Gazette des Hôpitaux.* A paper relating to the same subject, viz., "On the Diseases of Silkworms" was read by M. Guérin-Ménéville, at the Academy of Sciences of Paris, on the 26th of August.

The '*Stettin Entomologische Zeitung*' for the year 1850, is rich in memoirs and notices; the principal papers are as follows: "Catalogue of the species of *Sphex* of Linnæus, found in the principality of Birkenfeld at Herrstein;" by Tischbein. "On some new Alpine Coleopterous Insects;" by Miller. "On the *Rhizotrogus marginipes*, Mulsant;" by Rosenhauer. "On *Rhizotrossus foveolatus*, a new species;" by Bach (a corresponding member of our Society): and "Further observations on the *Bostrichus Kaltenbachii*;" by the same author. "On the History, Economy, and Development of *Gonioctena 5-punctata*, *Fb.*, *pallida*, *Fb.*, *Leona cyanella* and L.

* Translated in the 'Annals of Natural History;' see No. 29, for May, 1850. (Vol. v. of second series).

melanopa;" by Cornelius. "Entomological Observations;" by Dornber. "On the Micro-Lepidoptera of the Neighbourhood of Dessau;" by Richter. "Description of a new species of *Setia* (*Sesia*, *Fab.*), with pectinated antennæ (*Pennisetia anomala*);" by Delme. "Remarks upon the 'Entomologiæ Neapolitanæ specimen primum' of Dominici Cyrilli;" by Schläger. "On six new species of the genus *Trypeta*;" by Loew. "Review of Modern Literature relating to the Neuroptera (concluded);" by Dr. Hagen. "On two new genera of German Neuroptera;" by Heyden. "Memoir on the species of *Raphium*;" by Professor Loew (concluded in part 4). "On three new species of the family *Carabidæ*;" by Herr Bielz. "Descriptions to Herr J. Mann's Tuscanian Micro-Lepidoptera;" by Herr Zeller. "On the European species of the genus *Colon*;" by Krantz. "Descriptions of fifty new, or little known, species of European Coleoptera;" by Herr Kiesenwetter. "On the distribution of the Lepidoptera in Germany;" by Dr. Adolf Speyer and Herr August Speyer. "On *Meghyperus* and *Anthropeas*, two new genera of Dipterous Insects;" by Loew. "Descriptions of two new Diurnal Lepidoptera;" by Zeller. "Description of a convenient Apparatus for rearing Caterpillars;" by Koch. "On an apparent abnormal form of Antennæ in the *Melolontha vulgaris*;" by Dornber. "On the Threadworms of Insects;" (3rd Supplement); and a paper "On the Worms infesting the Alimentary Canal of the Human Subject;" by the same author. "Description of a new species of *Orthochile* of Latreille;" by Loew. "Description of some new Colcoptera;" by Hampe. "Review of the more recent Literature concerning the Neuroptera of Linneus" (continuation); by Hagen. "On two new Diptera;" by Loew. "On Lepoptera *Cervi*;" by Siebold. "On *Nematus heliцинus*, a new species;" by Brischke.

As the '*Bulletin de la Société Impériale des Naturalistes de Moscou*' for 1849, has, I have reason to believe, but recently arrived in England, it may be well here to notice the several Entomological papers which it contains, in addition to those of the first two parts of 1850, which I have also consulted. In the volume for 1849 are the following papers: "Die Staphylinen-Fauna des Kaukasus und Transkaukasiens bearbeiten;" by J. H. Hochhuth. "Insectes Coléoptères de la Sibérie Orientale, nouveaux ou peu connus;" by M. Le Comte Mannerheim. "Note sur deux Araignées venimeuses de la Russie Méridionale qu'on croit être le Tchim des Kalmoaks;" by Victor de Motschoulsky. "Abhandlung über eine neue Daphnienart

(*Daphnia aurita*) ünd über die *Daphnia laticornis*, *Jurine*, mit Zeichnungen nach der Natur begleitet ;” by Sebastian Fischer. “Coléoptères reçus d’un Voyage de M. Handschuh dans le midi de l’Espagne, énumérés et suivis de Notes ;” by Victor de Motschoulsky. “Lepidoptere verzeichniss der Umgegend von St. Petersburg ;” by T. H. Fixsen. “Fauna Hymenopterologica Volgo-Uralensis ;” by Dr. Ed. Eversmann. “Orthoptères observés dans les Steppes des Kirguises ;” by MM. Le Prof. P. Wagner et le Docteur Kittary, en 1846, déterminés et décrits par Modeste Kittary. “Beitrag zur Naturgeschichte und Anatomie der gattung *Lycosa* ;” by Prof. Kessler. “Nachricht über die Kafersammlung des grafen Georg Muiszek ;” by H. Hochhuth. Parts 1 and 2 for 1850 contain a “Mémoire sur la famille des Carabiques ;” by Le Baron M. de Chaudoir. “Kritische Beurtheilung von Dr. Erichson’s Naturgeschichte der Insecten Deutschlands ;” by Victor V. Motschoulsky. “*Eucera* Rossicæ in districtu Romæ gubernii Poltavici captæ, descriptæ et icone illustratæ, auctore ;” by J. Bær.

The ‘*Annales de la Société Linnéenne de Lyon*’ for 1847—49 contains the following three papers: “On Grease in Coleopterous Insects ;” by Lerrat. “Notes on Coleoptera found at Fallavier ;” by M. Gascognés. “On a species of *Ochthebius* ;” by MM. Mulsant and Rey.

To the Academy of Sciences of Berlin, Dr. Klug has communicated a paper “On the Synemon of Doubleday (a remarkable genus of Lepidopterous insects, allied to *Castnia*), from New Holland.

A memoir on the Scorpionidæ, by M. Gervais, will be found in the fourth volume of the ‘*Archives du Muséum d’Histoire Naturelle*.’

Mr. Dana has published a synopsis of the genera of Gamaraceæ in the ‘*American Journal of Science and Art*,’ (second series, vol. viii. No. 22); and a ‘*Conspectus Crustaceorum*,’ (parts 1—3, inclusive) has been issued by the same author.

Dr. Herrich-Schäffer has published the first number of a new work, in 4to, containing figures of New Exotic Butterflies; and by the same Author, is a “Memoir on the Veins of the Wings of Lepidopterous Insects,” in the ‘*Proceedings of the Meeting of the German Naturalists, at Ratisbon*.’

An article “On the Fulgoridæ” has been contributed by Dr. Schaum to ‘*Ersh and Gruber’s Encyclopædia*.’

The continuation of the ‘*Entomologische Jahresbericht*,’ by the same Author, may be here noticed.

Band 4 of the 'Linnæa Entomologica,' contains the conclusion of a paper "On the European Diptera Asilici;" by Loew. A "Monographic revision of the genus *Hydræna*;" by Kiesenwetter. A "Memoir on the Coleophoræ;" by Zeller. A paper "On the genera and species of *Manticora*;" by Dr. Klug.

Of separate works in different branches of Entomology, it remains for me to notice the 'Monographia Cassidarum;' by C. H. Boheman. Vol. 1, 8vo. Holmiæ. The 'Species de Coléoptères Trimères Sécuripalpes;' by M. Mulsant, a thick 8vo volume (consisting of upwards of 1000 pages), published as part of the 'Annales des Sciences Physiques et Naturelles d'Agriculture, &c. de Lyon.' 'Révue des Odonates ou Libellules d'Europe;' by M. Edm. De Selys-Longchamps and M. Le Docteur H. A. Hagen; forming the sixth volume of the 'Mémoires de la Société Royale des Sciences de Liège.' 'Synopsis der Lepidopteren Fauna Böhmens;' by F. A. Nickerl. 8vo. Prag. 'Die Waldverderben und ihre Feinde, &c.;' by J. F. G. Ratzeburg. 8vo. Berlin. 'Versuch einer Monographie der Lycænen;' by Gerhard. 4 parts, 4to. 'Catalogue of the Coleoptera in the Museum of the Jardin des Plantes;' (No. 1, containing a thousand species belonging to the families Cetoniidæ and Melolonthidæ). 'Kafer Fauna der Preussischen Rheinlande;' (1st Lieferung, Coblenz, 1849, contains the Coleoptera to the end of the Lamellicornes) by Bach. 'Memoir on the Pselaphidæ of the United States;' and a 'Synopsis of the Cleridæ;' by Leconte. The 20th part of J. Sturm's 'Deutschland Fauna,' continued by his son, J. W. Sturm, contains descriptions of fifteen Coleopterous genera and numerous species: it appeared in 1849. 'Fauna Austriaca—Die Kafer nach der Analytischen Methode bearbeiten;' by Ludwig Redtenbacher. 1 vol. 8vo. Vienna.

Report of the Library and Cabinet Committee of the Entomological Society.

During the past year the Foreign Coleoptera have been removed into the Cabinet presented by Mr. Bond, and the arrangement of the British Lepidoptera, in the Cabinet that thus became empty, is far advanced.

The Foreign Insects that have been presented to the Society for some years past still remain in the boxes in which they arrived, and it is very desirable that they should be incorporated into the Collection and named, but in consequence of the amount of time that would be required if the Curator were to do this, we beg to suggest that some of the Members, conversant with Exotic Insects, should be requested to assist him. Many duplicates would be the result of the arrangement, and we would suggest whether it would not be desirable to offer them to the Members and Subscribers in exchange, more particularly for British Insects.

Some glasses are required for the Cabinets, and the drawers in that presented by Mr. Bond require some chenille or velvet for the glasses to rest on, in order to exclude dust.

The arrangement for the exchange of Books, ordered by the Council to be made with Mr. Lumley, is not yet completed, as Mr. Lumley has not yet taken away the whole of the volumes.

Several works of value in the Library, presented in parts, are in want of binding, in fact, in their present state, it is not safe that they should go out on loan. We therefore recommend that, if the funds of the Society will permit, those most urgently requiring it should be bound forthwith.

J. W. DOUGLAS.
 H. T. STANTON.
 EDWARD JANSON.
 J. F. STEPHENS.

February 3, 1851.

The Society's Collections are at present contained in Six Cabinets, Forty-three Store-boxes, and Twelve glazed Cases.

Cabinet No. 1, consisting of 40 mahogany drawers in two tiers, contains the Collection of British Lepidoptera.

Cabinet No. 2, consisting of 42 mahogany drawers, in two tiers, contains the first portion of the general Collection of Coleoptera.

Cabinet No. 3 consists of three tiers of drawers.

In tier 1 there are 25 drawers, containing the continuation of the general Collection of Coleoptera.

In tier 2 there are 26 drawers, containing the remainder of the general Collection of Coleoptera, Myriapoda, Onisci, Scorpions, and Orthoptera.

In tier 3 there are 23 drawers, several of which contain exotic Papilionidæ, and the remainder of which is to be transferred, as far as practicable, to the general Collection of Lepidoptera.

Cabinet No 4, consisting of 48 mahogany drawers, in two tiers, contains the Collection of British Coleoptera, Hymenoptera (chiefly Aculeates), Diptera, and the original specimens described by the late Rev. William Kirby, in "Monographia Apum Angliæ" and the "Monograph of the Genus Apion."

Cabinet No. 5, consisting of 18 drawers, contains the general Collection of Hymenoptera.

Cabinet No. 6, consisting of 20 drawers, contains the general Collections of Diptera, Hemiptera, Neuroptera, and Arachnoida.

The Store-boxes contain miscellaneous Insects, principally exotic Lepidoptera and Coleoptera, which have to be incorporated with the arranged Collections.

The 12 glazed cases contain Insects from the East Indies, chiefly Lepidoptera, lately presented to the Society, and which have likewise to be incorporated with the arranged Collections.

ABSTRACT OF THE TREASURER'S ACCOUNTS.

INCOME.

	£.	s.	d.
On hand at the Audit, January, 28th, 1850	9	17	6
Arrears of Subscriptions	20	15	0
Subscriptions for 1850	75	2	0
Five Admission Fees	10	10	0
Two Compositions	21	0	0
Tea Subscriptions	5	2	0
Sale of 'Transactions'	98	10	7
Donation of W. W. Saunders, Esq., in aid of Colouring Plates	10	14	2
	<u>£251</u>	<u>11</u>	<u>3</u>
Deduct Expenditure	244	13	7
	<u>£6</u>	<u>17</u>	<u>8</u>

EXPENDITURE.

	£.	s.	d.
Arrears for 1849	71	18	8
Rent to Midsummer, 1850	17	10	0
Insurance	1	12	6
Curators	18	11	0
Thirteen Meetings (Tea)	13	0	0
Attendance, Coals, Oil, &c.	5	9	0
Freight, Postage, Stationery, &c.	4	4	0
Printing 'Transactions,' Vol. 5, Part 9	21	0	0
" " Vol. 1, N. S., Part 1	10	1	0
" " " " Part 2	8	10	0
" " " " Proceedings, President's Address, &c.	5	13	4
	<u>45</u>	<u>4</u>	<u>4</u>
Stitching up Back Parts	3	14	9
Engraving Plates	4	1	0
Printing Plates	7	16	0
Colouring Plates for Vol. 5, Part 9	16	1	4
" " Vol. 1, N. S., Part 1	0	12	0
" " " " Part 2	4	7	6
" " " " Part 3	3	1	8
	<u>24</u>	<u>2</u>	<u>6</u>
Colouring Plates for Back Parts, Vol. 1	1	19	8
" " " " Vol. 2	3	2	4
" " " " Vol. 3	0	17	10
" " " " Vol. 4	3	14	9
" " " " Vol. 5	12	1	1
	<u>21</u>	<u>15</u>	<u>8</u>
On account of W. W. Saunders, Esq.	5	14	2
	<u>£244</u>	<u>13</u>	<u>7</u>

LIABILITIES AND ASSETS OF THE SOCIETY.

<i>Liabilities.</i>	<i>£ s. d.</i>	<i>Assets.</i>	<i>£ s. d.</i>
Half-year's Rent to Xmas. 1850.	17 10 0	Cash in hand	6 17 8
Printer's Bill for 'Transactions,'		Arrears of Subscription for 1850.	22 1 0
Vol. 1, N. S., Part 3	8 17 6	Do. for former years	14 14 0
	<u>£26 7 6</u>		<u>£43 12 8</u>

State of Progress of the Entomological Society.

	Honorary Members		Ordinary Members		Subscribers	Total Of Ordinary Members & Subscribers
	English.	Foreign.	Annual Subscribers £1. 1s.	Who have Compounded		
January 1st, 1849.....	2	9	63	8	0	71
Elected in 1849		+1	-7	+1	+28	+36
Compounded in 1849..			-8	+8		
Withdrawn in 1849 ...			-2		-1	-3
Deceased in 1849.....			-3			-3
January 1st, 1850.....	2	10	57	17	27	101
Elected in 1850			+7	+1	+13	+21
Compounded in 1850..			-1	+1		
Withdrawn in 1850 ...			-1			-1
Deceased in 1850....	-1		-2			-2
January 1st, 1851.....	1	10	60	19	40	119

Income arising from Annual Subscriptions.

	<i>£. s. d.</i>
January 1st, 1849	66 3 0
January 1st, 1850	88 4 0
January 1st, 1851	105 0 0

PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY OF LONDON,
FOR 1851.

February 3, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

M. Motchulsky was present as a visitor.

The President returned thanks for his election and delivered the following inaugural Address.

GENTLEMEN,

Before proceeding to perform the first public official act which I am called upon to do in this chair, I must beg permission to be allowed to trespass a few minutes upon your time, in order to offer to you my best thanks for having elected me to the honourable position in the entomological world which I now occupy. Looking, as I do, upon the Entomological Society, as the mainstay and support of entomological science in this country, I cannot, whilst proud of my position as President of the Society, conceal from myself that that position is attended with duties of considerable weight, which will require a greater share of attention and much more time than I am afraid I shall be able to bestow upon them, as well as an amount of talent and self-possession, to which I am equally afraid I can lay no claim. I must look, Gentlemen, under such circumstances, to you for support, and I feel confident that if my exertions, although inadequate, are directed to the welfare of the Society, I shall receive that support. It will be now more than ever my duty to consider the well-being of the Society as of paramount importance; and acting on this principle, I feel convinced that I shall not disappoint the kind intentions of those gentlemen, who have considered that my election to the Presidency would advance the Society's interests.

But, Gentlemen, I look to you for more than a support of such exertions as I may myself make with this object in view. I look to you for cordial co-operation in your endeavours to render our meetings interesting and instructive; since it is only by such means that we can maintain our position among the Scientific Societies of the country, and can insure to ourselves, individually, the benefits of association. With this consideration it has suggested itself to my mind, that it might not be entirely useless to recall to your attention the chief branches of entomological science, and which indeed seems the more necessary, as too many of our younger members appear disposed to regard Entomology simply as an amusement. Nobody can indeed appreciate more completely than myself the pleasure attending a day's stroll in the woods with an object in view, such as the discovery of some rare insect or plant, and the increase of our collections by our own personal exertions. Neither can the pleasant task of investigating the names of our captures, and the mutual interchange of our novelties with our friends, be too highly regarded. The few observations which I now beg leave to address to you have, however, for their object, a higher cultivation of the science, and a more severe application of the mental faculties to the subjects of our research.

That Entomology, as a science, possesses such claims upon the attention of its votaries, will be evident, if we bestow but a few moments' attention upon each of its main features; to the cultivation of one or the other of which, I would earnestly beg to direct your attention, as the sure means of advancing the science.

Descriptive Entomology, that branch of the science which teaches us the names and distinctive characters of the species of insects, merits the first consideration. It ought not, however, to be undertaken without a careful investigation of the respective groups to which any species proposed to be described naturally belongs. It is a great mistake to suppose, that when a person has discovered what appears to be a new species, he has only to sit down with the insect before him and draw up a short technical description of it, without a careful study of the naturally allied species, or an investigation of what has already been published by previous authors upon the genus or family. Even then, much judgment is required, as to the style and description to be adopted, since some descriptions are as much too short as others are needlessly too long. There is, in my opinion, no better advice to be given on this branch of the subject, than to study the descriptions drawn up by the great masters of our science. Here, also, I would more especially be allowed to recommend the publication of mono-

graphs of particular groups, or even of isolated genera. These have, in all times, been considered of the greatest importance; and I am sure I cannot too often recall to your recollection the 'Monographia Apum Angliæ,' the finest entomological monograph hitherto published.

The *Anatomy of Insects*, either internal or external, also especially merits, on account of its extreme importance, more attention than it has of late received in this country. Two exceptions to this remark of course at once present themselves to the mind, namely, Mr. Newport's most valuable series of memoirs which have appeared in the 'Transactions of the Royal Society,' and Mr. Haliday's researches, which have not hitherto been published, but which we know to be very elaborate, from the specimen which he gave to us at one of our meetings, relative to the anatomy of that remarkable larva which resides in the fresh-water sponge. It has always seemed astonishing to me, that out of the vast numbers of young men educated for the medical profession, so very few should attach themselves to the anatomy of insects, or even to comparative anatomy in general. I cannot but think, that if Natural History formed a branch of popular education, many young men, who, as boys, had been devoted to insects or any other branch of zoology, would, whilst pursuing their academical or hospital researches, naturally apply the knowledge which they were then acquiring to the objects for which they had previously entertained a predilection. It is precisely this which takes place in the German universities, and hence it is that so many excellent Theses upon Entomology have been written by students on taking their degrees in that country. The vast strides also which have been made in the improvement of microscopical instruments, ought to produce some far more beneficial results to our science than have yet been achieved. Instead of allowing his observations to extend over the three kingdoms of Nature, if one microscopical observer would confine his attention to the variations of structure of any particular organ, or set of organs, of insects, tracing out its modifications, and carefully describing and delineating the results, it is unquestionable that much good would ensue. The fine work of Stein, on the female generative organs of the Coleoptera, affords an excellent specimen of such a work.

The *Investigation of the Natural History of Insects*, including, of course, their preparatory states, is another branch of the subject which cannot be too constantly kept in view; in fact, it is surprising to me that entomologists should in general be so regardless of the

wonderful marvels which are hereby brought to light. The extraordinary adaptation of structure to habit is a most fruitful subject of inquiry, whilst we cannot too much over-rate the vast importance of a precise knowledge of the larva state of most of the groups of insects, as a clew to their natural relations. Almost every number of the 'Annals of the Entomological Society of France' contains papers of this kind, whilst I regret to see that our own 'Transactions' now rarely contain any such.

The *Natural Relations of Insects* with each other is the last branch of the subject to which I shall allude. By such fanciful minds as those of Swainson, Gravenhorst, and Herrich-Schäffer, I am well aware that much discouragement has been thrown upon the investigation of the affinities and analogies of natural objects, and upon inquiries into their position in the great chain of Nature. I cannot, however, but believe, that a steady examination of the structure and habits of an insect with reference to those of other allied species, is one of the most legitimate objects of our study. To follow this out with effect, however, we must look upon Nature in general, and not confine our view to the productions of a limited district like our own country. This may, however, be done by the careful investigation of a very few exotic types, which cannot but afford an enlarged view of Nature, and which ought, I think, to be undertaken even by the professed British entomologist.

I have ventured, Gentlemen, to make the preceding observations, simply with the hope that some of our members who have hitherto been content to exhibit to us at our meetings the results of their entomological excursions, may thereby be incited to direct their attention to the subject in a more philosophical spirit, and led to give us the result of their investigations, so as to render our meetings worthy of public attention, and our 'Transactions' friendly rivals of, if not indeed superior in value to, those of the French and German Entomological Societies.

Thanking you again for the honour you have conferred upon me, I cannot sit down without throwing out one remark, which will of course require much discussion before it can be carried into effect, even if approved of, but which seems to me to promise considerable benefits to our members, if adopted in a liberal spirit,—I allude to the distribution of duplicates of rare British species, on the plan which has now been found to work so well for a considerable period at the Botanical Society of London.

The President appointed as Vice-Presidents, Messrs. Bond, W. W. Saunders and G. R. Waterhouse.

The following donations were announced, and thanks ordered to be given to the donors: 'Mémoires de la Société Royale des Sciences de Liege,' tome 6, being 'Revue des Odonates ou Libellules d'Europe;' par M. C. de Selys-Longchamps. 'Monographia Cassidarum;' auctore Carolo H. Boheman, tome 1; both presented by Mr. Stainton. 'Entomologische Zeitung,' for December, 1850; by the Entomological Society of Stettin. The 'Zoologist' for February; by the Editor. A specimen of *Sirex duplex* and one of the *Tenthredinidæ*; by Mr. Lubbock. A collection of Indian insects, contained in twelve cases and in the finest condition; by — Grant, Esq., Elchies.

The President observed that the addition of this valuable donation of Mr. Grant's, made the Society possessor of one of the finest collections of Indian insects in Europe.

Major E. Sheppard, F.L.S., Bellefield House, Parson's Green, Augustus Sheppard, Esq., Bellefield House, Parson's Green, and J. McIntosh, Esq., Charminster, near Dorchester, were balloted for and elected members of the Society.

Mr. S. Stevens exhibited a new butterfly (*Thaumantis Howqua*) Westwood MS., and two specimens of the *Papilio Telamon* of Donovan, both recently taken by Mr. Fortune, in the north of China.

The President remarked that the last species was especially interesting, although the specimens were in bad condition, for no example had been seen since the time of Donovan, and not one was known to be now in existence; and the examination of these had shown that the species was not a true *Papilio*, but formed a new genus between *Thais* and *Teinopalpus*.

Mr. Saunders exhibited some Lepidoptera from Brazil, remarkable for the great size of their projecting palpi, simulating the appearance presented by the peculiar legs of the genus *Polyogon*.

The President exhibited some galls found on vines, sent to him by Sir O. Mosley, Bart. No insect had yet been reared from them; indeed in many that he had examined, no insect was present, but in one he had found a larva which appeared to belong to a species of *Curculionidæ*.

Mr. Douglas and Mr. Stainton exhibited some twigs of yew, from Mickleham and Worksop, in which the growth had been stopped, and the agglomeration of the terminal leaves had caused the formation of a knob about the size of a hazel-nut. In some of these a small lepidopterous larva had been found, which was probably the cause of the arrested development: and Mr. Douglas, adverting to a conversation about the food of *Ditula angustiorana* which took place on the 4th of February, 1850, at this Society's meeting, suggested that these might be the larvæ of that species of *Tortricidæ*.

Mr. Stainton mentioned that during the past week he had seen in the seed-vessels of common furze, fully developed specimens of *Oxystoma Ulicis*, apparently waiting until their cells should open.

Mr. Lubbock exhibited some small globular nests, apparently of a spider, attached to stems of grass, but they were untenanted.

Mr. Douglas exhibited a somewhat singular nest, found last week at Mickleham, on the ground, formed between leaves still attached to the twig of beech on which they had grown, and the architect, a spider, accompanied it.

Mr. Stainton exhibited a small bunch of evergreen oak, the leaves on which were

mined by the larvæ of a *Lithocolletis*, observing as a fact he had noticed, that *Lithocolletis* larvæ feeding on the leaves of deciduous trees, passed before the winter into the pupa state, but in evergreens, they remained larvæ until the spring.

Mr. W. W. Saunders read a memoir 'Upon the Insects injurious to the Cotton Plant,' of which the following is an abstract.

"Having had my attention called to the insects injurious to the cotton-plant, I have been seeking for information from a variety of sources, but discover with surprise that the insects in question have been but very little studied, although it is evident from the published accounts of their ravages, the amount of loss to the planter must at times be very great. The particulars which have hitherto appeared regarding the cotton-moth, cut-worm or grub, cotton-bug, *Apate monochus* or bore-worm, will be found in Porter's 'Tropical Agriculturist,' and Dr. Ure's 'History of the Cotton Manufacture,' but the information is very unsatisfactory, and entirely wanting in that correctness of detail so necessary to the entomological enquirer, and which if fully developed might lead to some satisfactory method of diminishing if not preventing the injuries caused by these destructive insects.

"More positive information is to be obtained on the following insects, and in treating on these I will place them in two divisions.

"The first, containing the species which have already been described; and the second, such only as are for the first time brought forward as injurious to the cotton-plant.

"In the first division may be mentioned,

"*PHALÆNA OBLINITA*, Abbot and Smith's Insects of Georgia, Pl. 94, p. 187.

"The caterpillar feeds on the cotton and other plants, and the moth appears in April.

"Found in Virginia and Georgia.

"*DEPRESSARIA GOSSYPIELLA*, Ent. Trans., vol. iii. p. 284.

"Very destructive to the American cotton grown at Broach, in the East Indies, but seldom affecting the native cotton. The larva feeds on the cotton-seed until the pod is about to burst.

"In the second division I have to enumerate,

"*ARCTIA HORSFIELDII*.

"Expansion of the wings 1 inch 10 lines. Anterior wings purplish ashy gray, with several abbreviated, obsolete, wavy, dark gray strigæ, parallel to the hinder margin, and a more defined zigzag, dark gray line near the base, and with an elongate reniform mark on the disk beyond the middle: posterior wings brownish orange, gradually changing to purplish gray, marked on the disk with a dark gray spot, and with radiating lines of the same colour.

"The larva is yellowish white, covered with long cream-coloured hairs. The joints of the body, each crossed above with an ash-gray lunulate spot, and a round, rather large black spot on the upper side of the third joint.

"Feeds on the *Gossypium herbaceum*, *Lin.*; a native of Java; appears in the month of August, according to Dr. Horsfield.

“ EUDIOPTES INDICA.

“ Expansion of the wings 10—12 lines. Anterior wings hyaline, with a broad, dark brown band along the costa and hinder margin, the band rather widening as it approaches the anal angle : posterior wings hyaline, with a band of the same width and colour as on the anterior wings along its hinder margin, gradually tapering as it approaches the anal angle.

“ Larva smooth, pale grass-green, with the head yellowish.

“ Feeds on the *Gossypium herbaceum*, and on the *Corallodendron*; common in Java from January to April, according to Dr. Horsfield.

“ This species is nearly allied to *Pyrallis hyalinata*, *Lin.*, but is nevertheless quite distinct.

“ Three other species of insects attack the cotton plants in the East Indies, and cause serious injury, *viz.*,

“ The larva of some beetle, probably of the family of the *Chrysomelidæ*; an *Aphis*, for which I propose the name *A. Gossypii*; and the immature state of a Homopterous insect, probably related to the family *Cercopidæ*.

“ I trust that this notice, imperfect as it is, may be of some use as a first step towards a history of the insects injurious to the cotton-plant, and may bring the important subject to the notice of entomologists, who have opportunities of witnessing the ravages committed by insects on the cotton-plant, and induce them to record their observations, with a view of furnishing materials for a more complete investigation of the subject hereafter.”

The paper is accompanied by a plate.

The President announced that in addition to the donation of lithograph copies of the portrait of the late Rev. W. Kirby, for the ‘ Transactions,’ Mr. Spence had placed fifty copies at the disposal of the Council, who have determined to offer them to members and subscribers at one shilling each.

The President also said he had been requested to announce that Mr. Foxcroft intended to visit Wales this year, on an entomological expedition, for which he solicited subscriptions, to be repaid by his captures.

February 3, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors thereof: ‘ *Linnæa Entomologica*,’ v. Band; ‘ *Entomologische Zeitung*,’ January and February; by the Entomological Society of Stettin. ‘ *The Zoologist*’ for March; by the Editor. ‘ *Proceedings of the Berwickshire Naturalists’ Club*,’ vol. iii. No. 1; by the Club. ‘ *Transactions of the Zoological Society*,’ vol. iv. Part 1; by the Zoological Society. ‘ *Mémoires de l’Académie Royale des Sciences, des Lettres et des Beaux-arts de Belgique*,’ tomes xxiv. and xxv. 1850; ‘ *Mémoires Couronnées et Mémoires des Savants étrangers*,’ tome xxiii. 1848—50; ‘ *Bulletin de l’Académie Royale*,’ tome xvi. 2me partie, 1849, tome xvii. 1re partie, 1850; ‘ *Annuaire de l’Aca-*

démie Royale,' 1850; 'Catalogue des Livres de la Bibliothèque de l'Académie Royale;' 'Histoire Naturelle des Polypes composés, d'eau douce;' 'Mémoire de Chimie et la Physiologie Végétale,' 1849; 'Exposé Générale de l'Agriculture Luxembourgeoise,' both by Henry le Docte; 'Mémoire sur la Paupérisme dans les Flandres,' par E. Dupetiaux, 1850; all presented by the Académie Royale de Belgique. Five species of foreign Coleoptera, found alive in a warehouse in Glasgow; by J. Scott, Esq. Two boxes of insects, collected near Baltimore, United States, by R. H. Spence, Esq., and presented by him. A small hornet's nest, with a queen hornet, and four young ones reared from her eggs; by H. W. Newman, Esq., Stroud.

It was announced that copies of the President's Address at the Anniversary Meeting were on the table for distribution among the members; also that Part 4, vol. i. n.s. of the Society's 'Transactions' was ready.

The President informed the Meeting that larvæ of one of the *Æstridæ* had been found on the rein-deer in the Zoological Society's Garden; probably of *Ædemagena Tarandi*, or *Cephenemyia trompe*; and it was hoped they would be reared.

The following account of a hornet's nest, at New House, Stroud, Gloucestershire, by H. W. Newman, Esq., was read.

"At the end of the month of May, 1850, I placed an empty bee-hive on a board, on a bench in the garden, in expectation of a swarm of bees; the bees did not swarm as expected. On the 3rd of June, I took up the hive to examine it, and found some curious matter adhering to the top, inside, like part of a cork-screw, this I unfortunately (being in a hurry) broke off, and threw down the piece, about an inch long, without examining it. Next day, while I was watching my bees, a large queen hornet came to the empty hive and entered it; at first I thought of killing her, but finding that she remained about ten minutes in the hive, I let her alone; she went out, making her observations all round. I then recollected the piece of curious substance which I had thrown away; searched for it and found it: it was the foundation of three cells, and on examining it, found there was an egg in each of the cells at the bottom; the cells had not any sides at the time, being quite open. The queen hornet* seemed determined still to occupy the hive; she began the same day, and rebuilt all that I had unfortunately thrown down; I watched her day by day, and in about six weeks she had completed nearly twenty cells, and then formed a sort of covering like thin brown paper, nearly egg-shaped, about three inches long, open at the bottom. The comb was suspended by the integument on which the thread is tied. In about thirty-five days from the time the second batch of eggs was laid, two young hornets were hatched, and there were then about a dozen grubs of various sizes in the other cells; nearly all the cells had an egg or a grub (two or three remain now in different stages of development): only two or three more young ones were hatched, but the queen mother, at different intervals, carried out at least a dozen live grubs† and dropped them generally near the hive. The weather was showery and variable during the whole summer here, a hill country, and the *esprit de corps* of the queen seemed to be guided by the heat and cold; in a hot sunny day (of which there were but few),

* It is rather surprising that she did not forsake the hive when all her eggs were destroyed, for she had to begin *de novo*.

† I can only account for this by supposing that the want of sun prevented the mother-hornet from finding sufficient food for the grubs.

she seemed much more alive, and seldom remained absent more than from twenty to twenty-five minutes, working until the clock struck nine at night; there was sometimes just light enough for her to find the hive.* I had not the least fear of her, and used to sit within two yards of the hive she occupied; my wife frequently was with me, and was not the least afraid.

“On some of the stormy days, the hornet frequently remained out for two and three hours, and at one time I fancied she had been destroyed, for I visited the hive two days in July, nearly every hour, and remained waiting for a long time and never saw her, but on one of these evenings she came in at nine o'clock quite exhausted, so much so, that she fell short among some potatoes, and I was obliged to assist her to the hive. The queen worked from the entrance made for the bees; the young hornets worked very little, went out very seldom, and after four were hatched two died. The queen, in the beginning of September, became so weak that she used to fall two or three times when she first went out; so fearing she would be lost, I determined to kill her and the only two young ones left alive; these are the ones sent in the box. I regret that the outer part, or round covering, was broken in endeavouring to cut the nest from the crown of the hive with a pen-knife. The queen has shrunk in size nearly one third, and about half an inch in length since her death; her sting is partly out. Hornets do not act offensively until they become numerous; I frequently turned up the hive when they were all in, and they generally attempted to escape, but never to attack me; plainly verifying the old saying, “certain persons are not so black as they are painted.” I assure you that my pet hornets caused a good deal of surprise to some of my neighbours who saw them.

“Hornets appear to be originally natives of a warmer climate than England; in Scotland none were ever seen alive, and I believe in the northern counties none are to be seen; they are not nearly so hardy as the wasps, nor are they of so predatory a disposition. In 1848, when I lived at Thornbury Park, I had a strong hornet's nest in the top of one of my hay-stacks, within seventy-five yards of my bees, the hornets never attacked the bees nor even my wall-fruit, which was plentiful; my cows and sheep used to be within five yards of the nest nearly every day, and they never were stung.

“I found the hornets very fond of an exudation from the bark of a very old, decayed, but growing elm; every day, for a month, they were to be found about six feet from the ground, settling and biting at the moist parts; it may have been the substance from which they made their combs.

“In general hornets build in the hollow parts of old trees; I have seen them in apple-trees, elm-pollards, and now and then in the roofs of old, uninhabited houses and barns, or in a hay-stack.”

The President, referring to the observation that hornets did not attack bees, said that he knew a garden at Hammersmith, in which once were two bee-hives, two wasps' nests, and two hornets' nests, and the different inhabitants did not molest each other.

* Several times after nine o'clock she arrived, and it was so dark that I only knew it by hearing her superb “boom” as she flew to the entrance: the hum of the hornet is very magnificent, it is quite peculiar and different from the large *Apis terrestris* (queen), which is next to it in grandeur.

Mr. S. Stevens exhibited a moth, *Orthostixis catenaria*, *Hubn.*, a North American species, and a letter from Mr. Hemming, of Brighton, was read, stating that it came from the collection of Mr. Thorncroft, who believed he took it at Eastbourne.

Mr. Stevens also exhibited two specimens of the New Holland Longicorn beetle, *Phacodes Mossmanni*, *Newman*; and a *Curculio* from Brazil, with some spine-like fungi attached.

The President said that on examining some seed-pods of furze, he found in one, besides specimens of *Oxystoma Ulicis*, a cocoon, in which was a grub belonging he thought to some Hymenopterous parasite upon *Oxystoma*. In a seed-pod of *Lathyrus pratensis* he had lately found a larva and a pupa, which had not yet been perfected, but which he imagined were those of an *Apion*.

Mr. Douglas exhibited a stem of common dock, containing larvæ of a *Pemphredon* or *Cemonus*, placed one above the other at the bottom of a burrow about four inches long, at the top of which was a hole by which they would make their escape when perfect, and which was now closed by whitish papery film.

The President read the following descriptions of two new butterflies, and the characters of the new genus he proposed for *Papilio Telamon*, *Donovan*.

SERICINUS, *Westwood*.

Genus novum e familia Papilionidarum, Teinopalpo et Thaidi affine.

Caput mediocre anticè hirsutum; palpi labiales capite fere duplo longiores subhorizontaliter porrecti; hirti nec setis longis ut in Thaide instructi; antennæ vix clavatæ, articulis circiter 30 sensim incrassatis, articulis 10 ultimis paulò brevioribus. Alæ anticæ triangulariter ovatæ apice rotundatæ, vena post-costali 4-ramosa ramis simplicibus, 1mo et 2do ante apicem areæ discoidalis emissis, 3tio ad ejus apicem emissa, 4to in medio spatio inter apicem areæ discoidalis et apicem alæ; vena disco-cellularis supera brevissima; media multo longiori in medio angulata angulo versus basin alarum spectanti; vena disco-cellularis infera breviori, cum apice venæ medianæ fere continua, et spatio inter hujus ramos 2dum et 3tium longitudine fere equali. Alæ posticæ subovales, margine externo vix repando ramo tertio venæ medianæ in caudam longissimam at valde angustam producto; vena præcostali apice furcata, venæ costalis basi cum basi venæ post-costalis connexa, cellulam parvam prediscoïdalem efficiente. Abdomen feminæ absque lobis membranaceis Doritidum.

Typus *Papilio Telamon*, *Donovan*.

HAB.—Shanghai, China, *D. Fortune*.

In Mus. Britann. et Westw.

THAUMANTIS HOWQUA, *Westwood*.

T. alis supra fulvis omnium serie subapicali lunularum nigrarum valde curvatarum, maculis hastiformis nigris in alis posticis majoribus, anticè adjectis; alis infra luteo fulvis strigis duabus obliquis irregulariter sinuatis 1ma ante et 2da pone medium alarum anticarum, et ante et per medium posticarum, extensis externa e costa fere ad angulum analem ducta ubi recurrit; nubila recta obliqua fusca submedia ad angulum analem extensa, macula grisea terminata; alis anticis

ocellis tribus, posticis quinque rufis, pupilla alba iride tenui nigra, strigisque duabus parallelis vix angulatis prope marginem apicalem. Mas.

HAB.—Shanghai, China, *D. Fortune*.

In Mus. Britann.

DRUSILLA MYLECHA, *Westwood*.

D. alis niveis, omnium utrinque costa nigricantis posticis subtus ocellis duobus magnis æqualibus nigris pupilla minima alba circulo latiori fulvo, alteroque tenui nigro circumcinctis, capite thoraceque subtus nigris; palpis fulvis; abdomine lutescenti. Mas et fœm.

HAB. in Insulis Louissiadis maris Indici, *D. Mac Gillivray*.

In Mus. Britann.

The President also read 'Descriptions of Three New Genera of Exotic Coleoptera remarkable for possessing an external resemblance to groups to which they do not belong.' The first species, *Paromia Dorcoides*, from Columbia, unique in the cabinet of M. Reich, in Paris, has in fact been mistaken for a small species of *Lucanidæ*, to which family, however, it only bears a relation of analogy, its affinity being to the genus *Ips*. The second species, *Cossyphodes Wollastoni*, of which only a single specimen was found by Mr. Wollaston, under a stone, at Madeira, has a very close *primâ facie* resemblance to the heteromerous genus *Cossyphus*; while it is among the genera originally placed by Latreille among the *Xylophaga*, but separated therefrom by MacLeay and introduced among the *Necrophaga*, that we must look for its true relations. The third species, *Euchæta Scaritides*, in his own collection, from New Zealand, remarkable for the long setæ on its sides, appears by its slender filiform antennæ and general form to belong to the *Scaritidæ*; but it is really most nearly related to *Trogosita*.

Mr. Stainton exhibited a species of *Tineidæ*, forming the type of a new genus very near to *Pterolonche* of Zeller; he proposed to call the insect *Limnæcia Phragmitella*. It was captured by Mr. S. Stevens, in the marshes at Hammersmith, and a specimen is in the collection of Mr. Shepherd.

Mr. Stainton exhibited, on the part of Mr. Logan, a drawing of a new species of *Lithocolletis*; and read a description of the insect under the name of *L. nigrescentella*, *Logan*.

M. Stainton also exhibited a new *Tinea*, taken flying in the streets of Liverpool, by Mr. C. S. Gregson. Mr. Stainton proposed for it the name of *pallescentella*.

April 7th, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors thereof. — 'The Zoologist' for April, by the Editor. 'Hints on the History and Management of the Honey-bee. By Edward Bevan, M.D.' Presented by the author. A Portrait of the Rev. W. Kirby, on large paper; by W. Spence, Esq.

Two copies of 'A Supplementary Catalogue of British Tineidæ. By H. T. Stainton.' Presented by the author. 'The Athenæum,' from July, 1850 to March 1851; by the Editor. 'The Literary Gazette,' January and February; by the publishers. Bred specimens of *Catocala sponsa*, *C. promissa*, *Triphæna fimbria*, and other British Lepidoptera; by Mrs. Vines. About 200 species of British Lepidoptera; by Mr. Douglas.

The following gentlemen were balloted for and elected:—Johan Wilhelm Zetterstedt, Lund: Honorary Foreign Member. H. J. Steuart, Esq., 76, Jermyn-street, and the Rev. J. M. Simkiss, St. Mary's, Oscott, Birmingham; Ordinary Members. Robert Patterson, Esq., Belfast, and J. C. Hyndman, Esq., Belfast; Subscribers.

Mr. S. Stevens exhibited a most beautiful specimen of the Lepidopterous *Coeytia D'Urvillii*, *Boisd.*; the only previous example being one in bad condition in the collection of Dr. Boisduval. He likewise exhibited, from a collection just received from Mr. Wallace, on the Amazon, *Papilio Columbus*, recently described and figured in the Society's 'Transactions' by Mr. Hewitson, and three new species of the genus *Papilio*. Also a specimen of *Gymnancyla canella*, which he believed to have been taken on the coast near Southend, being the second known British specimen; and *Dryophilus Anoboides*, bred from the same stump of broom from which he reared the insect last year.

The President exhibited living larvæ of *Æstridæ*, from reindeer in the Zoological Society's Garden. He observed that Linnaeus stated from six to eight were the usual number on one deer, but in the present case there were from fifty to one hundred, and they were very conspicuous. Mr. Bracy Clark, in his "Memoir on *Æstridæ*" in the 'Linnean Transactions,' had given his opinion that *Æstrus Trompe* and *Æ. Tarandi* were only sexes of one species; but from the examination of specimens sent to him by Professor Zetterstedt, he could not concur in this opinion; moreover, *Æ. Trompe* was not found in the backs of reindeer, but in the frontal sinus. He also exhibited drawings of the head of the larvæ of *Æ. Tarandi* and *Æ. Bovis*, showing the mouth destitute of mandibles, and the larvæ could obtain nourishment by suction only; in this respect differing from *Æ. Equi*, in which mandibles were present.

The President also exhibited drawings made from the mutilated specimen of the parasite upon *Fulgora candelaria*, received from Mr. Bowring, and exhibited at the meeting last October. The venation of the wings was decidedly of a Lepidopterous type, and the legs were of a Lepidopterous character; the pupa also, as far as could be ascertained without divesting it of its cottony covering, appeared to be that of a Lepidopterous insect; but such an one was so anomalous, that more and entire specimens were greatly to be desired.

A note was read from R. Maysmor, Esq., Devizes, accompanying some cocoons of *Trichiosoma Lucorum*, stating that he believed the imago made its exit from the cocoon backwards; at least, he always found the exuviae remaining in the passage out, with the head in the interior of the cocoon, and there does not appear to be room for the insect to turn round in the skin it is about to leave behind.

Mr. F. Smith called the attention of the meeting to a very interesting paper intitled "A New Phase of Bee-life," recently published in Dickens's 'Household Words,' from which he read the following extracts, premising that the scene of the discovery was about 170 miles from the mouth of the Essequibo river.

"Seating myself on the smooth gray trunk of a tree, which lay prostrate across the sluggish water, whose broken limbs shone bright in the gay drapery of a scarlet-blossomed epiphyte, I lighted my pipe, and taking a book from my pocket, began lazily turning over the pages and lightly gleaning the pleasant thought of a witty and social

poet. My attention now and again drawn away by the ceaseless tappings of a yellow-headed woodpecker on a decaying tree close at hand, to the glittering flashes of a Karabimitas, a Topaz-throated humming-bird—a frequenter of dark and solitary creeks, capturing flies among the gay petals, for his nest-keeping partner, who, a few paces up the stream was gently swinging with the evening breeze, in her tiny home. I had been in this position for some time, little regarding the whizzing hum of insects constantly passing and repassing—when, my gaze chancing to fall a yard or more from my resting place, I detected a small bright-gray bee, about the third of an inch in length, disappearing in what seemed a solid part of the trunk.

“There was no hole or crevice perceptible to the eye, nor did that portion of the bark feel less smooth than that immediately adjoining. I might be mistaken—nay! *I must be*. I had just arrived at this last conclusion, when a tiny piece of the bark was suddenly raised, and out flew the little gentleman I had seen disappear, or one too like him not to belong to the same family. The mystery was solved. Some ingenious bee-architect had devised an entrance-gate, fitting so admirably as to defy discovery when shut; while I was certain that I could lay my finger almost on the precise spot, the closest inspection failed to reveal any trace of its outline. The bark, though polished and even, was covered with faint interlaced streaks, from which even the smoothest bark is never free; and the skilful carpenter had adapted the irregular tracings of nature to his object of concealment. Wishing to inspect the workmanship without injuring its delicacy, I had to wait patiently until it should again fly open; nor was I kept long in expectation, for it presently popped up to permit the egress of another of the fraternity, and a ready twig prevented its descending. I found it designedly crooked and jagged at the edges, with an average width of about a quarter of an inch, and twice that in length: its substance was little more than the outer skin of the bark, and, being still connected at one end, opened and closed as with a spring. The cunning workman had no doubt been aware that had he made it much shorter—which the size of the passengers would have permitted—it would have required to be thrown farther back, when the greater tension would soon have destroyed the elasticity of the hinge, and, with that, its power of fitting close to the tree. Immediately within the doorway was a small ante-chamber, forming a sort of porter’s lodge to the little surly gray-liveried gentleman inside, who, without quitting his retreat, showed his displeasure at my intrusion in a manner too pointed to be mistaken, and certainly manifesting neither trepidation nor alarm at the sight of one of the ‘lords of the creation,’ though probably the first offered to his inspection. From the entrance-hall, two circular tunnels conducted into the interior of the establishment, from whence came the confused murmurs of a numerous and busy community. I had just allowed the door to close, and was admiring the exceeding neatness of the workmanship, when another of the family returned home, signifying his arrival, and obtained admittance in a manner at once novel and singular.

“After darting against the entrance, and touching it with his feet, he rose again into the air, and taking a wide swoop round the trunk, came up on the other side, this time, flying straight towards the “trap,” which was quickly raised, when he was a few inches distant, and, on his entering, as quickly closed. The office of the pugnacious individual inside was explained; he was actually the door-keeper, and his returning comrades, having, like any other modern gentlemen, politely rapped, circled out of the observation of prying eyes, till he was prepared to admit them. Numbers were constantly arriving, and all went through the process I have described, each flying away,

after knocking, in a different direction, but all allowing the same time to elapse before returning for admission:—thus, the door was never opened save at the proper moment.

“After watching their proceedings for some time, I discovered the reason of their not waiting quietly at the entrance. Sneaking among the stray leaves and rubbish in the trunk and in the holes and cavities of the bark, were numbers of small insects, of the same colour as the bees, but with the addition of one or two minute bands of black across the abdomen; their slender, graceful forms and partially exposed ovipositors revealed, however, the cause of their slinking about, and stamped them the parasitic ichneumons of the hive. I thought that, after the habits of their tribe, they were endeavouring to obtain an entrance, when they pouncingly hovered over the bees as they were disappearing in the door-way; but, as none ever succeeded, I conjectured that they had devised and were pursuing some other plan of introducing their blood-thirsty progeny. Further observation showed this to be correct. The rascals were endeavouring to attach their eggs to the small pellets of pollen with which each bee was laden, and they often succeeded, in spite of the admirably devised tactics to prevent them.

“We were up and away down the sparkling river at daybreak the next morning; and I had no other opportunity of observing the economy of the bees and their enemies; nor in my rambles, did I ever chance to meet with another family of the same species, or with kindred habits.”

Mr. Smith also read the following extracts from letters received by him from the author of the paper, hoping that some day the bee would be captured and examined by an entomologist.

“I think nothing more will be necessary than simply to attest the truth of ‘A new Phase in Bee-life’ to which you allude, and to add, that in recounting the facts therein contained, I used neither invention nor distortion, and but little embellishment. Indeed, that portion which describes the bee’s workmanship and movements is nearly, and but little more than, a verbatim copy of rough notes of a day’s gleanings, serawled by the light of the hissing night-fire, as I sat in my hammock that same evening, scarcely a stone’s throw from the scene of such rare instinct and sagacity. Johnson used oftentimes to quote the Spanish proverb,—‘He that would bring home the wealth of the Indies, must take the wealth of the Indies with him;’ and truly this aphorism could not find a better application than in my case. It has been, and ever will be, a matter of extreme regret, that when I took up my residence in British Guiana, I was possessed of so mean a knowledge of Entomology, and that, too, in a country so rich and so unexplored, and that seemed to promise such inestimable treasures to the investigator, and without a smattering of the science or technicology of the subject, by which alone the most careful observations can possibly be rendered intelligible, or any thing but useless to naturalists at home.

“In reply to your first question, as to the manner of conveying the pollen to the hive, I may state that the posterior thighs (tibiæ) were considerably expanded, and hollowed out into spoon-like cavities, in which the balls of kneaded pollen were steadied, or rather, secured by numerous stout bristles. The bee itself could but little have exceeded a quarter of an inch in length, and in form approximated more to the rounded humble- than to the oblong hive-bee; its colour was a light gray, and its body and legs were in some places profusely covered with hair of a light hue; though in the latter, as in the head, face, and breast, the black predominated. Such is the impression

which my mind retains of its appearance, for I did not make any notes at the time, entering into the minutæ of size, form or colour, and write entirely from memory. I did not observe the eggs of the parasite on the pollen; their minuteness, similarity of colour and rapidity of deposition, baffling the unaided sight; but I judged of their intention, as you conjecture, from their movements. The eggs were certainly left either on the pollen or hinder parts of the body or legs of the bee. I assumed the former as the more probable. I regret that I did not procure specimens of this ingenious insect, but my attention was almost exclusively devoted to the acquisition of the more brilliant species of Lepidoptera."

Mr. Smith then read a note on a nest of *Polistes Lanio*, *Fabr.*, lately sent by John MacGillivray, Esq. to the British Museum, from St. Salvador, where the wasp is abundant, the nests being formed under the eaves of the houses. In one of the cells he found a specimen of *Trigonalys bipustulatus*, *Smith*, not enveloped in any pellicle, and the wings crumpled up; nor had the cell been closed in any way, proving that it had never quitted the cell, and that *Trigonalys* is the parasite of *Polistes*,—a discovery of much interest, as showing the relationship of the insect to be among the Pupivora.

Mr. Smith also read a note on another nest, recently presented to the British Museum, of a social wasp, unfortunately without any tenants, the chief interest attached to it arising from its being constructed entirely of sandy loam, and the exterior being so hard that a saw used in opening one of its sides was blunted.

The following note by J. M'Intosh Esq., of Charminster, was read:—

"In the 'Proceedings of the Entomological Society,' October 7, 1850, p. 36, it is recorded that "Mr. Westwood, on the part of Mr. Gould, exhibited two insects he had found in Scotland, impaled on the spines of furze." And Mr. Westwood says "the subject of insects impaled on thorns required elucidation." Perhaps the following memoranda made by myself on this subject, may prove interesting to the Entomological Society.

"I have frequently taken from off the thorns of *Cratægus* and *Ulex*, the following insects:— 1. *Pieris Cratægi*. This insect was alive, and had been driven against the thorn by the force of a gust of wind. The caterpillar also of this insect I have found in the same position. On one occasion I watched a caterpillar of this species crawl over a thorn, in doing which its weight, and a slight breeze of wind at the same time giving a motion to the branch, caused the sharp thorn to pierce the caterpillar, which, struggling about to relieve itself, worked the thorn through its body, by which means it became completely fixed. This was not a case of determined suicide, but an accidental death. That insects meet with their death by being driven by wind or rapid flight against the thorns or spines of trees, numerous examples have come under my own observation. On heaths and in plantations, caterpillars, by crawling over the sharp thorns or spines of plants, become in many cases pierced, and in their endeavours to escape only fix themselves the more securely, and become the easy food of some feathered enemy. 2. and 3. *Vanessa Urticæ* and *Cynthia Cardui*. The perfect insects I have taken from off the thorns of *Cratægus Oxyacantha*, on several occasions dead, but not in any way injured to lead me to suppose that they had been placed there by any enemy. If so, they would have been mutilated in some degree. 4. *Ourapteryx sambucaria*. An example of this moth I have taken from off the spines of *Ulex*, not injured. 5. *Coccinella 7-punctata*. I have met with frequent examples of this insect impaled on the spines of *Ulex*, and what is more curious, on the sharp leaves of *Araucaria imbricata* and *Abies Canadensis*, as well as on *Cratægus Oxyacantha*. I

have taken specimens dead and very much mutilated, and others alive. 6. *Sarothripus ilicanus*. Specimens of this moth I have taken on the sharp prickles of the leaves of the holly, *Ilex Aquifolium*."

Mr. Spence read the following extract from a newspaper, called 'The Scientific American,' dated March 22, 1851, "On the American Locust (*Cicada septemdecim*)," communicated by Dr. Gideon B. Smith.

"I have made this remarkable insect a special object of study for seventeen years, beginning in April, 1834. During the spring and summer of that year, I made a careful examination of its anatomy and habits, from the perfect larva state to the descent of its progeny in July and August into the earth. I have frequently found the larvæ since 1834, in the ground, where they went down in that year, from one and a half to two feet from the surface, in oblong cells, varying from an inch to two or three inches in diameter, and generally horizontal. These cells, however, appear to be moveable, that is, the insect digs the earth from one end and packs it in the other. The object of these movements seems to be to obtain fresh vegetable matter on which to feed. The insect obtains its food from the small vegetable radicles that everywhere pervade the earth. It takes its food from the surface of these roots, the moist exudation (like animal perspiration), for which purpose its rostrum or snout is provided with three delicate capillaries or hairs, which it projects from the tube of the snout, and sweeps them over the surface, gathering up the minute drops of moisture. This is its only food: the mode of taking it can be seen by a good glass.

"It does not puncture the bark, because it has no instrument for such a purpose, and therefore that they puncture the roots of pear-trees and thus kill the trees is erroneous. It is also an error to say, should a tree on which these larvæ have been feeding be cut down, the insects perish for want of food. If a place be found where trees grew in 1834, which were cut down, the land cleared, and even houses built upon it sixteen years ago, the locusts will be there *now*, and will be seen to emerge from the ground about the 25th of next May.

"The tract of country that will be occupied this year by the locusts extends from the Patapseo river in Maryland, to Buck's county in Pennsylvania, and from the Delaware river to the middle of the range of the Alleghany mountains, including Bedford county, Pennsylvania.

"There is another locust-district this year in Georgia and South Carolina, a small tract embracing a portion of these States, and another small one in Mississippi. I have the location of thirty from different districts, occupying fourteen of the seventeen years. The other three years are no doubt occupied in the western wilds of N. America, between latitudes $43\frac{1}{2}^{\circ}$ N. and 29° S., beyond which parallels I have not been able to hear of them. The locusts will appear about New York in 1860; this district extends to the Connecticut river East, and as far North as Washington Co., N. Y., West to Amsterdam in Montgomery Co., and a large portion of New Jersey.

"In the whole range of Natural History there is nothing more strange than the fact,—which has been established with as much certainty as any fact in Astronomy ever was,—that a little insect, not so large as the smallest ant, should pass into the ground, and remain there seventeen years, and then emerge a comparatively large insect; or that a certain tribe of insects should appear here in immense numbers, exactly once in seventeen years, always in the same month, almost on the same day, and same hour. It is indeed wonderful, but it is nevertheless true.

"The music or song produced by the myriads of these insects, in a warm day,

from about the 25th of May to the middle of June, is wonderful. It is not deafening, as many describe it; even at its height it does not interrupt ordinary conversation. It seems like an atmosphere of wild monotonous sound, in which all other sounds float with perfect distinctness. After a day or two, this music becomes tiresome and doleful, and to many very disagreeable. To me it was otherwise, and when I heard the last note on the 25th of June, the melancholy reflection occurred—shall I live to hear it again?

“Probably the first indication many persons will have of the approach of the locusts, will be the industry with which they will find the hogs rooting up the ground in the woods and fields. It is a great festival for them: and as soon as the insects appear above ground, chickens, turkeys, and all poultry will also have their feast. So fond are all fowls of these insects, that they will scarcely touch other food during the locust-season. This has a remarkable effect upon all hens’ eggs laid after the locusts appear—their yolks are nearly white. The chicken become very fat, and of fine flavour. Even the little wren will be seen flying off with a locust in its mouth, and all insectivorous birds have a great festival.

“From the 1st to the 20th of June, all shrubbery of value should be protected, either by covering it with cheap gauze, or in case of pot-plants, by keeping them in the house. About the 15th of June, the insects commence depositing their eggs; and about the 25th of June, the old locusts will have disappeared altogether.”

“In conclusion, people ought not to be alarmed. The insect has neither means of offence nor defence, and all the stories told of children being killed by their sting or bite are fabulous.”

May 5, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the respective donors:—‘The Zoologist’ for May; by the Editor. ‘On the Probable Relation between Magnetism and the Circulation of the Atmosphere;’ from the ‘Appendix to the Washington Astronomical Observations for 1846:’ Washington, 1851. ‘Bericht über die Leistungen in der Entomologie während des Jahres 1848, von Dr. H. Schaum; Berlin, 1850:’ presented by the author. ‘Entomologische Zeitung’ for March and April; presented by the Entomological Society of Stettin. ‘The Athenæum’ for April; by the Editor.

The President announced a Resolution of the Council, that during the Great Exhibition any foreign entomologist might see the Society’s collection on any day of the week, if accompanied by a member or subscriber.

Mr. S. Stevens exhibited a species of Curculionidæ, of which he had not been able to determine the name, but which was new to Britain; also an *Adela cuprella*, the second known British specimen: both captured recently on sallows at Fenny Stratford. He likewise exhibited a living specimen of *Callidium sanguineum*, caught at Bow,

Middlesex, and some splendid Lepidoptera and Coleoptera from Ega on the Amazon, collected by Mr. Bates, who, he mentioned, was now on his way home. He brought for distribution specimens of *Hylastes rhododactylus*, recently taken in stumps of broom at Coomb wood.

Mr. Shepherd exhibited a hermaphrodite *Smerinthus Populi*, found at liberty. In this instance the right side was male.

Mr. Douglas exhibited a longicorn beetle, *Coptomma variegatum*, *Fabr.*, a native of New Zealand, caught flying at Bow Common, by Mr. Robertson, last September. He also exhibited one of the Tipulidæ, apparently a species of *Trichocera*, the pupa of which he found sticking out of the very hard side of the sand-pit at Charlton, the insect being in the act of emerging therefrom. It was difficult to think how so slender a creature had the power to work through such hard material.

Mr. Smith exhibited a specimen of *Formica graminicola*, *Latr.*, taken by Mr. Wing, December 9, 1850; and a specimen of *Formica cunicularia*, taken by Mr. S. Stevens, April 18, 1851. Both insects were females, and were caught flying, the interest attached to them arising from the season at which they were found, the usual time of appearance of the former being the end of June, and of the latter, the autumn.

The President observed that such observations as these might appear trivial, but they were in reality of much importance, and in the aggregate would serve as clues to the elucidation of many obscure points in the history of insects. For instance, in respect to the economy of ants, we are in some species quite in the dark, certain things observed of some having been attributed to all, quite erroneously, as the habits of species differ greatly.

Mr. Waring exhibited two singular crustaceous-looking spiders from Western Africa.

The President stated that some plants of a strawberry brought by him from Paris, had been all but destroyed by *Haltica arata*, the young leaves and buds having been eaten in the same manner as those of turnips are devoured by *H. nemorum*.

The following note on *Trichiosoma lucorum*, by R. Maysmor, Esq., in a letter addressed to the President, was read.

“I am still puzzled respecting these cocoons, for those I have found with the insect inclosed, are opened when it escapes in a very different way to the greater number of this kind of cocoon. I have observed the escape of several, and I see they cut a round piece very nearly out at one end, so that it merely hangs by a little hinge; the hole thus made is just large enough for the escape of the insects. In one instance the fly had made a slight mistake, for after having cut the piece completely out, it proved too small, and after several unsuccessful attempts to force itself out, it set to and cut off a slip round the hole, which made it large enough. The flies cut the holes with their mandibles as true as they could be done with a pen-knife, and when ready, they force themselves out head first. I fancy the flies which cut these round holes are all females. I have five cocoons opened in this way, and all the flies are females: the cocoons which are opened in such an irregular manner, I think belong to the male flies: the exuviæ are considerably different in the two cocoons. At any rate, the tenants of the irregularly opened cocoons appear to make their exit at least a month earlier than the others, for I found them opened by the middle of March, whereas I have not yet seen any of the others opened on the hedges. My first flies did not come out till the 12th of April, and they had been a month in a warm room. The day after

they came out I placed them in a sunny window, and they became very active; I then put them upon some hawthorn-leaves, and had very soon the pleasure of seeing them begin to oviposit, which they continued four or five hours. They were so intent upon this, that I could turn the leaves about so as to enable me to see the whole operation distinctly with a Coddington lens. The fly having placed herself in a favourable position upon a leaf, so that her abdomen is in contact with it, raises the cuticle of the side upon which she is (for I found with gathered leaves that she made use of either, but generally the upper), by inserting the ovipositor very gradually, but working it rapidly all the time till it was wholly extended, when it was withdrawn a liquid oozed out, which left the cuticle raised like a little blister, of an oval form, and about the tenth of an inch long: the ovipositor is about a quarter of an inch long. The operation lasts about three minutes, during which the fly lowers her antennæ in front, and the segments of the posterior part of the abdomen have a slight tremulous motion. The sight is a most beautiful one, equally as interesting as the ciliary currents of the Rotifera; the cuticle of the leaf is so transparent, that at a little distance the ovipositor absolutely appears to be on the exterior surface. It would seem that although there may be no connexion with the male fly, the desire of propagating their species is equally strong.

“I would not say that the fly which leaves the cocoon by the small irregular opening does so backwards; it appears strange to me that the skin should be left in the hole with the head of it in the cocoon unless it is so: but I hope next year to see the actual escape of this fly. With regard to the cocoon containing larvæ of ichneumon flies, I cannot see what insect made the hole in that cocoon like the others, as it certainly was, if the fly had been destroyed by the parasites, as they did not seem in a state to make it. I inclose one of the cocoons with irregular opening, containing the skin, also one opened by one of my female flies, with the insect and its skin. I hope to find out from some quarter the solution of the difference of these cocoons.”

Mr. Smith observed that he had frequently observed this insect emerge from its cocoon, and always with the head first.

A paper ‘On the Effects of Temperature, Gases, and Vapours on Insects,’ by John Davy, M.D., F.R.S., in a letter to Wm. Spence, Esq., was read, giving a detailed account of various experiments, from which it appeared that no two of the agents employed acted precisely in the same manner. Those agents most fatal to life appear to have been sulphuretted hydrogen, ammonia, chlorine, nitric acid, iodine, camphor, oil of turpentine, each varying in degrees of rapidity of effect, but so far analogous that no perfect revival ensued on exposure to the air, after a motionless state had been induced. Those less fatal to life appear to have been azote, hydrogen, carbonic acid, coal-gas, muriatic-acid vapour, ether, chloroform;—all of them producing immobility, and probably insensibility, with different degrees of rapidity, but not commonly terminating in death, revival in most instances following. Oxygen seems to stand alone in its effects on the functions of life; that death sooner occurred in the trial with it than in that with atmospheric air, may have been owing to exhaustion connected with increased vital action of the insect unsupported by nourishing food.

Mr. Smith read a note 'On the Habits of the Bee, *Lestis bombylans*, and a Correction of its Synonymy,' as follows:—

LESTIS BOMBYLANS.

Apis bombylans, *Fab. Ent. Syst.* ii. 338, 104, ♀.

Centris bombylans, *Fab. Syst. Piez.* 358, 19.

Also a description of a new species under the name of

LESTIS ÆRATUS, *Smith*.

"Female, (7 to 8 lines). Brassy green; the pubescence on the face pale yellow; thorax punctured; wings slightly fuscous; pubescence at the apex of the abdomen pale yellow.

"Male, (7 to 8 lines). Brassy; face as in *L. bombylans*, but yellow, patches of pubescence much more dense and bright yellow; wings hyaline, slightly fuscous; all the legs fringed with bright yellow pubescence."

Mr. Smith also read a note 'On the Habits of *Abispa*, a solitary Australian Wasp.'

June 2, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the respective donors:—'The Zoologist' for June; by the Editor. 'The Athenæum' for May; by the Editor. 'Entomologische Zeitung' for May; by the Entomological Society of Stettin. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1850, No. 2; by the Society. 'Abhandlungen der Mathematisch-Physikalischen Classe der Koeniglich Bayerischen Akademie da Wissenschaften,' band v. parts 2 & 3: Bulletin, ditto, 1848—50: by the Academie. 'Hymenopterologische Studien von Arnold Foerster;' by Mr. Stainton. 'Insecta Saundersiana, Diptera, part 2;' by W. W. Saunders, Esq. A box of Cape insects, by—Rooper, Esq., through Mr. Spence. A fine hornet's nest, found in an uninhabited cottage near Thornbury Park, Gloucestershire; by H. W. Newman, Esq.

H. W. Newman, Esq., Thornbury Park, Gloucestershire, and Herr Ernst A. Zueckold, Halle, Prussia, were elected Members of the Society; and Alfred Beaumont, Esq., Huddersfield, a Subscriber.

Mr. Spence, on the part of Mr. Ellis, exhibited some oak leaves attacked by two different larvæ, one of which was Lepidopterous, and the other, which had rolled up the leaves, was Coleopterous.

Mr. Preston exhibited an *Anthocharis Cardamines*, recently captured, destitute of the green markings on the under side.

The President exhibited from the Horticultural Society's garden, cases of larvæ of *Coleophora Hemerobiella*, which, as he had noticed, fed on the underside of pear-leaves. He had also observed, on the same trees, larvæ of *C. nigricella*, feeding on the upper side of the leaves; another case-maker which fed at the base of the leaves; and a fourth, with a very rough case, which fed all over the leaves indiscriminately: besides a larva under a transparent web, and some leaf-rollers. He also stated that he had again found the once rare *Lyda fasciata*, in considerable numbers, several species of *Curculionidæ*, and *Cemistoma scitella*, all in his own garden, showing how many species might be found in a small space.

Mr. Rich exhibited some splendid Goliath beetles in the finest condition.

Mr. E. Shepherd exhibited a bred specimen of *Vanessa Io*, remarkable for the nearly white colour of the wings towards the extremity. He mentioned that Mr. Bond had a similar bred specimen; and that Mr. Doubleday possessed another, taken at liberty.

Mr. Augustus Sheppard exhibited a male *Smerinthus Populi*, found at liberty, with a long appendage at the base of the right under wing, but distinct, apparently of the same texture as the wing, and, like it, covered with scales.

Mr. Stainton exhibited some cases of the larvæ of *Coleophora Paripennella*, found on a fence at Brixton, where he had observed them to assume a position parallel to the fence, by reason of the case being abruptly curved near the mouth.

Mr. Douglas exhibited one of the larva-cases off *Origanum vulgare*, of which he had spoken at the January meeting. It had been stationary since the middle of March, but no insect had yet emerged.

Mr. J. F. Stephens exhibited from his own garden specimens of *Selandria sericans*, *Hartig*, a new British species of *Tenthredinidæ*, and a male and female of *Lyda inanita*.

Mr. Saunders exhibited some rare Homoptera, and a moth accompanied by its pupa-skin and transparent cocoon, similar to one exhibited by him at the meeting in June, 1850; all received from Assam.

Mr. Smith mentioned that he had seen a specimen of *Gastropacha Illicifolia*, a new British species, captured on heather at Channock Chase, Staffordshire, in the middle of May, by Mr. Atkinson.

Mr. S. Stevens exhibited several specimens of a new species of *Mecinus*, found in company with *Baris Atriplicis*, about the roots of *Plantago maritima*, growing below Gravesend; also a new species of *Limonius* from oaks near Tooting. He likewise exhibited fine specimens of *Eupisteria carbonaria*, recently taken in Perthshire by Mr. Weaver; and some remarkably beautiful butterflies, including one which he believed to be the male of *Papilio Zagrus*, captured on the banks of the river Napo, district east of Quito, South America, and sent home between folds of paper.

The following note by Mr. Rich, on a *Goliathus Cacicus* which he had alive nearly five months, was read.

"In going on board a vessel which had arrived two days prior from Africa, I saw suspended in the lamp-glass a fine female *Goliathus Cacicus*, which at the time was very dormant, and on inquiry of the steward found it had been so ever since the vessel came into soundings, the weather being much colder than before; that it was hung in a draft, but it had been very lively during the passage home, and fed freely on satu-

rated biscuit and sugar: it had been on board more than three months. On purchasing it of the captain, I put it in my hat, and did not expect it to live, but on going homewards, found it not quite so dormant, as by a sudden movement, after it had been there some little time, I felt something equal to a dozen lancets running into me, which will readily account for my having so many specimens with the tarsi gone, the natives not liking to handle them. On arriving at home I found the beetle to be exceedingly active and restless; and having at the time a large *Fuchsia* in bloom on the table, I put it on the pot, when it immediately ran (if I may so term it) up the plant to the top, and to my surprise took flight to the window, where there stood a vase of roses, and immediately began to bury its head in the centre of a rose, and appeared to be eating. The flight was very rapid, and accompanied by considerable noise. The sun coming out, I left the beetle for some little time, when on going into the room again, and coming suddenly upon it, it directly took flight; and I afterwards found that by making a sudden noise, it would invariably do so if the sun were out. I could rarely get it to take flight if the sun were not shining, but at all times it was very watchful, and at the slightest noise would erect its antennæ, and look towards the point whence the noise proceeded, and then lie quite still; but if the noise were repeated, the beetle would take flight. On giving it its liberty, which I generally did every day, by allowing it to crawl over me, I found that it would always take three or four steps, then stop and look about, then a few more steps, and if I chanced to move my hand, or any one came near me, it would take flight. After having it some time, and always feeding it myself, it came quite to know me, would not start, and would come to my finger if I held it out, and if there was no sugar, it seemed quite disappointed. I believe that it knew my voice, having tried it several times when several persons were in the room, for as soon as I spoke to it, if previously quite still, it would brisk up and be quite restless until I fed it, which was invariably with sugar, or honey, and a little moistened biscuit or bread. As far as I could I supplied it with roses, having tried it with many flowers, but to none was it so partial as to the rose. After feeding it invariably cleaned its antennæ, and the tarsi also, if by chance either of them had touched the sugar. The antennæ were cleaned by using the two fore tarsi, and drawing them to its mouth; the hair on the middle and lower legs was used to clean the wings and elytra."

A paper on the Habits of the Bombinatrices, by H. W. Newman, Esq., of Stroud, was then read, of which the following is an abstract.

"Although there have been several publications on this branch of Natural History, I still venture to submit to the public the observations I have made on four species of humble bees, having spent the leisure hours of four or five summers of my youth in this pursuit. My object is mainly to describe the extraordinary habits of the drones or males of all the four species of Bombinatrices which have come under my immediate notice and observation, which have never been described by any former writer on the subject.

" Genus BOMBUS.

"1. *Apis terrestris*. — This is the most common and the best known of the four species. It inhabits all parts of Great Britain and the Continent, but is more plentiful in the northern part of the kingdom than in the south; indeed, I have found that in the southern and western counties, the nests do not contain so many inhabitants as even in the midland counties, probably owing to the scarcity or abundance of the wild flowers. The female may be seen in the spring, flying from flower to flower. She is

much larger than the worker, and commences a nest by herself, in the ground; sometimes she takes possession of some hole near, excavated by some reptile, but it is often made entirely by herself: in the latter case, her nest is not so apt to be destroyed by the field mouse, the most determined enemy to the wild bee. The queen and workers are so well known that it is almost useless to describe them; but the male bee is very different, being of a bright buff colour, with a white abdomen, and is one of the most beautiful of the whole species. These drones are very fond of the blossoms of the puce-coloured *Salvia* and the blue *Veronica*, a common spiry plant to be seen in almost every garden. Although the *Apis terrestris* appears the first in the spring, generally in the beginning of March, the males do not hatch or leave the nest until fully a month later than some of the other species.

“The whole of this species is subject to a disease from small lice, which fasten upon the head and trunk of the poor insect, and often eventually separate the trunk from the lower part of the body, and destroy the insect. It is a remarkable fact, that I have invariably found the queens at spring time, more infested with these lice in the south and south-west of England than in Scotland, where my first acquaintance with their habits began.

“As soon as the queen mother has formed two or three cells her labours are incessant, and I have watched her from the nest for the first fortnight. At this period she is seldom longer from the nest than from three to five minutes, no doubt to prevent the young brood-bee from getting chilled to death in its cell. Only one bee is hatched at first, which, immediately after making great observations around, leaves the nest and commences work. It is wonderful to see what observation a bee makes the first time it issues from the nest. It is about two minutes in particularly noticing the entrance, and all the objects near; returning many times before taking its final flight to work. The organ of *locality*, as the phrenologists term it, is very strongly developed in the whole genus of the *Bombinatrice*s. It is the same with wasps, hornets, and hive-bees. The queen now remains at home a longer time, and when some half-dozen bees are hatched, her journeys are very rare indeed. I should here remark that the proof of these labours of the mother bee are much more easily ascertained with the *Apis muscorum*, in consequence of their easiness of access in the moss; and it is to this species of bee that I am indebted for my first notice of the gradual labours of the queen mother.

“I shall now proceed to notice the extraordinary habits of the drones or males of all these species of wild bees, my first discovery of which was with the *Apis terrestris*, and purely accidental. They leave the nest but once, never to return.

“When about thirteen years of age, I began to collect nests of bees, and place them in my garden. In the months of June and July I used to employ my idle hours in looking for their nests; and meeting with a very strong and numerous one, about the 15th of July, in a wood, a schoolfellow accompanied me to take it. We were armed with a large knife, and two wooden boxes, with holes and stoppers, to hold the bees. This nest (*Apis terrestris*) was so numerous that at fifty yards' distance I could see the bees ascending and descending to the place. The flight of this bee is much higher in the air and steadier than that of any of the others. After an hour's labour we got to the combs, and succeeded in capturing no less than 500 bees, including a new hatch of about fifty drones; these were all brought home, with nearly all the combs. Having left a small bit of comb, to decoy the stray bees, we returned home. This nest contained 800 bees, fully 200 or 300 more than in any I ever found before

or since. It contained three full quarts of combs, and there was nearly a pound of honey-comb filled. It shows how much sometimes a good season with good situation will do. Huber mentions about 300 bees as near the number in a strong nest; but the majority, particularly in a wet season, contain a much smaller number. The nest was found near the root of an old tree, in a wood near Hamilton, in Lanarkshire, which had been cut down many years; and the combs were so placed, that any wet from them was drained into a large space of hollow ground beneath. Near the new nest I found, in another compartment, the remains of a nest full of decayed combs of the previous year. I have no doubt that one of the females had issued from this, and planted the colony in the same spot. For three mornings following I visited the nest, and collected nearly 200 stray workers, which were either lost in the bustle of disturbing the nest, or were out at work. However, I am indebted to this nest for my first observation of the wonderful habits of the males; and which was afterwards confirmed to me many hundred times. My garden was almost two miles from the nest, and having collected nearly the whole of the bees, excepting some few drones which escaped, I do not think any of the bees which I brought home went back to the old nest. Next morning early, having opened the aperture in the wall where I had placed them, the bees sallied forth in the most cautious manner, each worker bee, as it came out, remaining on wing very near the entrance, on which it made the closest observation, going farther and farther until it took flight. About 10 o'clock, when the sun became hot, several drones found their way out, and flew off without looking behind them, or making observation like the workers; and during the week nearly the whole of the males departed never to return.

“When taking the nest, I observed the same thing: those which escaped never returned, like the workers, to visit the spot. To test this, I took several other nests of the *Apis terrestris*, and placed them in very small hives made by the shepherds, and found the same result. Within the first fourteen days after the drones are hatched, they voluntarily depart, and commence searching for food for themselves, which they do until the end of September or later, when they perish. Divine Wisdom has deprived them entirely of the power or faculty of returning to or finding the nest; indeed they make not the least observation on their departure, like the workers. The male bee of *Apis terrestris* is a very handsome insect, and so unlike the worker, that it cannot be mistaken for it, being nearly all over of a light buff colour, with a black stripe on the back, excepting the abdomen, which is white.

“How wonderful is this provision of Nature, when we contemplate it! These drones have the faculty of gathering honey but for themselves alone, during their voluntary and necessary exile. They also copulate with the females, but not until they leave the nest. I have witnessed about half a dozen of these connexions in my lifetime, one on the ground, and the rest on flowers and thistles. After the connexion, they invariably take a flight, adhering together for a short time. This I have observed in the months of August and September; but I never saw a male and female come out of the nest *in coitu*.

“The most determined enemies to these bees are the field-mice, which destroy more than two-thirds of them all over England. Near villages and small towns, I have found their nests more numerous, which I attribute to the number of cats that destroy the mice. Another enemy is a caterpillar, which gets into the outer coating of the combs of *Apis terrestris*, and destroys the nest, if not discovered and killed. Each species of wild bee has its own peculiar mode of going its round in fine weather, some near the ground, others through hedges, trees, shrubs, &c.

"2. *Apis hortorum*, Linn. This is very similar to the last in appearance; its body is longer, but not so thick. It is easily distinguished from *Apis terrestris* by the quickness and volatile nature of its flight; it flies much nearer the ground on all occasions, in a sort of jerking and uneven way. The males of this species are much more difficult to be distinguished from the workers by a casual observer, being of the same colour; but their antennæ are much longer, and the abdomen much broader and more hairy. The nests of this species are also in the ground, and generally about half a foot further from the entrance than those of *Apis terrestris*; indeed, much time must be lost by these insects in going and returning; they usually prefer old drains, or the sides of old walls, for their habitations, and are not nearly so strong in numbers as *A. terrestris*, generally not more than from twenty to fifty in a nest. The male is among the first to appear; I have seen them at the end of June: the queen is a month later than in *Apis terrestris*. I have had several colonies of them, but they were never such favourites, not being so docile, and more irascible than the last described, so I had fewer nests of this species than of the other four. The drones are of the same habits precisely as the last; they are deprived of the faculty of returning to the parent nest after once leaving it, and these males can be more easily discovered after their exit; and they become regular wanderers, even more than any other species. Any observer may watch them in their unsteady flight, very near the ground, paying visits to the roots of trees, holes in banks, &c. At first appearance they look as though they intended to alight at these haunts, but this they never do, until a round of probably a quarter of a mile is made in this manner, when they require nourishment; they then return to the thistles and flowers, where they frequently remain all night, particularly in cold weather, and may be seen dormant in the morning; when taken in the warm hand they soon recover and fly away. These bees I have also observed in connexion at various times on the wing. Though I never saw the connexion commence, I believe it be on the ground, as I once watched a male bee go to a spot and stop: on my reaching it, I found a queen with the drone, but they both flew away; probably my visit to the place was too quickly made.

"The nests of this species being further in the ground, and often amongst old drains, are more difficult to take. When a boy, I have often made an attempt to take them, and failed; and in the neighbourhood where I reside at present, the wet summer and autumn of 1839, destroyed the greatest part of this species of bee, and they have never been so plentiful since. They seem to be more numerous in the midland and southern counties than in the North. I have found great numbers in Northamptonshire; and some years since, in the Isle of Thanet, I observed hundreds of the drones of this species vagabondizing about, and scarcely any of the *Apis terrestris*: close to the sea-side they were more numerous than anywhere else. The *Apis hortorum* does not interfere with the hive-bee in its pasture; they select large flowers which the other bees cannot reach with their proboscis. This bee is very fond of the Digitalis or foxglove. It is beautiful to see how it opens the flower of the great red snapdragon, particularly the queen mother. Were a small bee to get into this flower, the collapse is so strong it could not force its way out, consequently it never attempts it. In Creation, how wonderfully is everything adapted to its particular purpose! The *Apis hortorum*, having the longest proboscis of the four most common species, searches for a different set of flowers from its congeners. Despising the white clover, the sweet-scented lime-blossoms, and preferring the wood honeysuckle, the foxglove, snapdragon, and others of the largest and wildest flowers of the forest; when it condescends

to visit our gay parterres, it will be seen busy among the flowers above mentioned. In the month of August, the queens of this species are seen booming along, scarcely able to fly, probably full of eggs, and quite different from the active, nimble worker. The male bees may be seen late in November, dormant on the thistle, with their hairy bodies and long antennæ; after this time they all perish. There is a variety of this species all black, very like them, but not so common; the males have the same habits, leaving the nest once, and not returning. The *Apis hortorum* may be found in great numbers in woodland countries, which they certainly prefer: but for the wild wood-mouse these bees would be ten times more numerous.

“I have found the two last-named species, *Apis terrestris* and *A hortorum*, more infested with lice than any others; the old queen mother is often covered with them, and so close do they keep, that it is a work of time and difficulty, as well as requiring patience, to rid them of these troublesome vermin. Sometimes their poor bodies are nearly eaten in two by these lice, and I have often found them in consequence weak, unable to fly, and in a dying state.

“The *Apis hortorum* is full fourteen days or a month later in making its appearance in the spring than its congener, the *Apis terrestris*; another instance of the wisdom of Providence, as no flowers fit for its use are in blossom at an earlier period. Notwithstanding this, and the paucity of numbers, the males are a month earlier in being hatched and leaving than *Apis terrestris*.

“The two following species which I am going to describe are also later in awaking from their slumbers from the same cause.

“There are several varieties of the next species, called the orange-tailed bee.

“3. *Apis lapidaria*, red or orange-tailed. This is another beautiful species of wild bee, and very common in England. It forms its nests sometimes in old walls, heaps of stones, &c., but I have found the greatest number in heaps of moss, or in the earth, generally a couple of inches only from the surface. The female or queen bee is large, very black and hairy, with the three last segments of the abdomen red or deep orange. The male is smaller, and quite differently marked, being nearly all yellow, except the abdomen, which is red. The worker is a smaller bee, and marked the same as the queen. This is a very common bee in some parts of England and on the Continent, but I never saw one of this species in any part of Scotland, though there is a variety of it differently marked, with nearly the same habits in every respect, most frequently found there in old walls; they go by a very vulgar name among the lower orders in the North.

“Of these (red-tailed) I have taken many nests. This is easily done, as they are mostly on or near the surface of the ground, but out of reach of the tread of cattle. My method is to lay the nest bare in the course of the day; and after sunset, when they are all quiet, to go with a small box, and lift the whole of the nest, combs, bees, &c., all at once, and cover them up for the night. It will amply repay any one curious in these trifles, to watch the exit of the workers in the morning, when the aperture is opened, and they find themselves in a new situation. The care with which they survey the entrance one by one, the slow and cautious manner in which they take their first few flights, is most admirable. Surely no one who observes this, can for a moment suppose that the bee finds its way to its hive or nest mechanically, without full observation.

“The males of the *Apis lapidaria* have precisely the same habits as the two last-described species; they leave the nest a few days after they are hatched, guided much

by weather, to become wanderers like their congeners. They voluntarily leave, and may be seen flying from thistle to thistle, in their lively liveries of yellow and red.

“ There are several more species of the wild bee in Britain, varieties of those which I have described, but they have all the same habits as to the internal economy of the nest, the drones all leaving, without the faculty of returning; and each of the males of all the species making a round of visits in fine weather, in the early part of the day, to particular spots, and each species varies its flight in this respect, on the ground, in a manner that a little resembles the workers. I need scarcely add, that none of the honey-cells of any of these bees are sealed like those of the hive bee. The *Apis lapidaria* is the handsomest of its congeners.

“ 4. *Apis muscorum*, or Moss Carder.

“ ‘ In saltibus omnia libant.’

“ The queen mother of this species is not so large as the others I have described, and is the latest of the *Bombinatrices* in appearing in the spring. The colour is pale yellow, very nearly the same as the moss in which it makes its nest: the body is hairy, the proboscis long, the legs black: the abdomen of the male is longer than that of the female. The worker becomes cinereous as it gets older. This species is very easily taken, as they make their nest on the surface of the moss, and in most cases removed from the tread of cattle, in some quiet lane or retired spot with a southern aspect. A single queen commences a colony, which in general is few in number, although in favourable situations in Scotland, where the wild flowers of their seeking abound, I have found 200 in number, and from that down to twenty, or even ten. This is a good species for watching the operations of the queen bee: I have easily taken many of their nests in the same way as those of the last described. The more cultivated and rich the country, the fewer bees of this species are found, and they vary in colour; in Scotland they are of a much darker yellow, and are called the *foggy* bee, from moss being called *fog* in that part of the kingdom.

“ When shooting on the moors in August, I have found the nest of this species very few in number, sometimes only three or four workers, besides the queen. One wonders how they exist in such a miserable locality; however, there they may be seen, booming along, and in a very calm day their hum is the only sound heard, except the whirr of the moor-cock. When a boy, I had many colonies of these insects in my garden, and have watched their habits, which I can inform my readers are precisely the same as those already described, at least as to the males adopting a voluntary banishment, and never returning to the nest. Excepting to an habitual observer, this is the most difficult species to watch, as the difference in colour and appearance is less than in any others between the workers and drones; the antennæ of the latter are large, and a little curved, like a cow's horn.

“ In an old orchard overgrown with moss, in Northamptonshire, I found at least twenty of their nests in the space of twenty yards square. No cattle had been in it, as it adjoined a kitchen-garden; nor had there been any carts or wagons there. I had some difficulty myself to walk without treading on their nests, which may be known by being a little raised above the surface, and the moss of a lighter colour. These bees are fond of the wildest of all wild flowers; they fly very near the earth, but have a very straight flight; they may be seen on the wild flowers in the deepest valleys and woods, as well as on the highest hills, and they are by far the hardiest and strongest of all their congeners. I have seen them in the most stormy weather, winging their

way from flower to flower, at a time when no other bee could be seen to brave the wind and rain.

“The male of this species is the latest of all in appearance, at least in our climate, seldom appearing before the end of August or beginning of September; and may be distinguished by his low flight along hedge-rows, and his stopping frequently as if intending to go into the ground; this he will continue for a mile together, and if watched, he will be seen to return to the same places more than ten times in an hour.

“There are two or three varieties of the *Apis muscorum*, of one of which, the workers are good-sized bees, with scarcely any small ones in the nest: these inhabit the West of England. I found that it does not answer the end to examine the nests of the carders often. I found a strong nest in Northamptonshire a few years since, and examined it repeatedly by breaking the moss. At last, a young friend of mine, wishing to have it in his garden, we went one night to take it, and discovered about 1000 ants in possession of the combs, and all the bees gone. The ants had got through the moss where it was broken and unguarded, and had overpowered the bees.

“In the dry summer of 1844, although there were plenty of queen bees in the spring, the wild bees were very scarce all over England. I believe firmly the ground was so hard in May and June, that the queen mothers could not bore through it. I never saw them so scarce as during that summer. A very wet summer destroys them in the same proportion. A wild woodland country is the most favourable for their increase in numbers: a rich pasture country without woods is very unfavourable for the whole genus.

“My acquaintance with the ‘dumble dores’ is of fifty years’ standing. I commenced catching them when a child. The first nest I took was in 1798, the last in 1848! I have spent many happy hours in studying their history and economy; and I trust those of my readers who are real naturalists, will not think the pursuit trifling or unsatisfactory, as many do who are no lovers of these things. For myself, I may truly say that to this day I feel thankful that the first fifteen years of my life were spent in the country, and in these pursuits. The old adage,—

“‘God made the country, and man made the town,’

is to me a true saying; for the agency of a Great First Cause is much more apparent in every object around us, in the country than in the town. Even in the history of these little insects, how wonderful their preservation during the winter! Their frail bodies are five months in the year in the cold wet earth, and other holes and corners, (I once found one in a small fissure of a wooden fence; it was dormant until the beginning of February, when it recovered and flew away): they arise from their long slumbers, refreshed by their rest, as soon as the glorious sun begins to warm the earth. Should not this remind us mortals of the great change which must happen to us all, when we shall be called into new and everlasting life, from the sleep of death?

“The study of the wild bee has this advantage over the hive bee, that young people can follow it without danger: they are not vindictive, and if properly handled, do not sting, even when defending their young. It can also be followed without cost, except that of time; and who is there that has not a leisure hour each day in the summer? I therefore strongly recommend this study to my young friends in the country, as an intellectual amusement. Natural History has of late years become more fashionable, and this is no mean part of it; besides, it is accessible to nearly all who reside in rural districts.”

Mr. Smith observed, that the preliminary remarks of Mr. Newman would lead one to expect a record of some new facts in the history of humble bees, but that he could not discover anything bearing even the aspect of novelty, except the statement that "the males leave the nest but once, never to return." Upon this point, he had some observations to make, since it was at variance with his own experience and observation. Mr. Smith said that in many particulars the social bees differ from the solitary species; thus, amongst solitary species, the males are the first to make their appearance, whereas the contrary obtains in social communities: the males also of the solitary species fly to their nests on the approach of night, or the passing of a summer cloud, so also do the males of the hive-bee. Mr. Smith observed that Mr. Newman's *Apis terrestris* he had undoubtedly considered identical with *A. lucorum*, and had probably considered all the yellow-banded species, except *hortorum*, as constituting but one, in which he was mistaken; Mr. Newman's *Apis terrestris* being the *lucorum*, as proved by his description of the male. Mr. Smith said he had some doubt whether the *Bombus lucorum* really was so much more numerous in the North; in the neighbourhood of London, and indeed in Kent, Surrey and Hampshire it is much more numerous than *terrestris*; but if Mr. Newman meant that the black and yellow-banded species are more numerous, he was probably correct. Mr. Smith said that some years ago he collected a number of *Bombi* in Yorkshire, and there the *Bombus Raiellus* abounds, this being Mr. Newman's variety of *Lapidaria* found in Scotland: this species he had always found constructing a moss nest, not building in old walls, but in meadows.

Mr. Smith said he had occasionally found *Bombi in coitu* (*B. pratorum*, June 20, 1847, *B. lapidarius*, July 27, both before 10, A. M., *B. soroensis*, in the Battersea-fields, August 19, 1840), and was of opinion that the reason why such connexions were not more frequently observed, was to be explained by the fact of their taking place usually at an early hour. In the month of June, a few years ago, he discovered a large colony of *Andrena fulvescens* in the after part of the day: there were thousands of their little hillocks turned up in the hard-trodden pathway, and a few females entering and issuing from them. The morning following, on revisiting the colony between 9 and 10 o'clock, he observed numbers *in coitu*. With regard to Mr. Newman's observation that the males of the *Bombinatrices* "leave the nest but once, never to return," Mr. Smith stated, that on the 10th of August, 1838, he found a nest of *B. Raiellus* constructed of moss, in a bank in the Hackney-marshes, and not knowing to which species it belonged, he gently raised it, and found some combs of empty cells, except a little honey in one or two of them, and four or five workers and one female. He then replaced the upper portion of the nest, and left it till he returned on his way home, when with a silk handkerchief he secured the nest, together with its contents: these proved to be four females, ten workers, and six males. These had all no doubt returned towards the evening, and he was quite confident there were no males there in the morning. There remained only the possibility of the subsequent development of the males, which he felt satisfied did not take place during the interval; the combs were in too empty a state to contain young brood, and when he examined them at home, they contained no brood of either sex. He also felt pretty sure of having observed the male of *Bombus terrestris* entering the nest; but his crowning remark was that Mr. Kirby, in his observations on *B. Lapidarius*, alluding to the male, says, "I have myself seen this insect entering the nidus of *A. lapidaria*."

The President read the conclusion of his Memoir on the genus *Evania* and its allies.

The President announced that Herr de Haan, an Honorary Member of this Society, had for a long time made researches into the venation of the wings of butterflies, with reference to their metamorphoses, general structure, and economy, in which he had received great assistance from M. Milne-Edwards, at Paris, and he now sought the help of English entomologists, in furnishing him with specimens of diurnal Lepidoptera, stating that it would be sufficient for his purpose if there were but an upper and an under wing free from damage.

Herr Helfrich, of Berlin, had also intimated his desire to exchange with any of the Members, specimens of the larger European Lepidoptera for English species.

It was announced that Part 5, Vol. I. n. s. of the Society's 'Transactions,' was ready for delivery.

July 7, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors thereof:—'The American Currant-moth, (*Abraxas? Ribearia*);' by Asa Fitch, M.D.: 'A Catalogue with References and Descriptions of the (Homopterous) Insects collected and arranged for the State Cabinet of Natural History, New York;' by Asa Fitch, M.D.: both presented by the author. 'Transactions of the Linnean Society,' Vol. xx. part 3: 'Proceedings of the Linnean Society,' Nos. 41—44, pp. 49—112: 'List of Members of the Linnean Society, 1850:' all presented by the Society. 'The Zoologist' for July; by the Editor. A *Blatta* and a *Pentatoma*, on which were living larvæ of one of the *Tenebrionidæ*, imported from Abyssinia in a parcel of the new vermifuge called "Koussou;" presented by William Mansell, Esq.

Mr. Edwin Shepherd exhibited specimens of *Phibalapteryx polygrammata*, *Harpalyce Sagittata*, *Eupithecia sparsata*, *Psecadia funerella*, *Cosmopteryx Lienigiella*, and a new species of *Gelechia* allied to *dimidiella*; all recently captured at Burwell Fen, Cambridgeshire: also *Phoxopteryx Upupana*, *Ephippiphora obscurana*, and a new *Spilonota* allied to *dealbana*; all from Darenth Wood: and a very fine *Stauropus Fagi*, captured at Black Park, Bucks.

Mr. Augustus Sheppard exhibited a fine series of *Depressaria assimilella*, reared from larvæ found on broom.

Mr. J. Jenner Weir exhibited *Bucculatrix Cidarella* from alders, *Gracilaria Ononidis* from *Genista tinctoria*, *Æchmia oculatella* from *Eupatorium Cannabinum*, and *Æ. metallicella*; all captured near Pembury, Kent.

Mr. Smith exhibited the specimen of *Gastropacha Ilicifolia* caught by Mr. Atkinson, mentioned at the June meeting; also living specimens of *Chrysomela cerealis*, which had fed for the last fortnight on leaves of wild thyme, on which plant Mr. Foxcroft found them in the Pass of Llanberris, N. Wales.

Mr. Douglas exhibited, in illustration of the natural history of the following Tortrices:—

A pupa-skin of *Ditula angustiorana*, projecting from the interior of one of the shoots of yew exhibited at the February meeting.

A pupa-skin of *Cochylis Francillana*, and a section of a dry stem of an umbelliferous plant, in which the larva had fed.

A pupa-skin of *Pædisca bilunana*, with a catkin of birch, inside which the larva fed.

Dry capsules of *Saxifraga granulata*, gathered at Southend, *in* which he had found pupæ which produced *Sphaleroptera Ictericana*.

It was somewhat singular that all the six or eight specimens of this insect that had appeared were males; the females (*longana*, *Haw.*) he had reared from larvæ found on *Aster Tripolium* growing near Gravesend, which quitted the plant prior to changing to pupæ; so that granting the larvæ of the pupæ found in the capsules of *Saxifraga granulata* had fed therein, it would appear, judging from the instances in question, either that the sexes fed on different plants, or that these two insects had been erroneously united as one species. It was not safe to speak positively without further experience, but it would at least seem that if there were but one species, the larvæ were not only polyphagous, but had different habits on different plants; in one case changing to pupæ in the seed-capsule of the plant, in the other quitting the plant and retiring to the earth.

Mr. S. Stevens exhibited *Chrosis Audouinana* from Black Park, *Psyche reticella* from Sheerness, and *Eupithecia tenuiata*, bred from fallows.

The President directed the attention of the meeting to the descriptions of the winter insects of New York by Dr. Asa Fitch; specimens of the greater part of which were intended to be presented to this Society. The following are extracts from the paper.

“It is the object of the following paper, to describe those insects of Eastern New York, which occur in their perfect state in the winter, and are peculiar to that season and the early part of spring. They are objects of curiosity, as coming forth to our view in full maturity and vigour, at that time in the year when almost every other member of the animal kingdom is reposing in torpidity under the chilling influence of solstitial cold. In an economical aspect, they possess but little importance, their period of life being limited to that season when the field furnishes no herbage, the garden no flowers, and the orchard no fruits, on which they can prey. They are chiefly interesting, therefore, merely as objects of scientific research—as forming integral parts of that vast array of animated beings, with which the Father of Life has populated our world, and rendered it vocal with his praise.

“A few words respecting the analogies of the two first species here described, may not be devoid of interest to the general reader. A small insect, destitute of wings, and bearing some resemblance to a flea in its general aspect, is found in the winter season, upon the snow in the northern part of Europe, and also occurs upon the Alps and the Harz mountains. It has been known for nearly a century, and from its singularly anomalous characters, naturalists have been much perplexed to determine in which particular family of the insect tribes it might with the most propriety be placed. Linnæus was the first to classify and name it. He regarded it as possessing more analogies with the species associated in his genus *Panorpa*, than with any other insects, and accordingly arranged it with them, bestowing upon it the specific name *hyemalis*. But, inasmuch as it differed from the *Panorpidæ* in some prominent particulars, such as possessing the faculty of leaping, and being furnished with an ovipositor similar to many grasshoppers and crickets, Panzer, at a subsequent day, placed it under the genus *Gryllus*. More recent naturalists, however, have concurred in the

propriety of the location originally given by Linnæus, and to obviate, in some degree, the incongruity of its situation, Latreille was induced to construct for it an independent genus, placed beside *Panorpa*, to which genus he gave the name *Boreus*. The *hyemalis* has remained to this day the sole species of this genus, no other insect having similar characters, having been discovered in any part of the world. Two years since, in the month of March, searching carefully upon the melting snow, to find if possible in this vicinity, a rare and singular insect which has been lately discovered in Canada—the *Chionea valga*, a fly destitute of wings—though unsuccessful, my labours were rewarded with an equally acceptable return, an insect co-generic with the curious *Boreus hyemalis* of Europe. Since that time, I have met with numerous specimens, and have also found, in the same situations, several individuals of a third species pertaining to the same genus.

“ 1. *BOREUS NIVORIUNDUS*. The Snow-born *Boreus*.

“ Shining black or brownish black; rudimentary wings, thorax above, with the rostrum and ovipositor excepting their tips, fulvous; legs dull fulvous.

“ Length, male 0.12 in.; female 0.15, or including the ovipositor 0.18.

“ This insect is by no means rare, being found upon the snow in forests in warm days, so early as December, and becoming more plentiful as the season advances. I have met with it the most plentifully in April, when there has been a fall of snow in the night, succeeded by a warm forenoon of bright sunshine. Appearing so suddenly, in numbers, upon the clean, dazzling white surface thus spread over the earth, at the first thought it seems to be literally bred from the snow. I have not yet searched for it in the moss of tree-trunks, but doubt not that like the European insect, ours will also occur in this situation. When observed upon the snow, it is almost always stationary; and when approached by the hand, it commonly makes a leap to the distance of a few inches only, its saltatory powers appearing but feeble.

“ 2. *BOREUS BRUMALIS*. The Mid-winter *Boreus*.

“ Polished deep black-green; legs, antennæ, rostrum, and ovipositor black; rudimentary wings brownish black.

“ Length, male 0.10; female 0.12, or including the ovipositor 0.15.

“ So far as I have at present observed, this appears abroad earlier in the season, and in colder weather than the preceding, though occasionally found associated with it on the last snows that fall in the spring. It is much less common than the other.

“ 3. *PERLA NIVICOLA*. The Small ‘Snow-fly.’

“ Black; wings gray, unclouded, a third shorter than the abdomen in the males, a third longer in the females.

“ Length 0.20, wings expand 0.45; males smaller.

“ On warm days in the latter half of winter, this species may be observed crawling with hurried steps upon the snow. It becomes most numerous about the time the snow finally disappears, and is then often seen on shrubs, fences, and buildings, and not unfrequently finds its way into our houses. It is extremely common, occurring most abundantly in the vicinity of streams of water, in which element the previous stages of its existence are passed. When first excluded from its pupa state, it is of a pale yellowish colour, but gradually changes to black, this change commencing upon the thorax. Copulation occurs immediately after the female comes from the pupa state.

“4. *NEMOURA NIVALIS*. The Large ‘Snow-fly.’ The ‘Shad-fly.’

“Black; wings griseous, faintly banded, double the length of the abdomen.

“Length, males somewhat under, females over, half an inch; wings expand about an inch.

“It is not uncommon to meet with specimens of this and the preceding species, infested with a minute parasite of the family Acaridæ. These parasites are of a bright vermilion-red colour, and fix themselves, one or more, at the sutures of the tergum, not quitting their hold after the death of the insect, unless disturbed.

“This species begins to appear soon after the small snow-fly is first met with. It occurs in the same situations, is nearly as abundant, and remains for a time after that has disappeared. One of the purposes served by these prolific insects in the economy of nature, doubtless is to supply with food the fish of our streams at this early period of the year. The larger of these species, continuing to be abundant when the shad first come into our rivers, has evidently received one of its popular designations in allusion to this fact.

“We regard this as the American analogue of the European *Nemoura nebulosa*, *Lim.* But, from several points in the extended description of that species given by M. Ramber (‘Suites à Buffon,’ *Insectes Neuroptères*, Paris, 1842), it is quite obvious that ours is a distinct insect.

“5. *CULEX HYEMALIS*. The Winter ‘Musketoe.’

“Thorax cinereous, with a broad black vitta on each side; extreme tips of the wings and two spots on their anterior margins black, with two intervening sericeous yellowish white spots.

“Length 0.22; to the tips of the wings 0.28, or including the beak, 0.39.

“The winter musketoe is met with in the last days of autumn, and again for a short time in the first days of spring, and specimens are occasionally found in any of the winter months. It is a somewhat rare insect, which no one can fail to distinguish clearly by the marks on its wings, as above described.

“6. *CHIRONOMUS NIVORIUNDUS*. The Snow-born Midge.

“Black; poisers obscure brown; wings pellucid-cinereous, their anterior nervures blackish.

“Length about 0.15 to the tip of the abdomen in the males; females a third shorter.

“This is a very common species, appearing upon the snow in the winter season, and upon fences, windows, &c., in the fore part of spring, the males and the females being about equally numerous. The beautiful plumose antennæ of the former distinguish them at a glance from all other insects abroad at this season. At times they may be met with in immense swarms. April 27th, 1846, in a forest, for the distance of a fourth of a mile, they occurred in such countless myriads as to prove no small annoyance to the passer, getting into his mouth, nostrils and ears at every step, and literally covering his clothing. These had probably hatched from the marshy border of an adjoining lake, on this and the preceding days, the weather having been remarkably warm and dry. The wings appear to be more hyaline and iridescent in those individuals that come forth earliest, but I am unable to detect any marks by which they may be characterized as specifically distinct from those which appear at a later day.

“TRICHOCERA BRUMALIS. The Mid-winter Trichocera.

“Brownish black; wings and legs pallid at their bases; poisers blackish, their pedicels whitish.

“Length of the male 0.18, of the female 0.25; the wings expanding twice these measurements.

“Common in forests in the winter season, coming out on warm days, flying in the sunshine, and alighting on the snow, its wings reposing horizontally upon its back when at rest. Even when the temperature is below the freezing point, and the cold so severe as to confine every other insect within its coverts, this may be met with abroad upon the wing. It is a plain, unadorned species, closely allied in its characters and habits to the European *T. hyemalis*, but in a number of impaled specimens before me, I can detect no stripes or bands upon the thorax; whilst the very obvious character of the legs and wings being pallid at their bases, I do not find mentioned as pertaining to that species.

“PODURA NIVICOLA. ‘The Snow-flea.’

“Black or blue-black; legs and tail dull brown.

“Length 0.08.

“Though found in the same situations as the European *P. nivalis*, ours is a much darker coloured species. Say’s *P. bicolor* is a larger insect than the one under consideration, and differs also in size and in the colour of the tail or spring. From the habits of the present species, we should infer that it might be abundant in all the snow-clad regions of the northern parts of this continent; it may therefore prove to be identical with the *P. humicola* of Otho Fabricius (‘*Fauna Grœnlandica*’), of which we are unable to refer to any but short and unsatisfactory descriptions, which do not coincide well with our insect.

“This is an abundant species in our forests in the winter and fore part of spring. At any time in the winter, whenever a few days of mild weather occur, the surface of the snow, often over whole acres of wood-land, may be found sprinkled more or less thickly with these minute fleas, looking, at first sight, as though gunpowder had been there scattered. Hollows and holes in the snow, out of which the insects are unable to throw themselves readily, are often black with the multitudes which here become imprisoned. The fine meal-like powder with which their bodies are coated, enables them to float buoyantly upon the surface of water, without becoming wet. When the snow is melting so as to produce small rivulets coursing along the tracks of the husbandman’s sleigh, these snow-fleas are often observed, floating passively in its current, in such numbers as to form continuous strings; whilst the eddies and still pools gather them in such myriads as to wholly hide the element beneath them.”

Mr. S. Stevens stated that Mr. Walton had had the kindness to determine the names of the two new British Curculionidæ he had recently captured. That from Gravesend he had no doubt was the *Mecinus collaris* of Germar, for it answered exactly to Germar’s description; the other from Fenny Stratford is *Acalyptus rufipennis* of Schönherr. Of this, Mr. Walton in a note, observes: — “The genus *Acalyptus*, Schönherr states, is not very dissimilar to *Sibynia*, and is partly like *Tychius*, but differs in the construction of the funiculus of the antennæ and in the form of the rostrum. The location of the genus is next to *Sibynia*. Schönherr records only two species in the genus, *viz.*, *A. Carpini*, *Herbst.*, and *A. rufipennis*; but I am of opinion that Car-

pini is identical with rufipennis, which is founded upon Gyllenhal's description. If I am right, the synonymy will stand thus:—

“*Acalyptus Carpini*, *Hbst., Gyll., Sch.* .

“*Ellescus sericea*, *Dahl., Dej.*

“*Sibynia sericea*, *Sturm, (Ins. Cat.)*

“*Acalyptus rufipennis*, *Schön.*

“According to Gyllenhal, it occurs plentifully in Sweden upon the flowers of *Salix cinerea*.”

Mr. Saunders alluded to the great abundance of cockchafers this year, and stated that he had made experiments on the relative weight of males and females. He found that in twelve males the average weight was $13\frac{1}{2}$ grains each, in twelve females $20\frac{1}{2}$ grains.

The heaviest male weighed 17 grains, the lightest 12 grains.

The heaviest female weighed $24\frac{1}{2}$ grains, the lightest 16 grains.

The difference between the heaviest male and female was $7\frac{1}{2}$ grains.

The difference between the lightest male and female was 4 grains.

The difference between the lightest male and heaviest female was $12\frac{1}{2}$ grains, the heaviest male being 1 grain heavier than the lightest female.

The President said that these observations might possibly prove to be more than curious, and to have an economic value; for in some places on the continent, in seasons when cockchafers were abundant, quantities had been collected and pressed for the sake of the oil they afforded; and in Transylvania they had been made into a paste with which cart-wheels &c. had been greased.

August 4, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

Herr Herrich-Schæffer and Count Mniszeck were present as visitors.

The following donations were announced, and thanks ordered to be given to the donors thereof:—‘*The Zoologist*’ for August; by the Editor. ‘*Entomologische Zeitung*’ for June; by the Entomological Society of Stettin. ‘*Isis*, 1848, Heft xi.’; by Herr Koch. Lieut. Maury’s ‘*Investigations of the Winds and Currents of the Sea*,’ (from the Appendix to the ‘*Washington Astronomical Observations for 1846*’), with a map: Washington, 1851; by the Author. ‘*Monographia Cassidarum*,’ tom. i., auctore C. H. Boheman; by the Author. ‘*Verslag van de Zesde Algemeene Verdragting der Nederlansche Entomologische Vereeniging*’; by the Netherlands Entomological Society. ‘*Transactions of the Microscopical Society*,’ vol.iii.parts 1 and 2; by the Society. ‘*Additamenta ad Faunam Carcinologicam Africæ Occidentalis*, scripsit J. A. Herklots;’ by the Author. A box of Brazilian Hemiptera; by M. de Gand. Specimens of *Apamea ophiogramma* and *Gelechia velocella*; by Mr. F. Grant. Two living specimens of *Chrysomela cerealis* from Llanberis; by Mr. Foxcroft. A nest of the spider, *Theridion variegatum* (T. callens, *Blackwell*); by Mr. Meade.

Mr. J. F. Stephens exhibited a series of varieties of *Abraxas Grossulariata*, caught

by himself; some of the specimens being remarkable for variation in the form of the wings as well as the colours.

Mr. Bond exhibited a specimen of *Saturnia Carpini*, reared by Mr. Barlow, of Cambridge, in which the usual ocellus on the upper wings was replaced by a yellow dash; and the President observed that at least one of the veins was deficient.

He also exhibited some very remarkable varieties of *Harpalyce suffumata*, *Cidaria fluctuata*, *C. montanata*, *Boarmia rhomboidaria*, and *Spilosoma Menthrasti*, all taken near Leeds.

Mr. Bedell exhibited the following Micro-Lepidoptera, all taken near Mickleham on the 27th of July:—*Pempelia ornatella*, *Depressaria rotundella* and *D. Douglasella*, *Gelechia neuropterella*, *Pterophorus baliodactylus* and *P. didactylus*.

Mr. S. Stevens exhibited some splendid Coleoptera and Lepidoptera, received from Messrs. Wallace and Bates, and collected by them at Ega and Guia, on the Amazon. Among the Lepidoptera were several novelties, and a female of the butterfly of which Mr. Hewitson had lately described the male in this Society's 'Transactions,' under the name of *Papilio Bolivar*. Mr. Stevens also exhibited some fine *Buprestidæ* from Swan River.

The President exhibited a living specimen of *Cerambyx Heros*, forwarded to him from Pembroke dock-yard by Sir T. Pasley; *Phibalocera Quercana*, reared from larvæ living under a silken web on leaves of pear-trees, to which they had done much damage; *Plutella Cruciferarum*, reared from leaves of turnips, on which in many counties they had appeared in immense numbers, and caused great devastation; turnip-leaves, containing living larvæ, probably of the last-mentioned species, and others which had been forwarded to him, accompanied by specimens of *Crambus culmellus*, which were said to have caused the damage to the turnip-plants, but which was not probable; *Meligethes æneus*, seen eating pollen of roses; *Balaninus Brassicæ*, found gnawing the petals of roses; a monstrous claw of *Astacus fluviatilis*, with two horns instead of one; a nest of *Chelostoma florisomme*, with three cells, in a straw; and a species of *Astyages* from asparagus. He also distributed a number of *Coleophora Hemerobiella* and *C. nigricella*, reared from leaves of pear-trees.

Mr. Moore exhibited some Lepidoptera from Hastings, among which were *Sphaleroptera longana*, *Haw.*, and *Bryophila glandifera*.

Mr. Smith exhibited two specimens of the rare *Ctenicerus castaneus*, captured by the Rev. C. Kuper, in Monmouthshire.

Mr. Smith also exhibited a great number of Hymenoptera, which he had recently captured in the Isle of Wight; among them the following were the most remarkable. *Mutilla Ehippium* (male and female), *Larra unicolor*, *Philanthus triangulum* (hitherto exceedingly rare, but of which he took between 200 and 300), *Andrena nigriceps* (*Kirby*), *Panurgus calcaratus*, *Nomada varia* (*Kirby*), *Cœlioxys vectis* (*Curtis*), *Megachile maritima*, the very rare *Osmia xanthomelana*, an immense number of *Fœnus assectator*, and one specimen of a *Dasy-poda*, probably a new species.

Mr. Smith stated that from the stem of dock exhibited by Mr. Douglas at the March meeting, containing larvæ then supposed to belong to *Cemonus* or *Pemphredon*, he had reared three specimens of *Hylæus*, of which two (males) were *H. plantaris*, *Smith* (Trans. Ent. Soc. iv. 32), and one (female) was *H. cornuta*, *Kirby*, *MSS. Smith*, (*l. c.*); thus leaving no doubt that these were but sexes of one species.

Mr. S. Stevens exhibited a quantity of insects, of all orders, part of a great mass he had brought from below Gravesend on the preceding day, when from 7 to 8, p. m.,

there were myriads on the grass, although at 5 o'clock scarcely any were visible. Among them he had already discovered a number of a species of *Haltica* new to him.

Mr. Waring exhibited two specimens of *Plusia orichalcea*, recently taken by Mr. Harding near Folkstone.

Mr. Augustus Sheppard exhibited specimens of *Tortrix transitana* from Fulham, *T. cinnamomeana* and *Dichelia Grotiana* from Weybridge, and two strongly-marked *Demas Coryli*, reared from larvæ.

Mr. Meade exhibited some cocoons of a *Coccus* found in May, from which a number of very minute insects, all alike, had escaped, and a sketch of which he exhibited.

The President said he thought the holes visible in the cocoons were not made by the *Cocci*, but by a parasite thereon,—*Coccophagus*; and he believed he perceived some of them among the *Cocci*.

Mr. Stainton exhibited the new species of *Lithocolletis*, recently described in the 'Entomologische Zeitung' by Herr Nicelli, under the name of *L. Coryli*; also the larvæ and pupæ in leaves of hazel.

Mr. Douglas exhibited *Gelechia Walkeriella*, from Dartford Heath; *Peronea aspersana*, with its pupa-skin, and *Sericoris conchana*, both reared from larvæ which fed on the leaves of *Spiræa Filipendula*; and a species of *Coleophora*, apparently undescribed, for which, if such should prove to be the case, he proposed the name of *Inulæ*, the larva having fed on leaves of *Inula dysenterica*.

The President read the following extracts from a letter he had received from I. P. Kirtland, Esq., M.D., Cleveland, Ohio, dated July 15, 1851:—

"In the 'Arcana Entomologica' it is stated, on the authority of Mr. Doubleday, that '*Papilio Ajax* is found chiefly in the lower country of the Southern States, east of the Alleghanies; its range is, I believe, from Virginia to Florida.' But this species has a more extensive range. At my residence on the south shore of Lake Erie, five miles west of Cleveland, it is not uncommon, and I have found it still more abundant at Columbus, near the centre of the State of Ohio. With us the larva feeds upon the foliage of the *Anona triloba*. This insect, in its various stages of metamorphosis is correctly figured in Leconte's Boisduval's 'History of Lepidoptera.'

"The *P. Marcellus* is still more common in the same northern localities, and feeds upon the same shrub. It is also well figured in the work to which I have referred. The pupa-case is occasionally of a pea-green colour, and remains unchanged during the winter. In their perfect state these two species are readily recognized by their peculiar modes of flight, as well as difference in size and markings.

"*P. Asterias* in the larva state feeds on all species of *Umbelliferæ*, not excepting *Cicuta virosa*, the most virulent of our vegetable poisons.

"*P. Philenor*, in the same state, confines itself to the several species of *Aristolochia*; *A. Serpentina*, in this vicinity, constituting its principal food. It is badly coloured in Say's 'American Entomology;' in Boisduval it is better, but far short of the original while living.

"You will perhaps be surprised to learn that *P. Cresphontes*, *Herbst.*, described and figured as *P. Thoas* in Leconte's Boisduval, has found its way as far north as my locality. In the August of last year I captured four beautiful specimens on my lawn. The present season two have already been seen here, and I have received one from the Scioto valley near Columbus. At the south it feeds on the orange trees; what its food is here I have not yet discovered. I do not think it has visited this section of the country till very recently.

“ Among the most rare species which I have taken, are *Vanessa Milberti*, *Melitæa Phaeton*, *Xanthidia Nicippe*, and *Limenitis Arthemis*.

“ It may interest you to learn the fact that three species of your English butterflies have become naturalized in this vicinity; viz., *Vanessa Antiopa*, *V. Atalanta*, and *Lycæna Phlæas*. All are now abundant. It is perhaps doubtful whether the last is specifically identical.”

The President announced that Herr Herrich-Schæffer, having come into possession of the works of Hübner and Panzer, would dispose of copies, including the continuations, at greatly reduced prices; and that he would receive in exchange English entomological books and English and Foreign Lepidoptera. Also that he had for sale or exchange small collections of European Lepidoptera. He intended to terminate, during the ensuing winter, his works on the Lepidoptera of Europe; and for illustration therein, he begged the loan of new species, especially of extraordinary genera of Nocturnes; and promised to return them in good condition as soon as possible, and free of expense.

A MS. list of a collection of Lepidoptera and books for sale by Herr Koch, of Frankfurt, was on the table.

September 1, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

Previous to the ordinary Meeting, a Special General Meeting was held, at which a revision of the Bye-Laws was made. One of the alterations was, that a new class of Members, called Associates, should be created, for the express purpose of admitting working entomologists to the advantages offered by the Society's Meetings, Library, and Collections.

The following donations were announced, and thanks ordered to be given to the donors:—‘*Entomologische Zeitung*’ for July and August; by the Entomological Society of Stettin. ‘*Bulletin de la Société Impériale des Naturalistes de Moscou*,’ 1849, No. 4, 1850, No. 1; by the Society. ‘*Abhandlungen der Mathemat.-Physikalischen Classe der Kœnigliche Bayerischen Akademie der Wissenschaften*,’ Band v., Abth. 1, and Band vi., Abth. 1; Munich, 1851: ‘*Bulletin*’ ditto, 1847, Nos. 1—35: by the Academy. ‘*Melitemata Entomologica*,’ auctore Dre. Frederico A. Kolenati, Fasc. 1; Petropoli, 1845; by the Author. ‘*On the Hessian Fly*,’ by Dr. A. Fitch; by the Author. ‘*The Athenæum*’ for July; by the Editor. ‘*The Zoologist*’ for September; by the Editor. A selection from the Hymenoptera collected at the Isle of Wight and exhibited at the last meeting; by Mr. F. Smith. Four specimens of *Lobophora polycommata*; by Mr. T. H. Allis. Two specimens of *Cecidomyia Tritici*, and two of a new species of *Cecidomyia*; by Mr. Brown, Burton-on-Trent.

Alfred Beaumont, Esq., of Huddersfield, was balloted for and elected a Member of the Society.

Mr. White exhibited a specimen of the spider-like crustacean, *Nymphon giganteum*, *Goodsir* (*Stromii*? *Kröyer*), taken at a depth of twenty fathoms, in the sea on the coast of Zetland.

The President exhibited a moth reared from eggs received from Mr. Parker this

year, and which came from the province of Chectiang, in the North of China, where the fine kind of silk called "Tsatlee" is produced by the caterpillars of this species. The moth, a Bombyx, apparently differed from the common *B. Mori*; the caterpillar, however, fed on mulberry-leaves.

The President also exhibited three specimens of a *Nepticula*, probably *N. centifoliella*, reared from leaves of a rose-tree. The larvæ, which apparently were without legs, mined the leaves in a tortuous manner, and when full-fed came out of the receptacle they had formed, and made flat, boat-shaped cocoons, each being placed between the foot-stalk and the bract of a leaf.

Mr. Spence sent for exhibition the eggs of some insect beautifully arranged round the foliage of a species of *Coniferæ*.

Mr. Grant exhibited a specimen of *Gelechia Brizella*, a new British species taken by him at Southend, in July. He also exhibited *Peronea permutana*, *Gelechia pictella* and *Agrotis valligera*, all taken by smoking bushes on Barnes Common, Surrey; a new and inland locality for these hitherto maritime species: and from the same place, smoked out of broom, *Depressaria atomella*.

Mr. Smith exhibited six specimens of a species of *Pteromalus*, reared from larvæ found in pods of furze with *Oxystoma Ulicis*, on which he had no doubt they were parasitic. He considered them identical with the example mentioned at the March meeting, when the President had stated his belief that it was a parasite upon *Oxystoma*.

Mr. Smith also exhibited a new British bee, *Bombus arcticus*, *Dahlbom*, taken by Mr. A. White, in August, at Lerwick, where it was not uncommon in the gardens of Mr. J. A. White, Union Bank, and Mr. Bruce, Sand Lodge.

Mr. Smith exhibited two living specimens of *Lamia textor*, female, taken by Mr. Jacques, near Bristol.

Mr. Douglas exhibited leaves of laburnum, showing how larvæ of *Cemiostoma Laburnella* had fed between the cuticles, and when full grown had left their habitations and made their cocoons on the under side of the leaves. Also, a specimen of *Mecinus collaris*, the new British *Curculio* discovered by Mr. S. Stevens at Gravesend, at which place, in June, Mr. Douglas had gathered some flower-stems of *Plantago maritima*, in which the larvæ of this beetle fed, causing a large swelling immediately below the flower, and from one of these the example now exhibited was produced. He also exhibited specimens of *Depressaria atomella*, reared from broom, *Gracilaria Ononidis*, *Dicrorampha acuminatana*, *Z. (caliginosana)*, *Guen., Doub., non Tr.*, and an apparently new species of *Stigmonota*, all taken at Headley Lane, August 10.

Mr. Stainton exhibited a minute pupa-case, probably of a *Nepticula*, on oak. It exactly resembled a caraway-seed, and was fastened to a twig by some exceedingly fine filaments of silk.

Mr. Spence communicated the following extract of a letter from his son, R. H. Spence, Esq., dated Cold Springs, near Baltimore.

"As Dr. Smith predicted, the *Cicadæ* [*C. septemdecim*] came out of the ground from May 25th to June 5th, in swarms, the ground being actually riddled with the holes from which the pupæ emerged. Every tree, and shrub, and fence, and stick, and stone, in fact, everything, was covered with them. I have counted a hundred on a small peach-tree planted last year. Their habits, in one respect, are different from those of other *Cicadæ*, as they are excessively slow and lazy, and will allow themselves to be caught without the least attempt to get away. The *black locust*, as they call it

here, and all the South-of-Europe Cicadæ, are very active, and exceedingly difficult to get hold of. The injury they do is this. The female with her ovipositor makes several incisions in the bark of the small branches of trees, and in each incision lays about one hundred kidney-shaped white eggs. In about a week or ten days the branch withers and falls to the ground, when the grubs, which are then hatched, penetrate into the earth and remain there, as they say, seventeen years. The trees have suffered so much, that the woods have quite an autumnal appearance."

Mr. Spence also communicated the following extract of a letter from Signor Carlo Passerini, of Florence, Honorary Foreign Member of the Society:—

(Translation).—"This autumn I have had the fortune to find the habitat, where it undergoes all its transformations, of the rare teredile *Denops personatus*, and soon I shall publish its history with plates, which I believe will augment the known notices (and they are very few) of the Terediles. I have collected several specimens of this pretty Coleopterous insect, which I shall be able to impart to entomologists. In announcing this to English entomologists, you may say that I reserve a couple of this *Denops* for each. Remember me particularly to Messrs. Capt. Parry, Thwaites, Curtis, Westwood, and G. R. Gray, and I shall be well content if they ask from me Coleoptera, Hymenoptera and Lepidoptera of Tuscany."

Mr. Stainton read an extract of a letter from J. C. Bowring, Esq., Corresponding Member of the Society, dated Hong Kong, June 9.

"I inclose a pair of *Cyclosomus insularis*, *White*, a species I met with yesterday morning for the first time. This beetle burrows to some depth in the sand by the seashore; it is very active in its movements, and when exposed on the surface disappears beneath the sand with truly wonderful rapidity, diving down head foremost. I captured about twenty specimens by turning up the sand for some distance to the depth of five or six inches."

Mr. White read the following extracts of a letter from Mr. Bowring, dated Hong Kong, June 2.

"Captain Champion tells me that you entomologists at home will not believe my account of the parasite on *Fulgora*. Now yesterday I showed Mr. Harrington a specimen which I have just reared, the moth having come out a day or two ago—a fine male, with beautifully pectinated antennæ. The pupa-case with its cottony covering is well preserved. This specimen I intend to send to the Entomological Society. Among my most recent captures are my *Cicindela speculifera*, now out, and of which I took fifteen specimens yesterday, also a few of the three other species of which I sent specimens to the British Museum last year. The other day, when up at Canton, I got no less than thirty-two specimens of *C. Chinensis*—magnificent fellows, as perfect as can be. The insect is in every collection, but all the specimens are villainous things, with great May-poles of needles stuck through them. I have also taken some very beautiful Carabideous insects this spring; a fine *Panagæus*, like *P. quadrimaculatus*, one or two species like *Pogonus*, and some which I cannot make out, one particularly, which belongs to the *Truncatipennes*, and has the labrum produced into a long snout, like some of the *Cistelæ*. Another capture made this spring is one which surprised me not a little; *viz.*, a fine *Creophilus*, quite as large as, and closely resembling, our *C. maxillosus*. Are you aware of any other species from the tropics? *Carabus Lafossei* is another fine thing I have added to my cabinet lately; and I hope this summer to get some good specimens of *C. prodigus* from the hilly country N. W. of Canton."

The President, in exhibiting the *Cecidomyiæ* presented by Mr. Brown, read the following extracts from letters received from that gentleman:—

“Last year, when examining the economy of *Cecidomyia Tritici*, I discovered another species of the same genus, which appeared to me also to be attached to the wheat, but I was not then able to verify my observations. I have, however, this year been more fortunate, and have seen the dark-winged species in the act of depositing its eggs in the ears of flowering wheat, exactly as is the habit of *C. Tritici*. All the specimens sent are females, as I have only been able to find one male, and I cannot at present tell to which species it belongs. The males appear to be excessively rare, or appear very early. Curtis says he has never seen the male of *C. Tritici*. I have swept at least two other species of *Cecidomyia* from the wheat, besides re-discovering the spotted-winged species which Markham bred about sixty years ago from wheat. I have however taken only two specimens of Markham’s species, and about the other species I know at present too little to bring them under notice.”

“I send herewith two preparations of the flea of the hen-roost, showing the insect in its three stages. I find the larvæ in the dust on the floor of the hen-house, apparently living on the fragments of feathers and scales from the quills of the fowls; some of them changed to chrysalids whilst in my possession, forming a slight cocoon of particles of dust.

“Wilson’s article on Entomology in the ‘*Encyclopædia Britannica*’ contains a strange error respecting the habits of *Echinomyia grossa*. He states, on the authority of Reaumur!! that it is bred in cow-dung; but it is really bred in the larva and pupa of the egger moth, (*Lasiocampa Quercus*). I always took Reaumur’s cow-dung species to be the common orange-shouldered fly whose name I know well, but which at this moment I forget.”

Mr. Douglas said that in the August number of the ‘*Entomologische Zeitung*’ was an account of the habits of some of the species of *Paussidæ*, which he had thought sufficiently interesting to translate. The note was communicated by Herr Guenzius, for some time and now resident at Port Natal, to Herr C. A. Dohrn, President of the Stettin Entomological Society.

“Port Natal is rich in species of *Paussidæ* peculiar to itself, for I have found here, besides one species of *Pentaplatarthrus* and four species of *Cerapterus*, nine other species of *Paussus*. All the species dwell parasitically with ants which make their nests variously, underground, under stones, or in timber. The larger *Paussidæ* (*Cerapterus* and *Pentaplatarthrus*) are supported by the larger ants, and the smaller by the smaller ants. All the species are night-creatures, and fly during the spring, that is, from the middle of October to December, especially in thundery weather, from 9 to 11 o’clock in the evening. In February also I find *Paussidæ*, but only the smaller species. Like almost all night-creatures they are dazzled and attracted by light, and I have taken my rarest *Paussidæ* through open windows and doors on still warm nights. Their flight is swift, and with a peculiar shrill sound, so that after hearing it I am sure to see a beetle. All the species contain a caustic liquid, which they eject in an audible manner from the abdomen upon being seized. This liquid from *Pentaplatarthrus Natalensis* stains one’s fingers blood-red for several days; from the larger species of *Cerapterus*, the purplish brown of iodine; from the *Pleuropterus alternans*, *Westwood*, it burns the epidermis, forming white spots. The odour of this liquid is extremely pungent, like ammonia, and reminds one also of iodine. The explosion is repeated, as in the *Brachini*, three or four times, each time weaker than before, when it becomes exhausted.

Pentaplatarthrus I searched for early in the morning in a more laborious manner in the ants' nests, until by accident an easier method was suggested. On one very hot afternoon, between 4 and 5 o'clock, immediately before a thunder-storm, I saw in the red sand of the roads, on a woody hill, a long train of ants busily running backwards and forwards, and I remarked among them a Pentaplatarthrus gently led by its antennæ by several ants, which accompanied it in the common procession. My first idea that it was forcibly held against its will I gave up, when, on this and following days, I several times saw the same fact occur on the approach of a thunder-storm. I had with me at the same times a young Kaffir, an ardent and dexterous collector, and when I told him what I had observed and seen confirmed, he stared with astonishment at the strange escort, and cried out — 'By Tschaka (by the Great King)! the ants have chiefs, and they lead them out to promenade.' In this manner, with the assistance of this and two other Kaffir boys, I obtained a good many specimens of Pentaplatarthrus, and a pair of another species of Paussidæ." Herr Dohrn adds: —

"So far Herr Guenzius. I have only to remark that among the collections of insects received from him is a specimen of Pentaplatarthrus with an ant still attached to it; two other specimens of the same ant lay in the wadding in which the Paussidæ were packed, so it is probable that it is this species of ant with which Pentaplatarthrus lives. It is red, with a silky shining body, and very much resembles our *Fornica rufa*, but is somewhat smaller.

"I have no doubt that the *Paussus Natalensis* of the Berlin Museum, and the species described under this name in the 'Proceedings of the Linnean Society' by Mr. Westwood, are identical with *P. 4-maculatus*, *Buquet*, (*in litt.*) Among a considerable number of examples before me, some are simply red-brown, but by far the greater number have a darker, nearly black, band across the middle of the elytra, which not unfrequently extends along the suture so much that only four red-brown spots are left, one at each angle of the elytra. I also agree with my friend Westwood (*Proc. Linn. Soc. June 19, 1849*), that *P. Natalensis* is synonymous with *P. Pausoides*."

Mr. Douglas read the following extracts from a letter he had received from Mr. Weaver, dated Corrie, Rannoch, August 22nd.

"The larvæ of the rose-beetle (*Cetonia aenea*) I discovered here, live for three years in ants' nests, and feed on the ants' eggs, of which they devour great quantities, which I learned by keeping and feeding some therewith for several months. I have seen them of all ages, and although exposed to thousands of ants, I never saw them molested. I have seen the beetle alight on a large ants' nest, and dive into it without fear to deposit its eggs. The larva changes to pupa within a cone of its own making, but still within the ants' nest."

"With respect to *Tinea ochraceella*, I believe that its larvæ feed in the ants' nest, for I always rout the insect out of the nest, and it has no disposition to fly away from it."

Part 6 of the new volume of the Society's Transactions was announced as ready.

The following is a condensed account of the American currant-moth (*Abraxas* ? *Ribearia*), from the pamphlet presented to the Society by the author, Dr. Asa Fitch.

"We have in Eastern New York a moth, which will rank as the compeer of the European *Abraxas Grossulariata* in destructiveness, though varying from it somewhat in its habits, and in the characters which it presents, both in its larva and perfect state.

"Soon after the middle of May, when the currant and gooseberry bushes have become well clothed with leaves, the larva appears upon them. It is of a lively light

yellow colour, and thickly covered with black dots of different sizes, most of which, when closely examined, are discovered to be symmetrically arranged, and forming rows lengthwise of the insect. It continues to feed and to increase in size until near the middle of June, when, being fully grown, it is about $\frac{7}{8}$ of an inch long and $\frac{1}{8}$ of an inch in diameter. It then descends to the ground, and burying itself slightly under the surface, changes to a pupa of a shining black colour, about thrice as long as broad, and measuring about $\frac{1}{2}$ an inch in length. The pupa is not inclosed in a cocoon, nor surrounded with any other covering, but lies naked in contact with the earth; in this state it continues but a few days."

"For at least three years past the currant and gooseberry bushes of particular gardens in this district have, in June, been stripped of their leaves by these worms so completely, that they would be bare as in winter, but for the dead stems and blighted fruit adhering to them. A second growth of leaves begins within a week after the worm has disappeared, but no fruit is yielded, and this annual destruction of foliage cannot but prove most pernicious to the shrubs."

"On first examining the larvæ of this insect, I felt confident that they would produce moths congeneric with the European gooseberry-moth. But an inspection of the perfect insect rendered it apparent that they could not be included in the genus *Abraxas*, as defined by its founder, Dr. Leach, without a modification of its characters, which must be made, or a new genus must be constructed to receive our insect. This is also the opinion of Dr. Harris, but I decline availing myself of it, and have therefore placed the insect doubtfully in the genus *Abraxas*.

"*Abraxas? Ribearia*. Nankin-yellow; body immaculate; wings with two brown bands, the outer composed of sub-confluent dots, whereof three in the midst of the anterior pair are more conspicuous and permanent. Wings expand slightly over $1\frac{1}{4}$ inch."

A detailed description follows, illustrated by a coloured plate of the larva, pupa, and imago.

October 6, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

Monsr. Victor Signoret and J. McGillivray, Esq. were present as visitors.

The following donations were announced, and thanks ordered to be given to the donors:—‘Proceedings of the Literary and Philosophical Society of Liverpool,’ No. 6, 1849—51; by the Society. ‘Catalogus Systematicus ad Cramerum, auctore Henrici Verloren;’ by the Author. ‘Mémoires de la Société de Physique et d’Histoire Naturelle de Genève,’ tome xii. 2^{de} partie; by the Society. ‘Journal of the Royal Agricultural Society of England,’ vol. xii. part 1; by the Society. ‘Memorias de la Real Academia de Ciencias de Madrid,’ tomo i. parte 1: and ‘Resumen de las Actas,’ ditto, 1849-50; both presented by the Academy. ‘Degli Insetti Carnivori adoperati a distruggere le specie dannose all’ Agricoltura di Antonio Villa,’ Milano, 1845: ‘Osservazioni Entomologiche durante l’Eclisse del 9 Ottobre, 1847, di Antonio Villa;’ both by the Author. ‘Entomologische Zeitung,’ for September; by the Entomological Society of Stettin. ‘The Zoologist’ for October; by the Editor. ‘Philosophical Transactions of the Royal Society,’ 1850, part 2, 1851, part 1: ‘Proceedings,’ ditto,

No. 75: 'List of Members,' ditto, 1850: all by the Society. 'Annales de la Société Entomologique de France,' tome viii. 1850; by the Society. 'Bericht über die Arbeiten der Entomologischen Sektion (of the Silesian Society of Natural History),' 1850; by the Society. 'Catalogue of the Mammalia in the Museum of the East India Company;' by the Hon. Court of Directors of the Company. 'The Athenæum,' for August and September; by the Editor. A number of insects, chiefly Coleoptera, collected in Renfrewshire; by Mr. Young, Paisley. A fine series of varieties of *Orthosia instabilis*; by Mr. Barlow.

John Curtis, Esq., F.L.S., and Captain H. Lodder, 47th Infantry, were balloted for and elected Members of the Society.

Mr. S. Stevens exhibited a fine series of the hitherto very rare *Heliophobus hispidus*, taken sitting on rocks in the Isle of Portland, between the 20th and 27th of September; *Aporophila australis*, from the same locality; *Eupithecia ultimaria*, *Ramb.*, *Boisd.*, *Dup.*, a new British species taken at Dover in the middle of September; a specimen of *Deiopeia pulchella*, taken in Somersetshire in 1847; and a specimen of *Claviger foveolatus*, taken near Dorking in September.

Mr. Edwin Shephard exhibited a new species of *Peronea*, reared from larvæ found on *Spiræa Ulmaria*.

Mr. Augustus Sheppard exhibited a pupa of *Saturnia Carpini* in its cocoon, which latter was rounded internally and externally, instead of being of the usual egg-shape; one side, that by which it had been affixed to the breeding-cage, being open and showing the pupa.

Mr. F. Smith exhibited a mass of cocoons of *Aphomia sociella*, found on the coast of the Isle of Wight.

Mr. Weir exhibited many species of *Depressaria*, lately captured, and a specimen of *Gelechia lentiginosella*, reared from a caterpillar which fed on *Genista tinctoria*.

Mr. W. Thomson sent for exhibition a box of Coleoptera, collected at Morocco by Mr. Drummond Hay, containing, among other interesting insects, a specimen of the British species, *Nebria complanata*.

Mr. Janson exhibited a box of fine Coleoptera from Himalaya.

Mr. Adam White exhibited a copy of a manuscript on spiders, by Mr. Joseph Dandridge, or Daindridge, an apothecary, who lived in Moorfields in the days of Petiver and Sloane. He was a keen collector of British spiders, and wrote descriptions of them, which were subsequently published by Albin in 1736. He found "above a hundred and forty kinds of them in England only," (see Bradley's 'Works of Nature,' p. 131, 1721). Mr. W. mentioned a New Zealand genus, and a curious species of New Zealand spider, named after this indefatigable collector; he also pointed out the clear manner in which Lister and Dandridge had described the habits and markings of the British spiders, directed the attention of the entomologists present to this interesting group, and requested them to collect specimens. He mentioned that Mr. Blackwall had commenced in the 'Annals and Magazine of Natural History' a series of papers on British spiders, and said that the arachnologist of Denbighshire had undertaken for the Ray Society a volume on the subject, which would include the descriptions and figures so admirably detailed and drawn by his friend Mr. Templeton, when residing near Belfast, a manuscript which Mr. W. some years ago urged the Zoological Society to publish. He alluded to the labours of Dr. George Johnston, of Berwick, on the mites of Berwick, published in the 'Proceedings of the Berwickshire Naturalists' Club;' and concluded by reading an extract from a MSS. journal of his own,

written in France in 1841: this extract referred to Walckenaer, Fabricius, and Latreille, and their labours in Arachnology.

The following communication from Mr. H. W. Newman, of Stroud, was read:—

“ In the ‘ Proceedings ’ (p. 93) I find my friend and brother member of the Society, Mr. Smith, has criticised my paper on the Bombinatrices, and seems to doubt the veracity of the statements respecting the drones; and I do not wonder at this, for any casual observer may come to the same conclusion. This very summer I have a fine nest of *Apis lapidaria* in my kitchen-garden, at the foot of the wall, which, for the last six weeks, I have watched at nearly all hours; and though they have had a traffic of the average of three per minute entering, I have *never seen one male go in*.

“ The wild bees are of an inoffensive character, and not in sufficient numbers (like the hive-bees) to expel the males; and the Creator has ordained that they shall leave the nest voluntarily and never return, they not having the same ‘ organ of locality ’ as the workers, for they make no observation like the workers: and yet they know their way to flowers, and have certain haunts. I watched one of the *Apis hortorum* a few days ago come exactly every three minutes and a half, for two hours, to two spots within view, hover about them as if going to settle, and then move on somewhere else. I can assure Mr. Smith that it cost me many months’ observation, for a dozen summers at least, before I could fathom their pastime, but at last I found it out, as I believe firmly when the males of the different species leave their nests, the ‘ Great Architect ’ has ordained their round of visits as an occupation. Each species has a different flight, but *Apis hortorum* is by far the easiest to discover going its rounds to the different haunts, as it flies very near the ground, and may be traced to some five or six places, where it appears to stop. The other species vary their flight through trees and bushes, but invariably keep the same track, generally from 10 or 11 o’clock till about 3 or 4, in fine sunny weather.

“ The whole of the Bombinatrices, about the beginning of September, begin to get feeble and slow; they lose their wings in many instances, and the females, many of which leave the nest, look out for dry and convenient holes in the ground and elsewhere to pass the winter in a torpid state.

“ Now of the moving habit of the drones Mr. Smith took no notice, and yet this is one of the things I thought worthy of remark. I have pointed it out to several of my friends many times, and I certainly think this eccentricity of the male a curious addition to their true history.

“ I can assure Mr. Smith that I shall be most happy next summer to meet him or any other lover of the genus, and prove the whole of this. I will only add that I have made the history of these insects my study for fifty years, and have taken at least 500 of their nests. I have also watched their nests in the fields for days and weeks, and had my observations confirmed over and over again.

“ The great Mr. Kirby has himself said ‘ that the Bombinatrices are in many instances so unlike (the males and females), that they may be mistaken for another species, and that unless by intense application it is quite impossible for any one person to be perfect in the history of more than one species.’ And again, ‘ I am by no means certain that I have not, in more instances than one, described the sexes under different names; until all can be traced to their nidi this is not easy to be avoided.’ *

“ Mr. Smith’s ‘ crowning remark ’ on Mr. Kirby, I cannot find in his work.”

* Kirby’s ‘ *Monographia Apum Angliæ*,’ 208.

Mr. Smith then made the following observations : —

“ When, at the June Meeting of this Society, a paper by Mr. H. W. Newman on some species of humble-bees was read, I, having paid some attention to their specific differences, and also to their economy, felt it incumbent on me to offer to the Society a few remarks as the results of my experience. In differing from Mr. Newman respecting the habits of the drones, or males, I gave but the result of my observations, which induced me to adopt a contrary opinion ; this opinion, as I stated at the time, was drawn from circumstantial evidence, and admitted even of the possibility of error ; but I felt an additional persuasion to its adoption from having the support of Mr. Kirby, who, in his ‘ *Monographia Apum Angliæ* ’ (ii. 367) says, ‘ I have myself seen this insect entering the nidus of *Apis lapidaria* ;’ and what appears to do away with all doubt upon the subject (of its being the male), ‘ I saw this insect in the collection of the celebrated Peter Collinson, with a memorandum affixed to it, that he had seen it connected with *A. lapidaria*.’ Mr. Newman now objects to my observations, at which I am surprised ; because in making observations, it should be the sole object of the naturalist to elicit truth, and he should always bear in mind that ‘ Nature is communicative at intervals only, and she must consequently be assiduously watched ;’ still it is only to few that she raises the veil.

“ Since making the remarks alluded to, I have had the good fortune to have my opinion confirmed by direct observation : the particulars are embodied in my notes on the nest of *Bombus Derhamellus*, which, with permission, I will read to the Society. Before doing so, however, I will make one or two remarks on other points connected with the history of humble-bees as recorded by Mr. Newman. I cannot bring myself to coincide in the opinion that males have prescribed rounds, from which they never deviate, keeping in the same track ; because I have always found these, as well as insects generally, influenced by the direction of the wind, the sun, and the situation of such flowers as they most frequent ; and Mr. Newman’s theory would tell against his remark, that the males have not the organ of locality developed as in the females and workers.

“ With regard to the localities of *Bombus lapidarius*, which Mr. Newman never saw in Scotland, I made it a point to inquire of residents in that part of the kingdom. From Mr. Little I received the whole of his black-and-red humble-bees captured in various parts of Scotland, and all but two were *B. lapidarius*.

“ Mr. Newman limits the number of species of *Bombus* to four, considering all others as mere varieties : this is certainly incorrect ; I am acquainted with twenty-two distinct species found in Great Britain. In differing from the author of the paper on the habits of the *Bombinatrices* in some particulars, I should be sorry indeed if he should suppose that I doubted the veracity of his statements ; so far from that, I fully appreciate the value of his remarks on their general history, and also on the various particulars of numbers of the different species inhabiting the same nest, their modes of construction, times of appearance, &c. : but I differ from him in the conclusions which he draws from his observations, and can see nothing to uphold the assertion that ‘ Divine Wisdom has deprived them (the males) entirely of the power or faculty of returning to, or finding the nest.’

“ The following notes, in connexion with the observations of Mr. W. H. S. Walcott, will, I think, prove conclusive on that point.

“NOTES ON THE NEST OF BOMBUS DERHAMELLUS.

“On the 2nd of August, whilst walking at the side of a wood at Hampstead, my attention was attracted by a *male* humble-bee which was skimming over a bank. It suddenly alighted and disappeared: on examining the spot where I lost sight of it, I found a track of moss, about nine inches long; this was the covered way to the nest, which, together with its contents, I carefully secured for examination. The species was *Bombus Derhamellus*. The nest was about eight inches long and six broad. At this period of the year the labours of the community were over; with the exception of about half a dozen females, all the bees had quitted the cocoons; in six cells I found a small portion of honey. The total number of cocoons was 187; judging from the differences in the sizes of these, I consider 107 as being those of workers, 44 those of males, and 36 those of females. In the nest I found thirteen females (six others were subsequently developed), fourteen males and two workers. The mass of comb was of an irregular form, the cocoons being spun one over the other, that is to say, the females had spun a layer of cocoons on the top of some of those of the workers, those of the males being intermixed with them. Reaumur says the pupa is placed with its head downwards, and makes its way out at the bottom of the cocoon; in my nest the case was exactly the reverse. The females were all in fresh and beautiful condition, the mother bee, or founder, having probably perished some time previously, when the process of depositing her eggs was completed.

“The nest swarmed with the *Acarus* with which humble-bees are so much infested; the larvæ of *Volucella bombylans* were also very numerous, and in all stages of growth, and I reared two or three perfect insects from them. I also found the larvæ, pupæ, and perfect insects of *Cryptophagus Lycoperdi* in considerable numbers. The larvæ of a *Tinea* (*T. Sarcitella*) were also very numerous; from these I obtained the perfect insect. I also found three or four specimens of *Antherophagus glaber*.

“The immature larvæ of *Volucella* were plentiful, but on what they would feed I cannot determine, there being neither larvæ nor pupæ remaining. I observed them to frequent those cells which contained honey, and I think, notwithstanding they are said to be insectivorous, that they feed also on the honey and wax: on the latter, the *Acari* undoubtedly partly subsist. The larva of *Tinea Sarcitella* feeds on the cocoons themselves: a number of these moths appeared in a perfect state at intervals, and I observed the larvæ in the empty cocoons of the bees in all stages of growth. The larvæ of *Cryptophagus* I found also in the honey and wax; when full fed, they bury themselves in the ground, and soon appear in the perfect state.

“Since writing the above notes, I have received a letter from Mr. Walcott, of Bristol, a gentleman who has made the bees a particular study, and is well acquainted with the genus *Bombus*. He says, ‘In the last week in August, I found a nest of *Bombus Derhamellus* on our Downs; it was at least a hundred and fifty strong. In watching the nest, *the males re-entered* it with the neuters; but, I should observe, that the females had not appeared, this strengthens what I have lately supposed, that the males continue to re-enter the nest until the females are out, after which they forsake the nest. The bees invariably make their exit from the top of the cocoon; their mode of proceeding is this: a note or hum being heard from the encased bees, both males and neuters hasten in a body, clustering themselves as close as possible on and about the cell, either to soften the wax on the cocoon, or to give encouragement to the encased bee to make the great effort of delivering itself; and immediately on the bee making its exit from the cell, it hastens to the old cocoons containing honey to feed,

it appearing much exhausted by its late effort. All the masses of cells that I have seen have been placed upwards, but should a bee select a hole somewhat circular and confined, there I think the bee would make her cells not only on the ground surface, but as they increased would go on until some were placed downwards; but this would be an extreme case, and form an exception to the general rule.’”

Mr. Stainton exhibited a species of *Lithocolletis*, which he had hitherto confounded with the true *L. Frölichella*, but which was yet quite distinct; and read the following note:—

“Mr. Allis suggested to me last December, that it was not improbable we had two species under the name of *Frölichella*, and a further examination of more specimens has convinced me of the correctness of his suggestion. Naturally, on first hearing of *L. Nicellii*, my idea was that it would prove to be our other species, but in this I was mistaken. Both are indeed smaller than *Frölichella*; but whereas *Nicellii* is paler than *Frölichella*, our new species is darker.

“For this species I have much pleasure in proposing the name of *Dunningiella*, in honour of Mr. J. W. Dunning, of Leeds, whose extreme quickness and perseverance give promise of great doings in that branch of science called Micro-Lepidopterology.

“*L. Dunningiella* is smaller and darker than *Frölichella* (yet not so small as *Nicellii*), the anterior wings are narrower, especially above the anal angle, where in *Frölichella* they are very broad; the black scales of the apex of the wing are also more collected, thus resembling *Nicellii*, and the hinder marginal line is much more distinct and darker than in *Frölichella*, where it is barely perceptible.

“From *Nicellii*, fine specimens of *Dunningiella* may be readily distinguished by their dark colour; worn specimens are less easily separated, but the longer and narrower anterior wings, less brilliant markings, and the clouded appearance of the ground colour, are sufficient characters to enable one eventually to separate them.

“*Dunningiella* was the species I described in the ‘*Zoologist*’ (2088), under the name of *Frölichella*, and is in most collections under that name. It probably is attached to hazel or oak. Of the true *Frölichella* I have a specimen taken ‘among alders on Askham Bog, near York, May 31, 1849,’ (*Zool.* 2897).”

Mr. Stainton read a translation from the Silesian ‘*Bericht über die Arbeiten der Entomologischen Sektion*’ for 1850, of Professor Siebold’s “Remarks on the *Psychidæ*.” In this paper, Siebold alludes to a former suspicion of his that “alternation of generation” did not occur among the *Aphides* only; and affirms that he is now certain the same phenomenon occurs among the *Psychidæ*, he having discovered it in the *Taleporiæ*. He had particularly investigated the history of *T. Lichenella*, *Zell.*, and found that for several generations fertile eggs were produced by the females (or *nurses* as under these circumstances they are called), without male intercourse. It had also been observed that from some spiral cases found in Germany and Italy, apparently belonging to a *Psyche*, nothing but vermiform females were produced, which again laid fertile eggs without male intercourse; and indeed the male of this species was not hitherto known.

Mr. J. E. Gray expressed his dissent from the theory of “alternation of generation,” and cautioned young entomologists against believing in such a doctrine because it was advocated by a physiologist of so great a reputation as Siebold.

The President observed that M. Guérin had known an example of a female *Bombyx Mori* having produced fertile eggs without male intercourse; and it was recorded that a similar circumstance had occurred among the *Sphingidæ*.

November 3, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors: — ‘The Annual Report of the Leeds Philosophical and Literary Society,’ 1849-50; by the Society. ‘Jahresbericht des Naturwissenschaftlichen Vereines in Halle,’ two parts, 1849-50 and 1850; by the Society. ‘Bibliotheca Historico-Naturalis et Physico-Chemica,’ Erster Jahrgang, 1s Heft; Halle, 1851; by E. A. Zuckold, Foreign Member of the Society. The ‘Athenæum’ for October; by the Editor. The ‘Zoologist’ for November; by the Editor. A second box of Renfrewshire insects; by Mr. Young, of Paisley. A case of Tasmanian insects (from the Great Exhibition); by F. Cox, Esq., Van Diemen’s Land. A glass case containing a piece of honeycomb, in which a queen bee had been reared from the worker-brood, (from the Great Exhibition); by Mr. Golding.

The following books had been obtained for the Society: — ‘Orthoptera descripta et depicta a T. de Charpentier.’ Lipsiæ, 1845; and ‘Libellulinæ Europææ descriptæ ac depictæ a T. de Charpentier.’ Lipsiæ, 1840.

Mr. John Hunter, of 24, Bloomsbury Street, London, was balloted for and elected a Member of the Society.

The President, in exhibiting the honeycomb presented by Mr. Golding, read the following memorandum from that gentleman’s note-book: — “July 2nd. Hive No. 5 having lost its queen, gave it a piece of brood-comb from another hive. On the 8th found a sealed royal cell upon it. On the 15th, the young queen was come forth. On the 28th found eggs and young larvæ in the hive; consequently the operation was completely successful. The queen thus raised is now queen of the hive.” Mr. Golding adds that “this might be taken as a specimen of the facilities offered by hives having movable leaves or bars.”

Mr. Stevens exhibited a new British coleopterous insect — *Dircæa discolor*; and one of the rare British Tineidæ — *Gracillaria Phasianipennella*; both taken this year in Scotland, by Mr. Weaver. Mr. Stevens also exhibited specimens of *Helops pallidus*, *Curtis*, found at Tenby by the Rev. H. Burney.

Mr. Edwin Shepherd exhibited some beautiful specimens of *Aporophila australis*, and one example of the pale variety of *Colias Edusa*; all captured this autumn near Deal.

Mr. Smith exhibited some oak-leaves, with galls, commonly known as “oak-span-gles,” attached. In one of these he had found a larva, probably that of *Cynips longipennis*, an insect hitherto obtained only in the perfect state.

Mr. Wilkinson exhibited larva-cases of a *Talæporia* (*T. Ferchaultella*, *Stephens* ? Zool. App. cix.), found in July, from which females had been produced, which laid fertile eggs without male intercourse. The larvæ that had been hatched were also in the box.

Mr. White exhibited some specimens of Crustacea, including *Idotea Baffini*, *Acanthonotus hystris*, *Amphithoë Edwardsi*, *Nymphon* (new species), &c., collected by Charles Ede, Esq, Assistant-Surgeon to H. M. S. Assistance, lately returned from the Arctic regions. He exhibited some drawings by Mr. Ede, of minute Crustacea, espe-

cially of a species of *Cyclopsina*, which Dr. Baird thinks may prove to be the type of a new genus. He exhibited an unpublished plate of Crustacea and Insects, which will shortly appear in Mr. MacGillivray's 'Voyage of H. M. S. Rattlesnake.' He also exhibited a portrait of Jules-César Savigny, Member of the Academy of Sciences, and one of the *savans* employed during the French expedition to Egypt and Syria; and gave a short account of his valuable labours and published works.

Mr. Spence submitted a letter, addressed to him by Mr. T. Thompson, of Hull, inquiring the name of an insect, the larvæ of which were doing considerable damage to the corks in wine-bottles in the cellar of a wine-merchant in that town; and also what means could be adopted to stay their ravages. A specimen of the eaten corks was also sent, but the larvæ had escaped.

Mr. J. F. Stephens said that on a former occasion some perforated corks were forwarded to the Society, from which he had reared *Gracillaria Vau-flava*, *Haw.*, and the larvæ certainly fed on the cork; so that it was probable the damage in the present instance was caused by that species.

Mr. Bedell observed that the moth was frequent in vaults in the London Docks and other places. Other members concurred in the opinion that the larvæ were imported in the cork, and that the only cure for the damage they caused was to recork the bottles.

Mr. Douglas exhibited specimens of a moth, a species of *Ephestia*, which appeared to be undescribed, and which he proposed to call *E. Ficella*, from its having been reared (by Mr. Doubleday) from larvæ which fed on dried Turkey figs. The specimens exhibited were lately found in the bonded warehouse at Botolph Wharf, where great quantities of figs were deposited.

Mr. Douglas also exhibited specimens of *Gelechia costella*, reared from larvæ found on *Solanum Dulcamara*, on which they feed variously; some mining the leaves, some fastening two or more leaves together and feeding between them, some eating the seeds, and others boring into the stems. He observed that the larvæ of another species of *Gelechia*—*G. contigua*, *Haw.* (*tricolorella*, *Haw.?* *St.*), closely allied to *G. costella*, fed on the young shoots and leaves of *Stellaria holostea*, and the larvæ of another species, *G. blandella*, fed in the capsules of the same plant. These discoveries, all made by Mr. Stainton, were not only interesting in themselves, but showed that in some instances, much stress could not be put upon the manner of feeding of larvæ, as a guide to generic association, for there could be no doubt of the close relationship of these three species, notwithstanding the habits of their larvæ were so different.

Mr. Ingpen exhibited, mounted as objects for the microscope, young *Coccidæ* found on leaves of maple: they probably belonged to the genus *Cyanops*.

Mr. W. W. Saunders mentioned that an instance had lately come under his notice, in which some ornaments formed of macaroni, and worked into fancy baskets, had been totally destroyed by *Anobium paniceum*.

Mr. Saunders also stated, that over a large extent of garden-ground on the south side of London, French beans had been freely attacked by a red-brown *Acarus*, causing the formation of yellowish spots on the leaves, and killing the plants in about ten days. On looking at some plants that had been cast aside for a few days, he found them covered with a fine delicate web.

The President exhibited a specimen of the rare beetle, *Leptinus testaceus*, taken some years since at Box Hill, by Mr. Janson; and stated that at a future time he should have some observations to offer on this and other species of blind insects.

The following note by Mr. Weaver was read :—

“ In 1850 I discovered, in Scotland, an empty larva-case of a species of Psychidæ, differing from any I had seen before, and having this year found some of the same kind with living larvæ in them, from which I have reared the perfect insect, I am satisfied it is a new species. The male very closely resembles *Sterrhopterix opacella*, which I formerly discovered in Hampshire; but the female is very dissimilar, as I propose to show by comparison: and, for the sake of brevity, I will call *S. opacella* No. 1, and the new species No. 2.

“ *The Cases.*—No. 1 is found on dry ground, and is thickly covered with sprigs of heath, on which plant the larva feeds. No. 2 is found on boggy ground, is much larger than No. 1, has on it no sprigs of heath, and therefore I think the larva does not feed on heath.

“ *The Larvæ.*—No. 1 has the back of a tortoiseshell colour, and the under side of a light colour; in fact it resembles the larva of *S. nigricans*, but is smaller. No. 2 has the back nearly black, and the under side black as far as the third pair of legs.

“ *The Perfect Insects.*—No. 1. The female has no breast, is quite destitute of legs, and the body is much shorter than in No. 2. It has eight or ten distinct tufts of hair? all round each segment of its body; this hair is very brittle, and as, when the insect falls out of its case it rolls about, the tufts soon get broken. No. 2. The female has a breast, six slender legs (which may easily be overlooked), and two antennæ; it has a black mark down the under side of the breast as far as the legs; head and thorax shining black, the head protruded. On each side of the body are three patches of hair or down, also one patch on the fore part and one on the hinder part of the back, all of which are so short that they can scarcely be seen without a glass. When the insect drops out of its case, it does not roll about like No. 1, but remains quiet. In conclusion, I would remark that any entomologist seeing the two females alive, would at once say they were different species.”

The President observed that the males of these species, under the above circumstances observed in the females, might be expected to show a difference in the number of the joints of the antennæ and in the neuration of the wings.

The President exhibited a living larva of *Hamaticerus Heros*, received from Sir T. Pasley, the head of Pembroke Dock-yard, where this insect is often found to be very destructive to the Italian oak timber, into which it burrows to a considerable depth. Living specimens of the perfect insect had been exhibited by the President on previous occasions, received from the same gentleman, who had informed him that the larvæ are frequently found when the timber is being cut up at the saw-pits. The son of the Timber Inspector of Pembroke Dock-yard had also obtained eggs of this beetle, which were hatching at the end of October. The President remarked that this larva, from its size, afforded the means of solving the difficulty which had arisen respecting the construction of the anterior portion of the body of this and other longicorn larvæ; the large membranous segment succeeding the head having been considered by some authors as a portion of the head itself.* It is true, indeed, that this large segment is destitute of spiracles, and that the first pair of legs seems placed rather on the fold between it and the following segment; that, moreover, the first pair of spiracles is placed in the following segment, and, as it is the general principle of larvæ to have the first pair of

* See various papers in the 'Annales de la Société Entomologique de France.'

spiracles either in the first, or in the fold between the first and second segments, it might at first sight seem to warrant the conclusion, that the large membranous segment following the head is really part of the head. But when the corneous head itself is separately examined, it presents all the characters of a perfect head, and it is seen, moreover, that the second pair of legs is certainly attached to the segment which bears the first pair of spiracles, we shall be compelled to consider the first segment as reduced to the small inferior fold which bears the first pair of legs. Taking all these circumstances into consideration, the President was clearly of opinion that the large segment in question is not part of the head, but is the real first segment greatly developed; and that the position of the first pair of spiracles on the second segment of the body is anomalous.

December 1, 1851.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors: — ‘Entomologische Zeitung’ for October; by the Entomological Society of Stettin. ‘The Zoologist’ for December; by the Editor. ‘The Literary Gazette,’ three Nos. for November; by the Publishers. ‘Annals of the Lyceum of Natural History of New York,’ Vol. v. No. 3; by the Lyceum. ‘Smithsonian Contributions to Knowledge,’ Vol. ii., 1851. ‘Proceedings of the American Association for the Advancement of Science, fourth meeting, August, 1850. ‘Fourth Annual Report of the Smithsonian Institution.’ ‘Ephemeris of Neptune for 1852, by B. A. Gould, jun.’ ‘Report to the Smithsonian Institution on the Discovery of Neptune.’ ‘Report to the Smithsonian Institution on the Public Libraries of the United States, by Prof. C. C. Jowett,’ 1851. ‘Patent Office Report,’ 1848: — all presented by the Smithsonian Institution. ‘Boston Journal of Natural History,’ Vol. vi. No. 1 and 2, Boston, 1850: by the Boston Society of Natural History. ‘Diptères Exotiques,’ par J. Macquart, Suppl. Paris: 1847-8; by the Author. ‘Analyse des Expériences sur la Muscardine et les autres Maladies des Vers à Soie en 1849.’ ‘Insectes nuisibles aux Récoltes, moyens d’arriver à leur destruction.’ ‘Enumeration des Insectes qui consomment les Tabacs.’ ‘Extrait des Matériaux recueillis pendant la Campagne Séricicole de 1850, sur les Maladies des Vers à Soie.’ ‘Essaie sur les Insectes utiles et nuisibles.’ All by M. Guérin Ménéville, and presented by him. ‘Rapport sur les deux Essais sur les Maladies des Vers à Soie, par M. Duméril;’ by M. G. Ménéville. ‘Proceedings of the Royal Society,’ Vol. vi. No. 80; by the Society. A box of British Lepidoptera, in very fine condition; by H. Doubleday, Esq.

There have also been purchased for the Library, ‘Systematische Beschreibung Zweigelflügeligen Insekten;’ by J. W. Meigen, Vol. vii.

G. Guyon, Esq., Richmond, and T. Dossetor, Esq., London, were elected Members of the Society; and James Dutton, Esq., Hammersmith, was elected a subscriber to the Society.

Mr. Douglas exhibited, on the part of H. Cooke, Esq., *Argynnis Lathonia* and *Diphthera Orion*, both captured near Hastings, and *Adela rufimetrella* from the same locality, taken among shallows in April.

Mr. Douglas reported that of the larvæ of *Origanum vulgare*, exhibited at a former meeting, one had arrived at the perfect state, and proved to be *Gelechia subocellea*, *St.*

Mr. Adam White read the following note, addressed to him by Mr. H. George, jun.

“Dear Sir,—Three weeks ago I was walking, one very dark evening, in the Brompton lanes, when I observed under a hedge a dozen or more luminous spots, about the size of a pin’s head. Expecting that it might be some decayed animal, I cut a twig from the hedge, and gently stirred the ground, and to my astonishment, about half a dozen of these spots made apace towards me, while the rest retreated. Not having my collecting-bottle, I secured this movable mass in my handkerchief, where it remained luminous until I had thickly covered it to prevent any means of escape. When I arrived at home, to my further astonishment I discovered it to be no more than the common *Goërius olens*. It was no longer luminous: I did not immediately kill it, but waited to see whether it would show the same phosphoric appearance, but without any success. The causes of what I observed I leave for you to determine, and have submitted it to you, knowing how acceptable any information of the kind generally is.

“I remain, yours respectfully,

“HENRY GEORGE, JUN.

“4, Hornton Villas, Kensington,

“October 29, 1851.”

Mr. Stephens suggested that the *Goërius* had been caught in the act of attacking or feeding on a *Scolopendra*, and that some particles of phosphorescence therefrom had adhered to it. Mr. Curtis concurred with this view, and added that the favourite food of this beetle was *Forficulæ*, a fact that might be turned to account by growers of Dahlias and other plants attacked by earwigs. The President mentioned as an instance of the predaceous character of this *Goërius*, that it had been known to attack a worm six times its own length. Mr. Smith said that he once, at night, disturbed a *Creophilus maxillosus*, which appeared luminous, the phosphorescence doubtless having originated in the decaying matter within an old crab-shell on which the beetle had been feeding.

Mr. White exhibited a spider brought by C. Ede, Esq., R.N., from the Arctic regions, lat. 76, long. 69. He observed that Otho Fabricius, in his ‘*Fauna Grœnlandica*,’ has noticed only four species of *Aranea*, one of which, *A. saccata* (now *Lycosa saccata*) this specimen resembled, but he thought it not identical, and proposed to call it *L. Baffini*. Mr. White also exhibited *Tipula glomerata*, *Walker*, and a *Chironomus*, both brought from the same locality as the spider; and observed that the eggs of these two Diptera being deposited upon the ground, exposed for many months to the most intense cold, and still preserving their vitality, was a wonderful instance of the power of life in insects. Judging from the variety of insects brought by various visitors to the Polar regions, he believed the number there to be much greater than is generally supposed. Mr. Curtis remarked that Sir James Ross had, as an experiment, caused a caterpillar to be frozen and thawed several times without injuring its vitality.

The Secretary read the following extracts of a letter from Mr. H. W. Newman:—

“I have to trouble the Society again with a few observations in reply to Mr. Smith’s remarks, (Proceed. 110). First of all, Mr. Smith mistakes entirely about the limited

number of the species. My paper was only an extract. I mention my selection of *four* for examples, being the most common. I know at least ten species which make honey. Mr. Kirby enumerates nearly one hundred of the wild bees in his work.

"2. The *Apis Derhamellus* I am unacquainted with by name, but from description I presume it is a black bee, like *A. lapidaria*.

"3. In the numerous nests which I took for seven or eight summers, I always selected those which had at least two-thirds of their combs *in brood*, generally before the males were hatched. In all cases, when the males were hatched they left the nest and never returned; those which escaped during the digging out of my numerous nests, never came back to the place like the workers.

"I mentioned the case of the nest in my own garden this year: now Mr. Walcott, who mentioned the nest on Durdham Down this year, says that in the *third week in August* he saw males entering the nest! This is still more extraordinary, as in all my long experience of fifty years, I never saw nests of *Bombus Derhamellus*. Long before this, in my nest of *B. lapidarius*, the males were all gone and over, the queens looking out for holes to stop in. In 1850, the males in all the nests here, a hilly and late country, were all out and gone by the middle of August, and many of them much sooner, it being a fine summer.

"I had nests within a hundred yards of my house, when I lived at Thornbury Park, of the *Apis terrestris*, *A. hortorum*, and *A. muscorum*; these nests I visited nearly every day in July and August, and no males ever entered.

"By the *last week* in August this year, the development of all the bees had taken place, and the purposes of their existence accomplished.

"Lastly, the pastime of the drones is much more easily shown than the other questions, and in any fine day, towards the end of July, it may be observed between the hours of 10 and 3 o'clock. I grant that the sun and wind have a good deal to do with the movements of all insects. I trust next summer to have the pleasure of meeting Mr. Smith and Mr. Walcott 'at Philippi' to settle the argument.

"Now respecting Mr. Smith's remark about the *Apis lapidaria*, I will assure him that there is one, if not two, species of wild bees in the West of England, which do not inhabit Clydesdale, which is a most prolific field for *A. terrestris*. One species of *A. lapidaria*, with a yellow band and a *brown red* abdomen, is most common, and universally has its nest in walls.

"Mr. Smith also mistakes my observation about the organ of locality in the drones. I merely contend that as far as their nest is concerned, the males leave it without the least observation, and are never intended to return, like the workers, which act entirely differently. When the males become vagabonds, they then commence the round of visits described by me until they perish."

The President read a portion of his Report on the Entomological Productions in the Great Exhibition, showing from the examples therein how much society was indebted to insect labours.

The Secretary read some extracts of a letter from Mr. H. W. Bates, dated Pará, October 8, in which he stated his intention of going into the interior for the purpose of exploring a branch of the Amazon not yet visited by any naturalist.

Part 7, Vol. i., n. s., of the Society's 'Transactions' was announced to be ready.

The Secretary called the attention of the meeting to 'A Memoir on the Pselaphidæ of the United States, by J. L. Le Conte, M.D.,' in 'The Boston Journal of Natural History,' Vol. vi. No. 1, 1850; of which the following is an abstract:—

ABSTRACT OF A MEMOIR ON THE PSELAPHIDÆ.

I would invite the attention of observers to the fact, that the antennæ of the genus *Bryaxis* are provided with only two joints, when the medial thoracic fovea is larger than the lateral ones, or when these last are entirely wanting. I have not yet succeeded in finding which joint becomes obsolete, but it would be very interesting to follow up this investigation by the aid of foreign species, and to ascertain whether other forms than those specified are also embraced in the division with ten-jointed antennæ. The genus *Batrisis* having been very much increased, it became necessary to search for some means of dividing it into groups, and the structure of the front has enabled me to do this in a tolerably natural manner.

The parallelism of the productions of the two continents is seldom more beautifully displayed than in the present group. There is now but a single European genus (*Bythinus*), which has not its representative or its analogue in this country. This correspondence extends in a remarkable manner through the species of which the genera are composed, so that almost every species of the genera common to the two continents has its exact equivalent: moreover, in those genera which, from possessing less power of variation, consist only of a single species, the parallelism of characters is still kept up to a most surprising extent; so much so, that if we were to leave out all strictly generic characters, the two analogues would be represented by a single diagnosis.

In addition to these equivalents and analogues, we have still remaining many genera and species without representatives in Europe, a fact which leads me to infer that the total number of species of *Pselaphidæ* in North America, notwithstanding the rarity of individuals, is larger than in the corresponding part of the other continent.

Notwithstanding the difference in the structure of the palpi, I have placed *Ceophyllus* as the American analogue of *Chennium*. The form of the body, and in fact the external characters, are exactly similar in the two genera. And on account of the variation of the cephalic organs, and especially of the palpi (as noticed in *Tychus* and *Ctenistes*) it is obvious that a similarity of structure is not necessary to a strong affinity between two species; and I have in this instance considered it of secondary importance, as compared with the general habit, and very particular structure of the antennæ.

It will be observed, too, in comparing a number of species of any genus of *Pselaphidæ*, that however much the relative proportions of the joints of the antennæ vary, there is still a particular appearance, depending perhaps on the method of articulation, which enables a practised eye at once to recognize the antennæ of each genus. On this account I have been led to consider in this group the structure of the antennæ as of fundamental importance in arriving at a philosophical arrangement of the genera in their mutual relations.

The differences already alluded to are, however, so slight as scarcely to be appreciated in a description. Not so with the manner of insertion of these organs; here we find great and important variations: some having the antennæ inserted under the front, as in many *Brachelytra*; while others have the front projected and elevated into a narrow tubercle, upon or under which the antennæ are inserted.

Using this principle of division, the genera fall into two very natural series, which to some extent repeat each other.*

* Another reason why I consider the position of the antennæ as of primary importance in the division of this group, rather than the number of their articulations, and

Antennæ approximatæ.

- a. Tarsi didactyli.
 - Chennium.
 - Ceophyllus.
 - Cedius.
 - Tmesiphorus.
 - Ctenistes.
 - Tyrus.
 - Phamisuus.
- b. Tarsi sesquidactyli.
 - Metopias.
- c. Tarsi monodactyli.
 - Pselaphus.
 - Tychus.
 - Claviger.
 - Adranes.
 - Articerus (?)

Antennæ distantes.

- a. Tarsi didactyli.
 - Hamotus.
 - Faronus.
- b. Tarsi sesquidactyli.
 - Batrisus.
- c. Tarsi monodactyli.
 - Bryaxis.
 - Eupsenius.
 - Arthmius.
 - Bythinus.
 - Rhexius.
 - Euplectus.

the tarsal claws, which are the bases of Aubé's tables, is that the character selected by me is entirely independent of particular stages of development. After the light which has been thrown, by embryological researches, on the true signification of allied animals, scarcely any naturalist will be inclined to deny the existence of *series* in nature, which, starting from a common origin, of low organization, can be traced in different directions to very diverse forms. The particular members of each series therefore stand in a linear relation to each other, and mark the progressive material evolution of the intellectual idea, previously existing in the mind of the Creator, until the perfection of this idea is attained in the most highly organized member of each group. Gradually, too, as the primary idea is evolved, others seem to be brought out into greater prominence; so that the intermediate forms of a small group may be in direct relation with the lowest forms of a group standing higher in the same series. It is therefore obvious, that if any group be defined by a character variable in the development of similar animals, that group is *ipso facto* not natural; because it indicates not a series, but a stage of development. However, it may be itself a particular stage of development in a group of higher value; but in this case the definition of the entire series will also be added to the definition of the group, and the latter will not be a distinctly limited collection of forms, but only a *transitus* from lower to higher species. The *primary principle* of division of any natural group *must* therefore be independent of any development which takes place after the animal has assumed a definite, peculiar, recognizable form. Now here Aubé's principles fail, because the number of the articulations of the antennæ and the tarsal claws varies from the larva to the imago, and therefore indicates stages of development. Hence, if the group were composed of smaller series, manifesting affinities in different directions, his arrangement would not render them evident, and they would remain rather matters of inference than of demonstration. It is of course very difficult to detect these characters which are independent of development, because they are usually obscured by physiological developments, required by the habits of the animal, and the part it has to play in the economy

The first group (with the front elevated) is the most normal form, and shows an unbroken series; *Metopias*, with its immarginate abdomen, being the inosculating point with *Batrisus*, which, by slight variations in the form of its front, shows its tendency towards the typical stem.

The second group requires more careful analysis. The curious sculpture on the thorax of many of its members is not found in the first group, and should lead us to suspect that it may be the connecting chain with other forms. The embryonic character is plainly seen in the elongate form, and six-articulated abdomen of *Euplectus*; while in the other series, *Adranes*, though of very low organization, preserves the typical *Pselaphus* form. Of the two genera in this second series, *Hamotus* is plainly a *Bryaxis* form, while *Faronus* is a *Euplectus* form. Accordingly the genera must be thus arranged.

<i>Scydmanoid genera.</i>	<i>Oxyteloid genera.</i>
Hamotus.	Batrisus.
Bryaxis.	Rhexius.
Eupsenius.	”
Arthmius.	”
Bythinus.	”
B.	A.
	
Euplectus.	
Faronus.	

The left-hand branch being almost typical *Pselaphi*, with globular thoraces, scarcely sculptured, and leading very obviously to the *Scydmani*; the right-hand branch being altogether abnormal, *Batrisus* being the only genus tending at all to the typical chain. The six-jointed abdomen and elongate form of *Euplectus*, proves that the lower forms of this line must possess a multi-articulate abdomen, with a linear body. They must therefore be sought among the *Brachelytra*.

To circumscribe this large group containing *Pselaphi*, *Scydmani*, and *Oxytelini*, all closely related, and to discover its higher forms (if any exist), is a work of much labour, and could be undertaken only after a careful study of all the groups of *Coleoptera*, and a knowledge of their larvæ. Since the *Coleoptera* have heretofore been studied for the purpose of being arranged into groups rather than series, many characters used in defining these groups must be rejected, when we attempt to find the relations of these to each other. In fact, too strict an adherence to characters indicating states of development, has already led to the formation of two very heterogeneous tribes, the *Brachelytra* and *Heteromera*; the latter containing many embryonic

of nature. But we must remember that the progress from artificial to natural arrangement has always been slow, and that we are *compelled* by the limitation of our own intellects, to make use of the former in order to attain the latter. Again, having once discovered the true principle of definition, it is only necessary to make use of it in cases of difficulty, as, for instance, in the decision of the articulate nature of *Balanus*, the decomposition of the *Infusoria*, &c. In all ordinary inquiries we associate with the primary idea such characters as are of less importance but more obvious, and which depend on the beautiful co-relation of parts evident throughout all nature.

forms, known by their softness and imperfect structure, while the former is a general receptacle for all larval forms with a corneous abdomen. The first effort to decompose this tribe has herein been made by joining the Oxytelini and Omalini with the Pselaphi; and in future memoirs I hope to point out how some other portions of the Brachyelytra may be disposed of.

CEOPHYLLUS, (n. g.)

Antennæ approximatae, 11-articulatae, moniliatae, sub fronte elevata in fovea insertae. Palpi maxillares 4-articulati, articulis 3tio et 4to clavam transversam formantibus. Mentum basi angustatum. Tarsi unguiculis binis aequalibus.

1. *C. monilis*. Long. .11.

Specimen unicum ad fluminis St. Clair (Michigan) ripas, sub cortice *Tiliae Americanae*, mense Augusto, inveni.

CEDIUS, (n. g.)

Antennæ approximatae, 11-articulatae, sensim incrassatae, ad marginem frontis elevatae subtus insertae. Palpi maxillares 4-articulatae, articulo 3tio cuneiforme extus acuto, 4to majore convexo. Mentum quadratum. Tarsi unguiculis binis aequalibus.

1. *C. Ziegleri*. Long. .11.

Hab. Pennsylvania sub cortice arborum.

2. *C. spinosus*. Long. .07.

Hab. in Carolina Australi, Columbiae.

TMESIPHORUS, (n. g.)

Antennæ approximatae, 11-articulatae, sensim clavatae, ad frontis elevatae marginem subtus insertae. Palpi maxillares 4-articulati, articulo 2ndo et 3tio extus appendiculatis, 4to triangulari emarginato. Mentum quadratum. Tarsi articulo 3tio quam 2ndo sesqui longiore, unguiculis binis aequalibus.

1. *T. carinatus*. Long. .08—10.

Hab. sub cortice Pinuum et Quercum, minus frequens. Ohio, Alabama, Pennsylvania. Abundat in Georgia.

Pselaphus carinatus, *Say, J. Ac. N. Sc.* 4, 97.

Ctenistes? *carinatus*, *Aubé, An. Ent.* 2, 100.

2. *T. costalis*. Long. .11.

Hab. Pennsylvania, sub cortice.

CTENISTES, *Reichenbach, Aubé.*

1. *C. piceus*. Long. .08.

Hab. Vermont.

2. *C. Zimmermani*. Long. .07.

Hab. Georgia et Louisiana.

3. *C. consobrinus*. Long. .07.

Specimen unicum masculinum ad Athenas Georgiae inventum.

TYRUS, *Aubé.*

1. *T. compar.* Long. .07—.08.
Hab. Georgia et Carolina.

PSELAPHUS, *Herbst.*

1. *P. longiclavus.* Long. .07.
Hab. in provinciis australibus.
P. Heissei Europæ simillimus, et palpis aliter clavatis solum differt.
2. *P. Erichsoni.* Long. .065.
Hab. Nov. Ebor.

TYCHUS, *Leach.*

1. *T. longipalpis.* Long. .08.
Hab. Carolina.
2. *T. minor.* Long. .06.
Specimen unicum e valle Nakutshi, Georgiæ.

ADRANES, (n. g.)

Antennæ approximatae, 2-articulatae, articulo 2^{do} longissimo truncato. Palpi maxillares brevissimi (biarticulati?). Oculi nulli. Abdomen supra excavatum, articulo 1^{mo} maxime. Tarsi unguiculo unico, articulis 2 primis obsoletis.

Genus *Clavigero* similis.

1. *A. cæcus.* Long. .08.
Specimen unicum ad Montis Jonæ (Georgiæ) apicem, cum *Formica* parva nigerima, abdomine cordato, inventum.

HAMOTUS, *Aubé.*

1. *H. humeralis.* Long. $1\frac{2}{3}$ mill.
Hab. Carolina boreali.

BRYAXIS, *Leach.*

1. *B. conjuncta.* Long. .08.
Hab. in provinciis orientalibus. *B. sanguinea* Europæ simillima.
2. *B. dentata.* Long. .08.
Hab. Mass., Nov. Ebor., Illinois.
Pselaphus dentatus, *Say, J. Ac. Nat. Sc.* 4, 99.
B. xanthopteræ (*Aubé*) simillima, thoracis solum forma differt.
3. *B. velutina.* Long. .05.
Hab. Nov. Aureliani.
4. *B. abdominalis*, *Aubé, Mon. Ps.* 27, tab. 82, fig. 2.
B. dentata, *ej. An. Soc. Ent. Fr.* l. c. 112.
Hab. ad Cantabrigiæ (Mass.) in pratis salinis.

5. *B. hæmatica*, *Leach, Aubé*.
Mihi ignota, an rectè Americæ citata?
6. *B. luniger*. Long. .10.
Specimen unicum (femineum?) ad Cambridge in pratis salinis lectum.
7. *B. puncticollis*. Long. .06.
Hab. Novi Aureliani.
A *B. juncorum* Europæ præcipue capite impunctato differt.
Mas pectore abdominisque articulo inferiore penultimo excavatis.
8. *B. rubicunda*, *Aubé*. Long. .06.
Hab. ubique sat frequens.
9. *B. propinqua*, *Aubé*. Long. .06.
Hab. Lacum Superiorem.

B. Antennis 10-articulatis.

10. *B. abnormis*. Long. .06.
Hab. in provinciis australibus et borealibus.
11. *B. longula*. Long. .06.
Hab. Nov. Ebor. et ad Lacum Superiorem minus frequens.
12. *B. formiceti*. Long. .04.
Specimen unicum in Pennsylvania, cum Formica Pennsylvanica, Aprilo inveni.

EUPSENIUS, (n. g.)

Antennæ clavatæ, distantes, ad marginem frontis anteriorem lateraliter sitæ. Palpi maxillares breviusculi, articulo ultimo ovali. (Mentum basi angustatum?). Abdomen marginatum, 5-articulatum, articulo 1mo majore. Tarsi unguiculo unico, articulis 2 et 3 æqualibus.

1. *E. glaber*. Long. .04.
Specimen unicum ad Columbiam (S. C.)

ARTHMIUS, (n. g.)

Antennæ basi subapproximatæ, in fossula ad frontis marginem insertæ. Palpi maxillares 4-articulati, articulo 3tio parvo, 4to elongato, fusiformi. Mentum basi angustatum. Abdomen immarginatum. Tarsi unguiculo singulo.

1. *A. globicollis*. Long. .06.
Hab. in Georgia et Pennsylvania.

BATRISUS, *Aubé*.

Antennæ basi distantes, in fossula laterali, sub frontis margine rectæ insertæ. Palpi maxillares 4-articulati, articulo 4to fusiformi. Tarsis articulis 2 et 3 æqualibus, hoc unguiculis binis inæqualibus. Abdomen immarginatum.

Tabula synoptica.

A. Tibiis posticis calcare obsoleto vel nullo.

1. Fronte posticè concava, vertice non cristato: ♂ antennarum articulo ultimo dentato solum cognoscendus.
- Sp. 1. ♂ ♀ *Ionæ*. Capite læviusculo vertice valdè elevato, thorace 3-lineato.
(Hic ponendi sunt *B. formicarius*, *Germari*, *Dregei*, et *venustus*).
2. Fronte posticè concava, vertice cristato, fossulis lateralibus permagnis; ♂ tibiis anticis contortis spiniferis.
- Sp. 2. ♂ *Armiger*. Vertice 3-cristato, antennarum art. ult. longissimo, tarsis posticis art. 1mo dilatato.
- Sp. 3. ♂ *Monstruosus*. Vertice 3-cristato, antennarum art. ult. longiusculo, tarsis posticis simplicibus.
- Sp. 4. ♂ ♀ *Ferox*. Vertice 3-cristato, antennarum art. ult. ovali, impress. capitis confluentibus.
- Sp. 5. ♀ *Cristatus*. Vertice 3-cristato, antennarum art. ult. ovali, impress. capitis discretis.
- Sp. 6. ♀ *Confinis*. Vertice 1-cristato, antennarum art. ult. ovali, impress. capitis conjunctis.
(Ad hanc turmam fortè referendus *B. australis*, *Er.*)

B. Tibiis posticis calcare terminali longo, tenui.

3. Fronte inter antennis plus minusve elevata, retusa vel marginata, clypeo apice sæpius ♂ dentato, vel cornuto.
- Sp. 7. ♂ *Frontalis*. Capite lævi, fronte valdè retuso, rufus, elytris impunctatis.
- Sp. 8. ♂ ♀ *Punctatus*. Capite lævi, vertice tuberculato, rufus, elytris punctatis.
- Sp. 9. ♂ ♀ *Riparius*. Capite leviter scabro, vertice cristato, lævi, rufus, elytris punctatis.
- Sp. 10. ♂ ♀ *Scabriceps*. Capite scabro, castaneus, elytris punctatis, antennis gracilibus.
- Sp. 11. ♂ *Nigricans*. Capite lævi, thorace 3-lineato, niger, elytris impunctatis.
(Hic interponendus *B. oculatus* Europæ).
- Sp. 12. ♂ ♀ *Striatus*. Capite lævi, thorace 3-lineato, elytris obsolete punctulatis.
(Forte hic *B. Delaporti* Europæ).
- Sp. 13. ♂ ♀ *Globosus*. Capite scabro, vertice lævi, thorace 3-lineato, elytris impunctatis.
- Sp. 14. ♂ ♀ *Spretus*. Capite lævi, thoracis linea media obsoleta, niger, elytris impunctatis.
4. Fronte plana, minime retusa.
- Sp. 15. ♂ *Bistriatus*. Capite scabro, vertice lævi, thoracis linea media obsoleta.
- Sp. 16. ♂ ♀ *Lineaticollis*. Capite scabro, thorace 3-lineato.
(In hac turma, verisimiliter ponendus *B. albionicus*, Californiæ).
- Sp. 17. *B. albionicus*, *Aubé*.
Hab. California.

Sp. 18. *B. Schaumii*, *Aubé*.

B. punctato proximus videtur.

Obs. — In the Northern States an individual of this genus is scarcely ever seen apart from a colony of ants, but in the South they are frequently found under the bark of trees where no ants are seen. The northern species, as far as my experience goes, are found only under stones; the southern ones (except *B. Ionæ*, and a few specimens flying in twilight) under bark.

RHEXIUS, (n. g).

Antennæ distantes, ad frontis marginem insertæ, geniculatæ, clavatæ. Palpi maxillares breves, articulo ultimo ovato, acuto. Abdomen subtiliter marginatum, articulis subæqualibus. Tarsi unguiculo singulo.

1. *R. insculptus*. Long. .06.

Hab. Nov. Aureliani.

EUPLECTUS, *Leach*.

A. Corpus elongatum, elytris depressis, antennarum articulis penultimis crassioribus.

a. Thorax canaliculatus, vel medio foveatus.

1. *Linearis*. Canalicula integra, medio dilatata, capite lævi.
2. *Confluens*. Canalicula integra, medio dilatata, capite thoraceque punctulatis.
3. *Interruptus*. Thorace fovea elongata, capite lævi, vertice elevato.
4. *Difficilis*. Thorace fovea elongata, capite lævi, vertice elevato, foveatoque.
5. *Pumilus*. Thorace fovea elongata, capite punctulato.

b. Thorax medio non canaliculato.

6. *Arcuatus*. Capite antice arcuatim impresso, postice utrinque foveato.

B. Corpus convexiusculum.

a. Thorax subtiliter canaliculatus; antennæ articulis 9—10 crassioribus.

7. *Canaliculatus*. Capite utrinque bi-impresso, elytris confertim punctatis.

b. Thorax non canaliculatus, foveis posticis linea conjunctis, antennarum articulo 11mo maximo globoso. *Trimium*, *Aubé*.

8. *Globifer*. Capite arcuatim impresso, elytris stria dorsali brevi.
9. *Dubius*. Capite punctato, angulatim impresso, elytris stria dorsali.
10. *Parvulus*. Capite lævi minus profunde impresso, posticè bifoveato.

FARONUS, *Aubé*.

1. *F. Tolulæ*. Long. .09.

Specimen unicum ad Tolulæ cataractam Georgiae inveni.

January 5, 1852.

J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors: — ‘Bulletin de la Société Impériale des Naturalistes de Moscou,’ Nos. 3 and 4, 1850, and No. 1, 1851; by the Society. ‘Insecta Caffrariæ, annis 1838—45, a J. A. Wahlberg collecta, descripsit C. H. Boheman; pars 1, fasc. 2. — Coleoptera:’ Holmiæ, 1851; by the author. ‘The Entomologists’ Companion, being a Guide to the collection of Micro-Lepidoptera,’ by H. T. Stainton: London, 1852; by the Author. ‘The Zoologist’ for January; by the Editor. ‘The Literary Gazette’ for December; by the Publishers. ‘The Athenæum’ for November and December; by the Editor. ‘Diagnosen neuer Coleoptera aus Abyssinien von Dr. J. R. Roth:’ Munchen, 1851; by the Author. ‘Systematische Uebersicht der Käfer um Munchen, von Dr. Max Gemminger:’ Jena, 1851; by the Author. ‘Bulletin der Königl. Akademie der Wissenschaften,’ Nos. 1—33: Munchen, 1851; by the Academy. ‘Descriptions of the Insects brought home by Commander James Clark Ross,’ by John Curtis, Esq., F.L.S.; by the Author.

Mr. Adam White exhibited a specimen of the moth, *Anarta Richardsoni* (*Hadena Richardsoni*, Curtis, in ‘Appendix’ to Sir John Ross’s Arctic Voyage), taken by Charles Ede, Esq., on the north shore of Baffin’s Bay.

Mr. White also exhibited some rare and beautiful insects, part of a quantity sent to him for this Society by Hugh Low, Esq., Corresponding Member at Labuan. Among the Coleoptera were *Trictenotoma Childreni*, *G. R. Gray*, *Sarothroceria Lowii*, *White*, *Chrysodema Helena*, *White*, *MSS.*, and *Cladognathus Tarandus*, *Thunb.* Among the Lepidoptera were *Thaumantis?* *Lowii*, *Hewitson*, *MSS.*, *Papilio Neptunus*, *Guérin*, a series of an Ornithoptera, and a fine species of *Terias*. Mr. White took occasion to remark that the *Trictenotoma* had an extensive habitat, ranging from Tenasserim to Borneo; and that the same observation might be applied to some of the Lepidoptera now before the Society, certain of the species being also found at Assam and Sylhet. Indeed there was a great similarity among many Lepidoptera from Singapore, Sumatra, Java and New Guinea, insomuch that it might be almost doubted whether the differences relied upon by entomologists as pointing out distinct species, were any more than variations, induced by the altered circumstances of the several localities. The genus Ornithoptera was probably abundant in New Guinea, as nearly all our specimens had come thence; it extends also along the N. E. coast of Australia. *Papilio Turnus*, which extends southward as far as Florida, has been found also as far north as Rupert’s Island. On the other hand, it was certain that the habitat of many species of insects was very circumscribed, many places, islands in particular, having peculiar forms and species.

Mr. S. Stevens remarked that he had received from China a *Colias* which did not differ, in any respect, from the European *C. Hyale*.

Mr. White observed that the genus *Colias* has a wide range — the species being found throughout the temperate regions of Europe, Asia, and America, but it did not appear that they extended further to the South. *Cynthia Cardui* is found everywhere, agreeing in every respect with our English specimens.

Mr. J. E. Gray remarked that this identity of appearance in some species was not confined to insects, for among the Vertebrata, the musk deer was found from the centre of Siberia to the south of the Himalayas, and no difference was perceptible.

Mr. Curtis remarked that he had once seen a collection of insects from Calcutta, which had generally a very European appearance; and in another collection from Van Diemen's Land, they were so like European forms, that they might be associated therewith generically if not specifically.

The President remarked that in looking at some insects from Shanghai, he had been struck with the remarkable resemblance, in several instances, not only to European, but even to English species.

Mr. Curtis exhibited an exotic species of Cicada, found alive on the 11th of August last by Mr. R. Gordon, in one of the hot-houses in the Horticultural Society's Garden at Chiswick, into which it had probably been brought with some Orchidaceæ from Central America. He also exhibited a curious nest of eggs of a spider (*Epeira zebata* [?]), which he found at Nice last spring. It was of a dirty white colour, of a spherical shape, and about an inch in diameter; M. Guérin had informed him that these nests were sometimes thrice as large.

Alluding to the experiment of Sir James Ross, mentioned at the last meeting, Mr. Curtis read the following note from the 'Appendix' to Sir J. Ross's Voyage, in 1830, transcribed by him from Sir James's MSS. — "About thirty of the caterpillars were put into a box in the middle of September, and after being exposed to the severe winter temperature of the next three months, they were brought into a warm cabin, where, in less than two hours, every one of them returned to life, and continued for a whole day walking about. They were again exposed to the air at a temperature of about 40° below zero, and became immediately hard frozen; in this state they remained a week, and on being brought again into the cabin, only twenty-three came to life. These were at the end of four hours put out once more into the air, and again frozen; after another week they were brought in, when only eleven were restored to life. A fourth time they were exposed to the winter temperature, and only two returned to life on being again brought into the cabin. These two survived the winter, and in May an imperfect *Laria* (Rossii) was produced from one, and six flies from the other; both of them formed cocoons, but that which produced the flies was not so perfect as the other."

Referring to the exhibition at the meeting of this Society on the 4th of November, 1850, by Mr. Evans, of some Culicidæ received from the Great Slave Lake, Mr. C. said he had no doubt they were the *C. Caspius* of Pallas, of which insect Sir James Ross remarked that "It first appeared about the 10th of July, on the 15th it became very numerous, and on the 22nd so exceedingly troublesome as to prevent the necessary duties of the ship. They swarmed in perfect clouds over the marshes, and their larvæ constitute the principal food of the trout that inhabit the lakes. On the 13th of August they came out again after the rain, but were no longer very troublesome, being apparently nipped by the frost at night." Mr. Curtis added that Sir James told him the crew were obliged to wear nets over their faces while fishing.

The Chironomus and Tipula exhibited by Mr. White at the last meeting, Mr. Curtis said were described by him in the 'Appendix' to Sir J. Ross's Voyage already mentioned, the former being the *C. borealis*, *Curtis*, the latter the *Tipula arctica*, *Curtis*. It was a curious fact, that all the Culicidæ received from the Arctic regions were females.

With reference to the note on *Oecypus* olens*, read at the last meeting, Mr. Curtis said that in the 'Gardener's Chronicle' of November 5, 1842, he had made the following note on this insect, showing the value of these persecuted animals in gardens, especially in the autumn, when earwigs are most abundant and destructive to flowers:—

"Having heard that our rove-beetle was the natural enemy of earwigs, I placed one with a few of these insects under a tumbler glass. It commenced running round the inside, now and then resting, but it soon seized an immature earwig by the middle, and a full-grown one soon after, just behind the forceps, the back being uppermost, and in an hour and a half it had eaten six earwigs."

Mr. Curtis then referred to vol. i. p. 107 of the new series of this Society's Transactions, where, as one of the *Gelechiæ*, Mr. Douglas has recorded *Butalis cerealella* as a native insect. Mr. Curtis expressed his belief that Mr. Douglas's specimen was imported, and that fortunately the species was not British, for in France corn in granaries decreased from 40 to 70 ¢ cent. by its feeding thereon. He further observed that the species is well characterized by its extremely falcate inferior wings, and is apparently related to Stephens's genus *Cleodora*, which is established by dissections in plate 671 of the 'British Entomology,' though now included by Mr. Douglas in the genus *Gelechia*, which, as it now stands in Mr. Stainton's Catalogue, is a most heterogeneous group. Mr. Curtis expressed his regret that we cannot come to some understanding regarding generic names, for until they are settled, science must be a labyrinth not easily comprehended by the learned entomologist, and incomprehensible to the young student in Natural History.

Mr. Spence read an extract of a letter from G. H. Thwaites, Esq., M.E.S., now in Ceylon, informing him that he had lectured to a mixed audience of Europeans and Cingalese, on the habits and instincts of insects, especially directing attention to the Termites, with a view to the study of their metamorphoses. He suggested that the two kinds of workers did not undergo any subsequent change.

The President read a note from Albert Way, Esq., stating that in a basket of old Roman bones, sent a year or more since to Mr. Quekett, at the College of Surgeons, for examination, were found, after a long interval, a great number of *Obrium minutum*, which had doubtless proceeded from the willows of which the basket was made. The President said that Mr. Stevens had once brought a similar case before the Society; and Mr. Smith added that he had more than once reared this beetle from bramble-sticks.

Mr. Stevens exhibited a very fine variety of *Argynnis Paphia*, beautifully suffused with black, which had been captured in 1849 at Darenth Wood.

The President read the following extract of a letter from Brigadier J. B. Hearsey, dated Wuzerabad, August 6, 1851, and exhibited the insects referred to.

"As I was sitting in my flower-garden on the 4th of this month, with a 'bearer' fanning me with a large date-palm-leaf fan, he called my attention to a large showy plant of *Cenothera speciosa*, which he was aware I was taking great care of, covered with insects. It was then three feet high, and had eight or ten branches; the whole was densely covered with insects (the *Galeruca* sent herewith); they could not have been on it half an hour, and it was almost denuded of foliage and flowers. I drove them all off, and put twenty or thirty into a bottle of spirit of wine. The sun had now set, and soon after I went into my house, as it is not wholesome to sit out of doors in such hot, steamy nights. The next morning, the moment I was dressed, I went into

* Erichson, Gaubil, &c., adopt this name, and not Goërius.

the garden to look at my "speciosa:" the ten stems had nothing on them but some hard seed-capsules, every leaf, flower, and bud was devoured, and the stems bending from the weight of these Galerucæ. I determined on revenge. I ordered two 'chillumchees' (large, circular, shallow brass pans, which are used in this country for the water to fall into as the 'bearer' pours it into your joined hands to wash your face with, and also to wash your feet in) to be put under the stems and half filled with boiling water, the stems were then shaken, and the insects that did not fall were knocked into them as they attempted flight; at least 1000 were thus destroyed. But now for the wonderment. The *Cœnothera speciosa* is one of three kinds of that plant that I have raised from American seeds. I had blossoming in my garden one plant of *Cœ. speciosa*, and several of *Cœ. salicifolia* and *longicaulis*. These plants were never grown in this country before this rainy season, and certainly never blossomed. The *speciosa* does not flower till the second year, but still, an insect produced in this country, which could never have tasted or felt the perfume of this American plant, nor could even its progenitors have done so, selects it, the only one of its species in my grounds or in the country, for its food, destroys it completely, and touches no other! How can you account for this? Could the *Cœ. speciosa* have had a perfume (to me the flower has but a slight scent) so strong to the senses of this insect as to attract it in the mass? Please to ask any entomological friends if that is the way they can account for this proceeding, or can it be accounted for in any other manner?"

Mr. Saunders remarked that he had once seen this beetle (*G. Lawsonia*?) in immense numbers in a paddy-field near Calcutta.

Mr. Douglas remarked that probably the usual food of this Galeruca was some plant of the same natural order as *Cœnothera*, for he once, in this country, found caterpillars of *Cucullia Verbasci* feeding on *Buddlea globosa*, a native of Chili, belonging to the same natural order as *Verbascum*, on the leaves of which they usually feed.

Mr. Douglas read descriptions of ten species of *Gelechia*, being the completion of his Memoir on the British species of that genus. On a future occasion he intended to offer some observations on the structural characters of the genus, and now, at the request of many friends, he gave the following provisional arrangement of the species, according to the characters indicated by Zeller, in the 'Isis,' 1839.

Δ, a.	senectella	diffinis	contigua
a.	mulinella	sororculella	sequax
lobella	divisella	Galbanella	blandella
Populella	distinctella	boreella	Hübneri
temerella	fumatella	domestica	rhombella
	velocella	basaltinella	proximella
b.	lentiginosella	leucataella	notatella
rufescens	Atriplicella	alacella	humeralis
inornatella	instabilella	pelella	scriptella
cinerella	obsoletella	fraternella	fugitivella
Malvella	gallinella	marmorea	aleella
vilella	æthiops	junctella	Mouffetella
politella	fumosella	maculiferella	triparella
terrella	nigra	vicinella	
desertella	cuneatella	celerella	b.
acuminatella	longicornis	costella	ligulella

vorticella	lucidella	vulgella	pictella
tæniolella	lutulentella	nanella	
Coronillella	cerealella	albiceps	B, a.
nigritella	suffusella	gemmella	conscriptella
Anthyllidella	littorella	luculella	gibbosella
atrella	subocellea	Artemisiella	
bifractella	fuscipennis	pulliginella	b.
affinis	inopella	næviferella	Lappella
mundella	paupella	Hermannella	Carlinella
immaculatella	Gerronella	Brizella	Metzneriella
tenebrella	nigricostella	Ericinella	neuropterella
tenebrosella	dodecella		

January 26, 1852, (Anniversary Meeting).

J. O. WESTWOOD, Esq., President, in the chair.

The Secretary read the Report made to the Council by the Library and Cabinet Committee: and Mr. Wilkinson, one of the Auditors of the Treasurer's Accounts for 1851, read an abstract thereof, exhibiting a very improved condition of the Society's financial affairs.

The Ballot then took place, when Messrs. J. Curtis, W. Spence, J. J. Weir, and W. Wing, were elected Members of the Council, in the room of Messrs. F. Bond, W. S. Dallas, W. W. Saunders and G. R. Waterhouse: J. O. Westwood, Esq., was re-elected President, W. Yarrell, Esq., Treasurer, and J. W. Douglas and H. T. Stainton Secretaries.

The President delivered the following Address on the State and Prospects of the Society, and of Entomology generally; for which a vote of thanks was passed, and he was requested to allow it to be printed.

Votes of thanks were also passed to the Treasurer, Secretaries, and the retiring Members of the Council.

THE PRESIDENT'S ADDRESS.

GENTLEMEN,

In accordance with the custom of my predecessors in this chair, it now becomes my duty to address you on the progress of Entomology in general, and of this Society in particular, during the past year.

As regards our own body, you have already heard read the Reports from the Council and Auditors of the Treasurer's Accounts, relative to our general concerns and financial position, upon which we are fairly entitled to congratulate ourselves: there are, however, other matters to which I must direct your attention.

During the past year, our Bye Laws have undergone a searching revision, in the course of which several modifications in the previously existing Laws were made, with a view to the more efficient working of the Society, and a new class of members, named Associates, limited in number, and not subject to any pecuniary charge, has been introduced, in order to endeavour to bring within the sphere of the Society praiseworthy working entomologists, whose humble means have hitherto kept them aloof from our meetings. I trust that this, and the other alterations adopted by the Society, will be found to work beneficially.

As regards our monthly meetings, we may justly congratulate ourselves on the full attendance of our members, and on the great variety of objects contributed by them towards the amusement and instruction of their fellow-members. Indeed, considering the comparatively small number of our body, and the fact that our sittings are continued throughout the year, there are no scientific meetings in London better attended or more satisfactorily kept up. By this means we have been able to publish four quarterly parts of our 'Transactions,' containing much interesting matter, to which I shall subsequently call your more particular attention. I will therefore only add, in this place, that as we are thus now enabled to publish papers read before the Society, within a very short time after their perusal, it behoves our members to give their memoirs to the Society for publication, rather than consign them to works of a more general nature: the same cause will also operate in rendering unnecessary the loading of our 'Proceedings' with specific characters of new species, of which the full descriptions will so shortly appear in full in the 'Transactions.' It will also be observed that two papers are included in the parts of our 'Transactions' published during the past year, translated from the 'Transactions' of foreign Societies. The great interest of the subjects of those two memoirs sufficiently warrants this step, rendered however to a certain extent necessary, by the comparative absence of the usual amount of original memoirs laid before the Society during the year by our own members. This circumstance, I hesitate not to say, is attributable, in a great extent, to that great and all-absorbing fact which would of itself render the past year one of the most marvellous in the history of the world.

The Great Industrial Exhibition of all Nations is, indeed, an event, the effects of which can be but dimly discerned at present. As regards our own pursuit, however, we cannot but be gratified that amongst the manifold objects collected in the Crystal Palace to astonish the eye and inform the mind, insects and insect products held by no means an unimportant place. The collections of raw silks from almost all quarters of the world, of honey, wax, insect dyes and varnishes, insect medicines, as well as local collections of insects, and collections illustrative of their effects upon the useful products, cannot but have tended to prove to the thousands of visitors to that wondrous building, that insects and Entomology are subjects worthy of some share of the attention of mankind.

Another gratifying event connected with the Great Exhibition, has been the opportunity which it has afforded to many of our continental brethren to visit England (in many cases for the first time), and thus to make themselves acquainted with our collections, and establish with ourselves friendly relations which it is sincerely to be hoped no political events will have power to break. Amongst these visitors we have to number Dr. Boisduval, Messrs. Guérin-Ménéville, Mulsant, Chevrolat, Perroud, Sommer (of Altona), Jourdan (President of the Natural History Society of Lyons), Signoret, Professor Pictet (of Geneva), Deyrolle, De Saussure (grandson of the celebrated geologist, and who is at present engaged on an extended memoir on the *Eunneidæ*), the Baron de Selys Longchamps, Prince Charles Lucien Bonaparte, Count Mniszeck, Drs. Herrick-Schäffer and Verloren, Heer, Becker, Gehin, Silbermann, Nylander, Dohrn (President of the Entomological Society of Stettin), Javet, and Col. Motschulsky.

The amount of information reciprocally afforded by these visits, cannot fail to produce good fruit hereafter; at the same time it is allowable to congratulate ourselves on the pleasure and surprise which the sight of many of our beautifully preserved and arranged collections of insects afforded to our visitors.

This leads me to speak of the progress made in our entomological collections during the past year. Our own Society has received very considerable acquisitions; amongst which, a very valuable collection of Indian insects, presented by — Grant, Esq., of Elchies; two cases of insects collected near Baltimore, by the late Robt. Spence, Esq.; a case of Tasmanian insects, presented by F. Cox, Esq.; and a box of insects from the Cape of Good Hope, by — Rooper, Esq., must especially be mentioned. For specimens of several species of Coleoptera of rarity, we are indebted to the Rev. C. Kuper, Messrs. Scott,

Young, Foxcroft, and Mansell. Many interesting Hymenoptera have also been presented by Messrs. Smith, Lubbock, H. W. Newman, and Golding. Various Lepidoptera, generally in beautiful condition, have been received from Messrs. H. Doubleday, Douglas, T. H. Allis, Barlow, and Mrs. Vines: and other insects from Messrs Meade, Brown (of Burton-upon-Trent), and Mr. De Gand. Various interesting collections, containing many exotic novelties, have also been received in England from Messrs. Bates and Wallace in Brazil, Mr. Wilson of Adelaide, and Dr. Fitch, of North America.

Our British Fauna, during the past year, has also received some valuable accessions. Amongst Coleoptera, the most interesting have been *Dircæa discolor*, collected in Scotland by Mr. Weaver; *Aëpus Robinii*, detected by M. Javet, and taken by himself in the North, and by Mr. Wollaston on the south coast; with several new species of Curculionidæ. In Lepidoptera, *Gastropacha Illicifolia*, taken by the Rev. Mr. Atkinson on Cannock Chace, and its larvæ near Sheffield; *Trochilium Chrysidiforme*, by Mr. Barron near Haslar, in Hampshire; together with a considerable number of new Micro-Lepidoptera, chiefly recorded by Messrs. Stainton and Douglas. In Hymenoptera, *Bombus arcticus* has been taken by Mr. Adam White, in the island of Shetland; and Mr. F. Smith has added several new Aculeata to our lists: and in Crustacea, a new genus of Amphipods, with several new species belonging to the genera *Pagurus*, *Portunus* and *Amphithoë*, have been described by Mr. Spence Bate, in the 'Annals of Natural History.'

The Entomological collection of the British Museum has, during the two past years, received very great additions, for a notice of which I am indebted to J. E. Gray, Esq. In 1850, 299 specimens were received from Africa, 212 from North and 873 from South America, 477 from Turkey in Asia (presented by Mr. Loftus), 227 from India, 333 from Hong Kong (presented by Capt. Champion), and 244 from the Indian Islands (presented by the East India Company), 888 from Australia (including the insects collected during the Exploring Voyage of the Rattlesnake by Mr. MacGillivray), 844 European, and 2184 British specimens; together with 99 Crustacea from the Mediterranean.

In 1851, the British Museum received 280 specimens from Africa, 2756 from North and South America (including the collection made by Sir John Richardson in the Arctic Searching Expedition), 570 from Asia and the Asiatic islands, 694 from Australasia and the

adjacent islands, 638 British, and 3724 from Continental Europe (including 3000 well-named specimens).

During the like period the classification of the Museum collections has progressed satisfactorily, and several Catalogues of considerable portions have appeared.

The collection also of the East India House has received considerable additions, and an arrangement completed, in which careful copies of Dr. Horsfield's series of drawings of the transformations of the Javanese species have been placed side by side with the arranged specimens, rendering this portion of the collection extremely interesting and instructive.

With reference to the numerical progress of our Society, I have to report to you that during the past year we have elected as an Honorary Foreign Member, Dr. Johan Wilhelm Zetterstedt, of Lund, in the place of the late M. Wiedemann; and I am sure the Society will agree that no other foreign entomologist could have been selected more worthy to supply the place in our limited list of Honorary Members. Twelve new members and four subscribers have also joined the Society during the past year; whilst, on the contrary, one member and one subscriber have resigned. The names of two other subscribers have been struck from our list, being defaulters; and we have lost two of our original members by death, namely, John Fell Christy and Robert H. Spence, Esqs. I am not aware that Mr. Christy had published any entomological papers; and I believe the only memoir by the latter gentleman, is the description of *Carabus Cristoforii*, in the 2nd vol. of the 'Annales' of the French Entomological Society. Mr. Robert Spence was, however, a zealous collector; and during the past year he forwarded to our Society the two cases of American insects above referred to, collected by himself near Baltimore, as well as the notices relative to the appearance of *Cicada septemdecim*, recorded in our 'Proceedings' for September, 1851 (pp. 80 and 103). He died at Cold Springs, a watering-place near Baltimore, where he had been spending the past autumn and winter for his health. Our members will, I am sure, participate in the grief which so unexpected a loss will occasion to his father, our most excellent Honorary Member, W. Spence, Esq., and other relatives.

We have moreover to lament the loss of several naturalists and entomologists, who have more or less contributed, during their several careers, in extending the bounds of our favourite science. I regret that space will not allow me to do that justice to their merits to which they are so fully entitled.

Jules César Savigny must always be regarded as one of those naturalists who placed structural Entomology on its true foundation. His 'Mémoires sur les Animaux Invertébrés' are beyond all praise. In these he traced, with wonderful precision, the identity of structure which exists between the parts of the mouth in haustellated and mandibulated insects; and showed how remarkably a set of organs might be so much modified in form (in order to fit them for a change of functions), as in one tribe to appear as organs of locomotion, and in another as organs of manducation. These and various other equally important results, could only be arrived at by a precise investigation of the various structures themselves; and we accordingly find, in the plates which represent them, a series of the most beautiful figures which have ever been published; whilst the plates of annulose animals in the great work on Egypt (of the scientific expedition to which country he was one of the most indefatigable members), are unsurpassed for the drawing of the many species and details therein represented. Among the true insects, the orders Orthoptera, Neuroptera, and Hymenoptera are illustrated in that work. The fitful changes of events in France, and the subsequent blindness of Savigny himself, unfortunately put a stop to the publication of his beautiful works, without also the necessary descriptive text of the work. This want, to a certain extent, was remedied by the publication of the text by the late Professor Audouin; but much essential matter still remains unpublished, which, it is to be feared, is now entirely lost to science. He was a member of the Zoological Section of the Academy of Sciences of Paris.

John George Children, Esq., born August, 1777, died at Halstead, in Kent, on the 1st of January, 1852. He was for many years Secretary to the Royal Society, and was a very profound and practical chemist. He gave most important assistance to Sir Humphrey Davy, in prosecuting his researches on galvanism, which had such an important effect on the progress of that science. He was for several years Assistant Librarian in the Natural History Department in the British Museum, and was made Keeper of the Zoological Collection in 1838; and it was under his direction that most important changes were effected in the zoological collection, by which it has become one of the most perfect, and certainly the most accessible, collections in Europe. He devoted a considerable portion of his time to the study of Entomology, and formed a very large private collection of insects, as well as one of the most complete entomological libraries in Europe.

In addition to the above details, Mr. Children possessed strong

claims to our regard as one of the founders and the first President of our Society. It was, indeed, at his house that the establishment of the Society was resolved upon; and the interest which he naturally took in its affairs will be perceived on perusing the Preface to the first volume of our 'Transactions,' which was from his pen.

Mr. Children was also the author of a translation of Odier's memoir on the chemical composition of the corneous parts of insects, with additions by himself, published in the first volume of the 'Zoological Journal;' also of a Synopsis of Oechsenheimer and Treitschke's great work on European Lepidoptera, which appeared in Taylor's 'Philosophical Magazine and Annals;' as well as of an Abstract of the 'Systema Glossatorum' of Fabricius, a work previously almost unknown to entomologists, which appeared in the same Magazine in 1830. He was likewise one of the chief supporters of the 'Zoological Journal.'

Andrew Melly, Esq., of Liverpool. This gentleman was the possessor of one of the finest collections of Coleoptera ever formed, being equally rich in the splendid exotic species, and those of minute size, from all parts of the world. His untimely death in Egypt (where he was travelling with his wife and family) has deprived Entomology of one of its most indefatigable votaries: I am not, however, aware that he had published any Entomological memoirs.

Dr. J. Kidd, Regius Professor of Anatomy in the University of Oxford, was the author of a Memoir upon the Anatomy of the Mole Cricket, of considerable merit, published in the 'Philosophical Magazine' for 1825. He died full of years, universally regretted for the amiability of his character and the extent of his scientific knowledge.

General Feisthamel was the author of numerous memoirs in the 'Annales' of the French Entomological Society, Guérin's 'Magasin de Zoologie,' &c. Full of zeal for his favourite pursuit, although suffering from a disease of the heart, under which he at last sank, he had formed one of the most splendid collections of exotic Lepidoptera in France: his collection of Coleoptera was also very considerable.

Professor J. Kunze, born at Leipsic in 1793, a distinguished botanist and entomologist, died on the 30th of April, 1851. We are indebted to him for a valuable memoir on the genus *Scydmaenus*, published in the 'Transactions of the Natural-History Society of Leipzig,' 1823, (vol. i. p. 175—204), with figures of all the then known species; also, for a monograph, published under the title of "Entomologische Fragmente," in the 2nd volume of the 'Neue Schriften der Naturforschender Gesellschaft zu Halle,' 1818, on the genera *Donacia* and *Macrolea*; including a description of the larva of the latter genus:

together with notes on the genera *Potamophilus*, the larger species of *Dyticus*, the species of *Hydroporus*, and a new genus, *Zeugophora*. Five new species of *Monotoma* were also described by him in Germar's 'Zeitschrift,' v. 1.

Dr. Laurenz Oken, was editor of the 'Isis,' a work containing a mass of entomological articles from various contributors, and the author of many elementary works ('Lehrbuch der Naturgeschichte,' 'Lehrbuch der Naturphilosophie') written in a deeply philosophical spirit, of which scarcely any traces are to be found in English works, if, indeed, we except some of the recent memoirs of Professor Owen, in which several of the views of Oken are elaborated.

Dr. Frederick Augustus Gebler, born 3|15 December, 1782, of Saxon parents, having entered the service of Russia, became established at Barnaoul, in Siberia, where he died on the 9|21 of March, 1850. He was the author of numerous memoirs, chiefly on Siberian Coleoptera, which appeared, between 1817 and 1847, in the 'Mémoires' and 'Bulletin' of the Imperial Society of Naturalists of Moscow, the 'Bulletins' of the Imperial Academy of Sciences of St. Petersburg, in the 'Essais Entomologiques' of Hummell, and in Ledebour's 'Reise in das Altai Gebirge;' a complete list of which is given in the Moscow 'Bulletin' for 1850, (p. 589).

William Spry, formerly a member of this Society, also died in the beginning of the past year. He will be long remembered as an entomological artist of great ability, and as the draughtsman of the excellent plates of the work on the genera of British Coleoptera, published by him in conjunction with Mr. Shuckard. The portrait of Fabricius in the 4th volume of our 'Transactions' was also drawn by him.

In bringing this sad list to a close, allow me, on the other hand, to add, that it is a source of much hopeful anticipation that the place of these, our departed friends, may soon be filled up from the numerous ranks of our rising entomologists. A slight survey of the entomological world of the present day, as compared with its state a quarter of a century since, is sufficient to inspire strong hopes for the future progress of our science, if even but a few of the many of our younger members will only resolve to extend their views, and instead of resting satisfied with being collectors, will patiently investigate and record the *natural history and transformations*, the minute *anatomical structure*, external and internal, and the *natural relations* of insects amongst themselves. Any of these objects of study will, be assured, amply repay the attention bestowed upon it.

I have now to direct your attention to the progress of the literature

of our science during the past year; in doing which, it will be necessary, in some instances, to refer to books or memoirs published previously to 1851, but of which we have only obtained a knowledge during the past year. The necessity of these annual summaries of publications connected with Entomology is every day becoming more evident, from the multiplicity of channels in which new facts are recorded, and new species described or old ones illustrated. I am aware how difficult is the task which I have undertaken; but I trust few material omissions will be found in my summary, by which, with the assistance of those published by Burmeister and Erichson, and, since the decease of the latter, continued by Schaum in Germany, and by Bohemann in Sweden, the future entomological bibliographer will find his labours greatly relieved, and the means afforded of obtaining a knowledge of the majority of the publications, and consequently an idea of the state of the science at any particular period.

The plan which I propose to adopt in the following pages, is to classify these publications according to the orders and families upon which they treat,—a more useful, but, at the same time, a far more laborious plan than has been generally adopted by my predecessors, in their annual addresses from this chair.

I must, however, in the first place, direct your attention to the publication of the first volume of the 'Insecta Britannica,' published under the superintendence of the Officers of this Society, destined to supply the want, which has been so long felt, of a descriptive work upon those orders of insects which have not hitherto been described in detail in this country, or which have been found to require revision. The orders intended to be treated upon in the present series, are the Diptera, Hemiptera, Homoptera, and Micro-Lepidoptera; and it is confidently hoped that the support of the public will warrant a future series.

ENTOMOLOGY AND INSECTS IN GENERAL.

A remarkable memoir by Professor Louis Agassiz, on 'the Classification of Insects from Embryological Data,' has appeared in the 2nd vol. of the 'Smithsonian Contributions to Knowledge,' 4to., Washington, 1851. Taking up the idea (first propounded, I believe, by MacLeay) that the perfect state of one animal is represented by one or other of the preparatory states of another animal higher in organization than itself, and working out the assertion of Oken, that Lepidoptera are born as worms, then pass into the condition of Crustacea, and are finally developed into true insects, thus exemplifying the natural order of gradation of the three classes of Articulata, the author reviews the

characters of the different orders of true insects (especially with reference to their larva state and extent of subsequent development), adopting two primary groups, Mandibulata and Haustellata, placing the Neuroptera as the lowest of true insects, preceded by Coleoptera, Orthoptera, Hymenoptera, Hemiptera and Diptera, the Lepidoptera, "in the character of their wings, as well as in all other respects, ranking highest among Haustellata, and therefore among all insects." "The same evidence also which shows Lepidoptera to rank highest among insects, shows also that insects as a class rank higher than Crustacea." The larva of the Lepidoptera represents perfect worms; the chrysalis, in the junction of the head and thorax into an enlarged shield, with the abdomen free and movable, represents perfect Crustacea, and the true insect is above all. So also he further regards the Myriapoda as worm-like insects or larva-like insects, the spiders as Crustacea-like insects or pupa-like insects, "and the true insects as the highest stage of development, ranking above all." These views are developed with much ingenuity and at considerable length in the 1st and 5th sections of the Memoir, accompanied at the same time, as it appears to me, with just such an amount of direct general observation, mixed with assertion and assumption, as to give an appearance of *vraisemblance* to the argument,* which a more precise view of the subject does not appear to warrant.† In his second section, the author has detailed the transformations of one of the North American Hesperidæ — Eudamus Tityrus, especially describing the changes which take place on assuming the pupa state, and on passing from the pupa to the imago, and dwelling especially on the fact, which he believed to be a new discovery, that the limbs of the pupa are at the first free and detached from each other; a fact, however, well known ever since the days of Swammerdam, whose figures in illustration thereof are even more intelligible than those of Agassiz. With regard to the manner in which the limbs of the pupa become firmly and closely affixed on the breast in a mass, the author appears to be unaware that it is due to the existence of a gummy liquid, secreted by the insect at that period, attributing it to the pressure caused by the pupa escaping through the narrow slit on the back of the skin of the larva. The skin, legs, wings, antennæ and jaws are erroneously said to be thus fixed together. In like manner he describes the well-known pupa of *Musca vomitoria* (inclosed within the indurated skin of the larva) as a fact of which previous entomologists had been ignorant, or had not properly considered with reference to its analogy with the pupa of *Culex*! The only new fact which I find in this Memoir, is the manner in which the Hesperidæ attach themselves by silken threads in the pupa state, namely, by fixing themselves with

* For instance, the assertion that "however extensive the metamorphoses of the Coleoptera, Neuroptera, Hymenoptera and Diptera may be, they do not rise in any of these orders beyond the development which the Lepidoptera attain in their pupa condition, as in the pupa of Lepidoptera the jaws are already transformed into a sucker-like proboscis when wings and legs are developed," is at once disproved by the fact that the jaws of the larvæ of Lepidoptera become obsolete in the perfect insect, and that it is the maxillæ of the larva which are developed into the tubular sucker of the butterfly. So, again, in asserting that the type of the jaws of the Diptera is intermediate between those of Hemiptera and the perfect Lepidoptera, we have a confusion of ideas arising from three separate organs being brought into comparison; namely, the mandibles of the Diptera, the maxillæ of the Lepidoptera, and the labium of the Hemiptera.

† In this respect the memoir bears a curious resemblance to the 'Vestiges of Creation.'

some silk threads by the tail, *throwing a few others across the body*, and spinning a very thin, transparent, loose cocoon between the leaves. Another chapter is devoted to the "Special Classification of the Lepidoptera," in which the butterflies are asserted to be at the head of the order (and consequently the most highly organized of all the Annulosa), because they sit with their wings erect, the inner side in the pupa state becoming the outer one, whereas the Hesperidæ raise the anterior wings only, and stretch the lower ones more or less horizontally; while Sphingæ and moths sit with those organs more or less in the position they assumed in the pupa state: the precise method of spreading the wings in repose being considered as the first character to be employed in the classification of the families of heterocerous Lepidoptera.

M. E. Blanchard read a Memoir before the Académie des Sciences, on the 6th of October, 1851, on the Circulation of the Blood and on the Nutrition of Insects, with a view to explain why silk-worms, fed upon leaves powdered with coloured matters, produced similarly coloured silk; and in order to demonstrate the correctness of his views as to the peritracheal circulation in insects. (Rev. Zool. 1851, p. 492; and Ann. N. Hist. January, 1852).

M. Joly has published a Memoir on the asserted Peritracheal Circulation, (Ann. Sc. Nat. 3rd ser. xii. p. 306); in which he insists that it is physically, anatomically, and physiologically impossible.

On the other hand, M. Agassiz, in a Memoir on the Circulation of Blood in Insects, read before the American Association for the Advancement of Science, in 1850, adopts the peritracheal system of circulation.

A Memoir by M. Quatrefages, on the General Cavity of the Body of Invertebrated Animals, and on the Liquid contained therein, and its functions, has been published. (Ann. Sc. Nat. 3rd ser. xiv.)

A paper on the formation and use of the Air-sacs and dilated Tracheæ in Insects, by Mr. G. Newport, appears in the 'Transactions of the Linnean Society,' xx., pt. 3.

A curious memoir by Dr. Hollard, on the Structure of the Scales, Hairs, and other appendages of the Skin of Articulated Animals, has appeared in the 'Revue Zoolologique,' 1851, p. 283.

The 6th part of the 'Proceedings of the Literary and Philosophical Society of Liverpool' contains an elaborate paper on the Structure of the Feet of various species of Insects of different orders, with highly magnified figures, by Dr. Inman.

A paper by Professor L. Agassiz, on the Numerical Composition of the Segments of the Body of Larvæ, perfect Insects, and Crustacea, appears in the 'Proceedings of the American Association for the Advancement of Science,' for 1850.

A remarkable memoir by M. F. Dujardin, has appeared (Ann. Sc. Nat. 3rd ser. xiv.), in which the author asserts that there is a true brain in some insects, the structure and size of which depend on the development of their intellectual faculties; this true brain being surrounded by a cortical pulpy substance, which is of small extent in the more intelligent insects, but predominates in those in which intelligence is masked by instinct: the ganglions of the thorax and abdomen appearing to be exclusively composed of this pulpy cortical matter.

M. E. Perris, having reviewed the various opinions proposed on the subject of the seat of the sense of smelling in articulated animals, considers that it chiefly resides in the antennæ, and also, to a certain extent, in the palpi; and further, that the antennæ are not organs of hearing, the seat of which is placed in the cavity in which the antennæ are inserted. (Ann. Sci. Nat. 3rd ser. xiv. p. 149).

M. L. Dufour, in a note (*Ann. Sci. Nat.* xiv. 179), adopts the above views of M. Perris, but extends them by regarding the sense of smell merely as a modification of that of touch, and agreeing with Goureau and Newport in thinking that the antennæ are the seat of hearing as well as of smelling, the air being the vehicle through which the impressions of both senses are conveyed.

Professor Owen's remarkable views concerning the Metamorphosis, Metagenesis, and Parthenogenesis of Plants and Animals (by which the extraordinary anomalies in the generation of the Aphidæ are explained), have been communicated in detail in the 'Annals of Natural History,' viii. p. 59, as well as in a distinct work.

A memoir by M. F. Dujardin, on the Microscopical Texture and Properties of Wax, has been published in the 'Annales des Sciences Naturelles,' 3rd ser. xii. p. 250, in which the writer considers that the white secretion with which the Dorthesiæ, Coccidæ, Aleyrodes, and other Homoptera, are invested, and also the powdery matter on the elytra of the Notonectidæ and Gerridæ, as well as on the abdomen of the males of several species of dragon-flies, are all modifications of the same material.

A memoir by Bohemann on Parasitism appears in the 'Proceedings of the Royal Academy of Sweden' for 1850; in which appear notices of a *Typhlocyba* attacked by a *Pteromalus*, Forficula by a dipterous insect (found in the pupa state), *Ædipoda cyanoptera* by *Conops vittata*, and *Oryctes nasicornis* by *Sarcophaga striata*.

Dr. Philippi has published (*Ann. Sci. Nat.* 3rd ser. xv.) a memoir on the Parasitism of a Dipterous and Hymenopterous Insect, which he obtained from the closed nest of *Rhynchites Betuleti*, the eggs of which were infested with a dipterous larva, within the body of which was developed another parasite, belonging to the family *Pteromalidæ*. As the parent of the latter parasite is considered to have had no means of depositing her eggs in the dipterous parasite, the latter is regarded as one of the *nurses* of Steenstrupp's system of alternation of generations, sometimes producing a dipterous and sometimes a hymenopterous parasite!!!

M. Alex. Lefebvre has published some remarks on the similarity of colour existing between the soil or sand in Egypt, and the insects found thereupon, (*Ann. Soc. Ent. Fr.* ix. p. xxv.)

Likewise, a notice of a caterpillar mentioned by Levaillant in his 'Travels among the Namaquois,' which is venomous when it feeds upon venomous plants, and suggesting the inquiry whether the larva of *Deilephila Euphorbiæ* possesses the mordant action of the plant it feeds upon.

A remarkable memoir by Dr. J. Davy, F.R.S., on the Effects of various Chemical Agents on Insects, appears in our Transactions (p. 195).

A translation of M. Schiodte's 'Specimen Faunæ Subterraneæ,' made by Dr. Wallich, has also appeared in our Transactions, (Vol. i. No. 3, p. 134).

An article by Mr. Newman, on the Use of the Word *Hermaphrodite*, appears in the 'Zoologist,' cxi. The writer makes no allusion to the comprehensive classifications proposed by Geoffroy St. Hilaire, Lacordaire, or Agassiz.

A gynandromorphous specimen of *Formica sanguinea* is described by Tischbein, in the 'Stettin Zeitung' for October.

M. Wesmael has described two remarkable monstrosities occurring in the genus *Ichneumon*, in both of which the front part of the body was of the male, and the abdominal portion of the female sex. Also a monstrous *Melolontha vulgaris*, having one of the antennæ tripartite.

Dr. Lereboullet has also described a monstrous *Melolontha vulgaris*, having its right antenna furnished with three distinct seven-leaved clubs, (Rev. Zool. 1851, p. 433).

Instances of monstrosity occurring in *Calosoma Sycophanta* and *Oberea oculata*, are described by Stollwerk in 'Verhandlungen' of the Prussian Rhenish Natural History Society, 7th year.

M. Jacquelin Duval (Ann. Soc. Ent. Fr. viii. 533), has described a curious case of monstrosity observed in the left outer maxillary palpus of *Bembidium striatum*, the antepenultimate joint being dilated and triangular, supporting three distinct penultimate joints, each with a minute terminal subulated joint; the inner corresponding palpus having the last joint elongated, wide, and flattened, terminated by two small points. M. Laboulbene has added a list of fifteen cases of monstrosities observed in the antennæ of insects.

A remarkable variety of *Bombyx castrensis*, in which the ordinary colour and markings are entirely effaced, and which the author regards as "due à cette maladie qu'on appelle albinisme," has been described and figured by M. de la Chavignerie, (Ann. Soc. Fr. ix. 101).

Several notes on living specimens of lobsters of a red and blue colour, the variation of colour, also supposed to be the result of a disease analogous to albinism, have been read before the Académie des Sciences on the 22nd of September, 1851, by M. Guérin, 6th of October by M. Lereboullet (by whom also the description of a new species of *Astacus* was communicated), by M. Foulton and by M. Vallot.

An Obituary Notice of the late Honorary President of our Society, communicated by Mr. Spence, accompanied by a fac simile of a remarkably characteristic full-length sketch of Mr. Kirby, and a detailed account of his writings, furnished by myself, appear in our 'Proceedings,' pp. 19—32.

Our late President's Annual Address for 1851, contains extensive bibliographical notices of entomological works published in 1850.

M. Bohemann's *resumé* of the entomological works published in 1847-48, has been published by the Royal Academy of Stockholm, (8vo., 1851).

Dr. Schaum has undertaken the continuation of the Annual Reports of the Progress of Entomology, commenced by Burmeister and continued by Erichson up to his decease, when the coleopterous and hymenopterous works published in 1847 were reviewed. Dr. Schaum's first annual summary comprises the works published on the remaining orders in 1847, and all published in 1848, forming a closely printed volume of 212 pages. These summaries are of the highest utility.

A periodical work has been commenced at Breslau by the Silesian Entomological Society, under the title of 'Zeitschrift für Entomologie.'

The 'Proceedings' of the fifth and sixth annual meetings of the Entomological Society of the Netherlands, for 1849-50, have appeared, and contain a number of short notices, and two of greater extent by Dr. Verloren on the pupation and development of various Lepidoptera, especially *Sphinx Ligustri* and *Psyche nitidella*.

M. Dufour has published (Ann. Soc. Ent. Fr. ix. 55), under the title of 'Mélanges Entomologiques,' a series of notices relative to the following subjects:—

1. Etude de l'Entomologie. Observations on the Superior Advantages of Studying the External Structure, Habits, Transformations, and Internal Anatomy of Insects, in lieu of the Technicalities of Species, in which he asserts that instead of "*in parvo copia*," we find "*in copia parvum*."
2. Notes on the Habitat of *Serenthia læta* (*Agramma læta*, West.)

3. On the *Issus grylloides*, *Fabr.*, distinct from that so named and figured by Spinola.
4. On a new species of *Celonites* from Spain, both sexes of which are described under the name of *C. dispar*.
5. Remarks on the family *Masarides*.
6. On a *Hyalomyia* (*H. dispar*) born in the bowels of *Brachyderes lusitanicus*.
7. On *Musca vitripennis*, the fly which torments the collector in his rambles.
8. On *Otites pulchella* of Macquart.

An abstract of Dr. Asa Fitch's Memoir upon the Insects captured in winter in the neighbourhood of New York, with Notices of their Habits, appears in our 'Proceedings,' p. 95.

Descriptions of the following *Annulosa*, collected by Mr. Macgillivray during the voyage of the *Rattlesnake*, have been published by Mr. A. White, in the 'Appendix' to the Narrative of the Expedition. *Pachyrhynchus Stanleyanus*, (Coleopt. *Curculionidæ*); *Drusilla Mylæcha*, (Lepidopt. *Diurna*, *Morphidæ*); *Eusemia Mariana*, (Lep. *Heteroc. Gymnautoceridæ*); *Ommalocarcinus Macgillivrayi*, (Crust. *Decap.*); and *Porcellanella triloba*. All these species are beautifully figured by Mr. W. Wing.

Mr. Bowring has communicated to us various notes on the insects of Hong Kong, ('Proceedings,' pp. 76, 104).

The insects collected by Messrs. Ferret and Galinier in Abyssinia, have been described by M. Reiche, accompanied by a folio atlas of plates, representing a great number of species. The greater portion of the species belong to the *Coleoptera* (amongst which appear the *Composcephalus Galinieri*, distinct from *C. Horsfieldianus*, *White*), and a new *Paussus*), there are, however, a number of new *Orthoptera*, *Hemiptera*, *Hymenoptera* and *Lepidoptera*.

M. Bohemann has published a memoir on the Insects of Gothland (Trans. Royal Acad. Stockholm, for 1849, published 1851), containing lists (and descriptions of some new species) of the orders *Coleoptera*, *Orthoptera*, *Hemiptera* and *Homoptera*: and in the 'Proceedings' of the same Academy for 1850, is another paper on the *Coleoptera* of the same country, with descriptions of nine new species of different families.

M. Perris has published a 'Lettre sur une Excursion dans les Grandes Landes,' in the 'Memoirs of the Academy of Lyons,' containing various new species, and a new genus of *Diptera*, *Aphrozeta*, consisting of two species.

Mr. W. W. Saunders has published in our 'Transactions,' (n. s. i. p. 158) a memoir upon twelve species of insects, belonging to different orders, which are injurious to the cotton-plant.

Notes upon destructive Insects, by M. Amyot and Col. Goureau, have appeared in the *Annales Soc. Ent. France*, ix. xxxvi.

A pathological memoir on the Diseases of Plants produced by the attacks of *Aphidæ*, *Coccidæ*, and *Acaridæ*, was read before the *Académie des Sciences*, by Dr. Robouan, on the 20th of October, 1851.

A paper by myself, on the following insects obnoxious to the Rose, has appeared in the 'Gardener's Magazine of Botany,' (iii. p. 273). *Porthesia auriflua*, *Balaninus Brassicæ*, *Meligethes æneus*, *Lyda inanita*, *Megachile centuncularis*, and *Microsetia centifoliella*.

Articles upon the Natural History of the following species, — *Lyda fasciata*, *Bostrichus capucinus*, various species of *Apion*, *Astyages hemerobiella*, and *Cerostoma Xylostiella*, together with two articles on the Generic Characters of Insects, have been published by myself in the 'Gardener's Chronicle' during the past year.

The question as to the cause of the occasional occurrence of insects impaled upon thorns, has been re-opened by Mr. McIntosh (Proc. Ent. Soc. p. 79), by whom various instances have been observed. Mr. G. Ingall adopts the ordinarily received opinion, having observed instances of humble bees impaled evidently by the red-backed shrike, (Zool. 3285).

COLEOPTERA.

A work has been commenced by M. Chenu, intended to illustrate all the modern genera of insects. The numbers hitherto published contain the text of the earlier families of Coleoptera, with a vast number of wood-cuts, chiefly copied from other works, but forming a very useful text-book.

M. Ormancey has published an extended series of observations on the structure of the sheath of the penis of various Coleoptera, with the view to prove that the specific characters obtained from this part of the body are of the first importance in determining the limits of closely allied species, (Ann. Sci. Nat. 3rd ser. xii. p. 227). Figures are given of this organ in sixty different species.

A paper on the minute species of beetles found in ants' nests, by Kraatz, appears in the Stettin 'Zeitung,' p. 166. Another on the same subject by Bach appears in the October number of the same work.

M. Mulsant has published the descriptions of various new Coleoptera, in the 'Memoirs of the Society of Agriculture,' &c., of Lyons, consisting of a new genus of palpicorns (*Ceratoderus graniger*, Columbia), a new genus of Trogidæ (*Erimazus 1-striatus*, Algeria), two new genera, forming a new tribe amongst the Coccinellidæ, and new species of Aphodius, Mordella, Ochthebius, Ergates, Clytus, and various other Longicorns; with notes on the Linnæan collection of Longicorns.

Dr. Schaum has published a series of critical synonymical notices of various species of Coleoptera, chiefly Carabidæ, Cicindelidæ, and Staphylinidæ.

Dr. Kuster has continued his work entitled 'Die Käfer Europa's,' Heft 21: Nuremberg.

The 21st volume of Sturm's 'Deutschlands Fauna' has appeared, with sixteen plates.

Herr Gemminger has published a 'Systematic Revision of the Coleoptera of the neighbourhood of Munich,' (8vo., 65 pp. 1 pl.)

Herr Maehler has published a catalogue of 2124 species of Coleoptera found near Heidelberg. The ordinary order of arrangement of the families is reversed, the author commencing with the Coccinellidæ and ending with the Cicindelidæ.

M. Keisenwetter has published a memoir upon the species of Coleoptera collected by himself in his journey through the South of France and Catalonia, with descriptions of a number of new species, (Ann. Soc. Ent. Fr. 1851, 3rd trim.)

Numerous species of Coleoptera of the Mark Brandenburg, omitted by Erichson in his work on the beetles of that country, are published by Kraatz, in the Stettin 'Zeitung.'

M. Graells has published the descriptions of a decade of new species of Coleoptera from Spain (Ann. Soc. Ent. Fr. ix. 5), belonging to the genera Cebrio (with notes on the habits of the new species), Anomala, Misolampus, Mylabris, Cneorhinus, Thylacites, and Doreadion.

A memoir on the character of the Insect Fauna of Southern Persia, with a list of 160 species of Coleoptera, including 33 new species (with 2 new genera of Malacoderms, and a new genus of Longicorns allied to Aromia), appears in the 1st volume of

the 'Transactions of the Royal Society of Sciences of Vienna,' by Kollar and Redtenbacher.

Dr. Roth has published a descriptive list of 100 new species of Coleoptera from Abyssinia, in the continuation of Wiegmann's 'Archives.'

The 2nd volume of the 'Coleopterous Insects of Caffraria,' described by Bohemann, has appeared, comprising 287 new and 54 previously described species, belonging to the families Buprestidæ (93 species, 72 new), Elateridæ, the Malacoderms, Cleridæ (37 species, 31 new), Ptinidæ, Clavicorns and Hydrophilidæ.

Signor Bertolini has published a series of papers on the Coleoptera of Mozambique, containing 81 species (22 new), with figures of the more remarkable species, in the 'Memoirs of the Royal Society of Bologna.'

Descriptions of 31 new species of Coleoptera, of various families, natives of Madagascar, including new species of Stenotarsia and Pogonotarsus, 10 species of Tetraphyllus and 5 of Oryctes, have been published by Dr. Coquerel, in the 'Revue Zoologique,' 1851, p. 86.

The Coleoptera of Lake Superior have been described by Dr. Leconte, consisting of 152 new species, together with an extensive list of already described species, in Professor Agassiz's work on Lake Superior (Boston, 1850), accompanied by notes on their geographical distribution.

M. L. Fairmaire has described two new species of Coleoptera from Venezuela, — *Hyperantha hæmorrhœa* (Buprestidæ) and *Alurnus 8-punctatus* (Hispidæ), with notes on *Arescus monoceros*, *Oliv.* (Rev. Zool. 1851, p. 350).

Mr. Newman has described a number of Coleoptera from New Holland (Zool. cxxviii., cxxxiii., clxxix.), some of which however appear to have been previously described by Dr. Germar, in the 'Linnæa Entomologica.'

M. Perris has described and figured the transformations of the following Coleoptera, (Ann. Soc. Ent. Fr. ix. 39); *Triphyllus punctatus*, *Fabr.*, the larva of which lives in the *Boletus* named *Fistulina hepatica*; *Diphyllus lunatus*, the larva of which feeds upon *Sphæria concentrica*; *Agathidium seminulum*, the larva and perfect insect of which feed upon the subcortical Fungus called *Trichia cinnabarina*; and *Eucinetus* (*Nycteus*, *Latr.*) *meridionalis*, also found in both states feeding on the byssus and mycelium growing under decaying wood.

CICINDELIDÆ.

M. Gehin has published the first part of a 'Catalogue des Coléoptères' in his own collection, containing the Cicindelidæ, (Metz, 1851).

A note on the dentition of the tiger beetles, was communicated by myself to the Zoological Society, on the 24th of June, 1851.

Mr. Tatum has described four new exotic Cicindelidæ, and an Indian *Carabus*, in the Ann. Nat. Hist. viii. 49.

CARABIDÆ.

A remarkable new species of *Carabus* from Algeria, having the prothorax regularly obcordate, has been described by M. Lucas, (Rev. Zool. 1850, p. 504).

A new fossil species of *Carabus* from Aix, in Provence, has been described by M. Barthelemy, (Rev. Zool. 1851, p. 203).

A paper of considerable length, containing descriptions of new, and revisions of

previously described, Russian species of *Carabus*, *Linn.*, has been published by M. Chaudoir, in the 'Bulletin of the Nat. Hist. Soc. Moscow,' 1850, pt. 3.

An important memoir, containing a revision of the genera and species of Harpalidæ forming Dejean's section Patellimanæ (*Panagæus*, *Chlænium*, *Oödes*, &c.), has been commenced by the Baron de Laferté-Sénéctère, (*Ann. Soc. Ent. Fr.* ix. p. 209).

M. Laferté-Sénéctère has also continued his descriptions of the Carabidæ of Portuguese Guinea, collected by M. Bocandé, in the *Rev. Zool.* 1851, pp. 81, 221, 427.

Dr. Coquerel (*Ann. Soc. Ent. Fr.* viii. 529) has published some interesting observations on the habits of *Æpus Robinii* (lately detected by M. Javet in this country). It is never found above high-water mark, and M. Coquerel has searched for it in vain on the shores of the Mediterranean (where there are no tides). Its mode of respiration is similar to that of *Æ. fulvescens*. Dr. Coquerel has also added a description and figure of its larva.

The occurrence of *Æpus Robinii* in England has been noticed by Mr. Wollaston (*Zool.* 3090), and that of *Bembidium Schuppelii*, *Dej.*, in Cumberland, by Mr. Bold, (*Ibid.* 3289).

The commencement of an extended memoir by M. Jacquelin Duval, entitled 'De Bembidiis Europæis,' has appeared in the *Ann. Soc. Ent. Fr.* 1851, (3rd trim.)

HETERO CERIDÆ.

Von Kiesenwetter has published a revision of the genus *Heterocerus*, in the *Linnæa Entomologica*, v.

STAPHYLINIDÆ.

M. Doue has described a new *Staphylinus* (*S. Mulsanti*) from the South of France, (*Ann. Soc. Ent. Fr.* viii. lv.)

A dichotomous tabulation of the numerous species of *Stenus*, with the description of a new species, has been given by M. Leprieur, (*Ann. Soc. Ent. Fr.* ix. 191).

A new species of *Stenus*, found near Lille, is described by M. Cussac, (*Ann. Soc. Ent. Fr.* ix. p. xxix.)

PSELAPHIDÆ AND SCYDMENIDÆ.

A memoir by M. Bohemann, on the *Scydmenidæ* and *Pselaphidæ* of Sweden, appears in the 'Proceedings of the Royal Academy of Stockholm' for 1850. No new species is described.

PAUSSIDÆ.

The note by Herr Guenzius, on the economy of the *Paussidæ*, published in the *Stettin 'Zeitung,'* p. 227, has been translated by Mr. Douglas ('Proceedings,' p. 105).

Descriptions by myself of two new species of *Cerapterus* from Australia, have been published in the *Ann. Nat. Hist.* vii. 491.

CLAVICORNIA.

Three new remarkable exotic genera have been described by myself in our 'Transactions' (vol. i. n. s. p. 167), under the names of *Paromia Dorcoïdes* (allied to *Ips*), *Cosysphodes Wollastonii* (apparently allied to *Bitoma*), and *Chætosoma scaritides* (allied to *Trogosita*).

CISIDÆ.

M. L. Dufour (Ann. Soc. Ent. Fr. viii. p. 549) has described and figured the larva and pupa of *Xylographus Bostrichoides* (one of the *Cisidæ*), the larva of which resides in *Boletus igniarius*; the terminal joint of the body is only slightly emarginate, but the angles "durcissent en une pointe épineuse, quand la larve préluide à sa métamorphose," thus differing from the larva of *Cis Boleti*, *Alni*, &c.

LAMELLICORNIA.

The second part of the 'Catalogue de la Collection Entomologique du Mus. d'Hist. Nat. de Paris,' containing the continuation of the lamellicorn beetles, described by M. Blanchard, has appeared.

Von Heyden has communicated a note of the discovery of a number of specimens of *Propomacrus* (*Euchirus*) *bimucronatus*, in a hollow oak near Constantinople, (Ent. Zeit. Stettin, p. 243).

A paper by myself on the South American genus *Athyreus*, with descriptions of 13 new species (all of which are figured), has appeared in the *Trans. Linn. Soc.* vol. xx. pt. iii.

The earthen balls formed by a new species of *Heterogomphus* inhabiting the Andes, have been described, together with the insect itself, by M. Guérin-Ménéville, in the *Rev. Zool.* 1851, p. 160.

The genus *Dasystema*, *Dej. Cat.*, allied to *Elaphocera*, *Géné*, and *Artia*, *Ramb.*, has received the addition of three new species, natives of Algeria, described by M. Lucas, (Ann. Soc. Ent. Fr. viii. 515).

A series of experiments on the relative weight of various specimens of *Melolontha vulgaris*, of both sexes, has been made by Mr. W. W. Saunders, (*Proc. Ent. Soc.* 99).

A note by Mr. Rich on the habits of a living specimen of *Goliathus Cacicus*, appears in our 'Proceedings,' p. 85.

The parasitism of the larva of *Cetonia aurata* in ants' nests has been confirmed by Mr. Weaver, (*Proc. Ent. Soc.* p. 106).

The distinctive characters of *Cetonia stictica* and *funesta*, have been pointed out by Cornelius, (*Ent. Zeit. Stet.* 1851, p. 22).

The employment in Southern Russia of dried specimens of *Cetonia aurata*, reduced to powder, as a remedy against madness arising from hydrophobia, has been recorded by M. Motschoulsky, (*Rev. Zool.* 1851, p. 60; *Ann. Soc. Ent. Fr.* ix. p. xlv.)

MELANDRYIDÆ.

A paper by Braselmann, on the habits and transformations of *Orchesia micans*, has appeared in the 'Verhandlungen of the Prussian Rhenish Natural History Society.'

BOSTRICHIDÆ.

The habits and transformations of *Apate capucina*, *Fabr.*, *A. 6-dentata*, *Oliv.*, *A. sinuata*, *Fabr.*, and *A. Dufourii*, *Latr.*, have been described and figured by M. Perris (*Ann. Soc. Ent. Fr.* viii. 555), followed by some observations on the affinities of these insects, and the necessity of breaking up the Latreillian group of *Xylophaga*, and placing *Apate* near *Anobium*, a position it has long held in the English lists. See also my article on the first-named species in *Gard. Chron.*, referred to above in p. 144.

A note by Kollar on the injuries committed by *Apate bispinosa*, *Oliv.*, on vine-stocks in Austria, has been published in the 'Proceedings of the Royal Society of Sciences of Vienna.'

SCOLYTIDÆ.

A note by Kollar on the injuries committed in Austria by *Tomicus typographus*, appears in the Proc. Royal Acad. Sci. Vienna.

BRUCHIDÆ.

The fact of the importation of myriads of *Bruchus rufimanus*, *Sch.*, into Newcastle-on-Tyne, in a cargo of beans from Sicily, is recorded by Mr. Bold, (Zool. 3289).

CURCULIONIDÆ.

Mr. Bold has also published the result of some experiments, in which specimens of *Calandra granaria* were immersed in water from 1 to 15 days; even after the latter period some few survived, (Zool. 3289).

Mr. Walton's revision of the Curculionidæ has been continued (Ann. Nat. Hist. vii. 310): the genera *Dorytomus* (with 16 species) and *Elleschus* (with 2 species) being described in detail.

An extensive memoir by Hochhuth, on the Curculionidæ of Russia, has appeared in the Bulletin Soc. Hist. Nat. Moscow, 1851, pt. i.

A new genus of Curculionidæ (*Cotaster*, type *Phlæophagus uncipes*, *Schönh.*), and a new French species belonging thereto, have been described by M. Motschoulsky, (Rev. Zool. 1851, p. 425).

Another new genus near *Mesites*, taken near Lille, has been described by M. E. Cussac under the name of *Elmidomorphus Aubei*, (Ann. Soc. Ent. Fr. ix. 206).

The occurrence of *Trachoides hispida*, *Sch.*, a weevil new to Britain, in the New Forest, is announced by Mr. J. Walker (Zool. 3102), and that of *Acalyptus Carpini* and *Mecinus collaris*, two new British weevils, by Mr. S. Stevens, (Proc. Ent. Soc. July, 1851).

Captain Godart has published a note on the powder-like matter which covers the elytra of *Lixus angustatus*, and other species, which he considers not to be cryptogamous, as has been asserted by Laboulbene and denied by Coquerel, (Ann. Soc. Ent. Fr. ix. p. xiii.)

LONGICORNIA.

Mr. A. White's descriptions of exotic longicorn beetles, including several new genera, read at a previous meeting of the Zoological Society, have been published in the Ann. Nat. Hist. vii. 70.

An abstract of Mr. Newman's monograph on the Australian genus *Distichocera*, in which *D. fulvipennis* is regarded as the female of *D. maculicollis*, and three other species described, appears in the 'Zoologist,' 3091 and 3122. Descriptions of many Australian species of longicorns, by the same author, appear in the 'Zoologist.' (See ante, p. 146).

A note by M. Lucas, on some of the species of *Purpuricenus*, appears in the Ann. Soc. Ent. Fr. ix. p. x.

A monograph of the genus *Cometes* (containing 4 species) by M. Buquet, is published in the Rev. Zool. 1851, p. 188.

M. Lucas describes a new species of *Clytus* from Algeria, (Ann. Soc. Ent. Fr. ix. p. xxxi.); and a new *Phytœcia* from Algeria, (Ibid. p. xli.)

M. Graells has published the description and figures of the transformations of *Aganpthia irrorata*, the larva of which resides in the stems of *Onopordon*, and resembles

in its form that of the larvæ of *Parmena* and *Calamobius*, ('Memoirs of the Royal Academy of Spain,' vol. i. pt. i.)

Mr. A. White has communicated to us the fact of *Monolammus Sutor* eating its way through a leaden pipe, (Proceedings, p. 34).

The destruction of the carrot crop by the larvæ of one of the *Lepturidæ* (*Phytœcia Ephippium*), which form burrows in the roots, has been noticed by M. Lareynie, (Ann. Soc. Ent. Fr. ix. p. liv.)

CRIOCERIDÆ.

The larva of *Hæmonia Gyllenhalii*, *Lacord.* (*Donacia Zosteræ*, *Gyll.*), has been described by M. Lacordaire in the Stettin 'Zeitung,' p. 263.

PHYTOPHAGA.

The European species of *Chrysomela* are described by Suffrian in the 5th volume of the 'Linnæa Entomologica.'

A new *Chrysomela* (*C. islandica*, *Köhler*) has been described by Letzner, in the 'Proceedings of the Entomological Society of Silesia' for 1850.

M. Lambert notices two instances in which parasitic *Muscidæ* had been produced from *Chrysomela Graminis* and *Timarcha coriaria*, (Ann. Soc. Ent. Fr. ix. p. xxii.) The parasite from the former of these insects has been described by M. R. Desvoidy, under the name of *Rhinomyia Lamberti*, (Op. cit. p. xxvii.)

M. Léon Fairmaire has published (Ann. Soc. Ent. Fr. viii. 535) a monograph on the genus *Cytonus*, consisting of eleven species, chiefly from Spain, the major part new to science. The memoir published by Messrs. Mulsant and Wachanru, in the Trans. Acad. Lyons, 1849, has supplied the author with the details relative to the habits and transformations of *C. rotundatus*.

The European species of *Clythridæ* described by Lacordaire, have been revised by Suffrian in the 'Zeitung' of the Stettin Society, p. 194.

M. Lucas (Ann. Soc. Ent. Fr. ix. 29) has given us some interesting observations on the remarkable striated cocoon and metamorphoses of *Clythra octo-signata*, *Fabr.*

A memoir by Cornelius on the transformations of various species of *Cassida*, appears in the Stettin 'Zeitung,' p. 88. Those of *C. Austriaca* are also described by Bach, in the same work, p. 158.

ORTHOPTERA AND NEUROPTERA.

Dr. Fischer has published a 'Beitrag' on the Orthoptera and Neuroptera of Breisgau, (17th Bericht of the 'Mannheimer Vereins.')

ORTHOPTERA.

Herr Von Borck has published a revision of the Scandinavian Orthoptera, (Skandinavien Rätvingade Ins. Nat. Hist. ; Lund.)

A paper upon fossil *Blattidæ* and *Acrydites*, by Herr Giebel, has appeared in the 2nd Jahresbericht of the Natural Society of Halle.

LOCUSTIDÆ.

The *Locustidæ* of Algeria, accompanied by the description of a new and beautiful species, have formed the subject of a memoir by M. Lucas, (Ann. Soc. Ent. Fr. 1851, 3rd trim.)

M. Brisout de Barneville has described several new species of *Acridium*, *Acinipe*, and *Tetrix*, from Algeria and France, (Ann. Soc. Ent. Fr. viii. pp. lvi. lxiii.)

A new genus of Orthoptera, named *Dachinia*, is described by Haldemann, in the 'Transactions of the American Association for the Advancement of Science' for 1850.

NEUROPTERA.

HEMEROBIIDÆ.

Dr. Hagen has continued his revision of the modern literature of the Neuroptera, his recent articles consisting of the genera *Nematoptera* and the *Hemerobiidæ*, in the Stettin 'Zeitung,' pp. 118, 185; *Ascalaphidæ*, p. 186; * *Phryganeidæ*, p. 365.

Dr. Schneider's 'Symbolæ ad Monographiam Generis *Chrysopæ*' (Vratislav. 1851, pp. 178, tab. 60), is one of the most complete monographs hitherto published, containing 53 species of the restricted genus *Chrysopa*, and 1 of the new closely allied genus *Apochrysa*. The plates are quite remarkable for their elegance and delicacy.

The species of the genus *Chrysopa* found in Austria have been described by Brauer in Hardinger's 'Abhandlungen.' A critical notice of this memoir is appended by Schneider at the end of his monograph on the same genus.

M. F. Dujardin has published (Ann. Sci. Nat. 3rd ser. xv.) the description of a neuropterous larva, apparently allied to *Hemerobius*, but without elongated mandibles and maxillæ, and with dilated palpi, which he regards as that of *Hemerobius hirtus*, but which appears to be that of the genus *Coniortes*, *Westw.* (*Coniopteryx*, *Curt.*, *Malacomyza*, *Wesm.*), agreeing with Mr. Haliday's figure, published by Mr. Curtis, in most of its essential characters.

ASCALAPHIDÆ.

Descriptions of four Russian species of *Ascalaphus* have been published by Eversman in the Bull. Soc. Nat. Moscow, 1850, pt. 3.

PERLIDÆ.

A paper by Mr. G. Newport, on the anatomy and affinities of *Pteronarcys regalis*, *Newm.*, with descriptions of some American *Perlidæ*, and notes on their habits, has appeared in the Trans. Linn. Soc. xx. pt. iii.

TRICHOPTERA.

PHRYGANEIDÆ.

A memoir by Hagen on *Phryganea grandis* and *striata*, appears in the 5th volume of the 'Linnæa Entomologica.'

A note by Hagen on the remarkable *Phryganideous Dromophila montana*, and on the identity of *Lepinotus*, *Heyden*, with my genus *Clothilla*, † appears in the Stettin 'Zeitung,' p. 164.

* The new Indian species described in my 'Cabinet of Oriental Entomology,' are not noticed.

† The contraction *Westm.*, twice repeated, may possibly be mistaken for that of the name of Wesmael, who has written upon the allied groups.

HYMENOPTERA.

An important memoir on the structure of the female organs of generation in the Hymenoptera, by M. L. Duthiers, has appeared in the 12th and 13th volumes of the *Ann. Sci. Nat.* 3rd ser.; in which the author has endeavoured to prove that the saw of the Serrifera, the ovipositor of the Terebrantia, &c., and the sting of the Aculeata, are only modifications of one and the same instrument, as asserted by myself in the 'Introduction to the Modern Classification of Insects.' The author has given highly magnified views and descriptions of these parts, in all the chief types of the order.

A notice of the geographical distribution of the Hymenoptera of North America, has been published by Mr. Adam White, (*Ann. Nat. Hist.* viii. 503).

Mr. F. Smith has also published descriptions of various East Indian Hymenoptera in the collection of the East India Company, collected by Mr. Ezra Downes, with notes on their economy, (*Ann. Nat. Hist.* ix. 44). Also, descriptions of four new British Hymenoptera belonging to the families Chrysididæ, Crabronidæ and Apidæ (*Zool.* cxxv.)

A note by Mr. F. Smith, on the Hymenoptera of the Undercliff of the Isle of Wight, makes us acquainted with several new British species of ants and other Aculeata, and is accompanied by remarks on the habits of *Philanthus triangulum*, and on the singular position in which *Fœnus assectator* hangs suspended by its mandibles beneath the umbels of the wild carrot when asleep, (*Zool.* 3248).

Thirty species of new Prussian Hymenoptera, belonging to different families, are described by Foerster in the 'Verhandlungen' of the Prussian Rhenish Natural History Society, 7th year.

TENTHREDINIDÆ.

A note upon the economy of *Trichiosoma lucorum*, with reference to the mode in which it escapes from the cocoon, has been communicated to us by Mr. Maysmor, (*Proceedings*, p. 82).

Mr. Stephens has announced the discovery of the *Selandria sericea*, a Tenthredinidan new to Britain; and also described the male of the rare *Lyda inanita*, (*Zool.* 3163).

SIRICIDÆ.

A notice by the late Mr. Edward Doubleday of the transformations of *Sirex Gigas*, with a beautiful plate, is published in the last part of the 'Proceedings of the Zoological Society.'

ICHNEUMONIDÆ.

Three articles by Professor Wesmael, on the Ichneumonidæ, have appeared in the 16th volume of the 'Bulletin' of the Acad. Roy. de Belgique. 1. A Review of the genus *Anomalon*, divided into 5 subgenera, containing 20 species. 2. Adnotiones ad Descriptiones Ichneumonum Belgii. 3. A Notice of the Belgian Species of *Metopius*, *Banchus* and *Coleocentrus*.

A monograph by Herr Foerster of the genus *Pezomachus*, *Grav.*, has appeared (Berlin, 1851, pp. 240), comprising 233 species, divided into 9 subgenera, *Pezomachus* alone containing 201 species.

The continuation of M. Boyer de Fonscolombe's memoir on the Ichneumonidæ of

the environs of Aix, in Provence, containing descriptions of 19 species of Phygadeuon, appears in the *Ann. Soc. Ent. Fr.* ix. 103.

A memoir by Herr Foerster on the apterous Ichneumonidæ, forming the genus *Pezomachus*, has appeared in the continuation of Wiegmann's 'Archives,' 15th year, 5th part.

CYNIPIDÆ.

A note on the habits of *Cynips Calicis*, *Burgsd.*, by Kollar, appears in the *Proceedings of the Roy. Acad. Sci. Vienna*.

CHALCIDIDÆ.

Mr. F. Walker has continued the publication of his descriptions of Chalcididæ, in the *Ann. Nat. Hist.* vii. 210, ix. 39. With the exception of a neat synopsis of the *Trichogrammini*, communicated by Mr. Haliday, the descriptions are of isolated species.

CHRYSIDIDÆ.

Descriptions by Dr. Dahlbom, of species of Chrysididæ from Southern Africa, appear in the 'Proceedings of the Royal Academy of Stockholm' for 1850, containing 1 new species of *Omalus*, 7 of *Chrysis* (6 new), and 1 of *Stilbum*.

ACULEATA.

An excellent 'Catalogue of the British Aculeate Hymenoptera,' by Mr. F. Smith, has been published by the Trustees of the British Museum.

Mr. F. Smith has described a number of new and interesting exotic aculeate fossorial Hymenoptera, including a new genus, *Larraxena*, and a description of the previously uncharacterized genus *Sericophorus*, in the *Ann. Nat. Hist.* vii. 28.

FORMICIDÆ.

Herr Foerster, of Aix, has published, under the title of 'Hymenopterologisches Studien' (Aachen, 1850), a monograph on the Rhenish species of Formicidæ.

A review of the first part of M. Foerster's 'Hymenopterologisches Studien,' has been published by Dr. Nylander (*Ann. Nat. Hist.* viii. 126), in which the latter has commented upon or corrected the nomenclature of the species.

The Rev. A. C. Smith describes the ants' nests in Norway to be occasionally from 2 to 4 feet high; and adds that the inhabitants use the insects to give a flavour to their corn-brandy by bruising them in it, ('*Zoologist*,' 3257).

MASARIDÆ.

A note by M. de Romand, on the structure of the antennæ of both sexes of the *Masarides*, appears in the *Ann. Soc. Ent. Fr.* ix. p. li.; and see L. Dufour's memoir above referred to, p. 144.

VESPIDÆ.

A memoir by Schilling, on the Silesian species of Vespidæ, appears in the 'Proceedings of the Entomological Section of the Natural History Society of Silesia' for 1850.

Mr. F. Smith has given us a notice of the nest of *Polistes Lanio*, and of the discovery of *Trigonalys depressa*, as a parasite in one of its cells, as well as a description

of the nest of one of the social *Vespidæ*, formed entirely of sandy loam, (Trans. Ent. Soc. n. s. i. 176). He has also published a note on the habits of the genus *Abispa*, (Ibid. 180).

Some interesting notes on the economy of the hornet, have been communicated by Mr. H. W. Newman, (Proc. Ent. Soc. 72).

A note by Mr. H. W. Newman, on the habits of British wasps, appears in the 'Zoologist,' 3164.

A paper by Mr. F. Smith, on the specific distinctions between *Vespa vulgaris* and *V. germanica* (which he had previously regarded as identical), appears in the 'Zoologist' (p. clxxxiii.) In addition to the characters derived from external markings, the writer has had recourse to the differences in the structure of the male generative organs, in which he finds still more decisive proofs of the specific difference of the two insects. The superiority of these organs, as affording fixed specific characters, had been so long ago pointed out by Kirby (Mon. Ap. Aug. i. 39) and MacLeay (Horæ Ent. i. 1), that it is surprizing they are not more frequently had recourse to. Mr. Smith has also arrived at different results from Reaumur, as to the number of individuals composing the wasp-nest in a season.

ANDRENIDÆ.

A note by Mr. Meade on the habits of *Andrena albicans*, and on the occurrence of a pupa of *Calathus Cisteloides* close to its burrow, appears in the 'Zoologist,' 3221.

APIDÆ.

Mr. Smith has communicated a very interesting note to the 'Zoologist' (p. 3253), on the habits of *Osmia parietina* (= *Anthophora inermis*, Zett.), 230 cocoons of which were discovered on the under side of a stone, 10 inches by 6. The parasitic *Chrysis austriaca* was found in some of the cocoons. Mr. Smith adds notes on the distinction of the females of the different species of *Osmia*.

The nest of *Chalicodoma Sicula*, a mason bee of Sicily and North Africa, has been described by M. Lucas, (Ann. Soc. Ent. Fr. ix. p. xlv.)

A remarkable account of the proceedings of a wild bee in British Guiana, published in Dickens's 'Household Words,' has been brought under our notice by Mr. F. Smith, (Proc. Ent. Soc. 76).

Mr. F. Smith has published some observations on the Australian genus *Lestis*, with the description of a new species, (Trans. Ent. Soc. n. s. i. 179).

Mr. E. Newman has published a notice of the mode in which bees open the blossoms of the snapdragon, (Proceedings, 37).

The habits of various species of humble bees have formed the subject of several notices, communicated by Messrs. H. W. Newman, F. Smith, and Walcott, (Proceedings, pp. 86, 93, 109, 111).

Dr. Von Frantzius has described a small Acarus-like parasite, apparently allied to *Triungulinus*, in the nest of the Javanese *Xylocopa amethystina*, in the Natur. Archiv. v. Neerlands Indie (iii. Jaarg.), reprinted in the Stettin 'Zeitung,' p. 237.*

A new edition of Richardson's 'Hive and the Honey-bee,' with additions by myself, has appeared; also, a new edition of Milton's 'Practical Bee-keeper,' of Golding's

* Dr. Schilling has described, in his 'Beitrage,' a curious *Gamasus*, *G. cerapus*, found on *Xylocopa violacea*.

'Shilling Bee-book,' and of the 'Description of the Bar and Frame Hive invented by W. A. Munn, Esq., (Van Voorst, 1851). Dr. Bevan has also published two lectures on bee-culture, under the title of 'Hints on the History and Management of the Honey-bee.'

HEMIPTERA AND HOMOPTERA.

A paper by Wallenberg, on the Hemiptera and Homoptera of Eastern Scania, appears in the 'Proceedings of the Royal Academy of Stockholm,' for 1850.

HEMIPTERA.

The first part of the 'Catalogue of the Hemipterous Insects in the British Museum Collection,' containing a very great number of new species, by Mr. Dallas, has been published by the Trustees. The care bestowed by the author upon this first part merits the thanks of the entomological world.

M. Signoret has described 16 new species of Hemiptera from Gaboon, chiefly belonging to the Scutelleridæ and Pentatomidæ, (Rev. Zool. 1851, p. 438).

A number of new exotic species of Pentatomides and Edessides have been described and illustrated with an excellent plate, by the same author, (Ann. Soc. Ent. Fr. 1851, 3rd trim.); and a new species of Petascelis, of large size, from Port Natal, has been described by him, (Ann. Soc. Ent. Fr. ix. 121).

Mr. Dallas has published a monograph on the four British species of Acanthosoma, (Trans. Ent. Soc. i. n. s. 109).

A new species of Rhyparochromus (*R. brachiideus*) has been described by M. L. Dufour, (Ann. Soc. Ent. Fr. 1851, 3rd trim.)

HOMOPTERA.

Dr. Asa Fitch's 'Synoptical Catalogue of the Homopterous Insects of the State of New York,' has appeared in the 'Fourth Annual Report of the Regents of the University on the Condition of the State Cabinet of Natural History.' The new species described are numerous (including a new *Otiocerus*, named after our late Honorary President, O. Kirbii), and several new genera are added in the Membracidæ and Tettigoniidæ.

The 2nd and 3rd parts of Mr. F. Walker's 'Catalogue of the Homoptera contained in the British Museum Collection,' has been published by the Trustees.

Some notes by Dr. G. B. Smith, on the periodical appearance in America of the *Cicada septendecim*, have been communicated to us by Mr. Spence (Proceedings, 80). A further note on the same subject, by the late Mr. R. Spence, appears at p. 103.

A paper by myself, on new exotic species of Homoptera chiefly belonging to the genera separated from Derbe, has been published in the Ann. Nat. Hist. vii. 208.

M. Signoret has published a monograph on the Australian genus *Eurymela*, containing observations on the position of this genus among the Cercopidæ, and descriptions of 18 species, 10 of which are new to science, (Ann. Soc. Ent. Fr. viii. 497).

A paper by Herr Tollin on various species of Cicadellina, including the genus *Typhlocyba*, appears in the Stettin 'Zeitung,' p. 67.

PSYLLIDÆ.

The 3rd part of the 1st volume of the 'Proceedings of the Royal Society of Van Dieman's Land,' contains a curious paper on the secretion called Laap or Lerp, formed upon the leaves of certain Eucalypti, by different species of Psyllidæ, descriptions of which are also given, by Mr. Thomas Dobson.

Dr. Anderson has also communicated the description of a new species of Manna from New South Wales, in the same work.

COCCIDÆ.

Descriptions of two new species of Aleyrodes (A. *Aceris* and A. *Phyllicæ* *) and various new species of Coccidæ, have been published by Bouché in the Stettin 'Zeitung,' 109.

APHIDÆ.

The discovery of a wingless species of Aphidæ, destitute of anal tubercles, in an ants' nest, has been recorded by Mr. Meade, (Zool. 3222).

A curious new genus which infests the leaves of *Quercus sessiliflora*, forming small circular galls, has been described by Kollar under the name of *Acanthohermes Quercus*, ('Proceedings of the Royal Society of Sciences of Vienna').

LEPIDOPTERA.

Dr. Herrick-Schäffer has continued both the plates and text of his fine work, the 'Systematisches Bearbeitung.'

Herr Heydenreich has published a 'Lepidopterorum Europæorum Catalogus Methodicus,' 8vo., Leipzig.

Two memoirs by Wallenberg, on the Lepidoptera of Eastern Scania, with tables of the months in which the insects appear in the larva and perfect states, is published in the 'Proceedings of the Royal Academy of Stockholm' for 1850.

Notes on various Lepidoptera by Herren Schmidt, Bremi and Zeller, appear in the Stettin 'Zeitung,' pp. 74, 83, 145.

A notice of the Lepidoptera of Brunswick, by Herr Heinemann, with a list of the species, appears in the Stettin 'Zeitung,' 55.

Nickerl has published the 1st part of a 'Synopsis of the Lepidoptera of Bohemia,' (royal 8vo. 1850).

Dr. Von Nordman has given a notice of the Lepidoptera of Taurian Caucasus, with 6 plates, in the 'Bulletin Soc. Nat. Moscow;' and Dr. Eversmann has also published some new Russian species in the same work.

The Lepidoptera of the neighbourhood of Bologna have been published by Bertolini, (Hist. Lepidopt. Agri Bonon. 4to. 1850).

A list of 49 species of Lepidoptera from Southern Persia, including 10 new species of Diurnal Lepidoptera, described by Kollar, has appeared in the 1st volume of the 'Transactions of the Royal Academy of Sciences of Vienna.'

A paper by Signor Bertolini, on the Lepidoptera of Mozambique, has appeared in the 'Transactions of the Academy of Bologna.' It contains descriptions of only 3 new species, belonging to the genera *Papilio*, *Hesperia*, and *Deilephila*.

* Sic. An A. *Phillyreæ*, *Haliday*?

The Lepidoptera of Lake Superior have been described by Dr. T. W. Harris, in Professor Agassiz's work on Lake Superior.

A controversy on the adoption by Mr. Stephens, of the generic names of Lepidoptera proposed by Hübner in his 'Verzeichniss,' has been carried on by Messrs. H. Doubleday, Guenée, and Stephens, in the 'Zoologist.' It is clear, that if any of Hübner's groups are well founded, and had not been previously indicated and named, his generic names must be adopted.

The question as to the superior value of the characters derived from the transformations of Lepidopterous insects, has been further discussed by M. Bruand (Ann. Soc. Ent. Fr. ix. 89), who has replied to M. Guenée, and corrected his figures of the veins of the wings of Noctuæ *Batis* and *derasa*.

DIURNA.

The publication of the 'Genera of Diurnal Lepidoptera,' commenced by the late Mr. Edward Doubleday, and continued by myself, with illustrations by Mr. Hewitson, has been continued, the work being now nearly completed.

The 1st quarterly part of a new work by Mr. Hewitson, containing illustrations of new species of exotic butterflies, has also appeared. Each number is to contain 3 plates, each plate several figures, according to the size of the species. The 1st part contains various new species of the genera *Ithomia*, *Catagramma*, and *Epicalia*.*

Mr. Hewitson has published a memoir in our 'Transactions' on four new Brazilian butterflies, and notes on the identification of the sexes of various Brazilian species of *Papilio*, hitherto regarded as distinct, (n. s. i. 97).

A memoir by M. Kollar on the diurnal Lepidoptera of New Granada and Venezuela, containing descriptions of new species of *Papilio*, *Morpho*, and *Pieridæ*, with 4 plates, has appeared in the 1st volume of the 'Transactions of the Royal Academy of Sciences of Vienna.'

A critical revision of the European butterflies has been published by Keferstein in the 'Zeitung' of the Stettin Entomological Society, pp. 220, 242, 272.

Several livraisons of a new work by M. De la Haye, on the Lepidoptera of France, containing beautifully coloured figures of all species, at a very low price, have appeared.

M. Alex. Lefebvre (Ann. Soc. Ent. Fr. ix. 71) has given us a remarkable memoir on the fossil Lepidopterous insect figured by Dr. Boisduval in the 1st series of the 'Annales' (ix. 371, pl. 8), under the name of *Cylo sepulta*, but which from a consideration of the veins of the wings, M. Lefebvre regards as allied to *Vanessa Archesia*, the anterior (and not the posterior wings, as supposed by Boisduval) wings being strongly angulated, instead of the hind ones being furnished with a short tail, and the markings on the supposed hinder wings being those of the under side of the fore wings.

A note on the North-American species of the genus *Papilio*, by Dr. J. P. Kirtland, has appeared in our 'Proceedings,' p. 101.

Papilio Telamon of Donovan has been formed into a new genus, *Sericinus*; and

* From information received from Mr. Bates, in South America (which I have confirmed by an examination of the feet of all the specimens in the British-Museum collection), it appears that the orange-spotted species of *Epicalia* are the males of the 2nd section of *Myscelia*, to which Mr. E. Doubleday applied Hübner's name *Catonephele*, (Gen. D. Lep. 222).

descriptions of it and of *Thaumantis Howqua* and *Drusilla Mylæcha*, have been published by myself in our 'Transactions,' vol. i. n. s. p. 173.

The structure of the pouch-like apparatus attached to the abdomen of the females of the genus *Parnassius*, has been described by Von Siebold, in Siebold and Kolliker's 'Zeitschrift f. w. Zoologie,' Band iii., reprinted in the Stettin 'Zeitung,' p. 176.

A new European species of *Pontia* is described by Mayer in the Stettin 'Zeitung,' p. 151.

The caterpillars of *Limenitis Camilla* and *Sibylla* have been described by Mr. De la Chaumette (Zool. 3237), and of the latter by Mr. Hunter (Ibid. 3185).

A remarkable variety of *Cynthia Cardui* is described by Mr. Newman, (Zool. 3304).

A remarkable emigration of *Papilio Cardui* took place at Turin, on the 26th of April, (Ghiliani, Ann. Soc. Ent. Fr. ix. p. lv.)

SPHINGIDÆ.

Mr. De la Chaumette has published a series of interesting notes on the larvæ of the Sphingidæ observed in Switzerland, in the 'Zoologist,' (pp. 3100, 3158, 3241); and also on the habits and transformations of *Aglaia Tau*, (Ibid. 3063).

NOCTURNA.

A remarkable fact has been communicated to us by Mr. J. C. Bowring, of the occurrence of a parasite resembling a large *Coccus*, covered with white cottony matter, which is found upon the dorsal abdominal segments of *Fulgora candelaria*, and which proves to be the larva of a moth with strongly pectinated antennæ, ('Proceedings,' pp. 37, 76, 404).

Two memoirs by M. Bouchardat on the digestive powers and upon the diseases of silk-worms, have been published in the 'Revue Zoologique,' 1851, pp. 34 and 41.

An extended series of experiments on the muscardine and other diseases of silk-worms, by Messrs. Guérin-Ménéville and Eugène Robert, has appeared in the 'Annales de la Société Séricole,' tome 13.

M. Guérin-Ménéville has also communicated to the Académie des Sciences, the 'Résultats scientifiques et pratiques obtenus de 1847 à 1851, sur les maladies des Vers à Soie, et sur les meilleurs moyens de perfectionner leur race ou d'arrêter leur dégénérescence.'

A plan for employing the silk spun by the larvæ of the processionary moth (*Bombyx pityocampa*), was submitted to the Académie des Sciences by Messrs. Falguière and Cotelle on the 28th of July, 1851.

A memoir by Wahlberg, on the larvæ of *Psyche graminella*, appears in the 'Proceedings of the Royal Academy of Stockholm' for 1850.

Dr. Von Siebold's curious observations on the Psychidæ and their supposed Parthenogenesis, published in the 'Proceedings of the Entomological Section of the Natural History Society of Silesia' for 1850, and Stettin 'Zeitung' for November, have been translated by Mr. Stainton, (Trans. Ent. Soc. n. s. i. 234).

Three new genera of Nocturnal Lepidoptera have been established by Mr. Wing, upon species, natives of South Africa, Brazil, and Australia, in the last part of the 'Proceedings of the Zoological Society,' under the names of *Caligatus*, *Trichomoplata* and *Palparia*.*

* This last name was long ago used by Haworth for a genus of small moths.

Mr. H. Doubleday has published a note on the habits of the recently discovered *Hydræcia Petasitis* (Zool. 3289).

A Geometridan allied to *Abraxas*, which infests the gooseberry and currant in the State of New York, has been described and figured by Dr. Asa Fitch under the name of *Abraxas? ribearia*, (Trans. New York State Agric. Soc. vii. See also Proc. Ent. Soc. p. 106).

MICRO-LEPIDOPTERA.

A note on the habits of *Tortrix roserana*, injurious to the vine in Austria, has been published by Kollar, (Proc. Roy. Soc. Sci. Vienna).

Mr. J. A. Hill has published a few interesting notes on the habits of various Tortricidæ and Depressariæ, (Zool. 3245, 3288).

M. Goureaux has published a memoir on *Sericoris antiquana*, (Ann. Soc. Ent. Fr. 1851, 3rd. trim.)

A small volume with the title of the 'Entomologist's Companion, being a Guide to the Collection of Micro-Lepidoptera, and comprising a Calendar of the British Tineidæ,' has been published by Mr. Stainton, containing:— 1. A List of the Genera and Species of Tineidæ, with the times of their appearance in the different states. 2. A Monthly Calendar, with a list of the species appearing in each month.

A supplemental Catalogue of British Tineidæ has been published by Mr. Stainton.

A note by M. Boyer de Fonscolombe affirms the identity of *Æcophora Oleella* and *Elachista Olivella*, (Ann. Soc. Ent. Fr. ix. p. xvii.)

The identity of *Æcophora Oleella*, the larvæ of which in spring mine the leaves of the olive, and *Elachista Olivella*, the larvæ of which, in the autumn, feed on the fruit, has been re-affirmed by M. Ghiliani, (Ann. Soc. Ent. Fr. ix. p. lv.) So remarkable a modification of the habits of a species is deserving of attention.

The employment of the tissue spun by *Yponomeuta padella*, was brought under the notice of the meeting of the British Association at Edinburgh, in July, 1850.

Mr. Stainton's translation of Nicelli's memoir on *Lithocolletis*, containing 26 species, has appeared in the 'Zoologist,' p. cl.

The genera *Incurvaria*, *Micropteryx*, and *Nemophora*, are critically revised by Zeller in the 5th volume of the 'Linnaea Entomologica.'

Mr. Douglas has continued his memoir on *Gelechia* (Trans. Ent. Soc. n. s. i. 101), describing 10 additional species.

Mr. Stainton's monograph of the species of *Gracillaria*, *Haw.*, has appeared in our 'Transactions,' (n. s. i. 115, 183). Twenty-four species are described, 16 of which have occurred in this country.

A memoir by Nicelli on the Pomeranian species of *Lithocolletes* appears in the Stettin 'Zeitung,' 1850, pp. 34—51.

A new species of *Lithocolletes* from Northumberland, is described by Mr. Logan (Trans. Ent. Soc. 182); and another by Mr. Stainton in our 'Proceedings,' p. 112.

DIPTERA.

M. Léon Dufour's extended researches on the anatomy and physiology of the Diptera, have appeared in the 11th volume of the Mémoires des Sav. Etr. published by the Académie des Sciences, with 11 plates.

A memoir by M. Blanchard on the typical construction of the various parts of the

mouth of Dipterous insects, was read before the Académie des Sciences on the 16th of September, 1850.

A revision of the Diptera contained in the Linnæan cabinet, by Mr. Haliday, has been published in the Stettin 'Zeitung,' p. 131.

'Insecta Britannica. Diptera: Vol. i.,' is the title of the 1st volume of the series above alluded to. It contains the Brachycerous Diptera (except the Muscidae and Cestridae), described by Mr. F. Walker. The synoptical tables of the distribution of the families of the whole order, as well as of the genera of Empidæ and Syrphidæ, and the whole of the text of the Dolichopidæ, are by Mr. Haliday. The species of the last named family, as well as of the Empidæ (including the Tachydromidæ and Hybotidæ) have especially received considerable addition to their numbers. Each genus is more or less fully illustrated in ten elementary plates, Mr. Haliday having contributed elaborate details of several of the smaller genera.

The 2nd part of the 'Insecta Saundersiana,' by Mr. F. Walker, has appeared (8vo. pp. 80), containing descriptions of a great number of new exotic species and genera of the families Stratiomydæ and Asilidæ, with figures of 16 of the most interesting genera.

The 8th and 9th volumes of Zetterstedt's 'Diptera Scandinaviæ' have lately appeared at Lund.

TIPULIDÆ.

An elaborate memoir by Loew on the natural history of the gall-midges (Cecidomyia and Lasioptera), with a beautiful plate, appears in the 'Program' of the Royal Gymnasium of Posen for 1850, accompanied by a synoptical table of the species (62 Cecidomyiæ and 7 Lasiopteræ), amongst which are a great number of new species.

Dr. Loew's supplemental memoir on the gall-midges (Cecidomyiæ), and upon various new Tipulariæ terricolæ and European Asilidæ, have appeared in the 5th volume of the 'Linnæa Entomologica.'

A note by Mr. Brown, on several species of Cecidomyia which attack wheat when in blossom, appears in our 'Proceedings,' p. 105.

EMPIDÆ.

M. Alex. Lefebvre has published an extended notice relative to Empis platyptera (Ann. Soc. Ent. Fr. ix. 125), discovered by himself for the first time in France.

ASILIDÆ.

M. Léon Dufour has published extended descriptions, with figures of the larvæ and pupæ, of a number of species of Asilus, Dasypogon and Laphria, (Ann. Sci. Nat. 3rd ser. xiii. 141).

SCENOPINIDÆ.

The position of the curious genus Scenopinus in a higher range than that assigned to it by Latreille, among the Muscidæ, has been confirmed by the figure and description of the pupa given by M. L. Dufour, (Ann. Soc. Ent. Fr. viii. 493). M. Dufour is however in error in asserting that "les archives de la science gardent le silence le plus absolu sur les métamorphoses du Scenopinus," as its larva and pupa are described in my 'Introduction,' ii. 554, the former exactly resembling that of Thereva plebeia.

DOLICHOPIDÆ.

A new species of *Rhaphium* from Gothland is described by Steinhilber, and 16 new species of *Dolichopus* by Wahlberg, in the 'Proceedings of the Royal Academy of Stockholm,' 1850.

MUSCIDÆ.

A memoir on the Silesian species of *Tetanocera*, by Dr. Scholtz, containing descriptions of 18 species, appears in the 'Proceedings of the Entomological Section of the Natural History Society of Silesia,' for 1850.

M. Macquart has continued his descriptions of the European *Tachenariæ* (*Ann. Soc. Ent. Fr.* viii. 419), containing the genera *Phorocera* (19 species), *Frontina* (3 species), *Metopia* (9 species), *DeGeeria* (21 species), *Masicera* (61 species). Four crowded plates represent the wings and profile of the heads of the species, with full figures of the four first-named genera. The species are parasitic on *Lepidoptera*, except the *Metopiæ*, which infest the fossorial *Hymenoptera*.

The continuation of M. Robineau Desvoidy's memoir upon the *Myodaires* or *Muscidæ* found in the environs of Paris, has appeared in the *Ann. Soc. Ent. Fr.* ix. 177. The genera here treated upon are *Thryptocera* (5 species), *Herbstia* (1 species), *Actia* (2 species), *Osmæa* (1 species), *Ramburia* (1 species). The larvæ of the species whose habits have been observed, reside in the bodies of the larvæ of *Tineidæ*. A further continuation, containing *Zonia* and the allied genera, appears in the 3rd trimestre of the same volume of the 'Annales.'

The natural history of numerous small species of *Muscidæ*, the larvæ of which mine the leaves of different plants, together with that of the various *Ichneumonidæ* and *Chalcididæ* which are parasitic upon them, has been described and illustrated with figures by Colonel Goureau, (*Ann. Soc. Ent. Fr.* ix. 131).

M. Robineau Desvoidy has described in the 'Revue Zoologique,' 1851 (p. 147), 10 species of *Muscidæ* obtained by Col. Goureau from the chrysalides of various *Lepidoptera*, chiefly *Tortricidæ*, which roll up the leaves of different kinds of fruit-trees. A second memoir by the same author, on species of *Muscidæ*, the larvæ of which mine the leaves of different plants, appears in the same work, (pp. 229, 391).

M. L. Dufour communicated to the Académie des Sciences, on the 11th of August, 1851, the history of a species of *Muscidæ*, *Hyalomyia dispar*, the larva of which resides as a parasite within the body of a perfect beetle, *Brachyderes lusitanicus*, the spiracles at the extremity of its body occupying one of the spiracles of the perfect beetle, (*Rev. Zool.* 1851, p. 408; and *Ann. Nat. Hist.* viii. 425).

A valuable memoir by M. Guérin-Ménéville, has been presented to the Académie des Sciences, on the natural history of the *Oscinis Oleæ*, a small fly which deposits its eggs in the young fruit of the olive, within which the larva resides, thus often doing great injury to the crop, and deteriorating the quality of the oil, (*Rev. Zool.* 1851, 241).

A curious circumstance connected with the natural history of *Musca vomitoria* and *fulvibarbis*, has been observed by M. Blanchard, (*Ann. Soc. Ent. Fr.* ix. p. lxii.) A specimen of *Platydictylus muralis*, an Algerine reptile which had been fed upon these insects, and thrown upon them, was at length observed to have its bowels distended, and shortly afterwards died, when its intestines were found filled with nearly full-grown larvæ of these flies, which had been swallowed at the time when ready to deposit their eggs, and these had been hatched in the stomach of the reptile. A similar circumstance had also occurred with a green lizard fed by M. Gratiolet.

A notice of my paper on the Tsetse and Zimb, read at a previous meeting of the Zoological Society, appears in the 'Zoologist,' 3037.

ÆSTRIDÆ.

The occurrence of great quantities of the larvæ of *Æstrus Tarandi*, infesting the rein-deer in the Zoological Society's Menagerie in the Regent's Park, has been noticed by myself, (Proc. Ent. Soc. 76).

HIPPOBOSCIDÆ.

The species of Hippoboscidæ parasitic upon the deer, have been noticed by Von Siebold in the 'Verhandl. des Schlesischen Forstvereins.'

A note by Von Siebold on the spider-fly of the deer, *Lipoptera Cervi*, and its supposed identity with *Ornithobia pallida*, *Meig.*, and *Hæmobora pallipes*, *Curt.*, appears in the 'Proceedings of the Entomological Section of the Silesian Society of Natural History,' for 1850.

M. Lucas (Ann. Soc. Ent. Fr. viii. p. lxxvii.) has published some observations on the singular bee-parasite, *Braula cæca*, *Nitzsch*, (*Eutomobia Apum*, *Costa*).

APHANIPTERA.

A paper by Mr. Newman, on the 'Affinities of the Pulicites,' in which the opinion that they are Dipterous insects without wings is adopted, appears in the 'Zoologist,' p. cxliii. Independently however of the structure of the thoracic segments and their appendages warranting their separation from the Diptera, in respect to the alary Linnæan arrangement, that of the mouth, both of the larva and imago, appears to me to remove them from the Diptera with reference to the cibarian system of Fabricius.

THYSANURA.

Professor Allman has published a notice of the emission of light by *Podura fimetaria*, *Lin.*, numerous specimens of which were observed to be luminous, the light continuing to be visible for many nights.

CRUSTACEA.

Mr. C. Spence Bate has communicated various notes on the Crustacea (Ann. Nat. Hist. vii. 297), namely, 'On the Fifth Pair of Legs in the Anomoura,' 'On the Development of the Shell of Crabs,' 'Shedding the Exuvix,' and 'On the Reproduction of Limbs.' He has also described (ibid. 318) a new British genus of Amphipods, named *Bellia arenaria*, and new British species of *Amphithoë*, *Pagurus* and *Portunus*.

In a memoir by Mr. Huxley on the auditory organs of the Crustacea (Ann. Nat. Hist. vii. 304), Dr. Farre's views (exactly reversing the opinions of previous writers, and considering a sac at the base of the first pair of antennæ in some of the *Podophthalma* to be the auditory organ, whilst the sac in the second pair in all the *Podophthalma* is the olfactory organ, the *Brachyura* being considered as destitute of an auditory organ) are supported by the structure of these organs in a small transparent Crustacean taken in the South Pacific, allied to *Palemon*, and by *Lucifer typus*.

A paper by Sir John G. Dalzell on the exfoliation of the Crustacea, has appeared in the 'Edinburgh New Philosophical Journal,' No. 101.

A memoir by M. Duvernoy on the external organs of generation in the Crustacea, appears in the 'Revue de Zoologie,' 1850, p. 552.

The completion of Dr. De Haan's great work on the Crustacea of Japan, so long delayed by the illness of the author, has been published during the past year.

A series of articles by Mr. Dana has appeared in Silliman's 'American Journal of Science and Arts' (vol. xi. and xii.), giving a complete generic synopsis of the Cancroideous, Grapsoideous, and Oxyrhynchous crabs, with descriptions of many new species of Grapsoidea and Oxyrhyncha.

A memoir on the Crustacea of Western Tropical Africa has been published by Dr. Herklots ('Additamenta ad Faunam Carcinologicam Afr. Occid.' 4to. Lugd.-Batav. 1851), containing descriptions of various new species, and an excellent and extended table of the geographical distribution of the Crustacea of the whole of Africa.

Professor L. R. Gibbes has published a list of all the species of Malacostracous Podophthalma in the public collections of the United States,* amounting to 250 in number, of which 22 are described as new, 100 only being known as inhabiting the Atlantic coast of the United States.

The 7th part of Professor Bell's 'History of British Crustacea' has appeared, and is occupied with the genera of Palemonidæ, and also the genera Pasiphæa, Penæus, Cuma, Alauna, Bodotria, and Mysis.

A list of localities of the rarer British Podophthalmous Crustacea in the County Galway, has been published by Dr. Melville, (Ann. Nat. Hist. viii. 236).

A list of the time of spawning of 24 British species of Crustacea has been published by Mr. W. Thompson, (Ann. Nat. Hist. viii. 501).

M. Duchassaing has communicated notices on the habits of 11 species of Brachyura, natives of the Antilles, to the Rev. Zool. 1851, p. 77.

A note by Mr. Dana on the genera Hexapus and Arges, both allied to Pilumnus, is published in Silliman's 'American Journal,' Sept., 1851, and Ann. Nat. Hist. viii. 430.

Mr. W. Thompson has published a note on the occurrence of Athanas nitescens at Weymouth, (Ann. Nat. Hist. vii. 346); also a description of Gonoplax angulata (Ibid. 500), and a notice of Achæus Cranchii (Ibid. viii. 77).

Mr. White has also given an account of the rare Australian Potamobius serratus, and the description of a new species of Gonodactylus from China, (Ibid. 421).

ENTOMOSTRACA.

Dr. Baird's memoir on the Limnadiadæ (11 species, 6 being new), appears in the last part of the 'Proceedings of the Zoological Society.'

A new Entomostracan named Cypridina Zealandica, from New Zealand, has been described by Dr. Baird, (Ann. Nat. Hist. vii. 430).

The development and organization of Nicthoë Astaci, a minute parasite which infests the gills of the common lobster, has been described and figured in detail by Van Beneden, (Mem. Acad. Bruxelles, tome xxiv.); reprinted in the Ann. des Sci. Nat. 3rd ser. xiii. p. 354.

PARASITA.

A memoir by M. Van Beneden, on the species of Lernæidæ (32 in number, 8 of which are new) parasitic on the fishes of Belgium, with the detailed description of a

* The private collection of Mr. Wilson contains more than 1000 species.

new species of *Lerneonema*, parasitic on *Mustela vulgaris*, was communicated to the Academy of Sciences at Brussels, on the 5th of April, 1851.

CIRRHIPEDA.

The development of five different species of Cirrhipedes, belonging to the genera *Balanus*, *Chthalamus* and *Clitia*, from the first bursting of the egg, has been observed and illustrated by Mr. C. S. Bate, (Ann. Nat. Hist. viii. 324).

FOSSIL CRUSTACEA.

The fossil Crustacea of Sweden have been described and figured by H. P. Angelin in his 'Palæontologia Suecica (4to. Lund), fasc. 1. Iconographia Crustaceorum formationis transitionis, (24 plates).

TRILOBITES.

Dr. Taylor, in a communication to Silliman's Journal, has opposed the assertion of Barrande of Prague, that Trilobites vary greatly according to age (and consequently that many of the recently formed genera must be sunk, being established on individuals of the same species of different ages), having observed *Calymene senaria* and *C. Blumenbachii* of all sizes without any variation in their appearance. He has also described a specimen of *Isotelus megistos*, which, if complete, would measure $18\frac{1}{2}$ inches by $9\frac{1}{4}$ inches in size.

ARACHNIDA.

M. E. Blanchard has published (Ann. Sci. Nat. 3rd ser. xii. 316) an extended memoir on the circulatory and respiratory organs of the following Arachnida: — *Epeira diadema*, *Aranea domestica*, *Sagestria perfida*, the scorpion, and *Phalangium opilo*. As the classification of this class is so much dependent on these organs, the memoir acquires additional value. A supplementary note (Ibid. p. 351) describes the blood of the Arachnida and its corpuscles.

SPIDERS.

The 6th volume of the Boston 'Journal of Natural History' completes Dr. Hentz's memoir on the Araneides of the United States; all the species of which are figured, generally of the size of life.

Mr. Blackwell has communicated a very valuable synonymical list of 106 British species of spiders, accompanied by remarks on their habits, to the Ann. Nat. Hist. vii. and viii.

Captain Sherwill has published a note on the habits of a bird-devouring spider on the Kerrakpur Hills on the Ganges, the webs, of a bright yellow colour, being spun across paths, and in one of them a bird was found entangled, upon which the young spiders, eight in number, were feeding, (Ann. Nat. Hist. vii. 427).

A memoir on the genus *Salticus*, and on a new species found near Paris, closely resembling an ant, has been published by M. Lucas in the 'Revue Zoologique,' 1850, p. 492.

M. Lucas has noticed the occurrence of the genus *Filistata*, hitherto regarded as peculiar to the Old World, in the New, having received a species apparently identical with *F. bicolor*, *Walk.*, from St. Domingo, (Ann. Soc. Ent. Fr. ix. p. xxviii.)

SCORPIONS.

An abstract of M. L. Dufour's memoir on the anatomy of the Scorpionidæ, has appeared in the *Ann. Sci. Nat.* 3rd ser. xv.

A memoir by M. Duvernoy on the generative organs of the scorpion, was read before the Académie des Sciences on the 7th of October, 1850.

MITES.

The species of mites infesting sugar, cheese, meal, and the human body (the itch insect), have been described and illustrated in the '*Pharmaceutical Journal*,' Vol. x. No. 8).

The fact of a species of Acaridæ (*Argas reflexus*) living nearly two years and a quarter without food, is stated by M. Ghiliani, (*Ann. Soc. Ent. Fr.* ix. p. lvi.)

A memoir on the male of the *Acarus Scabiei*, and on the different modes adopted by the two sexes in their attacks on the skin, was read before the Académie des Sciences on the 20th of October, 1851, by M. Bourguignon.

An extended memoir by M. F. Dujardin has appeared, on the species of Acaridæ destitute of a mouth, and generally furnished with suckers at the extremity of the under side of the body, which have been formed into the genus *Hypopus*, but which the author regards as the young of species of the genus *Gamasus*. These *Hypopi* are generally found infesting the bodies of other insects, of various orders. Highly magnified figures of several of them are given, (*Ann. Sci. Nat.* 3rd ser. xii. 243). In a subsequent article (*Ibid.* 259) the author describes 11 of these species or supposed larvæ of *Gamasi*.

M. Laboulbene has published the descriptions of several new species of Acaridæ, and of a new species of *Hydrachna*, in the *Ann. Soc. Ent. Fr.* ix. 3rd trim.

M. Vogt has given an account of a water-mite (*Hydrachna Concharum*, *Baer*), which lives within the palleated cavity of the *Naiades*, the eggs being deposited in the branchiæ of these Mollusks, it being rare in winter to open a mussel without finding vast numbers of them, (*Ann. Sci. Nat.* 3rd ser. xii. 198).

The development and natural history of a species of water-mite which parasitically infests the *Anodontæ* (*Atax Ypsilophora*) has been described in detail by Van Beneden, (*Mem. Acad. Bruxelles*, tome xxiv.)

M. Dujardin has published the description of the 4-footed Acaridæ which are parasitic on vegetables, especially those of the galls of the leaves of the *Tilia* and *sallow*, which, contrary to the opinion of M. Dugés, he is not inclined to regard as the young of the 8-footed *Dermanyssi*. He accordingly forms them into a distinct genus, named *Phytoptus*. (*Ann. Sci. Nat.* 3rd ser. xv.)

The species of Acaridæ residing in the galls of different vegetables, regarded by Dugés as the young state of species of *Tetranychus*, have also been considered by Von Siebold as perfect animals, and formed by him into a distinct genus, named *Eriophyes*, (*Proceedings of the Entom. Sect. of the Nat. Hist. Soc. of Silesia*, for 1850).

M. Robineau Desvoidy addressed a memoir to the Académie des Sciences on the 22nd of September, 1851, in which he asserts that the prevalent disease of the vines, generally attributed to the Cryptogamous *Oidium Tuckeri*, in fact results from the attacks of an *Acarus*, to which he gives the name of *A. Caldiorum*, allied to *A. telarius*, *Lin.*! And further, that the potato-disease is caused by the attacks of another species of *Acarus*, which he names *A. Solanorum*!!

 ?

M. F. Dujardin has published the description of a new marine animal, provided with four pairs of jointed legs, which he regards as a new form of the Tardigrades, and which he considers as more nearly allied to Acaridæ than to Vermes, (Ann. Sci. Nat. 3rd ser. xv.)

 ?

M. Dujardin has published (Ann. Sci. Nat. 3rd ser. xv. 158), a memoir on a small marine animal (Echinoderus) from St. Malo, which he regards as a type between the Crustacea and Vermes, the head being retractile, and armed with long flexible spines, the body destitute of limbs, and terminated by small caudal plates and setæ. The insect has much the appearance of a Dipterous larva.

Report of the Library and Cabinet Committee for 1851.

The arrangement of the British Lepidoptera has been completed: a quantity of duplicates is the result, which we recommend may be offered in exchange among the Members.

The Curator has been, and still is, engaged in grouping, according to their affinities, the various insects, for the most part exotic, that have from time to time been presented to the Society, as a preliminary step towards their arrangement in the cabinets.

The faulty drawers in one of the cabinets, alluded to in last year's Report, could not be secured against dust by chenille, as then proposed; an arrangement has therefore been made to have the glasses put into tightly fitting frames, at a small expenditure.

Mr. Lumley has furnished the books agreed upon, in exchange for those he received from the Society; and in accordance with the Resolution of this Committee, the balance of £1 18s. 6d. received from Mr. Lumley has been applied to the purchase of the 7th vol. of Meigen's 'Diptera,' and the 2nd and 3rd vols. of Walckenaer's 'Aptera,' to complete the sets of those works. The former has arrived, but the latter are not yet come to hand.

Thirty-two volumes of books in the Library have been bound at an expense of £4 1s. 6d.; and as many remain in want of binding, we recommend the Council to allow £5 to be expended thereon this year.

Mr. Wilkinson having kindly offered to take the principal part in forming a Catalogue of the Books under the two heads of "Authors" and "Titles," a suitable book has been procured, and the work is commenced.

(Signed)

JNO. O. WESTWOOD, President.
 FREDK. SMITH.
 EDWARD W. JANSON.
 J. W. DOUGLAS.

Abstract of the Treasurer's Accounts.

INCOME.

	£	s.	d.	
On hand at the Audit, January 27, 1851	6	17	8	
Arrears of Subscriptions, „ 1848	£ 1	1	0	
Ditto ditto, „ 1849	3	3	0	
Ditto ditto, „ 1850	8	7	0	
Admission Fee pertaining to year 1850	2	2	0	
		14	13	0
Subscriptions for „ „ 1851	88	18	0	
Admission Fees „ „ 1851	23	2	0	
Two Compositions	21	0	0	
Tea Subscriptions	8	16	0	
Sale of 'Transactions'	45	9	1½	
		£ 208	15	9½
Deduct Expenditure	194	2	7½	
Balance in hand	£ 14	13	2	

EXPENDITURE.

	£	s.	d.	
Rent from Midsummer, 1850, to Christmas, 1851, 1½ year	52	10	0	
Fire Insurance to Lady-day, 1852	1	12	6	
Curator	18	4	0	
Tea, Attendance, Coals, Oil, &c.	18	12	4	
Freight, Postage, Stationery, &c.....	2	10	5½	
Printing 'Transactions,' Vol. I. Part 3, n. s.	£ 8	7	0	
„ „ „ 4,	12	5	0	
„ „ „ 5,	9	11	0	
„ „ „ 6,	8	16	0	
„ Bye Laws	3	9	6	
„ List of Members.....	2	7	0	
		44	15	6
„ Report, President's Address, Proceedings, &c.	17	9	9	
Stitching up back parts of 'Transactions,' old series	2	2	6	
Engraving Plates	1	9	6	
Printing Plates, and Materials	15	14	6	
Colouring ditto in 'Transactions,' old and new series	16	9	7	
Binding and purchasing books.....	2	12	0	
		£ 194	2	7½

Liabilities and Assets of the Society.

<i>Liabilities.</i>	£ s. d.	<i>Assets.</i>	£ s. d.
Printer's Bill for 'Transactions,' Vol. I. n. s. pt. 7...	8 14 0	Cash in hand	14 13 2
Ditto, 'Proceedings,' &c. ...	2 15 0	Arrears of Subscriptions for 1851.....	21 0 0
Book for Library Catalogue	1 9 0	Ditto for former years	7 7 0
	£ 12 18 0		£ 43 0 2

State of Progress of the Entomological Society.

	Honorary Members.		Ordinary Members.		Subscribers.	Total of Ordinary Members & Subscribers.
	English.	Foreign.	Annual Subscribers £1 ls.	Who have compounded		
January 1st, 1849.....	2	9	63	8	0	71
„ 1850.....	2	10	57	17	27	101
„ 1851.....	1	10	60	19	40	119
Elected in 1851.....		+ 1	+ 12		+ 4	+ 16
Compounded in 1851..			— 2	+ 2		
Withdrawn in 1851 ...			— 1		— 3	— 4
Deceased in 1851		— 1	— 2			— 2
	1	10	67	21	41	129

Income arising from Annual Subscriptions.

	£ s. d.
January 1st, 1849,	66 3 0
„ „ 1850,	88 4 0
„ „ 1851,	105 0 0
„ „ 1852,	113 8 0

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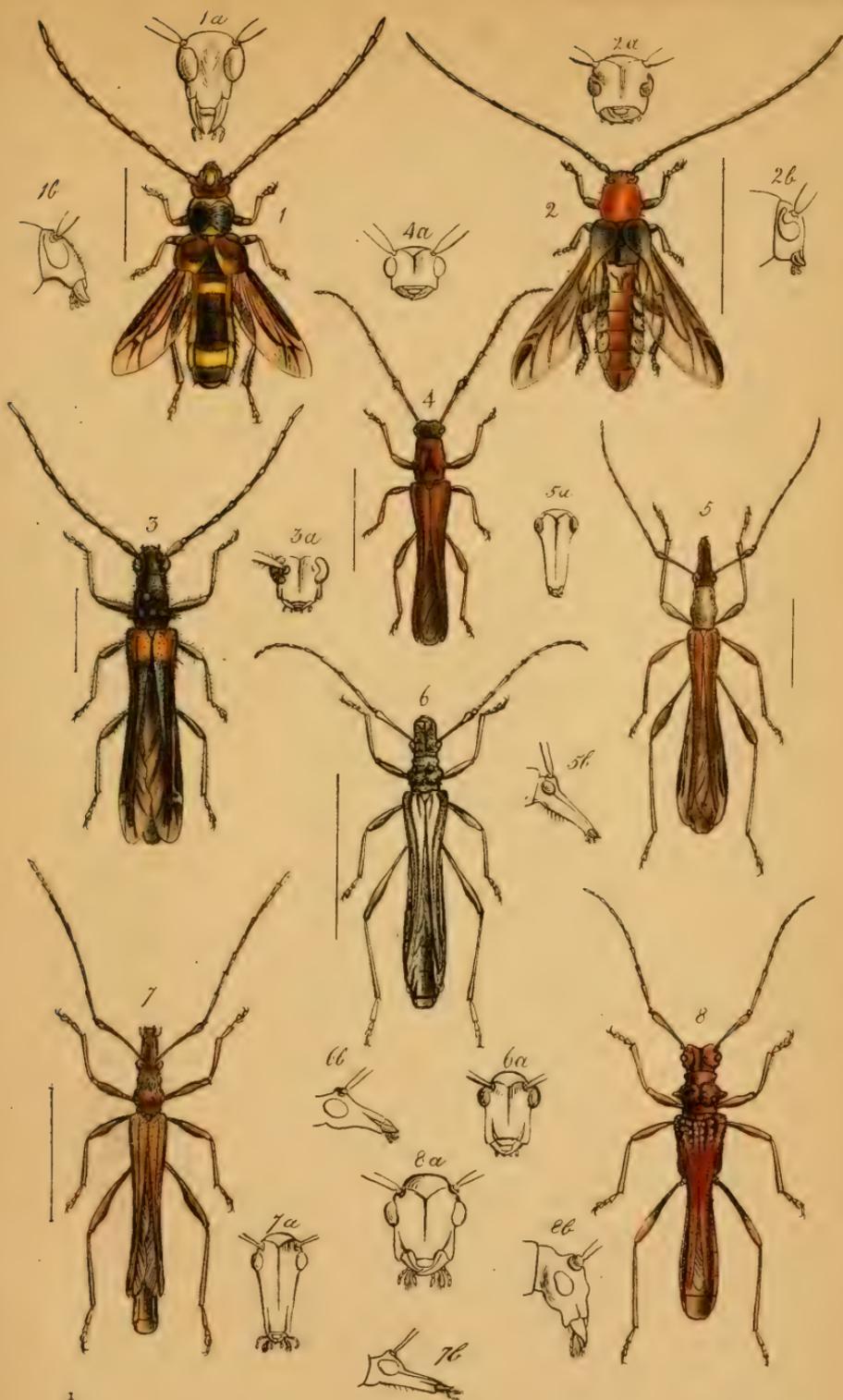
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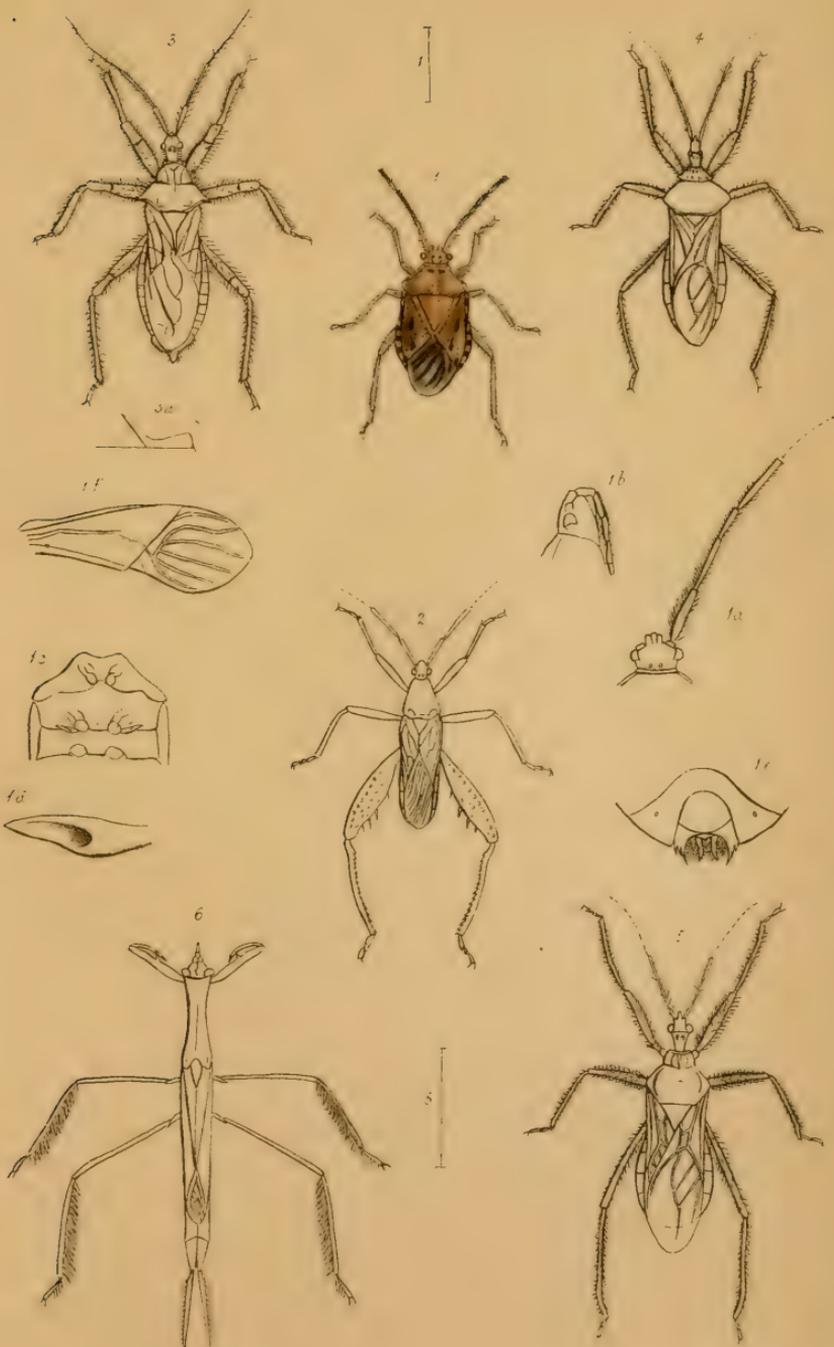
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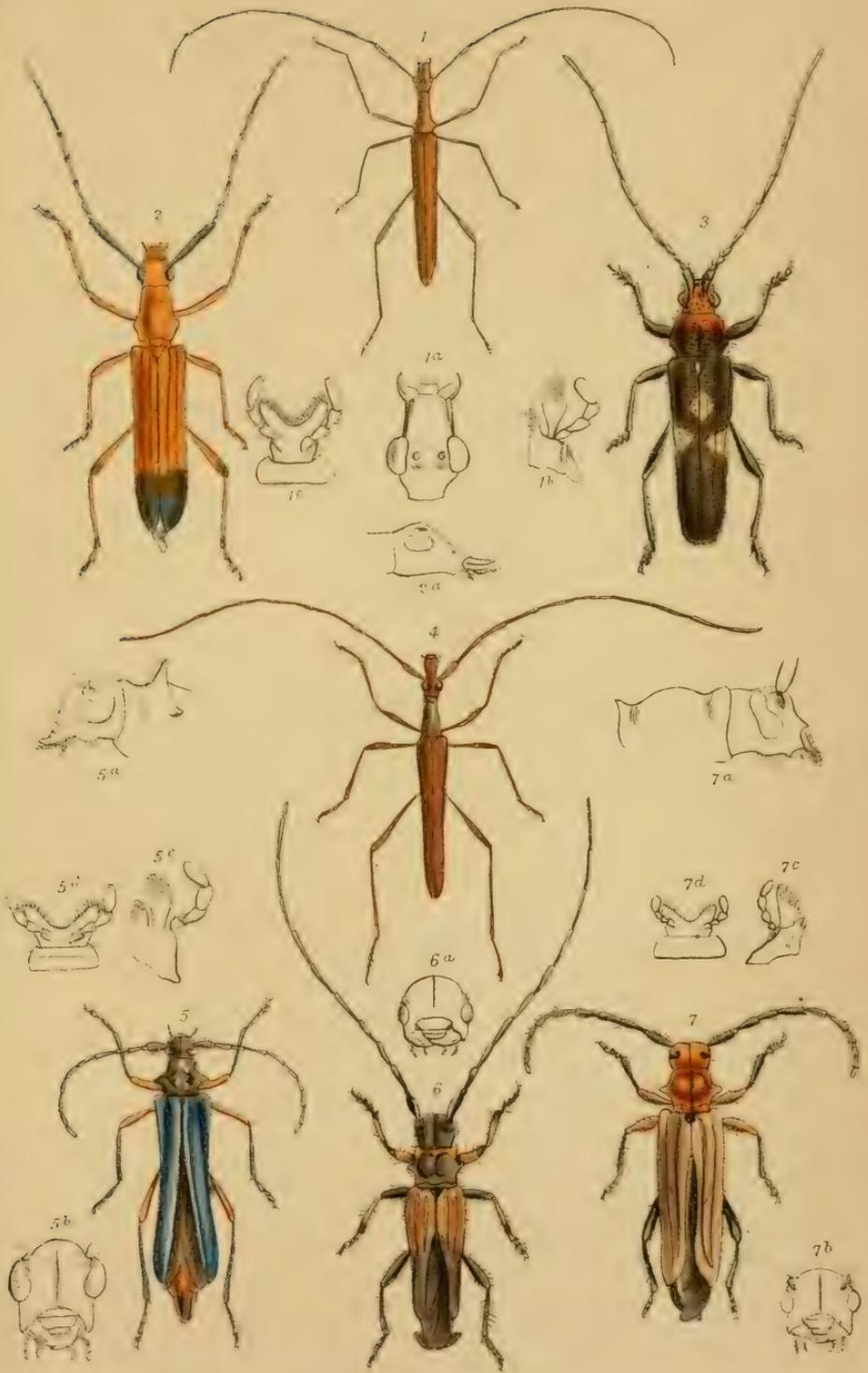
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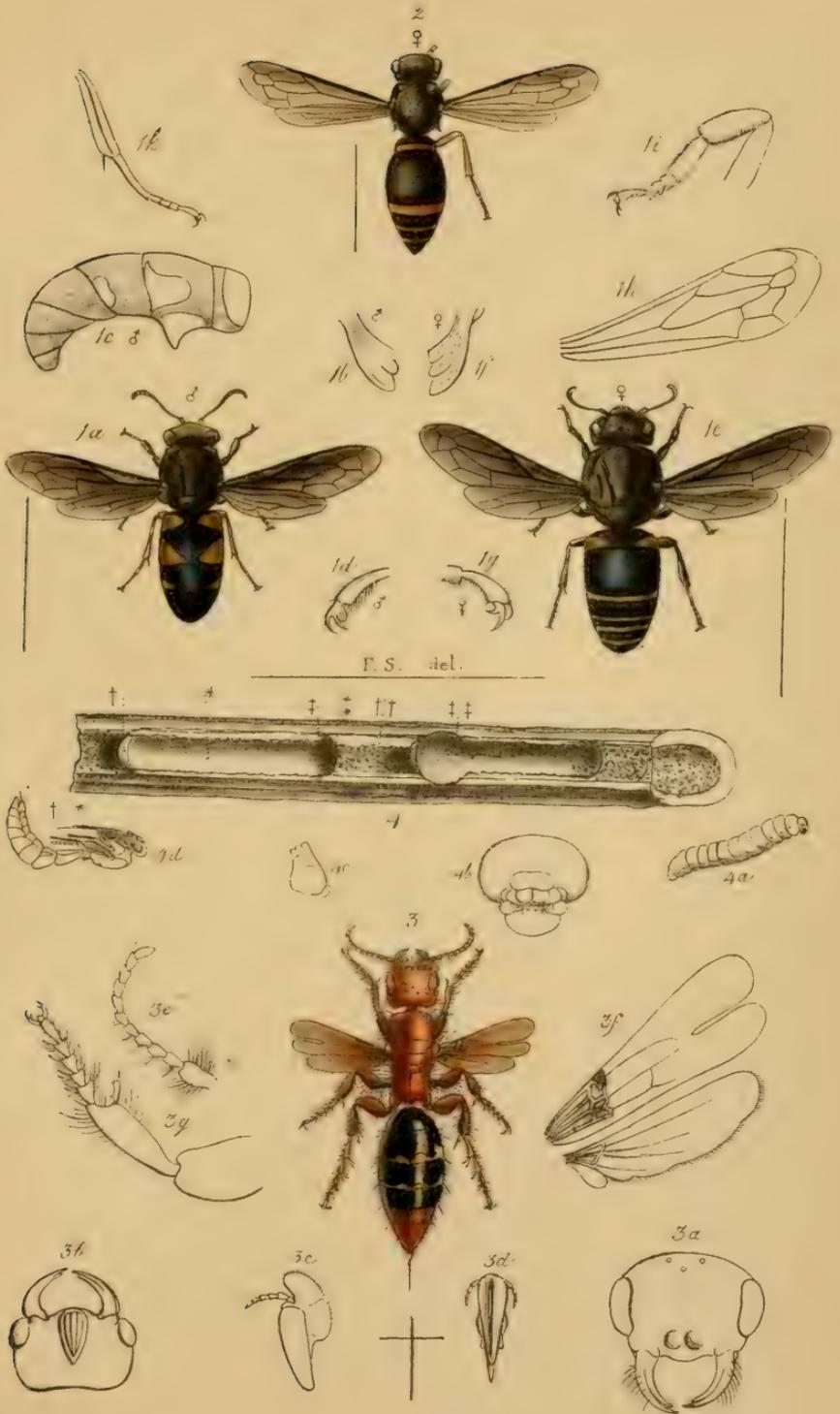
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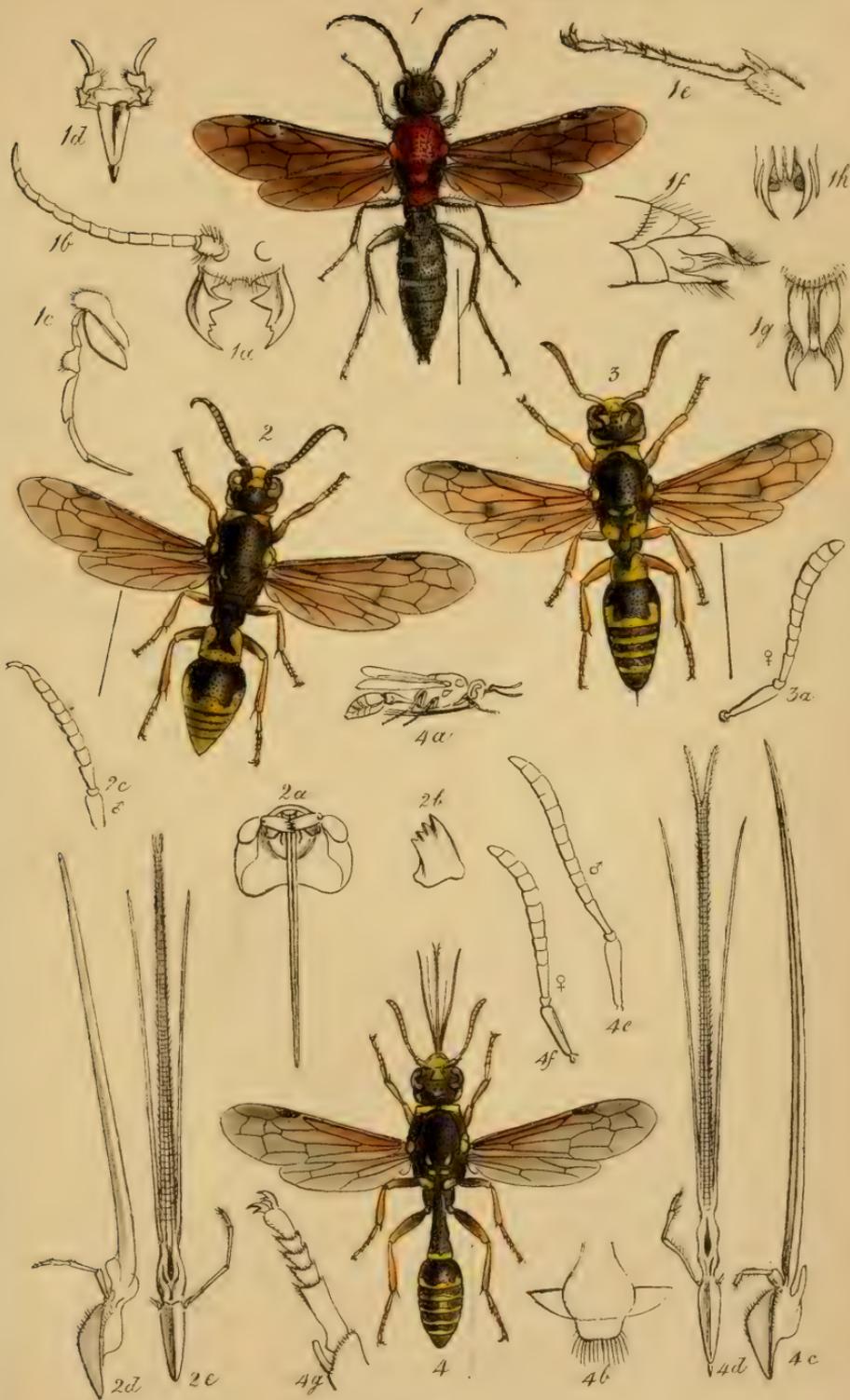


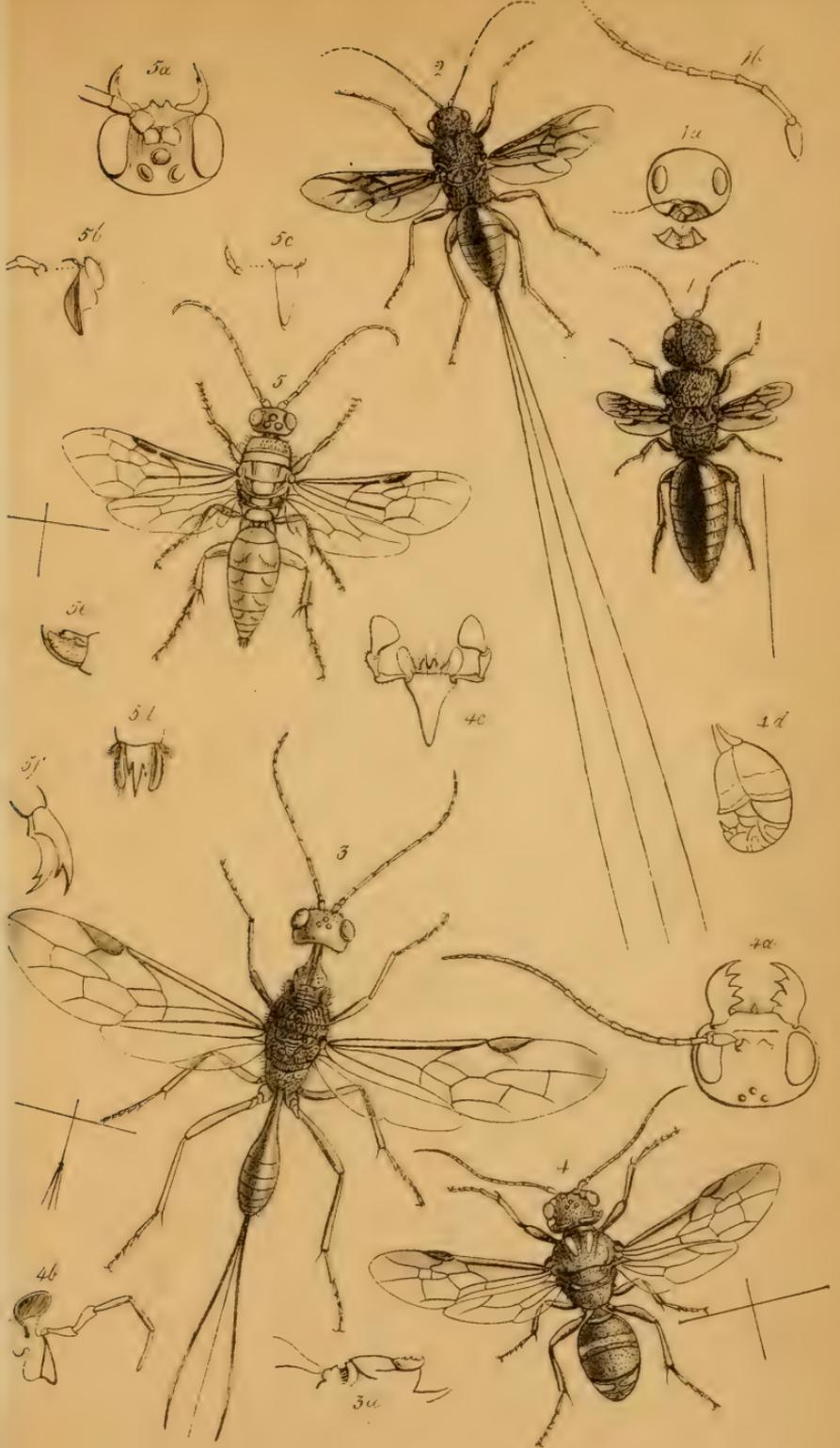


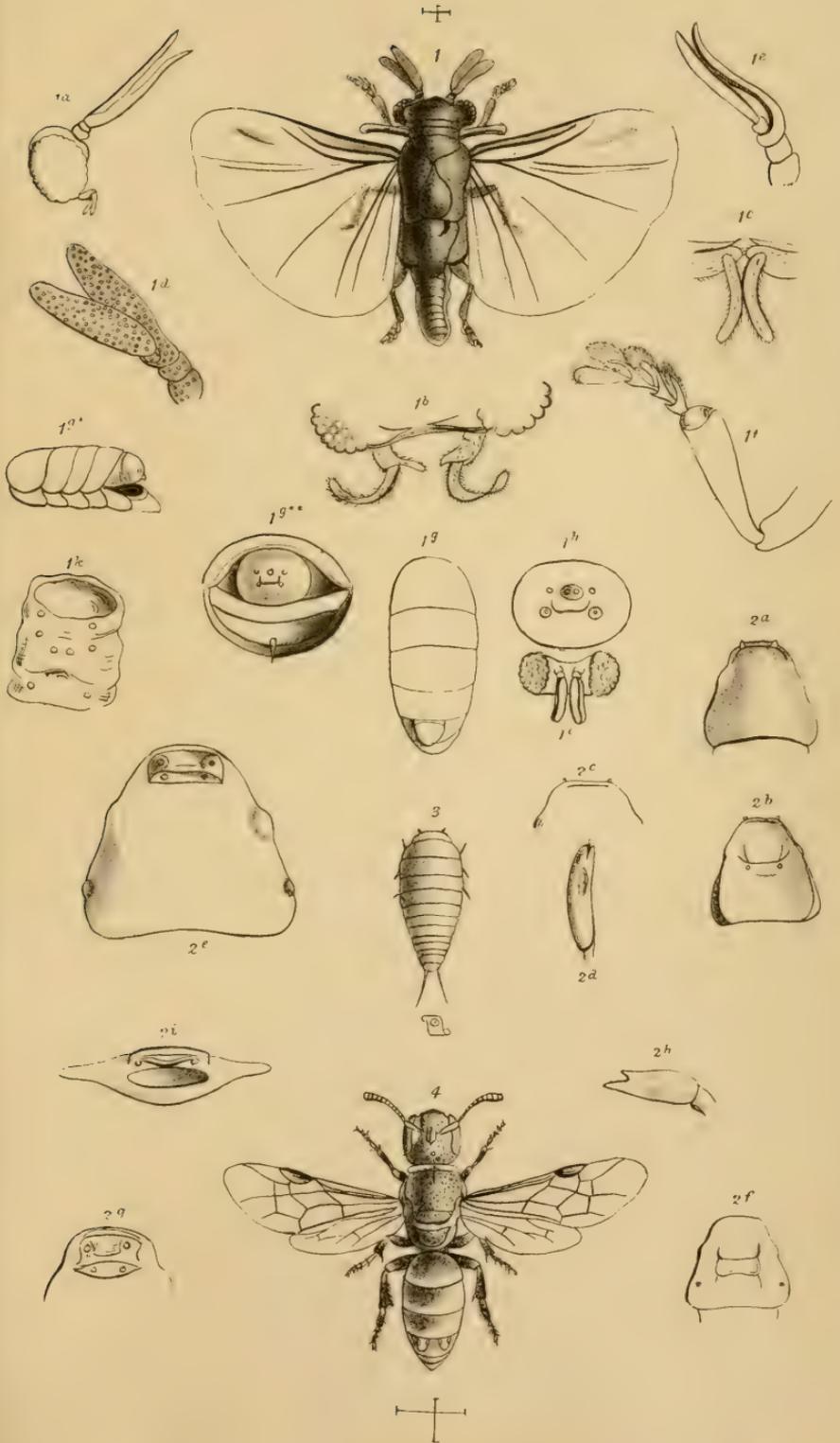


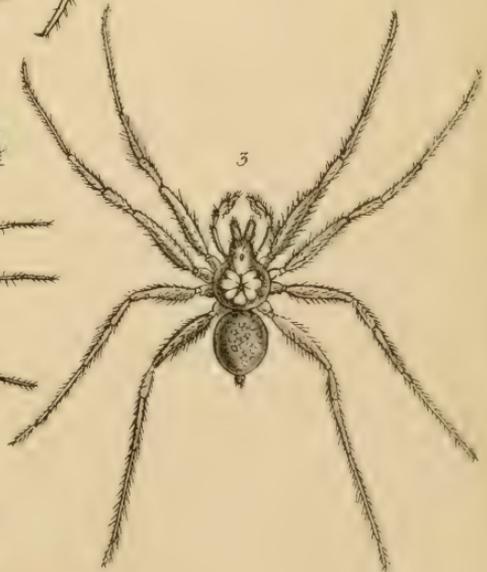
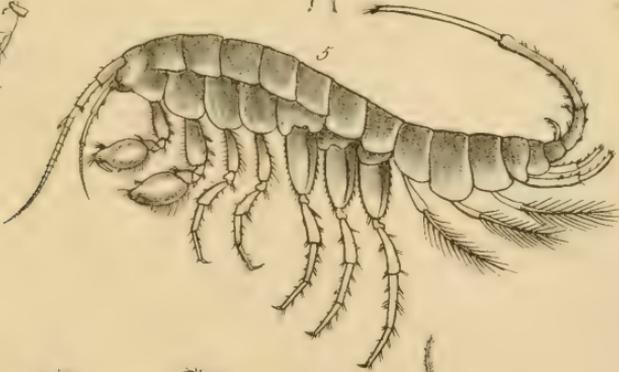
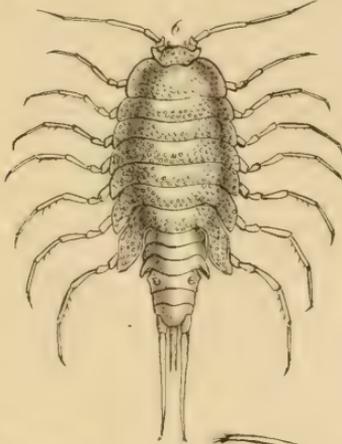
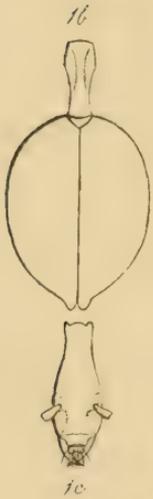
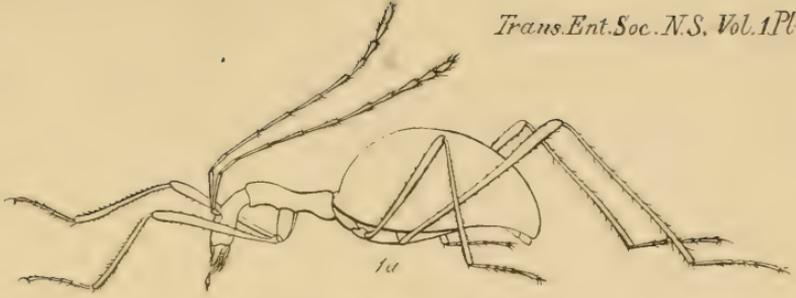
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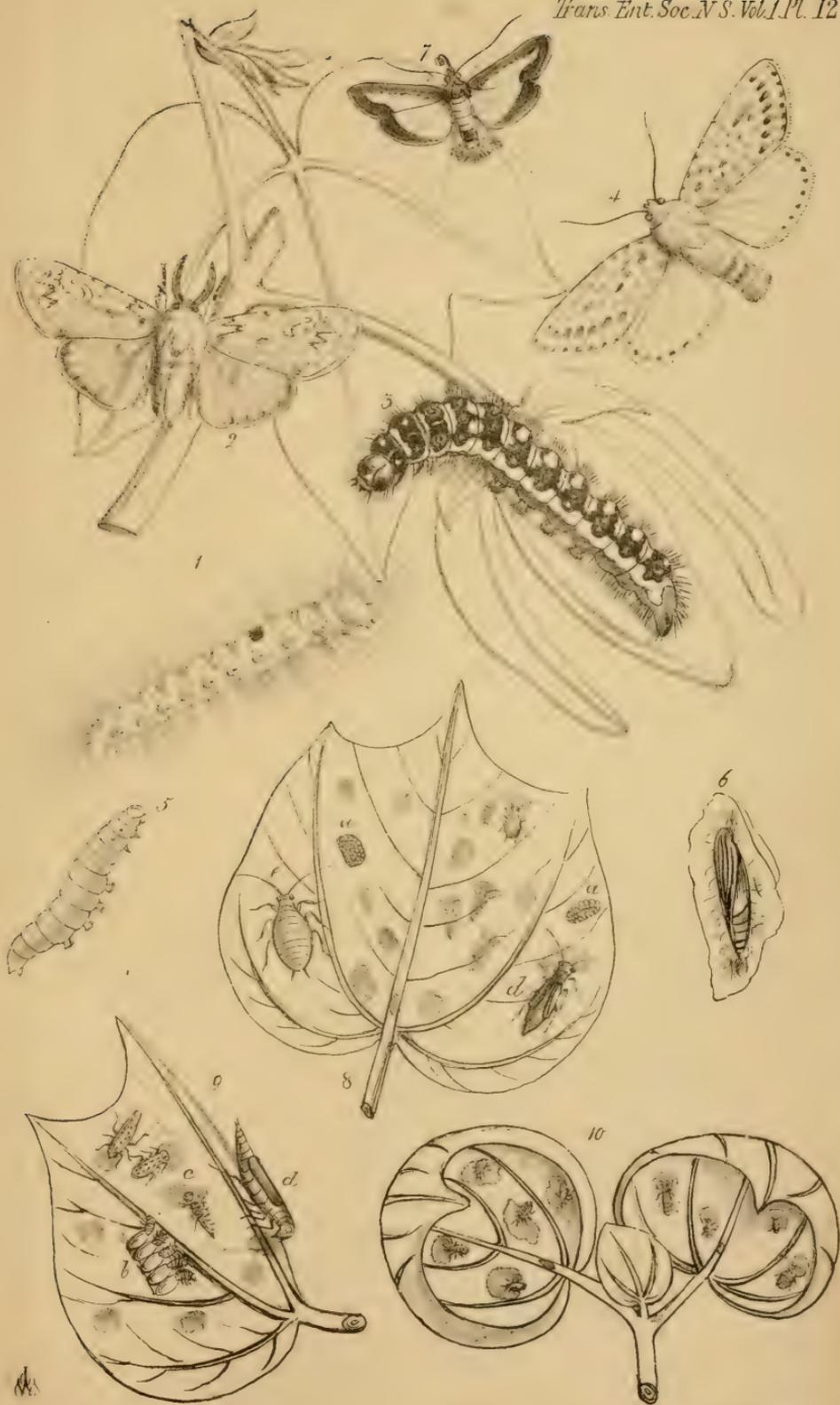


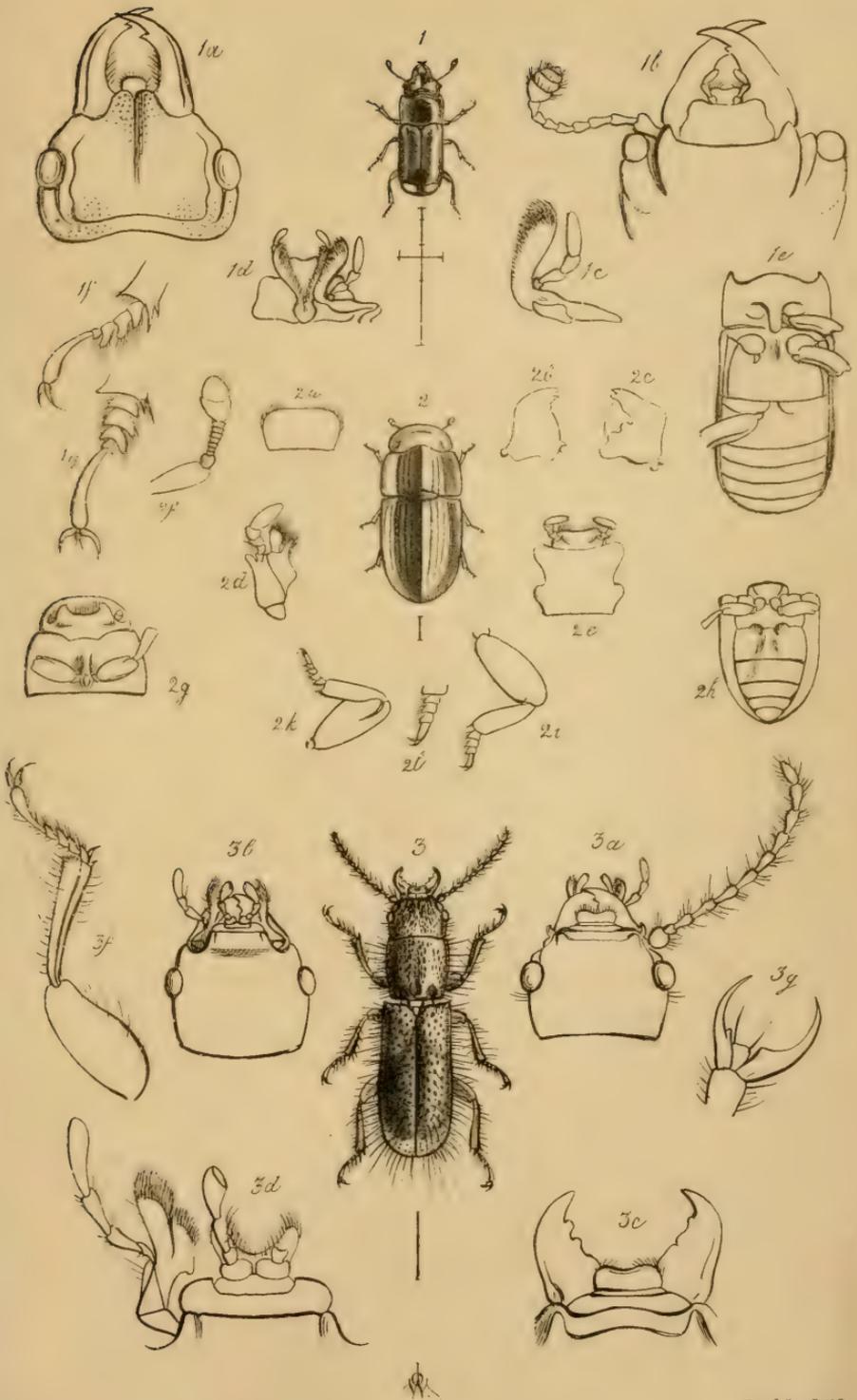














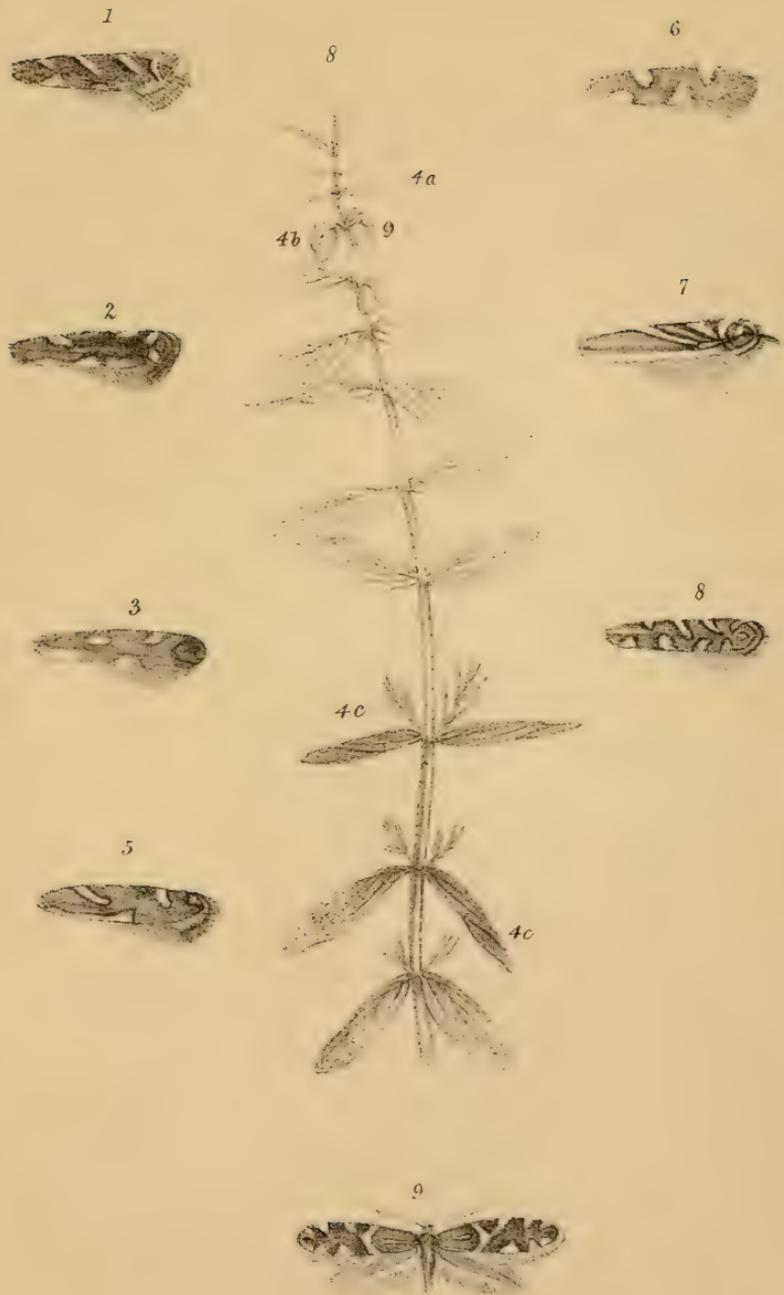


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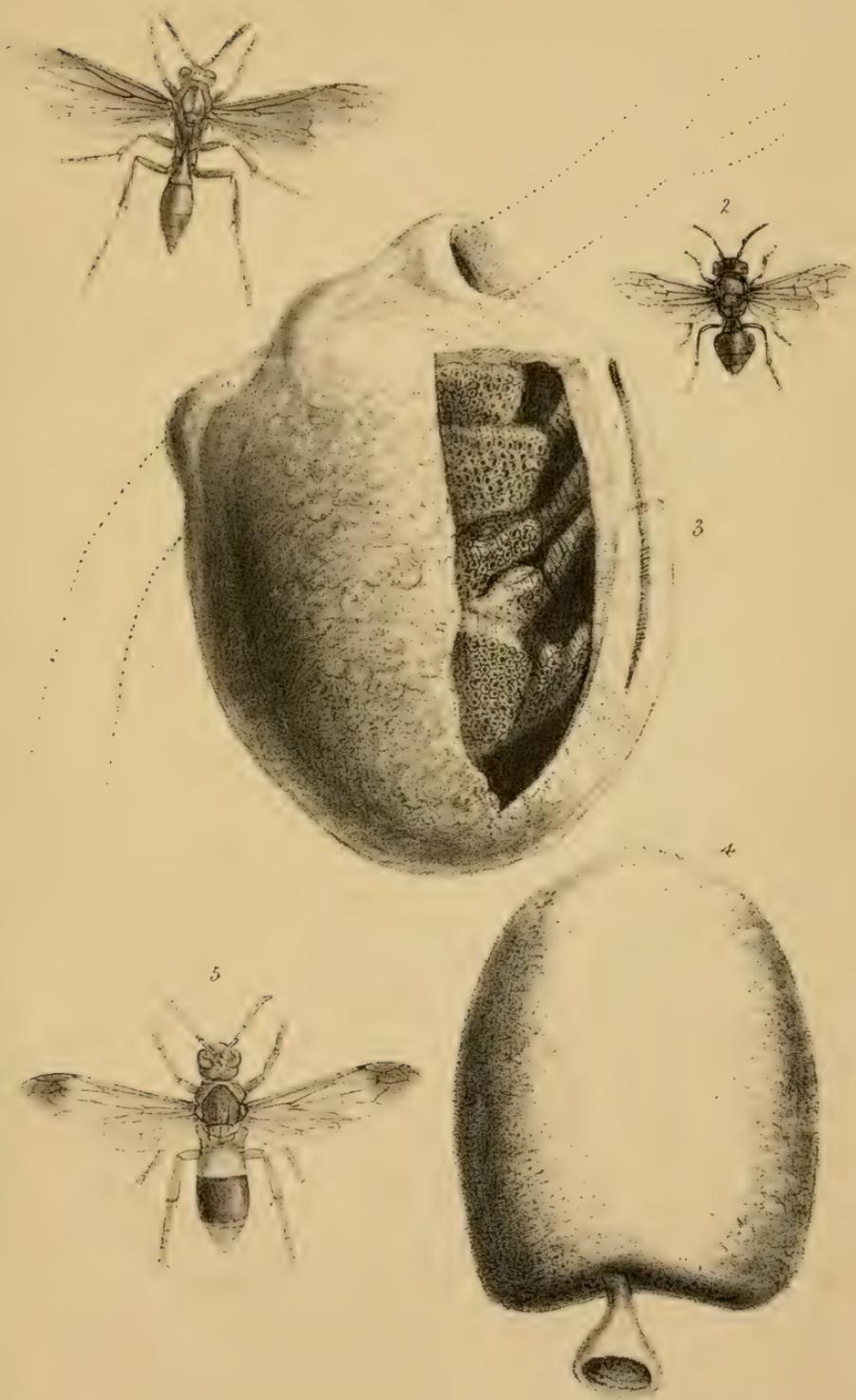
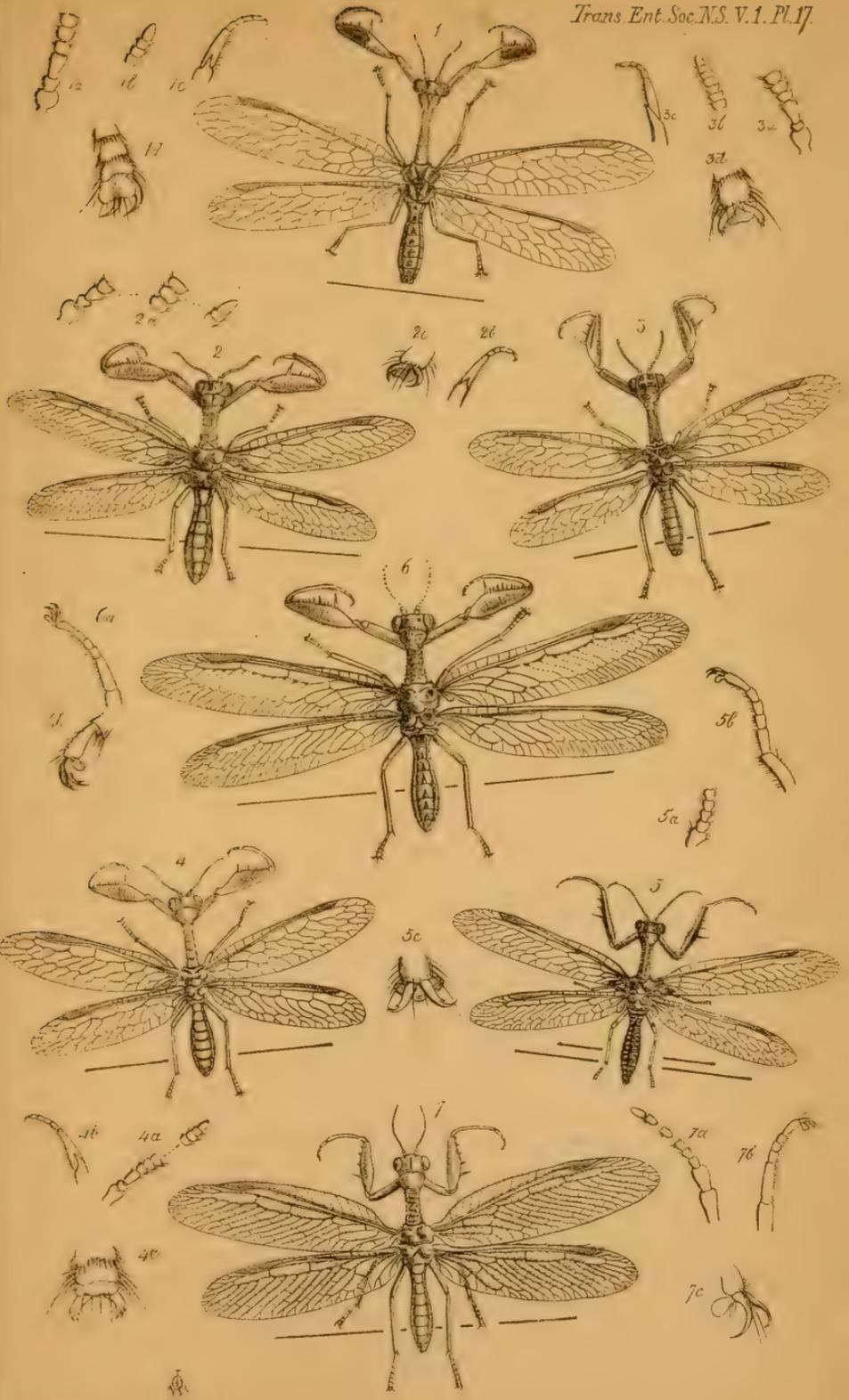
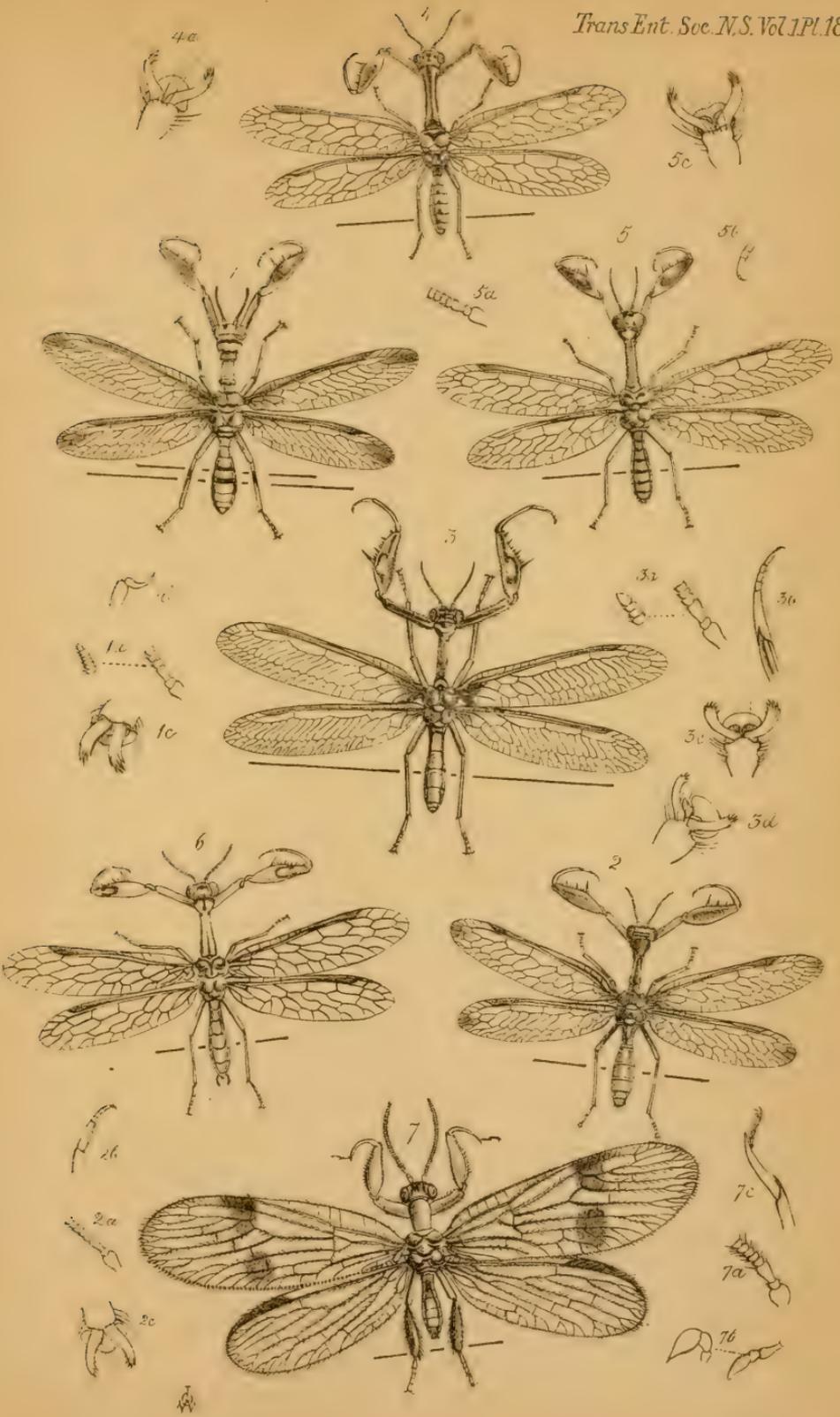


Fig. 1. *Polistes lanio*. — 2 *Trigonalys Compressa*. — 3. Nest of Wasp. Clay. — 4. Clay Nest of *Abispa*. — 5. *Abispa Ephippium*.





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