THE

ZOOLOGICAL RECORD

FOR 1881;

BEING

VOLUME EIGHTEENTH

OF THE

RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY

EDWARD CALDWELL RYE, F.Z.S., M.E.S.,

EDITOR ENT. M. MAG., LIBRARIAN TO THE ROYAL GEOGRAPHICAL SOCIETY.

Explorate solum : sic fit via certior ul

BOOK NO.
1164

LONDON :
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.LXXXII.

1882

ZOOL
Acc. No- 451
Date 12/12/06

LONDON:
PRINTED BY SIMMONS & BOTTEN,
4a, Shoe Lane, E.C.

591-05
GLOS

Zoological Record Association

(FOUNDED 11 JANUARY, 1871;

IN CONTINUATION OF THE ZOOLOGICAL RECORD, COMMENCED IN 1865).

Extract from the Rules adopted at the General Meeting, held 16th March, 1871.

"1. This Association shall be called the ZOOLOGICAL RECORD ASSOCIATION, and its object shall be to continue the publication of the 'Record of Zoological Literature.'

"2. The *Association* shall consist of *Members* and *Subscribers*.

"3. *Members* are entitled to receive a copy of the Annual Volume, and are liable to the extent of £5, in the event of the funds from all other sources not being equal to meet the Annual Expenditure. When this amount of £5 has once been reached, Members can either withdraw or renew their Membership, and thereby incur a fresh liability.

"4. *Subscribers* shall pay annually on the 1st of July *Twenty* shillings, but incur no other liability; in return for this they receive the Volume containing the 'Record of Zoological Literature' of the preceding year, as soon as it is published."

By a recent vote of Council of the ZOOLOGICAL RECORD ASSOCIATION, it has been resolved "to offer to each Member and to each Subscriber who has paid his subscription (£1) the issue of the next volume of the 'Zoological Record' in Parts as fast as printed, should they so prefer it."

The entire Volume only will be issued to the public, as heretofore, at the usual price (£1 10s.).

H. T. STAINTON,
Secretary.

MOUNTSFIELD, LEWISHAM, S.E.
December, 1882.

LIST OF MEMBERS.

Allman, Professor, F.R.S., Ardmore, Parkstone, Poole.
Asiatic Society of Bengal, Calcutta.
Barclay, Colonel Hanbury, F.Z.S., Ashleigh, Dorking, Surrey.
Blanford, W. T., F.R.S., Arts Club, Hanover Square, W.
Borrer, William, M.A., F.L.S., Cowfold, Horsham, Sussex.
Brooke, Sir Victor, Bart., F.L.S., Colebrooke, Fermanagh, Ireland.
Buckley, H., F.Z.S., 27, Wheeler's Road, Edgbaston, Birmingham.
Busk, George, F.R.S., 32, Harley Street, W.
Clifton, Lord, 21, Hill Street, London, W.
Crisp, Frank, LL.B., F.L.S., 5, Lansdowne Road, Notting Hill, W.
Dresser, H. E., F.Z.S., 110, Cannon Street, E.C.
Dunning, J. W., F.L.S., 12, Old Square, Lincoln's Inn, W.C.
Evans, A. H., Clare College, Cambridge.
Flower, Professor, F.R.S., Royal College of Surgeons, Lincoln's Inn Fields, W.C.
Foster, Dr. Michael, F.R.S., Great Shelford, Cambridge.
Gassiot, J. P., F.Z.S., The Culvers, Carshalton, Surrey.
Gatty, C. H., F.L.S., F.G.S., Felbridge Park, East Grinstead.
Godman, F. D., F.R.S., F.L.S., 6, Tenterden Street, Hanover Square, W.
Godwin-Austen, Colonel H. H., F.R.S., Deepdale, Reigate.
Grut, Ferdinand, F.L.S., 9, Newcomen Street, Southwark, S.E.
Günther, Dr., F.R.S., British Museum, W.C.
Gurney, J. H., F.Z.S., Northrepps Hall, Norwich.
Harting, J. E., F.L.S., 22, Regent's Park Road, N.W.
Huxley, Professor, F.R.S., 4, Marlborough Place, St. John's Wood, N.W.
Jeffreys, J. Gwyn, F.R.S., 1, The Terrace, Kensington, W.
Lilford, Lord, F.L.S., Lilford Hall, Oundle, Northamptonshire.
Lubbock, Sir John, Bart., M.P., F.R.S., 15, Lombard Street, E.C.
McIntosh, Dr. W. C., F.R.S., 2, Abbotsford Crescent, St. Andrews, N.B.
McLachlan, R., F.R.S., 39, Limes Grove, Lewisham, S.E.
Macmillan, A., F.L.S., 30, Bedford Street, Covent Garden, W.C.
Mivart, St. George J., Ph.D., F.R.S., 71, Seymour Street, W.
Newton, Professor, F.R.S., Magdalene College, Cambridge.
Norman, Rev. A. Merle, Burnmoor Rectory, Fence Houses, co. Durham.
Owen, Professor, F.R.S., Sheen Lodge, East Sheen, S.W.
Pascoe, F. P., F.L.S., 1, Burlington Road, Westbourne Park, W.
Plymouth Institution, Plymouth.
Rawson, H. Evelyn, Bromley Common, Kent.
Ronksley, J. C., Dalkeith House, Sheffield.

Rye, E. C., F.Z.S., Somerset Villa, Upper Richmond Road, Putney, S.W.
Salvin, Osbert, F.R.S., 10, Chandos Street, Cavendish Square, W.
Saunders, Howard, F.L.S., 7, Radnor Place, Hyde Park, W.
Sclater, Dr. P. L., F.R.S., 11, Hanover Square, W.
Stainton, H. T., F.R.S., Mountsfield, Lewisham, S.E.
Trinder, H. W., 135, Harley Street, W.
Tristram, Rev. Canon, F.R.S., College, Durham.
Van Voorst, John, F.L.S., 1, Paternoster Row, E.C.
Walker, Alfred O., F.L.S., Lead Works, Chester.
Walsingham, Lord, F.L.S., F.Z.S., Merton Hall, Thetford.
Wardlaw-Ramsay, R. G., F.L.S., Whitehill, Rosewell, N.B.
Wood-Mason, James, F.L.S., Indian Museum, Calcutta.

LIST OF SUBSCRIBERS.

Academy of Natural Sciences, Philadelphia, U.S.A.
Ashmolean Society, Oxford.
Boston Society of Natural Sciences, Boston, U.S.A.
Bristol Naturalists' Society.
Brotton Library.
Christiania University Zoological Museum.
Entomological Society of London.
Glasgow Natural History Society.
Godeffroy Museum, Hamburg.
Indian Museum, Calcutta.
Linnean Society of London.
Königlich. Zoologisch. Museum, Dresden.
Madras Museum.
Manchester Literary and Philosophical Society, Microscopical and Natural History Section of the
Mitchell Library, Glasgow.
Munich Royal Library.
Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
Norfolk and Norwich Literary Institution.
Otago Museum, Dunedin, New Zealand.
Queen's College, Cork.
Queensland Museum.
Radcliffe Library, University Museum, Oxford.
Royal College of Physicians, Edinburgh.
Royal College of Surgeons of England.
Royal Microscopical Society of London.
Royal Society, London.
Royal Swedish Academy of Sciences, Stockholm.
United States Entomological Commission, Washington, D.C., U.S.A.
University Library, Edinburgh.
Zoological Department, British Museum.

Anderson, John, M.D., F.L.S., Museum, Calcutta.
Bond, F., F.Z.S., 5 Fairfield Avenue, Staines, Middlesex.
Brown, J. A. Harvie, Dunipace House, Larbert, N.B.
Carus, Dr. J. Victor, Leipsic.
Chamberlain, Walter, Fern Bank, Augustus Road, Edgbaston, Birmingham.
Dalgleish, J. J., 8, Athole Crescent, Edinburgh.
Denison, Alfred, 6, Albemarle Street, W.
Elwes, H. J., F.L.S., 6, Tenterden Street, Hanover Square, W.
Gorham, Rev. H. S., Shipley, Horsham.
Grote, A., F.L.S., 20, Cork Street, Burlington Gardens, W.
Günther, Dr., F.R.S., British Museum, W.C. (*also a Member*).
Hagen, Dr. H. A., Cambridge, Massachusetts, U.S.A.
Hoek, Dr. P. P. C., Leyden.
Hudd, A. E., 94, Pembroke Road, Clifton, Bristol.
Jordan, Professor D. S., Indiana State University, Bloomington, Indiana, U.S.A.
Lawrence, G. N., 172, Pearl Street, New York.
Lütken, Professor, Köngl. Zoologisch Museum, Copenhagen.
Macleay, W.
Marshall, John, F.L.S., Belmont, Taunton.
Milne-Edwards, Alphonse, Jardin des Plantes, Paris.
Newton, Professor Alfred, F.R.S., Magdalene College, Cambridge (*also a Member*).
Newton, Edward, F.L.S., Jamaica.
Nicholson, Francis, The Grove, Oldfield, Altrincham, Cheshire
Peek, Cuthbert E., F.R.G.S., F.Z.S., Wimbledon House, Wimbledon.
Pusey, S. E. B.
Ragonot, E. L., 12, Quai de la Rapée, Paris.
Reinwald, C., Paris.
Roper, F. C. S., F.L.S., Palgrave House, Eastbourne.
Seebohm, Henry, Dannemora Steel Works, Sheffield.
Strickland, Mrs., Ardincaple, Brooklands, Cambridge.
Trouessart, Dr. E. L., Directeur du Museum d'Histoire Naturelle de la Ville d'Angers, 20, Rue d'Alsace, Angers (Maine et Loire).
Turner, Professor, F.R.S., University, Edinburgh.
Vaillant, Professor Léon, 8, Quai Henri IV., Paris.
White, Dr. F. Buchanan, F.L.S., Perth, N.B.

PREFACE.

I HAVE again the pleasure of acknowledging grants of £100 from the British Association for the Advancement of Science, and of £150 from the Government Grant Committee of the Royal Society, in aid of this undertaking. My thanks are also due to the Recorders, with whose aid I have again been enabled to bring out a volume within the year following that of which the work is recorded.

EDWARD CALDWELL RYE.

ROYAL GEOGRAPHICAL SOCIETY,
1, Savile Row, Burlington Gardens, London,
December, 1882.

Communications, Papers, and Memoirs intended for this work should be addressed *solely* to "THE EDITOR of the Zoological Record, care of Mr. Van Voorst, 1, Paternoster Row, London." It is earnestly requested that in the case of separately-printed copies of papers so forwarded, the *original pagination* be indicated.

LIST OF THE

PRINCIPAL ABBREVIATED TITLES OF JOURNALS, &c.

QUOTED IN THIS VOLUME.

Abh. Ges. Görlitz—Abhandlungen der naturforschenden Gesellschaft in Görlitz.

Abh. Ges. Götting.—Abhandlungen der k. Gesellschaft der Wissenschaften zu Göttingen.

Abh. mittelrhein. geol. Ver.—Abhandlungen des mittelrheinischen geologischen Vereins.

Abh. schw. pal. Ges. — Abhandlungen der schweizerischen paläontographischen Gesellschaft (Bâle).

Abh. senck. Ges. — Abhandlungen herausgegeben von der senckenbergischen naturforschenden Gesellschaft (Frankfurt-am-Main).

Abh. Ver. Brem.—Abhandlungen herausgegeben vom naturwissenschaftlischen Verein zu Bremen.

Act. Fenn.—Acta Societatis Scientiarum Fennicæ (Helsingfors).

Act. Soc. L. Bord. (4)—Actes de la Société Linnéenne de Bordeaux. Quatrième série.

Am. Bee J.—The American Bee Journal (Philadelphia).

Am. J. Micr.—American Journal of Microscopy (Hale : Chicago).

Am. J. Sci. (3)—American Journal of Science and Art. Third series. (New Haven).

Am. Micr. J.—American Monthly Microscopical Journal (Hitchcock: New York).

Am. Nat.—American Naturalist (Philadelphia).

Ann. Acc. Agric. Tor.—Annali della R. Accademia d'Agricoltura di Torino.

Ann. Agric.—Annali di Agricoltura (Rome).

Ann. Ent. Belg.—Annales de la Société entomologique de Belgique (Bruxelles).

Ann. mal. Belg. — Annales de la Société malacologique de Belgique (Bruxelles).

Ann. Mus. Genov.—Annali del Museo civico di Storia naturale di Genova.

Ann. N. H. (5)—Annals and Magazine of Natural History. Fifth series (London).

Ann. N. York Ac.—Annals of the New York Academy of Sciences.

Ann. Sci. géol.—Annales des Sciences géologiques (Hébert & Milne-Edwards : Paris).
Ann. Sci. Nat. (6)—Annales des Sciences Naturelles. 6me série (Paris).
Ann. Scuola Agric. Portici—Annuario della R. Scuola superiore di Agricoltura in Portici (Napoli).
Ann. Soc. Agric. Lyon—Annales de la Société d'Agriculture, Histoire naturelle, et Artes utiles de Lyon.
Ann. Soc. Ent. Fr. (6)—Annales de la Société entomologique de France. 6me série (Paris).
Ann. Soc. L. Lyon (n.s.)—Annales de la Société Linnéenne de Lyon. Nouvelle série.
Ann. Soc. mal. Belg.—Annales de la Société malacologique de Belgique (Bruxelles).
Ann. Soc. Mod.—Annuario della Società dei Naturalisti di Modena.
An. Soc. Arg.—Anales de la Sociedad cientifica Argentina (Buenos Aires).
An. Soc. Esp.—Anales de la Sociedad Española de Historia Natural (Madrid).
Anz. Ak. Wien—Anzeiger der mathematisch-naturwissenschaftlichen Classe der R. Akademie der Wissenschaften zu Wien.
Arb. Inst. Würzb.—Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg.
Arb. z. Inst. Wien—Arbeiten des zoologischen Instituts in Wien.
Arch. Anat. Phys.—Archiv für pathologische Anatomie und Physiologie (Berlin).
Arch. biol.—Archives de Biologie (Van Beneden & Van Bambeke: Gand).
Arch. f. Anthrop.—Archiv für Anthropologie (Braunschweig).
Arch. f. Nat. (2)—Archiv für Naturgeschichte. Neue Folge (Berlin).
Arch. ges. Phys.—Archiv für die gesammte Physiologie des Menschen und der Thiere (Bonn).
Arch. Math. Naturvid. — Archiv for Mathematik og Naturvidenskab (Christiania).
Arch. mikr. Anat.—Archiv für mikroskopische Anatomie (Bonn).
Arch. Mus. R. Jan.—Archivos do Museu Nacional do Rio de Janeiro.
Arch. Mus. Teyl.—Archives du Musée Teyler (Haarlem).
Arch. Nat. Liv.—Archiv für die Naturkunde Liv-, Ehst-, und Kurlands (Dorpat).
Arch. Nijmegen — Nederlandsch kruidkundig Archief; Verslagen en Mededeelingen der Nederlandsche botanische Vereeniging (Nijmegen).
Arch. Sci. nat. and *Arch. Sci. Genève*—Archives des Sciences physiques et naturelles (Genève).
Arch. Ver. Mecklenb.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
Arch. Z. expér.—Archives de Zoologie expérimentale et générale (Paris).
Atti Acc. Rom.—Atti della R. Accademia dei Lincei (Rome).
Atti Acc. Tor.—Atti della R. Accademia delle Scienze di Torino (Turin).
Atti Ist. Venet.—Atti del R. Istituto Veneto di scienze, &c. (Venice).
Atti Soc. Ital.—Atti della Società Italiana di Scienze naturali (Modena).

Atti Soc. Pad.—Atti della Società Veneto-Trentina di Scienze naturali (Padua).

Atti Soc. Tosc.—Atti della Società Toscana di Scienze naturali residente in Pisa.

Beitr. Russ. Reiches (2)—Beiträge zur Kenntniss des Russischen Reiches und der angrenzenden Länder Asiens. Neue Folge (St. Petersburg).

Ber. Ges. Chemn.—Bericht der naturwissenschaftlichen Gesellschaft in Chemnitz.

Ber. Ges. Freib.—Berichte über die Verhandlungen der naturforschenden Gesellschaft in Freiburg.

Ber. offenb. Ver.—Bericht über die Thatigkeit des offenbacher Vereins für Naturkunde (Offenbach-a.-M.).

Ber. senck. Ges.—Bericht der senckenbergischen naturforschenden Gesellschaft (Frankfurt-a.-M.).

Ber. Ver. Cass.—Berichte des Vereins für Naturkunde in Cassel.

Ber. Ver. Fulda.—Bericht des Vereins für Naturkunde in Fulda.

Ber. Ver. Innsbr.—Berichte des naturwissenschaftlich-medicinischen Vereins, Innsbruck.

B. E. Z.—Berliner entomologische Zeitschrift.

Bibl. École Hautes Ét.—Bibliothèque de l'École des Hautes Études, Section des Sciences Naturelles (Paris).

Biol. Centralbl.—Biologisches Centralblatt (Rosenthal : Erlangen).

Bol. Ac. Arg.—Boletin de la Academia Nacional de Ciencias de la Republica Argentina (Cordoba).

Boll. scient.—Bollettino scientifico (Maggi, Zoja, & Giovanni : Pavia).

Boll. Soc. Adr.—Bolletino della Società Adriatica di Scienze naturali (Trieste).

Bot. JB.—Botanischer Jahresbericht (Just : Berlin).

Bot. Zeit.—Botanische Zeitung (Halle).

Bull. Ac. Belg. (3).—Bulletin de l'Académie Royale des Sciences de Belgique. 3me série (Bruxelles).

Bull. Ac. Hipp.—Bulletin de l'Académie d'Hippone (Bona).

Bull. Am. Mus. Nat. Hist.—Bulletin of the American Museum of Natural History (New York).

Bull. Brooklyn Soc.—Bulletin of the Brooklyn Entomological Society.

Bull. Buff. Soc.—Bulletin of the Buffalo Society of Natural Sciences (Buffalo, N.Y.).

Bull. Com. Geol. Ital.—Bullettino del Reale Comitato Geologico d'Italia (Firenze).

Bull. Ent. Ital.—Bullettino della Società Entomologia Italiana (Firenze).

Bull. Ess. Inst.—Bulletin of the Essex Institute (Salem, U.S.A.).

Bull. Harv. Univ.—Harvard University Bulletin (Winsor : Cambridge, U.S.A.).

Bull. Illinois Lab.—Bulletin of the Illinois State Laboratory of Natural History (Bloomington).

Bull. Mosc.—Bulletin de la Société impériale des Naturalistes de Moscou.

Bull. Mus. C. Z.—Bulletin of the Museum of Comparative Zoology of Harvard College (Cambridge, U.S.A.).

Bull. Nutt. Orn. Club—Bulletin of the Nuttall Ornithological Club (Allen: Cambridge, U.S.A.).

Bull. Pétersb.—Bulletin de la classe physico-mathématique de l'Académie impériale des Sciences de St. Pétersbourg.

Bull. Sci. Nord—Bulletin scientifique, historique, et littéraire du Département du Nord et des pays voisins (Gosselet; Lille).

Bull. Soc. Acclim. (3).—Bulletin de la Société d'Acclimatation. 3me série (Paris).

Bull. Soc. Angers—Bulletin de la Société d'études scientifiques, Angers.

Bull. Soc. Anthrop. (3).—Bulletin de la Société d'Anthropologie. 3me série (Paris).

Bull. Soc. Beziers—Bulletin de la Société d'étude des Sciences naturelles de Beziers.

Bull. Soc. Colmar—Bulletin de la Société d'histoire naturelle de Colmar.

Bull. Soc. Ent. Fr.—Bulletin des séances de la Société entomologique de France (Paris).

Bull. Soc. Géol. (3).—Bulletin de la Société géologique de France. 3me série (Paris).

Bull. Soc. L. Brux.—Bulletin de la Société Linnéenne de Bruxelles.

Bull. Soc. mal. Ital.—Bullettino della Società malacologica Italiana.

Bull. Soc. Murith.—Bulletin des travaux de la Société Murithienne du Valais (Neuchâtel).

Bull. Soc. Neuch.—Bulletin de la Société des Sciences Naturelles de Neuchâtel.

Bull. Soc. Philom.—Bulletin de la Société Philomathique de Paris.

Bull. Soc. Rouen (2)—Bulletin de la Société des Amis des Sciences naturelles de Rouen.

Bull. Soc. Toulouse—Bulletin de la Société d'histoire naturelle de Toulouse.

Bull. Soc. Vaud.—Bulletin de la Société Vaudoise des Sciences Naturelles (Lausanne).

Bull. Soc. Ven.-Trent.—Bullettino della Società Veneto-Trentina di Scienze naturali (Venice).

Bull. Soc. Zool. and *Bull. Soc. Z. Fr.*—Bulletin de la Société Zoologique de France (Paris).

Bull. U. S. Ent. Comm.—Bulletin of the United States Entomological Commission (Washington).

Bull. U. S. Fish. Comm.—Bulletin of the United States Fish Commission (Washington).

Bull. U. S. Geol. Surv.—Bulletin of the United States Geological and Geographical Survey of the Territories (Washington).

Bull. U. S. Nat. Mus.—Bulletin of the United States National Museum (Washington).

Canad. Ent.—Canadian Entomologist (Saunders: Montreal).

Canad. Ent. (*n.s.*)—The Canadian Naturalist and Quarterly Journal of Science. New series (Montreal).

CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg.

CB. Ver. Rheinl.—Correspondenz-Blatt des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Bonn).
C. H.—Coleopterologische Hefte (Von Harold: München).
Cist. Ent.—Cistula Entomologica (Janson: London).
Conchol. Mitth.—Conchologische Mittheilungen (Von Martens: Cassel).
C. R.—Comptes rendus des séances hebdomadaires de l'Académie des Sciences (Paris).
CR. Ent. Belg.—Comptes rendus des séances de la Société entomologique de Belgique (Bruxelles).

Dan. Selsk. Skr.—K. Danke Videnskabernes Selskabs Skrifter (Copenhagen).
Denk. Ak. Wien—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna).
Denk. Ges. Jena—Jenaische Denkschriften, or Denkschriften der medicinish-naturwissenschaftlichen Gesellschaft in Jena.
Deutsche E. Z.—Deutsche entomologische Zeitschrift (Berlin).
Deutsche medic. Wochenschr.—Deutsche medicinisch Wochenschrift.

Ent.—The Entomologist (London).
Ent. M. M.—The Entomologist's Monthly Magazine (Douglas, &c.: London).
Ent. Monatsbl.—Entomologische Monatsblätter (Kraatz: Berlin).
Ent. Nachr.—Entomologische Nachrichten (Katter: Stettin).
Ent. Tidskr.—Entomologisk Tidskrift, på föranstaltande af Entomologiska Föreningen i Stockholm (Spånberg: Stockholm).

Feuill. Nat.—Feuille des jeunes Naturalistes (Paris).
Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskbet i Christiania.

Gard. Chron. (2)—The Gardeners' Chronicle. 2nd Series (London).
Gazz. Med. Ital.-Lomb.—Gazzetta Medica Italo-Lombarda.
Geogr. MT.—Mittheilungen aus Justus Perthes' geographischer Anstalt (Behm: Gotha).
Geol. Mag.—Geological Magazine (Woodward: London).

Ibis—The Ibis (Salvin: London).
Isis = *SB. Ges. Isis.*

J. Ac. Philad. (2)—Journal of the Academy of Natural Sciences of Philadelphia. 2nd series.
J. Anat Phys.—Journal of Anatomy and Physiology (Humphry: London).
J. A. S. B.—Journal of the Asiatic Society of Bengal (Calcutta).
JB. Anat. Physiol.—Jahresberichte über die Fortschritte der Anatomie und Physiologie (Hofmann & Schwalbe: Leipzig).
JB. geol. Reichsanst.—Jahrbuch der k.-k. geologischen Reichsanstalt (Wien).
JB. Ges. Graub.—Jahresbericht der naturforschenden Gesellschaft Graubündens (Chur).

JB. mal. Ges.—Jahrbuch der deutschen malakozoologischen Gesellschaft (Frankfurt-a.-M.).

JB. Mineral.—Neues Jahrbuch für Mineralogie, Geologie und Palæontologie (Leonard & Geinitz : Leipzig).

JB. Mus. Kärnt.—Jahrbuch des naturhistorischen Landesmuseums von Kärnthen (Klagenfurt).

JB. nass. Ver.—Jahrbuch des nassauischen Vereins für Naturkunde (Wiesbaden).

JB. schles. Ges.—Jahresberichte der schlesischen Gesellschaft für vaterländische Cultur (Breslau).

JB. Ver. Braunschw.—Jahresbericht des Vereins für Naturwissenschaft zu Braunschweig.

JB. Ver. Zwickau—Jahresbericht des Vereins für Naturkunde zu Zwickau.

JB. wes'f. Ver. and *JB. zool. Sect. westf. Ver.*—Jahresbericht der zoologischen Section des westfälischen provinzial-Vereins für Wissenschaft und Kunst (Münster).

J. Cincinn. Soc.—Journal of the Cincinnati Society of Natural History.

J. de Conch.—Journal de Conchyliologie (Paris).

J. de l'Anat. Phys.—Journal de l'Anatomie et de la Physiologie (Robin : Paris).

Jen. Z. Nat.—Jenaische Zeitschrift für Naturwissenschaft, herausgegeben von der medicinisch-naturwissenschaftlichen Gesellschaft zu Jena.

J. f. O.—Journal für Ornithologie (Cabanis: Leipzig).

J. G. Soc.—Quarterly Journal of the Geological Society (London).

JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg (Stuttgart).

J. L. S.—Journal of the Linnean Society, Zoology (London).

J. Microgr.—Journal de Micrographie (Pellétan : Paris).

J. Mus. Godeffr.—Journal des Museum Godeffroy ; geographische, ethnographische und naturwissenschaftliche Mittheilungen (Hamburg).

J. of Conch.—Journal [formerly Quarterly ditto] of Conchology (London).

J. Quek. Club—Journal of the Quekett Microscopical Club (London).

J. R. Agric. Soc. (2)—Journal of the Royal Agricultural Society. Second series (London).

J. R. Dubl. Soc.—Journal of the Royal Dublin Society.

J. R. Micr. Soc. (2)—Journal of the Royal Microcopical Society. Second series (London).

J. Sci. Lisb.—Jornal de Sciencias da Academia de Lisboa (Lisbon).

J. Soc. Arts—Journal of the Society of Arts (London).

Kosmos ; *Lemb.*—Kosmos: Zeitschrift der polnischen naturforschenden Gesellschaft Kopernicus (Lemberg).

L'Ab.—L'Abeille (De Marseul : Paris).

Le Nat.—Le Naturaliste (Paris).

Mal. Bl.—Malakozoologische Blätter (Cassel).

MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.

Medd. Soc. Fenn.—Meddelanden af Societatis pro Fauna et Flora Fennica (Helsingfors).

Mél. biol.—Mélanges biologiques tirés du Bulletin de la Classe physico-mathématique de l'Académie impériale des sciences de St. Pétersbourg.

Mem. Acc. Bologn.—Memoire dell' Accademia di Scienze dell' Istituto di Bologna.

Mem. Acc. Tor.—Memoire della R. Accademia della Scienze di Torino (Turin).

Mém. Ac. Lyon—Mémoires de l'Académie des Sciences Belles-Lettres et Arts de Lyon.

Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.

Mem. Mus. C. Z.—Memoirs of the Museum of Comparative Zoology of Harvard College (Cambridge, U. S.).

Mem. Peab. Ac.—Memoirs of the Peabody Academy of Arts and Sciences (Salem).

Mém. Pétersb. (7)—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg. 7me série.

Mém. Soc. Cannes—Mémoires de la Société des Sciences naturelles, &c., de Cannes.

Mém. Soc. Cherb.—Mémoires de la Société des Sciences naturelles de Cherbourg.

Mém. Soc. Lille—Mémoires de la Société de Sciences, &c., de Lille.

Mém. Soc. L. N. Fr.—Mémoires de la Société Linnéenne du Nord de la France (Amiens).

Mém. Soc. Phys. Genèv.—Mémoires de la Société de Physique et d'Histoire naturelle de Genève.

Morph. JB.—Morphologisches Jahrbuch : eine Zeitschrift für Anatomie und Entwickelungsgeschichte (Gegenbaur : Leipzig).

MS. deutsch. Ver. Schutze Vogelw.—Monatschrift des deutschen Vereins zum Schutze der Vogelwelt.

MT. anthrop. Ges. Wien—Mittheilungen der anthropologischen Gesellschaft in Wien.

MT. geogr. Ges. Hamburg.—Mittheilungen der geographischen Gesellschaft in Hamburg.

MT. Ges. Bern—Mittheilungen der naturforschenden Gesellschaft in Bern.

MT. Ges. Ostasien's—Mittheilungen der deutschen Gesellschaft für Natur- und Völkerkunde Ostasien's (Yokohama).

MT. Münch. ent. Ver.—Mittheilungen des Münchener entomologischen Vereins (Munich).

MT. orn. Ver. Wien—Mittheilungen des ornithologischen Vereins in Wien.

MT. schw. ent. Ges.—Mittheilungen der schweizerischen entomologischen Gesellschaft (Schaffhausen).

MT. Ver. Steierm.—Mittheilungen des naturwissenschaftlichen Vereins für Steiermark (Grätz).

MT. z. Stat. Neap.—Mittheilungen der zoologischen Station in Neapel (Leipzig).

Nachr. Ges. Mosc.—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde zu Moscou.

Nachr. mal. Ges.—Nachrichtsblatt der deutschen malakozoologischen Gesellschaft (Frankfurt-a.-M.).

N. Arch. Mus. (2)—Nouvelles Archives du Muséum d'Histoire Naturelle. 2me série (Paris).

Nat. Arg.—El Naturalista Argentino (Buenos Aires).

Nat. Canad.—Le Naturaliste Canadien (Provancher ; Cap Rouge, Quebec).

Nat. Mex.—La Naturaleza (Mexico).

Nat. Sicil.—Il Naturalista Siciliano: Giornale di Scienze Naturali (Ragusa: Palermo).

Nat. Tids.—Naturhistorisk Tidsskrift (Schiödte: Kjöbenhaven).

Naturaliste = *Le Nat.*

Nature—Nature (London).

Naturen—Naturen (Christiania).

Niederl. Arch. Zool.—Niederländisches Archiv für Zoologie (Hoffmann : Haarlem).

N. Mém. Mosc.—Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou.

N. Mag. Nature.—Nyt Magazin for Naturvidenskaberne (Sars & Kjerulf : Christiania).

Nor. Selsk. Skr.—K. Norske Videnskabers Selskabs Skrifter (Drontheim).

Notes Leyd. Mus.—Notes from the Royal Zoological Museum of the Netherlands at Leyden (Schlegel).

Nouv. et faits—Nouvelles et faits divers (De Marseul : Paris).

Nova Acta Ac. L.-C. Nat. cur.—Nova Acta physico-medica Academiæ Cæs. Leopoldino-Carolinæ Naturæ curiosorum [= *Verh. L.-C. Ak.*] (Leipzig).

Œfv. Ak. Förh.—Œfversigt af k. Vetenskaps Akadamiens Förhandlingar (Stockholm).

Öfv. Fin. Soc.—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar (Helsingfors).

Oesterr. Monatschr. Thierheilk.—Oesterreichische Monatsschrift für Thierheilkunde (Wien).

Onderz. phys. Lab. Utrecht.—Onderzoekingen gedaan en het physiologisch Laboratorium der Utrechtsche Hoogeschool.

Orn. Centralbl.—Ornithologisches Centralblatt (Berlin).

Overs. Dan. Selsk.—Oversigt over dat k. Danske Videnskabernes Selskabs Fordhandlinger (Kjöbenhavn).

P. Ac. Philad.—Proceedings of the Academy of Natural Sciences of Philadelphia.

Palæontographica—Palæontographica: Beiträge zur Naturgeschichte der Vorwelt (Cassel).

Pal. Ind.—Palæontologia Indica. (Folio) Memoirs of the Geological Survey of India (Calcutta).

Pal. Soc.—[Publications of the] Palæontological Society (London).

P. Am. Ass.—Proceedings of the American Association for the Advancement of Science.

P. Am. Phil. Soc.—Proceedings of the American Philosophical Society (Philadelphia).

Papilio—Papilio: the Organ of the New York Entomological Club, devoted exclusively to Lepidoptera (H. Edwards: New York).

P. A. S. B.—Proceedings of the Asiatic Society of Bengal (Calcutta).

P. Bost. Soc.—Proceedings of the Boston Society of Natural History (Boston, U.S.A.).

P. Bristol Soc.—Proceedings of the Bristol Naturalists' Society.

P. Dorset Club—Proceedings of the Dorset Natural History and Antiquarian Field Club (Sherborne).

Periód. Zool. Argent.—Periódico Zoológico, Organo de la Sociedad Entomológica Argentina (Buenos Aires).

P. E. Soc—Proceedings of the Entomological Society of London.

P. Geol. Polyt. Soc. Yorksh.—Proceedings of the Geological and Polytechnic Society of the West Riding of Yorkshire (Leeds).

Phil. Mag. (5)—The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. 5th series (London).

Phil. Tr.—Philosophical Transactions of the Royal Society (London).

P. Holmesd. Club—Proceedings of the Holmesdale Natural History Club (Reigate).

P. Linn. Soc. N. S. W.—Proceedings of the Linnean Society of New South Wales (Sidney).

P. Liverp. Soc.—Proceedings of the Literary and Philosophical Society and Natural History Society of Liverpool.

P. Manch. Soc.—Proceedings of the Manchester Literary and Philosophical Society.

P. N. H. Soc. Glasg.—Proceedings of the Natural History Society of Glasgow.

P. N.-Scot. Inst.—Proceedings and Transactions of the Nova-Scotian Institute of Natural Sciences (Halifax).

Pop. Sci. Rev. (*n.s.*)—Popular Science Review. 2nd series (London).

P. Perthsh. Soc.—Proceedings of the Perthshire Society of Natural Science (F. B. White: Perth).

P. Phys. Soc. Edinb.—Proceedings of the Royal Physical Society of Edinburgh.

P. R. Dubl. Soc. (*n.s.*)—Proceedings of the Royal Dublin Society. 2nd series.

P. R. Geogr. Soc. (2)—Proceedings of the Royal Geographical Society. 2nd series (London).

P. R. Irish Ac. (2)—Proceedings of the Royal Irish Academy. 2nd series (Dublin).

P. R. Soc.—Proceedings of the Royal Society (London).

P. R. Soc. Edinb.—Proceedings of the Royal Society of Edinburgh.

P. & Pr. & Rep. R. Soc. Tasm.—Papers and Proceedings and Reports of the Royal Society of Tasmania (Hobarton).

P. R. Soc. Vict. = *Tr. R. Soc. Vict.*

P. Soc. Antiq. Scot.—Proceedings of the Society of Antiquaries of Scotland (Edinburgh).

P. Soc. Manch.—Proceedings of the Literary and Philosophical Society of Manchester.

Pysche—Psyche: Organ of the Cambridge [U.S.A.] Entomological Club.

Publ. Inst. Luxemb.—Publications de l'Institut Royal Grand-Ducal de Luxembourg: Section des Sciences naturelles et mathématiques.

P. U. S. Nat. Mus.—Proceedings of the United States National Museum (Washington).

P.-v. Mal. Belg.—Procès-verbaux des séances de la Société malacologique de Belgique (Bruxelles).

P.-v. Soc. Tosc.—Processi verbali della Società Toscana di Scienze naturali (Pisa).

P. Z. S.—Proceedings of the Zoological Society (London).

Q. J. Micr. Sci.—Quarterly Journal of Microscopical Science (London).

Rec. Geol. Survey Ind.—Records of the Geological Survey of India (Calcutta).

Rend. Acc. Bologn.—Rendiconto dell' Accademia di scienze dell' Istituto di Bologna.

Rend. Ist. Lomb.—Rendiconti del R. Istituto Lombardo di scienze, &c. (Milan).

Rep. Brit. Ass.—Report of the British Association for the Advancement of Science.

Rep. Dep. Agric.—Report of the Entomologist of the United States Department of Agriculture. From the Annual Report of the Department of Agriculture (Washington).

Rep. Devon. Ass.—Report and Transactions of the Devonshire Association for the Advancement of Science (Plymouth).

Rep. Dulwich Coll. Soc.—Annual Report of the Dulwich College Science Society (Dulwich).

Rep. E. Soc. Ont.—Report of the Entomological Society of the Province of Ontario.

Rep. Geol. Surv. Canada—Report of the Geological Survey of Canada.

Rep. Geol. Surv. Minn.—Annual Report of the Geological and Natural History Survey of Minnesota (St. Paul).

Rep. Plym. Inst.—Annual Report and Transactions of the Plymouth Institution and Devon and Cornwall Natural History Society (Plymouth).

Rep. U. S. Geol. Surv.—Report of the United States Geological and Geographical Survey of the Territories (Washington).

Rep. Montp.—Revue des Sciences Naturelles (Montpellier).

Rev. Sci.—Revue Scientifique de la France et de l'étranger (Paris).

Rev. Sci. Nat. (2)—Revue des Sciences Naturelles. 2me série. (Dubreuil: Paris).

R. Z. (3)—Revue et Magasin de Zoologie pure et appliquée. 3me série (Deyrolle: Paris).

SB. Ak. Wien—Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften (Vienna).

SB. bayer Ak.—Sitzungsberichte der mathematisch-physikalischen Classe der k. bayerischen Akademie der Wissenschaften (Munich).

SB. böhm. Ges.—Sitzungsberichte der k. böhmischen Gesellschaft der Wissenschaften (Prag).

SB. Ges. Dorp.—Sitzungsberichte der Dorpater Naturforscher Gesellschaft (Dorpat).

SB. Ges. Isis—Sitzungsberichte der naturwissenschaftlichen Gesellschaft 'Isis' (Dresden).

SB. Ges. Leipzig—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.

SB. Ges. Würzb.—Sitzungsberichte des physikalisch-medicinischen Gesellschaft zu Würzburg.

SB. nat. Fr.—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.

SB. niederrhein. Ges.—Sitzungsberichte des niederrheinischen Gesellschaft für Natur- und Heilkunde zu Bonn.

SB. Ver. Brünn—Sitzungsberichte des naturforschenden Vereins in Brünn.

SB. Ver. Rheinl.—Sitzungsberichte des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Bonn).

SB. z.-b. Wien—Sitzungsberichte der zoologische-botanischen Gesellschaft in Wien (Vienna).

Schr. Ges. Danz. (2)—Neueste Schriften der naturforschenden Gesellschaft zu Danzig. Neue Folge.

Schr. Ver. naturw. Kenntn. Wien—Schriften des Vereines zur Verbreitung naturwissenschaftliche Kenntnisse in Wien (Von Nahlik: Wien).

Sci. Goss.—Science Gossip (Taylor: London).

Scot. Nat.—The Scottish Naturalist (White: Edinburgh & London).

S. E. Z.—Stettiner entomologische Zeitung (Dohrn: Stettin).

Sm. Misc. Coll.—Smithsonian Miscellaneous Collections (Washington).

Sprawozd. Kom. fizogr.—Sprawozdanie Komisyi fizyograficznéj, &c. (Krakau).

Str. Feath.—Stray Feathers (Calcutta).

Stud. Biol. Lab. Hopkins Univ.—Studies at the Biological Laboratory of the Hopkins University.

Sv. Ak. Handl.—K. Svenska Vetenskaps Akadamiens Handlingar (Stockholm).

TB. Vers. Naturf.—Tageblatt der Versammlung deutscher Naturforscher und Aertze.

Term. füzetek—Természetrajzi füzetek: az állat-, növény-, ásvány-, és földtan Köréből [= Naturhistorische Hefte: Vierteljahrsschrift für Zoologie, Botanik, Mineralogie, und Geologie] (Pesth).

Tijdschr. Ent.—Tijdschrift voor Entomologie (The Hague).

Tijdschr. Nederl. Dierk. Ver.—Tijdschrift der Nederlandsche Dierkundige Vereeniging (The Hague and Rotterdam).

Tijdschr. Nederl. Ind.—Natuurkundig Tijdschrift voor Nederlandsch Indië (Batavia).

Tr. Am. Ent. Soc.—Transactions of the American Entomological Society (Philadelphia).

Tr. Bot. Soc. Edinb.—Transactions of the Botanical Society of Edinburgh.
Tr. Epping Nat. Club—Transactions of the Epping Forest and County of Essex Naturalists' Field Club (Buckhurst Hill).
Tr. E. Soc.—Transactions of the Entomological Society of London.
Tr. Hertf. Soc. and *Tr. Herts. N. H. Soc.*—Transactions of the Hertfordshire Natural History Society and Field Club (Hopkinson: Watford).
Tr. Int. Med. Congr. — Transactions of the International Medical Congress (London).
Tr. L. S. (2)—Transactions of the Linnean Society, London. Second series.
Tr. Norw. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society (Norwich).
Tr. N. Z. Inst.—Transactions and Proceedings of the New Zealand Institute (Wellington).
Tromsö Mus. Aarsh.—Tromsö Museum's Aarshefter.
Troudy Ent. Ross. = Transactions of the Russian Entomological Society (St. Petersburg).
Tr. R. Soc. Vict.—Transactions and Proceedings of the Royal Society of Victoria (Melbourne).
Tr. S. Afr. Phil. Soc.—Transactions of the South African Philosophical Society (Cape Town).
Tr. Z. S.—Transactions of the Zoological Society (London).

Vall. Nat.—The Valley Naturalist (St. Louis).
Vergl. physiol. Stud. Adria—Vergleichend-physiologische Studien an dem Kusten der Adria: Experimentelle Untersuchungen (Krukenberg: Heidelberg).
Verh. Ak. Amst.—Verhandelingen der koninklijke Akademie van Wetenschappen (Amsterdam).
Verh. geol. Reichsanst.—Verhandlungen der k.-k. geologischen Reichsanstalt (Wien).
Verh. Ges. Würzb.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg.
Verh. L.-C. Ak.—Verhandlungen der königl. Leopoldinisch-Carolinisch deutschen Akademie der Naturforscher (Dresden).
Verh. schw. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft.
Verh. siebenb. Ver.—Verhandlungen und Mittheilungen des siebenbürgischen Vereins für Naturwissenschaften (Hermannstadt).
Verh. Ver. Brünn—Verhandlungen des naturforschenden Vereins in Brünn.
Verh. Ver. Hamb.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
Verh. Ver. Heidelb. (2) — Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg. Neue Folge.
Verh. Ver. Rheinl.—Verhandlungen des naturhistorichen Vereins der preussichen Rheinlande und Westphalens (Budge: Bonn).

Verh. z.-b. Wien—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien (Vienna).

Versl. Ak. Amst.—Verslagen en Mededeelingen der k. Akademie van Wetenschappen (Amsterdam).

Vid. Medd.—Videnskabelige Meddelelser fra den naturhistoriske Forening (Kjöbenhaven).

Viert. Ges. Zürich—Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich.

Yorksh. Nat.—The Yorkshire Naturalist (Hobkirk & Porritt: Huddersfield).

Z. deutsch. österr. Alpen-Ver.—Zeitschrift des deutschen und österreichischen Alpen-Vereins (München).

Z. E. Ver. schles. (2)—Zeitschrift für Entomologie, herausgegeben vom Verein für schlesische Insektenkunde zu Breslau. Neue Folge.

Z. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft (Berlin).

Z. ges. Naturw. (3)—Zeitschrift für die gesammten Naturwissenschaften. Dritte Folge (Giebel: Berlin).

Zool. (3)—The Zoologist. Third Series (Harting: London).

Zool. Anz.—Zoologischer Anzeiger (Carus: Leipzig).

Zool. Gart.—Der zoologische Garten (Weinland, Bruch, & Noll: Frankfurt-a-M.).

Zool. JB. Neap.—Zoologischer Jahresbericht. Herausgegeben von der zoologischen Station zu Neapel (Carus: Leipzig).

Zool. Rec.—The Zoological Record (Rye: London)

Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie (Siebold & Kölliker: Leipzig).

ERRATA.

MAMMALIA.

P. 23, line 2 from bottom, for "*ryderanns*" read "*ryderanus*."

AVES.

P. 14, line 24, for "JÄCKEL" read "JÄCKEL."
P. 17, line 33, for "Fontepointe" read "Foule Pointe."
P. 37, line 12, for "Melirrhop-he-tes" read "Melirrhophetes."
P. 51, for "PODICIPIDÆ" read "PODICIPEDIDÆ."

MOLLUSCA.

P. 85, line 3, for "*Rochbrunnia*," read "*Rochebrunia*."

CRUSTACEA.

P. 32, line 6 from bottom, after *Gigantione*, for "g.n.", read "[Zool. Rec. xvii. *Crust.* p. 48]."

MYRIOPODA.

P. 8, line 3, for "tubercles" read "tubules."

INSECTA.

P. 5, line 22, for "stigmatal striæ" read "stigmatic cords."
P. 43, line 17, for "*Epicrus*" read "*Epierus*."
P. 57, line 29, after "*Damarsila*," and line 34, after "*Monosacra*," add "[Zool. Rec. xv. *Ins.* p. 66]."
P. 122, dele lines 12 & 13.
P. 244, line 11, dele "*genera and*"; line 12, after "*Parasymmictus*, Bigot," add "[Zool. Rec. xvi. *Ins.* p. 197]; and line 14, after "*Dicrotrypana*," add "(*op. cit.* 5, ix. [1879] Bull. p. 88)."

CONTENTS.*

MAMMALIA. By W. A. Forbes, F.L.S., F.G.S., Prosector to the Zoological Society.

	Page
The General Subject	1
Faunæ	11
Primates	11
Lemures	12
Chiroptera	13
Insectivora	14
Carnivora	15
Creodonta.	17
Cetacea	19
Perissodactyla	20
Artiodactyla	23
Dinocerata	25
Proboscidea	25
Glires	26
Sirenia	28
Tillodonta (?)	29
Edentata	29
Marsupialia	29
Pantotheria	31
Allotheria	31
Monotremata	31

AVES. By Howard Saunders, F.L.S., F.Z.S., &c.

The General Subject, Titles, &c.	1
Passeres	30
Picariæ	41
Psittaci	44
Striges	45
Accipitres	45
Steganopodes.	46
Herodiones.	47
Odontoglossæ	47
Anseres	47
Columbæ	48
Gallinæ	48
Opisthocomi	49
Fulicariæ.	49
Alectorides	49
Limicolæ	50
Gaviæ.	50
Tubinares	51
Pygopodes	51
Impennes.	52
Casuarii	51
Odontornithes	52

REPTILIA and BATRACHIA. By G. A. Boulenger.

Faunæ	1
Reptilia	4
Chelonia	4
Crocodilia	5
Lacertilia	5
Ophidia	10
Batrachia	12
Ecaudata.	12
Caudata	15
Apoda	16

PISCES. By G. A. Boulenger.

Physiological, Anatomical, and General	1
Faunæ	3
Palæichthyes	
Chondropterygii	6
Ganoidei	7
Teleostei	8
Acanthopterygii	8
(Teleostei) Acanthopterygii Pharyngognathi	15
„ Anacanthini	17
„ Physostomi	19
„ Lophobranchii	24
„ Plectognathi	25
Cyclostomata	25
Leptocardii	25

* This volume is 36 pages longer than its predecessor.

MOLLUSCA. By Prof. Eduard von Martens, M.D., C.M.Z.S.

	Page
List of Publications	1
Anatomy, &c.	11
Geographical Distribution, &c.	17
Cephalopoda	34
„ Dibranchiata	34
Pteropoda	38
Heteropoda	38
Gastropoda	38
„ Pectinibranchia	39
(Gastropoda) Rhipidoglossa	54
„ Cyclobranchia	56
„ Telobranchia	57
„ Nudibranchia	58
„ Pulmonata	62
„ „ Operculata	82
[Solenogastra	61]
Solenoconchæ	85
Bivalvia	85

MOLLUSCOIDA. By Prof. Eduard von Martens, M.D., C.M.Z.S.

	Page
List of Publications	94
Brachiopoda	95
Tunicata	96
„ Salpæ	100
Polyzoa	101
(Polyzoa) Chilostomata	102
„ Cyclostomata	107
„ Cienostomata	108
„ Lophopoda	108
„ Endoprocta	108

CRUSTACEA. By Prof. Eduard von Martens, M.D., C.M.Z.S.

	Page
List of Publications	1
Anatomy and Physiology, &c.	5
Geographical Distribution	8
Decapoda	12
„ Brachyura	12
„ Anomura	18
„ Macrura	19
Schizopoda	24
Stomatopoda	24
Cumacea	25
Amphipoda	25
Isopoda	28
Phyllopoda	33
Ostracoda	33
Copepoda	33
Cirripedia	36
Xiphosura	37

ARACHNIDA. By the Rev. O. P. Cambridge, M.A., C.M.Z.S. (assisted by F. M. Campbell, F.L.S., &c.).

	Page
List of General Publications	1
Araneidea	6
Phrynidea	21
Scorpionidea	21
Phalangiidea	22
Pycnogonidea	23
Acaridea	27

MYRIOPODA. By W. F. Kirby, M.E.S., &c.

	Page
The General Subject	1
Chilopoda	1
Chilognatha	4
Symphula	7
Malacopoda	8

INSECTA. The General Subject. By W. F. Kirby, M.E.S., &c. 1–17

Coleoptera. By W. F. Kirby, M.E.S., &c.

	Page		Page		Page
The General Subject	17	Paussidæ	40	Cucujidæ	44
Cicindelidæ	24	Scydmænidæ	40	Cryptophagidæ	45
Carabidæ	26	Silphidæ	41	Lathridiidæ	45
Dytiscidæ	34	Anisotomidæ	42	Thorictidæ	46
Gyrinidæ	34	Scaphidiidæ	42	Dermestidæ	46
Hydrophilidæ	34	Histeridæ	43	Byrrhidæ	47
Staphylinidæ	36	Nitidulidæ	43	Georyssidæ	47
Pselaphidæ	38	Trogositidæ	44	Parnidæ	47
		Colydiidæ	44	Lucanidæ	48

	Page		Page		Page
Scarabæidæ	49	Ptinidæ	66	Curculionidæ	76
Buprestidæ	56	Bostrychidæ	67	Scolytidæ	88
Trixagidæ	58	Cioidæ	67	Brenthidæ	89
Monommatidæ	58	Tenebrionidæ	67	Anthotribidæ	89
Eucnemidæ	58	Cistelidæ	72	Bruchidæ	90
Elateridæ	58	Melandryidæ	73	Cerambycidæ	90
Cebrionidæ	59	Anthicidæ	73	Chrysomelidæ	98
Rhipidoceridæ	60	Mordellidæ	73	Languriidæ	106
Dascillidæ	60	Rhipidophoridæ	73	Erotylidæ	106
Telephoridæ	60	Cantharidæ	74	Endomychidæ	106
Cleridæ	65	Œdemeridæ	75	Coccinellidæ	106
Lymexylidæ	65	Aglyceridæ	76		

HYMENOPTERA. By W. F. KIRBY, M.E.S., &c.

The General Subject	107	Mutillidæ	116	Chalcididæ	125
Apidæ	109	Formicidæ	116	Proctotrypidæ	128
Vespidæ	112	Chrysididæ	119	Cynipidæ	129
Crabronidæ	113	Ichneumonidæ	120	Siricidæ	132
Thynnidæ	116	Braconidæ	123	Tenthredinidæ	133
		Evaniidæ	125		

LEPIDOPTERA. By W. F. KIRBY, M.E.S., &c.

The General Subject	136	Ægeriidæ	172	Drepanulidæ	185
Papilionidæ	149	Thyrididæ	173	Saturniidæ	185
Pieridæ	151	Uraniidæ	173	Ceratocampidæ	188
Danaidæ	154	Castniidæ	174	Bombycidæ	188
Acræidæ	155	Agaristidæ	174	Lasiocampidæ	189
Heliconiidæ	155	Chalcosiidæ	174	Zeuzeridæ	190
Nymphalidæ	156	Zygænidæ	175	Hepialidæ	190
Morphidæ	159	Arctiidæ	176	Cymatophoridæ	191
Brassolidæ	159	Dioptidæ	178	Noctuidæ	191
Satyridæ	159	Lithosiidæ	178	Deltoidæ	204
Libytheidæ	162	Nycteolidæ	180	Geometridæ	205
Erycinidæ	162	Nychthemeridæ	180	Pyralidæ	213
Lycænidæ	162	Liparidæ	180	Crambidæ	216
Hesperiidæ	166	Psychidæ	182	Tortricidæ	217
Sphingidæ	169	Notodontidæ	183	Tineidæ	225
		Limacodidæ	184	Pterophoridæ	232
		Siculodidæ	185		

DIPTERA. By W. F. KIRBY, M.E.S., &c.

The General Subject	233	Tipulidæ	238	Therevidæ	245
Cecidomyiidæ	236	Xylophagidæ	240	Scenopinidæ	245
Mycetophilidæ	236	Stratiomyiidæ	241	Cyrtidæ	245
Simuliidæ	237	Acanthomeridæ	241	Empidæ	245
Bibionidæ	237	Tabanidæ	241	Dolichopodidæ	246
Blepharoceridæ	237	Leptidæ	242	Syrphidæ	246
Culicidæ	237	Asilidæ	242	Œstridæ	247
Chironomidæ	238	Midaidæ	244	Muscidæ	247
Psychodidæ	238	Nemestrinidæ	244	Hippoboscidæ	254
		Bombyliidæ	244	(Aphaniptera)	254

NEUROPTERA. By R. MCLACHLAN, F.R.S., F.L.S., &c.

The General Subject	255	Pseudo-Neuroptera—		Embidæ	261
Trichoptera	256	Thysanura	260	Psocidæ	261
Neuroptera-Planipennia	258	Mallophaga	260	Perlidæ	263
		Thysanoptera	261	Ephemeridæ	263
		Termitidæ	261	Odonata	265

ORTHOPTERA. By R. MCLACHLAN, F.R.S., F.L.S., &c.

Page	Page	Page
The General Subject 269	Blattidæ 270	Gryllidæ 272
Forficulidæ 270	Mantidæ 272	Locustidæ 273
	Phasmatidæ. . . . 272	Acridiidæ 274

RHYNCHOTA. By W. F. KIRBY, M.E.S., &c.

General Subject . 276	Capsidæ 288	Cercopidæ . . . 294
Hemiptera — Heteroptera . . . 277	Anthocoridæ . . 290	Fulgoridæ . . . 294
Pentatomidæ . . 280	Saldidæ 290	Membracidæ . . 297
Coreidæ 284	Nabidæ 290	Iassidæ 297
Berytidæ 286	Reduviidæ . . . 290	Psyllidæ 298
Lygæidæ 286	Hydrometridæ . 294	Aphididæ 299
Pyrrhocoridæ . 287	Corisidæ 294	Coccidæ 301
Tingididæ . . . 288	Hemiptera — Homoptera . . . 294	Aleurodidæ . . . 303
Aradidæ 288	Cicadidæ 294	Anoplura 303

VERMES. By F. JEFFREY BELL, M.A., F.R.M.S., F.Z.S.

General Notes . 1	Acanthocephali. . . 7	Annulata 9
Platyhelminthes . 1	Rotatoria 7	Enteropneusti . . 12
Nematohelminthes 6	Gephyrea 8	Orthonectida . . 12

ECHINODERMATA. By F. JEFFREY BELL, M.A., F.R.M.S., F.Z.S.

Titles 1	Echinoidea 5	Holothuroidea . . 7
General Morphology 3	Asteroidea 6	Crinoidea 8
	Ophiuroidea . . . 7	

CŒLENTERATA.

HYDROZOA AND CTENOPHORA. By A. G. BOURNE, B.Sc. (LOND.).

Titles 1	Graptolites 9
Hydromedusæ—	Scyphomedusæ—
Gymnoblastea-Anthomedusæ 7	Stauromedusæ 9
Calyptoblastea-Leptomedusæ 7	Peromedusæ 9
Trachomedusæ 8	Cubomedusæ 9
Narcomedusæ 8	Discomedusæ 10
Hydrocorallinæ 9	

ANTHOZOA. By S. J. HICKSON, B.A., B.Sc. (LOND.), &c.

Titles 10	Octactiniæ 14
Hexactiniæ 12	

SPONGIIDA. By STUART O. RIDLEY, M.A., F.L.S., F.R.M.S.

Chief Works on Recent Sponges 1	General Anatomy and Physiology 11
Faunæ 3	Fossil Sponges 13
Genera, Species, &c., referred to 4	
New Genera and Species . . . 8	

PROTOZOA. By STUART O. RIDLEY, M.A., F.L.S., F.R.M.S.

The General Subject 1	Rhizopoda 11	Flagellata, Monads 26
Infusoria. 4	Fossil Rhizopoda 24	Gregarinida . . . 32

INDEX TO GENERA AND SUBGENERA DESCRIBED AS NEW, &c.

Kolkata

ZOOLOGICAL RECORD

FOR 1881.

Acc no. 457
dt. 12/12/06

MAMMALIA.

BY

W. A. FORBES, B.A., F.L.S., F.G.S., PROSECTOR TO THE ZOOLOGICAL SOCIETY.

THE year 1881 has, as far as *Mammalia* are concerned, perhaps shown rather a lull as compared with previous ones. This however has been caused, not by any appreciable diminution in the number of papers, but rather by the non-appearance of any fresh separate works of importance.

The flood of new forms of extinct Mammalian life from North America shows as yet no sign of slacking, thanks chiefly to the unwearying labours and exertions of Cope (p. 3). Balfour (p. 2) has completed his masterly treatise on embryology, whilst Chapman (p. 2), Dobson (p. 4), Watson (p. 10), and others, have contributed numerous valuable papers on anatomical subjects. Of faunal publications, the *Mammalia* in Messrs. Salvin & Godman's work on Central America (p. 5) have been practically completed, and Peters & Doria (p. 7) have published a valuable account of the Mammalian fauna of the Papuan sub-region.

THE GENERAL SUBJECT.

AEBY, C. Der Bronchialbaum der Saügethiere und des Menschen, nebst Bemerkungen über den Bronchialbaum der Vögel und Reptilien. Leipzig: 1880.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 6.]

ALLEN, J. A. List of Mammals collected by Dr. Edward Palmer in North-eastern Mexico, with Field-notes by the Collector. Bull. Mus. C. Z. viii. pp. 183–189.

Twenty-five species are mentioned, including a *Heteromys*, this being the most northern locality hitherto recorded for that genus.

Alston, E. R. [See Godman, F. D.]

Balfour, F. M. A Treatise on Comparative Embryology. Vol. ii. (for vol. i. *cf.* Zool. Rec. xvii. *Mamm.* p. 2) pp. 1–655.

The tenth chapter (pp. 177–228) of the first part of this work is devoted to the consideration of the development of the *Mammalia*. The Rabbit is taken as the type for these, what is known of the development of other forms, especially *Cavia*, being duly mentioned, considerable space being devoted to the consideration of the structure of the fœtal envelopes and placenta. The general conclusions as regards the formation of the latter organ and its taxonomic value are reproduced in the paper quoted below.

——. On the Evolution of the Placenta, and on the possibility of employing the Characters of the Placenta in the Classification of Mammals. P. Z. S. 1881, pp. 210–212.

The importance of a knowledge of the development of the placenta is insisted on, as apparently similar forms of placenta may arise in quite different ways.

Baraldi, G. Osteogenesi dell' arco neurale nei Suini (*Sus scropha*). Atti Soc. Tosc. Pr.-Verb. ii. pp. 160 & 161.

Bardeleben, K. Muskel und Fascie. Jen. Z. Naturw. xv. pp. 390–417.

Contains (pp. 410–417) a summary of the facts derived from a comparative study of *Mammalia* in support of his views.

Bergonzini, C. Sul *Myoxus avellanarius*, e sul letargo dei Mammiferi ibernanti. Ann. Soc. Mod. xiv.

[Not seen by the Recorder ; *cf.* Zool. Anz. iv. p. 424.]

Bischoff, T. von. [See *Simiidæ*.]

Bose, P. N. [See *Carnivora*.]

Brown, J. A. Harvie. The Past and Present Distribution of some of the Rarer Animals of Scotland. Zool. (3) v. pp. 8–23, 81–90, 161–171.

Treats of *Felis catus*, *Martes sylvatica*, and *Mustela putorius*.

Burmeister, H. Atlas de la description physique de la République Argentine. Deuxième Section. Mammifères. 1ère Livraison. Die Bartenwale der Argentinischen Küsten. Buenos Aires : 1881.

The present livraison consists of 7 plates, with descriptive letterpress in German, of the 3 species of *Balænoptera* (*B. intermedia*, *bonaerensis*, and *patachonica*) found on the Argentine coasts.

Caton, J. D. Effects of Reversion to the Wild State in our Domestic Animals. Am. Nat. xv. pp. 955–960.

Notes on this subject as observed in the Sandwich Islands.

Cattaneo, G. [See *Macropodidæ*.]

Chapman, H. C. [See *Hippopotamidæ*, *Macropodidæ*.]

CLARKE, W. E., & ROEBUCK, W. D. A Handbook of the Vertebrate Fauna of Yorkshire, being a Catalogue of British Mammals, Birds, Reptiles, Amphibians, and Fishes, showing what species are or have, within historical periods, been found in the county. London: 1881, pp. i.–xii. & 1–149.

Of 72 species enumerated as still British, 50 occur in Yorkshire.

COPE, E. D. On the origin of the Foot Structures of the Ungulates. Am. Nat. xv. pp. 269–273.

——. On the Effect of Impacts and Strains on the Feet of *Mammalia*. Am. Nat. xv. pp. 542–547.

An interesting paper showing the influence of mechanical forces on the development of the various forms of Mammalian feet, specialized as regards (1) the reduction of the number of digits; (2) the formation of a second hinge-joint in the tarsus (in Artiodactylates): (3) the formation of trochlear ridges and keels on the articular ends of the bones.

——. The Bad Lands of the Wind River and their Fauna. Am. Nat. xiv. pp. 745–748.

In this important paper [omitted accidentally from Zool. Rec. xvii.] notices are given of 19 species of fossil Mammals recently obtained from the "bad lands" of the upper part of the Big Horn River in Western Central Wyoming. 10 species are new, new genera being proposed for two of them. Some additional species are described, *l. c.* p. 908. [See *Lemuravidæ*, *Vespertilionidæ*, *Erinaceidæ*, *Leptictidæ*, *Oxyænidæ*, *Lophiodontidæ*, *Rhinocerotidæ*, *Chalicotheriidæ*.]

——. On some *Mammalia* of the Lowest Eocene Beds of New Mexico. P. Am. Phil. Soc. xix. pp. 484–495. (Separately issued as "Palæontological Bulletin, No. 33.")

Describes 12 new species, 8 of the genera being new, some of great interest. [See *Leptictidæ*, *Mesonychidæ*, *Phenacodontidæ*, *Anoplotheriidæ*.]

——. Contributions to the History of the Vertebrata of the Lower Eocene of Wyoming and New Mexico made during 1881. P. Am. Phil. Soc. xx. pp. 139–197. ("Palæontological Bulletin, No. 31.")

Contains an account of the vertebrate fossils, chiefly *Mammalia*, from the Lower Eocene deposits of the Big Horn River district. Many of the forms found belong to new genera or species. [See *Lemuravidæ*, *Limnotheriidæ*, *Miacidæ*, *Leptictidæ*, *Mesonychidæ*, *Lophiodontidæ*, *Coryphodontidæ*, *Phenacodontidæ*, *Anoplotheriidæ*, *Stylinodontidæ*.]

——. *Mammalia* of the Lowest Eocene. Am. Nat. xv. pp. 829–831.

Calls attention to some of the more characteristic *Mammalia* found in early Tertiary rocks, "probably the Puerco formation," which lies below the Wasatch, in New Mexico." A new Creodont and 2 new "Suilloid" genera are described, though the two latter are later on (*vide infrà*, p. 23) considered as probably belonging to the *Phenacodontidæ*.

[Cope, E. D.] On the *Vertebrata* of the Wind River Eocene Beds of Wyoming. Bull. U. S. Geol. Surv. vi. pp. 183–202.

Note and descriptions of 40 species of *Mammalia* from these deposits, 26 being new. [See *Lemuravidæ*, *Vespertilionidæ*, *Erinaceidæ*, *Miacidæ*, *Leptictidæ*, *Oxyænidæ*, *Uintatheriidæ*, *Lophiodontidæ*, *Chalicotheriidæ*, and *Phenacodontidæ*. See also *Insectivora*, *Carnivora*.]

Cunningham, D. J. The Relation of Nerve-supply to Muscle-homology. J. Anat. Phys. xvi. pp. 1–9.

The author's observations apply particularly to the innervation of the intrinsic muscles of the foot in *Mammalia*. Although usually supplied by the same nerves, homologous muscles are not invariably so supplied. [See also *Marsupialia*.]

Dobson, G. E. On the Tendinous Intersection of the Digastric [Muscle]. P. R. S. xxxii. pp. 29–35.

Chiefly relates to the modifications of this muscle in the *Primates*, *Insectivora*, and *Chiroptera*. [See also *Cercopithecidæ*, *Pteropodidæ*, and *Erinaceidæ*.]

Doria, G. [See Peters, W.]

Ehlers, E. [See *Simiidæ*.]

Elliott, D. G. [See *Felidæ*.]

Ercolani, S. B. Sul parte pretermesso o mancato nelle femmine del *Myoxus glis*, e nella specie umana. Rend. Acc. Bologn. 1880–81, pp. 85–92.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 587.]

Filhol, H. Étude des Mammifères fossiles de Ronzon. (Haute-Loire). Ann. Sci. Géol. xii. 2–4. pp. 1–270, pls. vi.–xxxi.

An important and detailed study, illustrated by numerous plates of the fossil (Miocene) Mammalian fauna of these deposits, founded chiefly on the collection made, and already in part described, by M. Aymard. Several new species and genera are described. [See *Carnivora*, *Anthracotheriidæ*, *Didelphyidæ*].

Fischer, P. [See *Cetacea*.]

Fletcher, J. J. [See Lister, J. J.]

Flower, W. H. [See *Phocidæ*.]

Focillon, A. Esquisses des Animaux Mammifères les plus remarquables. Tours: 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 6.]

Fontana, L. J. El gran Chaco. Buenos Aires: 1881, 8vo.

Contains (pp. 189–191) a list (obviously very incomplete) of the *Mammalia* of this interesting country.

Forbes, W. A. [See *Rhinocerotidæ* and *Phalangistidæ*; also Garrod, A. H.]

GARROD, A. H. In Memoriam. The collected Scientific Papers of the late A. H. Garrod. Edited, with a Biographical Memoir of the author, by W. A. Forbes. London: 1881, pp. i.–xxv. & 1–537, pls. i.–xxxiii.

A reprint, with the original illustrations, of the various physiological and zoological papers of this anatomist, chiefly published, originally, in the Proceedings and Transactions of the Zoological Society. Thirty-one relate to *Mammalia*.

GODMAN, F. D., & SALVIN, O. Biologia Centrali-Americana. (*Cf.* Zool. Rec. xvii. *Mamm.* p. 5).

In pt. xiii., the late E. R. Alston has concluded his account of the *Mammalia*, with some supplementary remarks, and an index to the whole.

GREWINGK, C. Uebersicht der bisher bekannten Reste altquartärer und ausgestorbener neuquartärer Säugethiere Liv-Est-und Kurlands. SB. Ges. Dorp. v. pp. 332-336.

[Not seen by the Recorder.]

HARRIS, V. Pacinian Corpuscles in the Pancreas and Mesenteric Glands of the Cat. Q. J. Micr. Sci. 1881, pp. 502 & 503.

HARTING, J. E. The Annals of Irish Zoology. Zool. (3) v. pp. 433–445, 473–483.

Historical materials for an Irish Fauna.

——, P. Les corps amniotiques de l'œuf de l'Hippopotame, comparés à ceux d'autres Mammifères. Verh. Ak. Amst. xxi. pp. 1–11, pls. i. & ii.

A study of the amniotic bodies found on the umbilical cord of the Hippopotamus, as of so many other *Mammalia*.

HEAPE, W. On the Germinal Layers and Early Development of the Mole [*Talpa europæa*]. P. R. Soc. xxxiii. pp. 190–198.

An important paper on the early stages of the development of this animal, which exhibit many striking features of difference from those of other Mammals as yet investigated; or at least render necessary a reconsideration of the meaning of the observed facts.

HENNIG, C. Versuch einer vergleichenden Beckenkunde. SB. Ges. Leipz. 1881, pp. 33–43, pl.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 276.]

HERON-ROYER, —. Concrétions vagino-utérines, observées chez le *Pachyuromys duprasi*. Zool Anz. iv. pp. 623–628.

The author suggests that the function of the peculiar penial armature of many male Rodents may be to clear away the secretions of mucus and semen collected in the genital passages of the female.

HIS, W. Mittheilungen zur Embryologie der Säugethiere und des Menschen. Arch. Anat. Phys. v. pp. 303–329, pls. xi. & xii.

HOLUB, E. Seven Years in South Africa: Travels, Researches, and Hunting Adventures, between the Diamond Fields and the Zambesi (1872–1879). London: 1881, 2 vols. 8vo.

Contains incidental observations on many species of Mammals.

HORVATH, A. Ueber die respiration der Winterschläfer. (Fortsetzung) Verh Ges. Würzb. xv. Anhang, pp. 177-186.

——. Einfluss der verschiedener Temperaturen auf die Winterschläfer. *L. c.* pp. 187–219.

These papers deal with the respiration and temperature of hybernating Rodents, chiefly *Spermophilus citillus*.

KLEIN, E. A further contribution to the minute anatomy of the organ of Jacobson in the Guinea-pig. Q. J. Micr. Sci. 1881, pp. 219–230, pls. xvi. & xvii.

LEFOUR, —. Animaux domestiques: Zootechnie générale. 6me Ed. Paris: 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 6.]

LEPSIUS, G. R. [See *Halitheriidæ*.]

LEWIS, W. B. On the Comparative Structure of the Brain in Rodents. P. R. Soc. xxxiii. pp. 15–21.

Describes the histology of the *cortex cerebri*, and the connection of the olfactory lobe with the cerebrum, as seen in the Rabbit and Rat.

LISTER, J. J., & FLETCHER, J. J. [See *Macropodidæ*.]

LUCAE, J. C. G. Zur Statik und Mechanik der Quadrupeden (*Felis* and *Lemur*). Frankfurt: 1881, 4to, pp. 1–24, pls. i. & ii.

LUCHSINGER, B. Von den Venenherzen in der Flughaut der Fledermäuse (Ein Beitrag zur Lehre von dem peripheren Gefässtonus). Arch. ges. Phys. xxvi. pp. 445–458.

LYDEKKER, R. Note on some Mammalian Fossils from Perim Island, in the collection of the Bombay Branch of the Royal Asiatic Society. Rec. Geol. Surv. Ind. xiv. pp. 155 & 156, and Pal. Ind. (10) ii. pp. 63–65.

Remains of *Dinotherium*, *Aceratherium*, and a trilophodont *Mastodon*. [See also *Carnivora* and *Rhinocerotidæ*.]

MACLEOD, JULES. Contribution à l'étude de la structure de l'ovaire des Mammifères. Arch. Biol. ii. pp. 127–144, pls. viii. & ix.

Deals with the structure and relations of the ovary in the *Primates* and *Lemures*.

MARKHAM, C. R. On the Whale Fishery of the Basque Provinces of Spain. P. Z. S. 1881, pp. 969–976.

An interesting account of the history of the fishery formerly carried on by the Basques. The whale hunted was *Balæna biscayensis*.

MIVART, St. G. The Cat. An introduction to the study of backboned Animals, especially Mammals. With 200 illustrations. London: 1881, 8vo, pp. i.–xxiii. & 1–557.

MÖBIUS, K. Beiträge zur Meeresfauna der Insel Mauritius und der Seychellen. Berlin: 1880, pp. 1–352. [Omitted from Zool. Rec. xvii.]

The introductory portion of this work (pp. 36 & 37) contains a few remarks on the land fauna of Mauritius. The few *Mammalia* noticed are all, except a *Pteropus*, introduced species.

Moniez, R. Le Lapin est-il un animal ruminant? Bull. Sci. Nord. (2) i. pp. 169–174.

According to these observations, the food in the Rabbit returns to the stomach after its first digestion.

Much, M. Ueber die Zeit des Mammut in Allgemeinen, und über einige Lagerplätze von Mammutjägern in Niederösterreich in Besonderen. MT. Anthrop. Ges. Wien, xi. pl. ii.

[Separate copy only seen.]

Nordenskiöld, A. E. The Voyage of the 'Vega' round Asia and Europe. Translated by A. Leslie. In two volumes. London: 1881, 8vo.

Contains interesting notices of the *Mammalia* of Novaya Zemlya (i. pp. 132–170), of the Land of the Chukchi (ii. pp. 44–46) and of Berings Island (ii. pp. 269–291), including notes on the *Rhytina* (ii. pp. 272–280). There is some evidence to show that live specimens of the latter have occurred within the last thirty years.

Osborn, H. F. [See *Uintatheriidæ*.]

Parker, W. N. [See *Leporidæ*.]

Pellegrini, B. Avanzi animali dell' epoca del bronzo nel Mantovano. Atti Soc. Pad. vii. pp. 110–143.

The species found are chiefly domestic animals.

Peters, W., & Doria, G. Enumerazione dei Mammiferi raccolti da O. Beccari, L. M. d'Albertis, ed A. A. Bruijn, nella Nuova Guinea propriamente detta. Ann. Mus. Genov. xvi. pp. 664–707, pls. v.–xviii.

An important paper on the Mammals of New Guinea, of which 57 species are enumerated, several being figured and some new. [See *Pteropodidæ*, *Emballonuridæ*, *Vespertilionidæ*, *Muridæ*, *Dasyuridæ*, *Peramelidæ*, *Phalangistidæ*, *Macropodidæ*.]

Pouech [l'Abbé]. Sur un ossement fossile supposé appartenir à un Mammifère, trouvé dan les Grès crétacés du Mas-d'Azil (Ariège). Bull. Soc. Géol. Fr. (3) ix. pp. 88–90.

A fragment of a pelvis, apparently Mammalian, though its condition is too imperfect to admit of any strict comparisons.

Pritchard, U. The Cochlea of the *Ornithorhynchus platypus* compared with that of ordinary Mammals and of Birds. Phil. Tr. clxxii. pp. 267–282, pls. xliv. & xlv.

Réguis, J. F. M. Note sur les Mammifères de la Provence, lue à la séance anniversaire de la Société d'études des sciences naturelles de Marseille, Dec. 1, 1878. Marseille: 1881, 8vo, pp. 1–70.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 295.]

Reinhardt, J. Nögle Bemærkninger om Gumlernes, især Baeltedyrenes, Bækken. Vid. Medd. 1881, pp. 154–164, pl. iii.

RÉROLLE, L. Étude sur les Mammifères fossiles des dépôts Pampéens de la Plata, d'après les collections du Musée de Buenos Aires. Mem. Ac. Lyon, xxiv.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 295.]

RICHIARDI, S. Intorno alle glande tubolari del derma del Dromedario. Zool. Anz. iv. p. 263.

ROBIN, H. A. [See *Chiroptera*.]

ROEBUCK, W. D. [See CLARKE, W. E.]

ROGER, O. Liste der bis jetzt bekannten fossilen Säugethiere. CB. Ver. Regensb. 1881, pp. 27, 52, 117.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 586.]

ROLLAND, E. Faune populaire de la France. Tome iv. Les Mammifères domestiques. Première partie: noms vulgaires, dictons, proverbes, légendes, contes et superstitions. Paris: 1881, 8vo, pp. i.–xii., 1–276.

[The first volume, containing the wild *Mammalia*, was published in 1877.]

SALVIN, O. [See GODMAN, F. D.]

SCHIÖDTE, J. C. Zoologia Danica. Afbildninger af Danske Dyr med populaer text. 2det Hefte. Kjöbenhavn: 1881.

The present part continues the account of the *Mammalia* (pp. 43–78), the species of *Carnivora* being figured on two plates. [The first part, containing the *Chiroptera*, *Insectivora*, and the commencement of the *Carnivora*, was published in 1878, but has hitherto been omitted from Zool. Rec.]

SCHLEGEL, H. On the Zoological Researches in West Africa. Notes Leyd. Mus. (Note xiv.) iii. pp. 53–58.

General remarks on an expedition by Messrs. Büttikofer & Sala to Liberia in 1879–80. The new *Mammalia* met with are described by Jentink. [*Pteropodidæ*, *Sciuridæ*.]

SCHULIN, K. Zur Morphologie des Ovarium. Arch. mikr. Anat. xix. pp. 442–512, pls. xxii.–xxiv.

A full account of the development and structure of the Mammalian ovum, and of the corpus luteum.

SCULLY, J. On some Mammals from the north-west frontier of Kashmir. Ann. N. H. (5) viii. pp. 95–101.

Notes on eight species of *Carnivora* and *Glires*.

——. On some Mammals from Kandahar. *L. c.* pp. 222–229.

Nine species are mentioned, one being new [*Muridæ*].

——. On the Mammals of Gilgit. P. Z. S. 1881, pp. 197–209.

Thirty-three species are mentioned, with notes on their habits and distribution. One is new [*Vespertilionidæ*].

SELOUS, F. C. A Hunter's Wanderings in Africa, being a narrative of nine years spent among the game of the far interior of South Africa. London: 1881, 8vo, pp. 1–445.

Contains valuable accounts, from personal observation, of the habits and distribution of many of the larger African *Mammalia*. The papers quoted below (pp. 21 & 24) on the Rhinoceroses and Antelopes are here reproduced, with some additional plates illustrating the latter group. [See also *Rhinocerotidæ* and *Bovidæ*.]

SORBY, H. C. On the green colour of the hair of Sloths. J. L. S. xv. pp. 337–341.

The green colour of fresh specimens of *Cholœpus* and *Bradypus* is due to the growth on the hairs of an Alga (*Chlorococcus*). [*Cf.* Zool. Rec. xvii., *Mamm.* p. 29.] These two genera of Sloths differ remarkably from each other in the microscopic structure of the hairs.

SOUTHWELL, T. The Seals and Whales of the British Seas. London: 1881, 4to, pp. i.–vi. & 1–128, with numerous woodcuts.

A popular account of these animals, the substance of which originally appeared in Sci. Goss.

SPEARMAN, H. R. Mammals of British Burma. British Burma Gazetteer (Rangoon: 1880, large 8vo), i. pp. 538—568.

Enumerates 130 species, the list being founded on Blyth's Catalogue. [*Cf.* Zool. Rec. xii. p. 2.] [Omitted from Zool. Rec. xvii.]

STILLMAN, J. D. B. The Horse in Motion, as shown in a series of views by instantaneous photography, with the study on animal mechanics founded on the revelations of the camera. Boston: 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 7.]

STRUTHERS, J. [See *Balænidæ*.]

TARTUFERI, F. Studio comparativo del tratto ottico e dei corpi genicolati nell' uomo, nella scimmia, e nei Mammiferi inferiori. Atti Soc. Tor. xvi. pp. 575–577.]

A brief abstract of the author's results.

THOMAS, O. Account of the Zoological Collections made during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the coast of Patagonia. I. *Mammalia*. P. Z. S. 1881, pp. 3–6.

Ten species are mentioned, one being new [*Muridæ*].

TROUESSART, E. L. Catalogue des Mammifères vivants et fossiles. [*Cf.* Zool. Rec. xvii. *Mamm.* p. 9.]

This third fasciculus (extracted from Bull. Soc. Angers, 1880, pp. 177–209) concludes the Rodents, in which are included the *Toxodontia*!

——. Du Rôle des Courants marins dans la distribution géographique des Mammifères Amphibies, et particulièrement des Otaries. C. R. xcii. pp. 1118–1121.

[*Cf.* also Naturaliste, i. pp. 429–431.]

Ugolini, U. Prima nota di Anomalie nel cranio dei Mammiferi. Bull. Soc. Ven.-Trent. ii. pp. 33–40.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 495.]

Valentin, G. Beiträge zur Kenntniss des Winterschlafs der Murmelthiere. 26 Abth. in: Moleschott's Untersuch. z. Naturlehre d. Mensch. xii. pp. 466–472.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 423.]

Watson, M. [See *Hyænidæ*, *Procyonidæ*, and *Elephantidæ*.]

White, F. B. The *Mammalia* of Scotland. Scot. Nat. 1881, pp. 49–56.

Fifty-two species, of which a list is given, still exist in Scotland, 17 being *Cetacea*, 3 *Chiroptera*.

Wilder, B. G. The brain of the Cat (*Felis domestica*). 1. Preliminary account of the gross anatomy. P. Am. Phil. Soc. 1881, pp. 524–562. pls. i.–iv.

A very full account of the macroscopic structure of the cat's brain. Numerous new terms for the different parts described are introduced.

Williams, H. S. Descriptive Anatomy of the Domestic Cat. Salem, Mass.: 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 153.]

Winge, H. Om Græske Pattedyr, samlede af L. Münter. Med Bemærkninger om Familierne *Soricidæ*, *Mustelidæ*, *Muridæ*, og *Myoxidæ*. Vid. Medd. 1881, pp. 7–59.

Notes 23 species of Mammals from Greece.

Young, A. H. [See *Marsupialia*, *Phalangistidæ*.]

Zörner, E. Bau und Entwickelungsgeschichte des Peritoneums, nebst Beschreibung des Bauchfells einiger Edentaten. Z. ges. Naturw. (3) v. pp. 105–185, pl. i.

An elaborate description of the general structure and disposition of the peritoneum, with notes on its conformation in *Cycloturus* and *Cholœpus*.

W. T. Blanford estimates the total number of Indian *Mammalia* at 405; J. A. S. B. l. p. 265.

J. Barboza du Bocage enumerates, with short remarks, 18 species of *Mammalia* collected by Major Serpa Pinto in his journey across Africa. J. Sc. Lisb. xxvii. pp. 139–141. [Omitted from Zool. Rec. xvii.*]

A. H. Everett gives notes on the 'guliga' of Borneo, a concretion formed in the stomachs (?) of species of *Semnopithecus*; Ann. N. H. (5) vii. pp. 274, 275. [Extracted from the Journal of the Straights Branch of the Royal Asiatic Society, 1880.]

---

* The article is indexed as "Aves da Zambezia," &c., with nothing to indicate that it contains any notes on *Mammalia*.—Rec.

W. Peters gives an account of 10 species of *Mammalia* from the interior of Angola; SB. Nat. Fr. 1881, pp. 131–133. One is new [*Spalacidæ*].

M. Schmidt continues his observations on the manners of *Simia satyrus* in confinement; Zool. Gart. xxii. pp. 97–103. [*Cf.* Zool. Rec. xvi. *Mamm.* p. 9.]

FAUNÆ.

Africa, S. [See F. C. Selous & J. Barboza du Bocage.]
America, C. [See F. D. Godman & O. Salvin.]
Angola. [See W. Peters.]
Burma. [See H. R. Spearman.]
Circumpolar Regions. [See A. E. Nordenskiöld.]
Denmark. [See J. C. Schiödte.]
France. [See J. F. M. Reguis & P. Fischer.]
Gilgit. [See J. Scully.]
Greece. [See H. Winge.]
Ireland. [See J. E. Harting.]
Kandahar. [See J. Scully.]
Kashmir. [See J. Scully.]
Liberia. [See H. Schlegel.]
Mauritius. [See K. Möbius.]
Mexico. [See J. A. Allen.]
Papua. [See W. Peters & G. Doria.]
Patagonia. [See O. Thomas.]
Scotland. [See J. A. Harvie Brown & F. B. White.]

PRIMATES

J. M. Brown describes the modifications of the femoral artery and its branches in five species of *Cercopithecidæ* and in *Anthropopithecus*; J. Anat. Phys. xv. pp. 523–535.

Török, A. von. Das Verhalten der Augenhöhlen bei Affen und Menschen. Kosmos, v. pp. 145, 146.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 153.]

Simiidæ.

Bischoff, T. von. Ueber Brachycephalie und Brachyencephalie des Gorilla und der underen Affen. SB. bayer. Ak. 1881, pp. 379, 390, pl.

Ehlers, E. Beiträge zur Kenntniss des Gorilla und Chimpanse. Abh. Ges. Götting. xxviii. pp. 1–77, pls. i.–iii.

An important paper on the anatomy of these Anthropoid Apes, based on the examination of two Gorillas, and one nearly adult Chimpanse.

Gorilla savagii. Its name should very probably be *Gorgada*; A. Riese, Zool. Gart. xxii. pp. 52, 53. On a young skull of the species; A. de

Török, Bull. Soc. Anthrop. (3) iv. pp. 46–57. On certain points in its brain; T. von Bischoff, Morph. JB. vii. pp. 312–322. On alleged hybrids between *Gorilla* and *Anthropopithecus*; A. B. Meyer, Zool. Gart. 1881, pp. 231–236.

Cercopithecidæ.

Saint-Denys, [Marquis] d' Hervey. Sur la reproduction des Singes. Bull. Soc. Acclim. (3) viii. pp. 1–4.

The author seems to have been very successful in keeping alive (for eleven years) and breeding *Cercopithecus callitrichus*.

Semnopithecus holotephrus (p. 27) and *rutledgii* (p. 39), spp. nn., "habitat unknown"; J. Anderson, Anat. Res. W. Yunnan. [Omitted from Zool. Rec. xvi.]

Cercopithecus callitrichus. On some points in its myology; G. E. Dobson, P. Z. S. 1881, pp. 812–818.

Cebidæ.

Pithecia albinasa alive in London and figured; P. L. Sclater, P. Z. S. 1881, p. 258, pl. xxix.

LEMURES.

Limnotheriidæ (?)

Anaptomorphus homunculus. Description of this interesting form [described in Am. Nat. xv.], E. D. Cope, P. Am. Phil. Soc. xx., pp. 152–156. "There is no doubt but that the genus *Anaptomorphus* is the most Simian Lemur yet discovered, and probably represents the family from which the true monkeys and men were derived. Its discovery is an important addition to our knowledge of the phylogeny of man."

Cynodontomys latidens, g. & sp. nn (foss.), *id. l. c.* p. 151. Lower Eocene of Wyoming. Allied to *Anaptomorphus* and *Necrolemur*.

Lemuravidæ.

Hyopsodus speirianus, sp. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 908, Wasatch beds of Wyoming. [Omitted from Zool. Rec. xvii.]

H. lemoinianus, sp. n. (foss.), *id.*, P. Am. Phil. Soc. xx. p. 148, Lower Eocene of Wyoming.

Pantole[i]stes metsiacus, p. 149, and *nuptus*, p. 150, spp. nn. (foss.), *id. l. c.*, Lower Eocene of Wyoming.

Pantole[i]stes secans, sp. n. (foss.), *id.*, Bull. U. S. Geol. Surv. vi. p. 187, Wind River Beds.

Microsyops scottianus, sp. n. (foss.), *id. l. c.*, p. 188, Wind River Beds.

Pelycodus [*cf.* Zool. Rec. xii. p. 7] *nunienum*, sp. n. (foss.), *id. l. c.*, p. 187, Wind River Beds.

CHIROPTERA.

Robin, H. A. Sur l'époque de l'accouplement des Chauves-Souris. Bull. Soc. Philom. (7) v. pp. 88–90. [*Cf.* Zool. Rec. xvi. *Mamm.* pp. 2, 4.]

Coition may take place during intervals of activity in the winter.

——. Sur la morphologie des enveloppes fœtales des Chiroptères. C. R. xcii. pp. 1354–1357.

——. Sur les enveloppes fœtales des Chiroptères du groupe des Molossiens. Bull. Soc. Philom. (7) v. pp. 142, 143. Supplementary to his paper in C. R. (*vide supra*).

W. D. Roebuck gives a list of the Bats, 5 in number, found in Yorkshire, with remarks on species likely to be found there; Yorkshire Naturalist, vi. pp. 145–148.

[See also B. Luchsinger, *suprà*, p. 6].

Pteropodidæ.

Cynopterus montanoi, sp. n., H. A. Robin, Bull. Soc. Philom. (7) v. p. 90, Malacca.

Epomophorus. On the structure of the pharynx, larynx, and hyoid bones in this genus; G. E. Dobson, P. Z. S. 1881, pp. 685–693.

Leiponyx [*Li-*] *buttikoferi*, g. & sp. nn., F. A. Jentink, Notes Leyd. Mus. iii. p. 59, Liberia. Allied to *Pteropus*, but with no claw on the index.

Pteropus melanopogon, var. *papuana*, W. Peters & G. Doria, Ann. Mus. Gen. xvi. p. 690.

Rhinolophidæ.

Triænops rufus and *humbloti*, spp. nn., A. Milne-Edwards, C. R. xci. p. 1035, Madagascar.

Nycteridæ.

Nycteris revoili, sp. n., H. A. Robin, Bull. Soc. Philom. (7) v. p. 90, Northern Somali Land.

Vespertilionidæ.

Vesperugo anemophilus, sp. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 745, Wasatch beds of Wyoming. [See also Bull. U. S. Geol. Surv. vi. p. 184.]

V. papuanus, sp. n., W. Peters & G. Doria, *l. c.*, p. 696, Salwatti.

Harp[*y*]*iocephalus tubinaris*, sp. n., J. Scully, P. Z. S. 1881, p. 200, Gilgit.

Vesperus humbloti, sp. n., A. Milne-Edwards, C. R. xci. p. 1035, Madagascar.

Scotophilus robustus, sp. n., *id. ibid.*, Madagascar.

Emballonuridæ.

Emballonura beccarii, sp. n., W. Peters & G. Doria, *l. c.* p. 693, Island of Jobi.

Mormopterus. W. Peters reviews the species of this genus, with figures of the 5 species (one new) recognized; MB. Ak. Berl. 1881, pp. 482–485, pl. *M. beccarii* (p. 484, fig. 5) is a new species from Amboina.

INSECTIVORA.

Erinaceidæ.

Dobson, G. E. Notes on the anatomy of the *Erinaceidæ*. P. Z. S. 1881, pp. 389–408. These notes chiefly deal with the dentition, myology, and osteology of *Gymnura* and *Erinaceus*.

Gymnura candida [= *G. rafflesi*, var. *candida*, Günth.; *cf.* Zool. Rec. xiii. *Mamm.* p. 12] is a good species, found only in Borneo; F. A. Jentink, Notes Leyd. Mus. iii. pp. 166–168.

Esthonyx spatularius, sp. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 908, Wasatch beds of Wyoming. [See also Bull. U. S. Geol. Surv. vi. p. 186.]

E. acutidens, sp. n. (foss.), *id.* Bull. U.S. Geol. Survey, vi. p. 185, Wind River Beds.

Potamogalidæ.

Potamogale velox occurs in Angola; W. Peters, SB. Nat. Fr. 1881, p. 132.

Chrysochloridida.

Chrysochloris albirostris occurs in Angola; W. Peters, SB. Nat. Fr. 1881, p. 132.

Macroscelididæ.

A. Günther has notes on the species of *Rhynchocyon* and *Petrodromus*, P. Z. S. 1881, pp. 163 & 164. Of four species of *Rhynchocyon*, two are here described as new, *R. macrurus* (p. 163), from the Rovuma River, and *R. chrysopygus* (p. 164, pl. xiv.), from the Mombas River, E. Africa.

Macroscelides revoilii, sp. n., — Huet, Bull. Soc. Philom. (7) v. p. 96, Northern Somali Land.

Talpidæ.

Talpa europæa. On some points in the osteology of its anterior limb; E. L. Trouessart, Naturaliste, i. p. 428. *T. leptura*, sp. n., O. Thomas, Ann. N. H. (5) vii. p. 470, Pekin.

Soricidæ.

Crocidura murina. Additional note on this species (*cf.* Zool. Rec. xvii. *Mamm.* p. 14); E. L. Trouessart, Ann. Sci. Nat. (6) xi. art. 5 *bis*.

Genus incertæ sedis.

Calamodon [*cf.* Zool. Rec. xii. p. 10] *cylindrifer*, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 184, Wind River Beds.

CARNIVORA.

Lydekker, R. Note on some Siwalik Carnivora. Rec. Geol. Surv. Ind. xiv. pp. 57–66. Criticising the species lately described by P. N. Bose [*cf.* Zool. Rec. xvii. *Mamm.* p. 14]. The latter replies, *l. c.* pp. 263–267.

Cope, E. D. On the *Nimravidæ* and *Canidæ* of the Miocene Period. Bull. U. S. Geol. Surv. vi. pp. 165–181.

Discusses the genera of these two groups found in the American Miocenes, with remarks on the evolution of the *Felidæ* and *Nimravidæ*. Several new species, some belonging to quite other groups, are described. [See *Nimravidæ*, *Canidæ*, *Oreodontidæ*, *Camelidæ*, *Suidæ*, *Sciuridæ*, *Muridæ*.]

Felidæ.

Part viii. of D. G. Elliott's Monograph of the *Felidæ* (*cf.* Zool. Rec. xvii. *Mamm.* p. 15) contains illustrations of *Felis concolor*, *F. marmorata*, *F. cervaria*, and *F. manul*.

Felis leo. On its occurrence in the district of Palamow, India; V. Ball, P. A. S. B. 1881, pp. 3, 4. *Felis catus*: see J. A. Harvie Brown, *suprà*, p. 2. *F. domestica*: see B. G. Wilder & H. S. Williams, *suprà*, p. 10.

Machærodus cerebralis, sp. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 143. Oregon. [Omitted from Zool. Rec. xvii.]

Nimravidæ.

E. D. Cope (Bull. U. S. Geol. Surv. vi. p. 167), recognizes the following as genera of this family. *Proælurus*, *Pseudælurus*, *Archælurus*, *Ælurogale*, *Nimravus*, *Dinictis*, *Pogonodon*, *Hoplophoneus*, *Eusmilus*.

Nimravus gomphodus, p. 171, and *confertus*, p. 172, spp. nn. (foss.), *id. l. c.*, Oregon.

Pogonodon, g. n. (foss.), *id.* Am. Nat. xiv. p. 143 [omitted from Zool. Rec. xvii.]. Type, *Hoplophoneus platycopis* (*cf.* Zool. Rec. xvii. *Mamm.* p. 15).

Hyænidæ.

Hyæna crocuta. Additional observations on its anatomy; M. Watson, P. Z. S. 1881, pp. 516–521. [*Cf.* Zool. Rec. xiv. *Mamm.* p. 12 & xv. *Mamm.* p. 13.]

Canidæ.

E. D. Cope recognizes 19 species of *Canidæ* (3 being new), from the American Miocene. Bull. U. S. Geol. Surv. vi. pp. 177–181.

Supplementary note on the above, *id.* Am. Nat. xv. p. 497, containing note on the dental formula of *Hyænocyon*, and *Oligobunis*.

On the *Canidæ* of the Loup Fork Epoch; Cope, Bull. U. S. Geol. Surv. vi. No. 2, pp. 387–390.

Four species belonging to the genera *Ælurodon* and *Canis*, 2 being new.

Woldrich, J. N. Beiträge zur Geschichte des fossilen Hundes. MT. anthrop. Ges. Wien, xi. pp. 8–17, pl. i.

An account of the various forms of *Canis* and its allies found in the quaternary deposits of Central Europe.

Canis brachypus, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 389, "Loop Fork" beds (Upper Miocene) of N. America.

Oligobunis, g. n. (foss.), *id.* Am. Nat. xv. p. 497. Type, "*Icticyon*" *crassivultus* [cf. Zool. Rec. xvi. *Mamm.* p. 15].

"*Dysodus pravus*" [cf. Zool. Rec. xvi. *Mamm.* p. 15]. Additional note on; *id. l. c.* pp. 233 & 234.

Ælurodon hyænoides, sp. n. (foss.), *id.* Bull. U. S. Geol. Surv. vi. p. 388, "Loup Fork" (Upper Miocene) of N. America.

Temnocyon [cf. Zool. Rec. xvi. *Mamm.* p. 15], *wallovianus* and *josephi*, spp. nn. (foss.), *id. l. c.* p. 179, Miocene of Oregon.

Galecynus latidens, sp. n. (foss.), *id. l. c.* p. 181, Miocene of North America.

Procyonidæ.

Procyon lotor. The female genital organs and placentation described in detail; M. Watson, P. R. S. xxxii. pp. 272–298, pls. iii.–vi. The most important points noticed are the presence of peculiar gigantic capillaries in the fœtal part of the placenta, the absence of an umbilical vesicle, and the presence of an epitrichium. For abstract, *cf.* Zool. Anz. iv. pp. 143, 144.

Mustelidæ.

Martes sylvatica. Note on the young of; A. H. Cocks, Zool. (3) v. pp. 333 & 334. On its occurrence in Wales; C. Smith, *l. c.* p. 419. See also J. A. Harvie Brown, *suprà*, p. 2.

Mustela jelskii (p. 647) and *stolzmanni* (p. 835), spp. nn., L. Taczanowski, P. Z. S. 1881; E. Peru. *M. putorius*, see J. A. Harvie Brown, *suprà*, p. 2.

Meles taxus. On some points in its natural history; G. Herbst, Z. wiss. Zool. xxxvi. pp. 471–484.

Lutra vulgaris. On its breeding; A. H. Cocks, P. Z. S. 1881, pp. 249, 250.

Enhydris marina. On its distribution and changes of coat; J. F. Brandt, Mél. Biol. xi. pp. 1–12.

Ursidæ.

Ursus. On the different species found in the cavern of Lherm, Ariège; H. Filhol, C. R. xcii. p. 929 [*cf.* also Ann. N. H. (5) vii. p. 428].

Ursus arctos. On the forms usually associated under this name; L. J. Fitzinger, SB. Ak. Wien, lxxxiv. Abth. 1, pp. 93–114.

Ursus horribilis: note on the young; C. Dury, J. Cincinn. Soc. iv. p. 68, pl. iii.

Ursus spelæus: F. von Hochstetter, Denk. Ak. Wien, xliii. Abth. i. [not seen by the Recorder; *cf.* Zool. Anz. iv. p. 587].

Otariidæ.

See E. L. Trouessart, *suprà*. p. 9.

Trichecidæ.

Trichecus rosmarus. On its remains in Maine; C. H. Boyd, P. U. S. Nat. Mus. 1881, pp. 234, 235.

Phocidæ.

Halichœrus gryphus. Note on its habits and breeding; R. Collett, P. Z. S. 1881, pp. 380–387.

Macrorrhinus leoninus. Notes on its characters; W. H. Flower, P. Z. S. 1881, pp. 145–162.

Amphicynodon, g. n. (foss.); H. Filhol, Ann. Sc. Géol. xii. p. 39, figs. 23–31, & 42–47. Type, "*Cynodon*" *palustris*.

Proplesictis aymardi, g. & sp. nn. (foss.), *id. ibid.* fig. 48, Miocene of Ronzon.

Hyænodon aymardi, sp. n. (foss.), *id. l. c.* p. 48, fig. 22 bis, Miocene of Ronzon.

CREODONTA.

Cope, E. D. On the Genera of the *Creodonta*. P. Am. Phil. Soc. xix. pp. 76–82.

Five families and 13 genera are recognized, 2 families (*Miacidæ*, *Mesonychidæ*) and 2 genera (*Hyodectes* [type, *Arctocyon gervaisi*, Lemoine] and *Heteroborus* [type *A. duelii*, Lemoine]) being here named as new. Their relationships to the existing *Carnivora*, and to other groups, are discussed.

The same author adopts the following families: — *Arctocyonidæ*, *Miacidæ*, *Leptictidæ*, *Oxyænidæ*, *Amblyctonidæ*, *Mesonychidæ*, as an improved arrangement as compared with that given above; P. Am. Phil. Soc. 1881, pp. 156–158. The following genera are included:—

Arctocyonidæ.—Arctocyon, Hyodectes, Heteroborus.

Miacidæ.—Miacis, Didymictis.

Leptictidæ.—Mesodectes, Ictops, Leptictis, Peratherium, Diacodon, Lipodectes, Triisodon, Deltatherium, Quercitherium, Stypolophus, Proviverra.

Oxyænidæ.—Pterodon, Protopsalis, Oxyæna.

Amblyctonidæ.—Amblyctonus, Periptychus, Palæonictis.

Mesonychidæ.—Mesonyx, Dissacus, Sarcothraustes, Patriofelis.

In describing a new genus (*Triisodon*, vide *infrà*) of this group (Am. Nat. xv. pp. 667–669), Cope considers that the tooth replacing the

single deciduous molar of Marsupials is the third, not the fourth, premolar, the latter tooth being therefore permanent in the Marsupials, between which and the Carnivora the *Creodonta* are intermediate, having both third and fourth milk premolars replaced by permanent teeth. The following identifications are made, pp. 1018 & 1019:—*Pachyæna* = *Mesonyx*; *Apterodon*, Fischer, = *Mesonyx*. There are 4 good species of *Mesonyx*.

Miacidæ.

Miacis canavus, p. 189, and *M. brevirostris*, p. 190, spp. nn. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi., Wind River Beds.

Didymictis massetericus, p. 159, and *curtidens*, p. 160, spp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. *D. leptomylus*, sp. n. (foss.), *id.* Am. Nat. xiv. p. 908. *D. altidens*, sp. n. (foss.), *id. op. cit.* xv. p. 746. All are from the Wasatch beds of Wyoming.

D. dawkinianus, sp. n. (foss.), *id.* Bull. U. S. Geol. Surv. vi. p. 191, Wind River Beds.

Leptictidæ.

Ictops didelphoides, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 192, Wind River Beds.

Lipodectes penetrans and *peleidens*, g. & spp. nn. (foss.), *id.* Am. Nat. xv. p. 1019, Lowest Eocene of New Mexico.

Triisodon quivirensis, g. & sp. nn. (foss.), *id. l. c.* p. 667, and P. Am. Phil. Soc. xix., p. 485, Puerco beds, Lower Eocene of New Mexico. *T. heilprinianus*, sp. n. (foss.), *id.* P. Am. Phil. Soc. xx., p. 193, Lowest Eocene of New Mexico.

Deltatherium fundaminis, g. & sp. nn. (foss.), *id.* Am. Nat. xv. p. 337, and P. Am. Phil. Soc. xix. p. 486, Puerco beds, Lower Eocene of New Mexico. *D. absarokæ*, sp. n. (foss.), *id.* Am. Nat. xv. p. 669, "Wasatch Eocene."

Stypolophus bicuspis, *id.* Am. Nat. xiv. p. 746, and *S. whitiæ*, id. P. Am. Phil. Soc. xx. p. 161, spp. nn. (foss.), Lowest Eocene of Wyoming. The former species is referred to the genus *Ictops*; id. Bull. U. S. Geol. Surv. vi. p. 192.

Oxyænidæ.

Protopsalis tigrinus, g. & sp. nn. (foss.), E. D. Cope, Am. Nat. xiv. p. 745, and Bull. U. S. Geol. Surv. vi. p. 193, Wasatch beds of Wyoming.

Mesonychidæ.

Apterodon gaudryi, g. & spp. nn. (foss.), P. Fischer, Bull. Soc. Géol. (3) viii. pp. 288–290. "Phosphorites du Quercy." Allied to *Hyænodon* and *Pterodon*. (According to Cope, *suprà*, this = *Mesonyx*.]

Mesonyx navajovius, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xix. p. 484, "Lowest Eocene" of New Mexico. It is made the type of a new genus *Dissacus*; id. Am. Nat. xv. p. 1019.

Sarcothraustes antiquus, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. p. 193, "Lowest Eocene of New Mexico."

Conoryctes comma, g. & sp. nn. (foss.), *id. op. cit.* xix. p. 486, "Lowest Eocene" of New Mexico. "Allied to *Mesonyx*."

CETACEA.

FISCHER, P. Cétacés du sud-ouest de la France. Act. Soc. L. Bord. (5) v. pp. 1–217, pls. i.–viii.

An important article on the *Cetacea*, 17 in number, observed on the shores of the south-west of France. The first three plates are devoted to osteology (tympanic bones, scapulæ, and sterna), the others are quoted below.

BALÆNIDÆ.

See H. Burmeister, *suprà*, p. 2, for species found on the Argentine Coasts.

Balænoptera juddi, sp. n. (foss.), H. G. Seeley, J. G. Soc. xxxvii. p. 709, Oligocene of Hampshire. With a note on its occurrence, by J. W. Judd. [Founded on a single caudal vertebra!]

Balæna biscayensis. On its occurrence on the east coast of Scotland; T. Southwell, Tr. Norw. Soc. iii. pp. 228–230. See also C. R. Markham, *suprà*, p. 6.

Balæna mysticetus. On the bones, articulations, and muscles of its (rudimentary) hind limb; J. Struthers, J. Anat. Phys. xv. pp. 141–176, 301–321, pls. xiv.–xvii.

PHYSETERIDÆ.

Hyperoodon rostratus. Note on a skull of this species; T. Southwell, Zool. (3) v. pp. 258, 259.

Mesoplodon bidens. Notice on a male example, A. H. Malm, Göteborgs Naturhist. Mus. iii. pp. 32–36.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 277.]

DELPHINIDÆ.

Delphinus delphis. Various forms figured; P. Fischer, *l. c.* pls. iv., v., vi. fig. 1. On some fossil remains; F. Castelli, Atti Soc. Tosc. Pr. Verb. iii. p. 131. [Not seen by the Recorder; *cf.* Zool Anz. iv. p. 77.]

Electra hectori, sp. n., P. J. Van Beneden, Bull. Ac. Belg. (3) i. pp. 877–887, pl. ii. New Zealand.

Grampus griseus figured; P. Fischer, *l. c.* pl. viii. fig. 2. Note on this species, S. Richiardi, Atti Soc. Tosc. Pr. Verb. iii. pp. 22–24. [Not seen by the Recorder; *cf.* Zool. Anz. v. pp. 139 & 155.]

Lagenorrhynchus albirostris. A specimen captured near the Bell Rock, J. M. Cambell, Zool. (3) v. pp. 41–44 and Scot. Nat. 1881, pp. 1–4. Another taken near Yarmouth; T. Southwell, Zool. (3) v. p. 420.

Phocæna communis. Specimens figured: P. Fischer, *l. c.* pl. vi. fig. 2, & pl. vii.

Tursiops tursio, figured; *id. l. c.* pl. viii. fig. 1.

Squalodontidæ.

Capellini, G. Avanzi di Squalodonte nella molassa marnosa miocenica della Bolognese. Bologna: 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 8.]

PERISSODACTYLA.

Cope, E. D. The systematic arrangement of the order *Perissodactylata*. P. Am. Phil. Soc. xix. pp. 377–401.

Ten families are recognized, with 48 genera, and 189 "well-determined" species.

The following (from a "forthcoming report" of Bull. U. S. Geol. Surv.) arrangement of families is adopted by E. D. Cope, Am. Nat. xv. p. 340:—

Lophiodontidæ, Triplopodidæ, Hyracodontidæ, Rhinocerotidæ, Tapiridæ, Chalicotheriidæ, Palæotheriidæ, Anchitheriidæ, Equidæ.

Lophiodontidæ.

Lophiodon calciculus and *ventorum*, spp. nn. (foss.), E. D. Cope, Am. Nat. xiv. p. 747, Wasatch beds of Wyoming. The same species are referred to the genus *Pachynolophus*; id. Bull. U. S. Geol. Surv. vi. p. 197.

Pachynolophus posticus, sp. n. (foss.), *id.* P. Am. Phil. Soc. xx. p. 187, Lower Eocene of Wyoming.

Palæosyops borealis, sp. n. (foss.), *id.* Am. Nat. xiv. p. 746 & Bull. U. S. Geol. Surv. vi. p. 196, Wasatch beds of Wyoming.

Triplopodidæ.

Triplopus cubitalis, g. & sp. nn. (foss.), E. D. Cope, Am. Nat. xiv. p. 383, Eocene beds of Washakie Basin, Wyoming. *T. amarorum*, sp. n. (foss.), *id.* P. Am. Phil. Soc. xix. p. 389, Bad Lands of Wyoming.

Rhinocerotidæ.

Lydekker, R. Siwalik *Rhinocerotidæ*. Pal. Ind. (10), ii. pp. 1–62, pls. i–x.

A supplementary account, founded on more extensive material, to

that already published in the first volume of this series of publications. [*Cf.* Zool. Rec. xiv. *Mamm.* p. 17.] Three species of *Rhinoceros*, and 1 of *Aceratherium* are recognized from the Siwaliks.

On the species inhabiting Africa, and their habits and distribution, F. C. Selous, P. Z. S. 1881, pp. 725–734, pl. lxii. Only two species (*R. bicornis* and *R. simus*) exist; the horns of the former, as shown in the plate, varying much in size and relative development.

Rhinoceros. On some points in its dentition; R. Lydekker, J. A. S. B. xlix. pt. 2, pp. 135–141, pl. vii. [Omitted from Zool. Rec. xvii.]

Ceratorrhinus sumatrensis. On its male generative organs; W. A. Forbes, Tr. Z. S. xi. pp. 107–109, pl. xx.

Cœnopus, g. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 611. Type, "*Aceratherium*" *mite.* A revised "genealogy" of the American forms of Rhinoceros is added.

Peraceras superciliosus, g. & sp. n. (foss.), *id. l. c.* p. 540, Loup Fork formation of Nebraska. "*Aphelops*" *malacorrhinus* belongs to the same genus. "The ancestral genus of the African forms" of Rhinoceros.

Aceratherium. [See R. Lydekker, *suprà*.]

Tapiridæ.

Tapirus minor. Remains of this species in the lignite of Sarzanello; G. Capellini, Atti Acc. Rom. v. [Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 175.]

Chalicotheriidæ.

Hyracotherium vortmani and *H. craspedotum*, spp. nn. (foss.), E. D. Cope, Am. Nat. xiv. p. 747. *H. venticolum*, sp. n. (foss.), *id.*, Bull. U. S. Geol. Surv. vi. p. 198. Wasatch beds of Wyoming.

Lambdotherium popoagicum, sp. n. (foss.), E. D. Cope, Am. Nat. xiv. p. 746. *L. brownianum*, sp. n. (foss.), *id. l. c.* p. 197. Wasatch beds of Wyoming. Allied to *Limnohyus* and *Oligotomus*.

Oligotomus osbornianus, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. p. 182, Lower Eocene of Wyoming.

Systemodon, g. n. (foss.), E. D. Cope, Am. Nat. xv. p. 1018; type, "*Hyracotherium*" *tapirinum. S. semihians*, sp. n. (foss.), *id.* P. Am. Phil. Soc. xx. p. 184, Lower Eocene of Wyoming.

Equidæ.

Major, C. Forsyth. Beiträge zur Geschichte der fossilen Pferde, insbesondere Italiens. 2 Theil. Abh. schw. pal. Ges. vii. pp. 17–153, pls. v.–vii. [For pp. 1–16, *cf.* Zool Rec. xiv. *Mamm.* p. 17.]

An elaborate account of the fossil European horses, chiefly based on materials in the Florence Museum.

Schlechter, J. Ueber Bau und Form der Zähne bei dem Pferde und seinen Vorfahren. Inaug. Diss. Leipzig & Wien: 1881. (Extract from Oesterreich. Monatschrift. f. Thier-heilkde.)
[Not seen by the Recorder.]

Cornevin, C. Nouveaux cas de didactylie chez le cheval et interprétation de la polydactylie des Equidés en général. Lyon: 1881.
[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 7.]

Machold, J. Zehn Tafeln zur Anatomie des Pferdes nach der Natur gezeichnet. 2 Aufl. Wien: 1881. Large fol.
[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 497.]

Flower, W. H. Article, "Horse: Part I. Zoology and Anatomy." Encyclopædia Britannica, 9th edit. vol. xii. pp. 172–181.

Equus caballus. On a case of polydactylism ("Das Hipparion auf Jahrmarkten"); C. von Siebold, Arch. f. Anthrop. xiii. pp. 427–432.

E. przewalskii, sp. n., M. Poliakoff, Izvestia Imp. Russ. Geograph. Soc. 1881, pp. 1–20, pls. i., ii. Central Asia. [*cf.* E. D. Morgan, Ann. N. H. (5) viii. pp. 16–26.]

Coryphodontidæ.

Coryphodon anax (p. 168) *repandus* (p. 171) *curvicristis* (p. 172) and *marginatus* (p. 174) spp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx., Lower Eocene of Wyoming.

Ectacodon cinctus, g. & sp. nn. (foss.), *id. l. c.* p. 167, Lower Eocene of Wyoming.

Manteodon subquadratus, g. & sp. nn. (foss.), *id. l. c.* p. 166, Lower Eocene of Wyoming.

Metalophodon testis, sp. n. (foss.), *id. l. c.* p. 175, Lower Eocene of Wyoming.

Phenacodontidæ.

Phenacodus, Cope [*cf.* Zool. Rec. xi. p. 9] is a Perissodactylate form, with bunodont molar teeth, as demonstrated by the recent discovery of a nearly entire skeleton. *Phenacodus* and its allies have, moreover, an astragalus "convex in all directions distally," as in the *Carnivora*, and articulating only with the navicular. The following classification of the *Perissodactylata* is suggested:—

Suborder *Diplarthra* (for the known families).
„ *Condylarthra* (for the *Phenacodontidæ*),

distinguished by the characters already mentioned.

The *Phenacodontidæ* were all pentadactylate in each limb, had a small smooth brain, with large olfactory lobes and cerebellum, and a third trochanter. They are all from the Lower Eocene. The genera are *Phenacodus*, and "very probably *Catathlæus*, *Mioclænus*, and *Protogonia*, and perhaps also *Anisonchus*;" E. D. Cope, Am. Nat. xv. pp. 1017 & 1018.

Phenacodus hemiconus (p. 179) *apternus*, *macropternus*, *brachypternus* (p. 180) and *laticuneus* (p. 181), spp. nn. (foss.), E. D. Cope, P. Am. Phil.

Soc. xx., Lower Eocene of Wyoming. To this genus is referred *Hyracotherium vortmani* (suprà, p. 21), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 199. *P. trilobatus*, sp. n. (foss.), *id. l. c.* p. 200, Wind River Beds.

P. paercensis and *zuniensis*, spp. nn. (foss.), *id.* P. Am. Phil. Soc. xix. p. 492. "Lowest Eocene" of New Mexico.

Catathlæus rhabdodon, g. & sp. nn. (foss.), *id. l. c.* p. 487, "Lowest Eocene" of New Mexico.

Protogonia subquadrata, g. & sp. nn. (foss.), *id. l. c.* p. 492, "Lowest Eocene" of New Mexico.

Anisonchus sectorius, g. & sp. nn. (foss.), *id. l. c.* p. 488, "Lowest Eocene" of New Mexico (= *Mioclænus sectorius*, Am. Nat. xv. p. 831).

Anacodon ursidens, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. p. 181, Lower Eocene of Wyoming.

Periptychus carinidens, g. & sp. nn. (foss.), E. D. Cope, Am. Nat. xv. p. 337, and P. Am. Phil. Soc. xix. p. 484, "Lowest Eocene" of New Mexico.

Meniscotheriidæ.

Meniscotherium [cf. Zool. Rec. xii. p. 16] *terrærubræ*, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. 1881, p. 493, "Lowest Eocene" of New Mexico.

ARTIODACTYLA.

Anoplotheriidæ.

Mioclænus turgidus, p. 489, g. & sp. nn. (foss.), E. D. Cope, *l. c.* "Lowest Eocene" of New Mexico. *M. subtrigonus*, p. 491. *M. angustus*, sp. n. (foss.), E. D. Cope, Am. Nat. xv. and P. Am. Phil. Soc. xix. p. 491, "Lowest Eocene" of New Mexico. *M. brachystomus* (p. 187) and *etsagicus* (p. 189), spp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. Lower Eocene of Wyoming.

The genus *Mioclænus* appears, on re-examination, to be, not Phenacodont, but Artiodactylate, being most nearly allied to *Dichobune* and *Anoplotherium*.

Anthracotheriidæ.

Palæochærus platyops, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 174, Dakota.

Plesiomeryx gracilis, sp. n. (foss.), H. Filhol, Ann. Sci. Géol. xii. p. 79, Miocene of Ronzon.

Anthracotherium. On the remains of this genus from the lignites of Volx, Basses-Alpes; — Collot, Rev. Montp. (2) ii. pp. 456–466.

Oreodontidæ.

Coloreodon ryderanus, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 173, Oregon.

Hippopotamidæ.

Hippopotamus amphibius. Observations on its anatomy; H. C. Chapman, P. Ac. Philad. 1881, pp. 126–148, pls. [*cf.* Zool. Rec. xvii. *Mamm.* p. 26]. See also P. Harting, *suprà*, p. 5.

Camelidæ.

Camelus dromedarius. See S. Richiardi, *suprà*, p. 8.

Protolabis prehensilis, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol Surv. vi. p. 175, S. Nebraska.

Bovidæ.

On the Antelopes of Central South Africa; F. C. Selous, P. Z. S. 1881, pp. 748–765, pl. lxv. Field-notes, containing valuable remarks on the distribution and habits of the species met with, 22 in number, by the author during eight years' travels in that country [*cf.* also *suprà*, p. 9].

Thomas, P. Recherches sur les Bovidés fossiles de l'Algérie. Bull. Soc. Z. Fr. 1881, pp. 92–136, pls. ii. & iii.

Two *Bovidæ* only have as yet been found fossil in Algeria, *Bubalus antiquus* and *Bos primigenius*.

Cobus vardoni figured; F. C. Selous, *l. c.* pl. lxv.

Oryx beisa bred in London, with a figure of the young; P. L. Sclater, P. Z. S. 1881, p. 626, pl. liv.

Haplocerus montanus. Notes on its habits; J. C. Merrill, P. U. S. Nat. Mus. ii. pp. 283 & 284.

Rupicapra tragus. On its remains in the lake-dwellings of the Bieler See; T. Studer, MT. Ges. Bern. 1880, pp. 97 & 98.

Ægocerus pallasi (? = *Capra caucasica*). Observations on its external characters and osteology; L. Schlachter, Arch. f. Nat. 1881, pp. 194–224, pl. x.

Bison americanus. On its history; W. E. Doyle, Am. Nat. xv. pp. 119–124.

Cervidæ.

Rutimeyer, L. Beiträge zur natürlichen Geschichte der Hirsche. Abh. schweiz. pal. Ges. viii. pp. 1–93, pls. i.–iv.

The present part deals chiefly with the description of the skull of the living *Cervidæ*, &c., and with the relations of their different groups to each other. The author, however, does not seem to be aware of some recent and important work done in the subject, as is evident when (p. 93) he places *Hydropotes* and *Moschus* close together, and removes *Coassus* from the other new-world forms to the vicinity of *Cervulus* and *Elaphodus*.

H. A. Pagenstecher makes some general remarks on this family; Verh. Ver. Heidelberg (n.f.) iii.

[A separate copy only seen by the Recorder.]

KALTENEGGER, F. Die geschichtliche Entwickelung der Rinder-rassen in den österreichischen Alpenländern. Prag: 1881, pp. 1–28.

[Not seen by the Recorder: *cf.* Zool. Anz. iv. p. 77.]

ZOEPF, F. Die österreichischen Rinder-rassen. II. Band. Die Rinder des oberen Donauthales in Ober- und Nieder-österreich. Wien: 1881.

[Not seen by the Recorder: *cf.* Zool. Anz. v. p. 7.]

Alces machlis. Note on the length of its alimentary canal; R. Morrow, P. N.-Scot. Inst. v. p. 313.

Cervus elaphus. On a hornless variety; A. von Pelzeln, Verh. z.-b. Wien, xxx. pp. 611–614. On its remains in the South of Scotland, J. A. Smith, P. Antiq. Scot. xiv. pp. 37–63. *C. luehdorfi* [cf. Zool. Rec. xvii. *Mamm.* p. 28], notes on; L. J. Fitzinger, SB. Ak. Wien, lxxxii. pp. 373–381.

DINOCERATA.

UINTATHERIIDÆ.

OSBORN, H. F. A Memoir upon *Loxolophodon* and *Uintatherium*, accompanied by a stratigraphical report of the Bridger Beds in the Washakie basin, by J. B. Macmaster. Contributions from the E. M. Museum of Geology and Archæology of the College of New Jersey. Vol. i. No. 1. Princeton, N.J.: 1881.

The present memoir, extending over 54 pages, and illustrated by a map and four plates, mainly treats of the specimens of *Uintatheriidæ* preserved in the Museum of Princeton, collected during the expeditions of 1877 & 1878 [*cf.* Zool. Rec. xvi. *Mamm.* p. 7]. A restoration is attempted on pl. iv., which differs in several points from that of O. C. Marsh (vide *infrà*). A species of *Loxolophodon* (*speirianum*) is described as new (p. 20).

Dinoceras mirabile restored; O. C. Marsh, Am. J. Sci. (3) xxii. pp. 31 & 32, pl. ii. Three genera only—*Dinoceras*, *Tinoceras*, and *Uintatherium* of the *Dinocerata* are here recognized.

Bathyopsis fissidens, g. & sp. nn. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 194, Wind River Beds. Allied to *Uintatherium*.

PROBOSCIDEA.

ELEPHANTIDÆ.

NAUMANN, E. Ueber Japanische Elephanten der Vorzeit. Palæontographica, xxviii. pp. 1–39, pls. i.–vii.

The species found, and here described and figured, amount to 4, 2 of *Elephas* and 2 of *Stegodon*. All are of species already found in India, and are not older than the Pliocene.

[See also R. Lydekker, Pal. Ind. (10), ii. pp. 65, 66.]

On the anatomy of the female organs of the *Proboscidea*; M. Watson, Tr. Z. S. xi. pp. 111–130, pls. xxi. & xxii.

Mastodon. On remains of this species from Asti; M. Baretti, Atti Ac. Tor. xvi. pp. 616–618.

[See also R. Lydekker, *suprà*, p. 6.]

Elephas africanus. Further remarks on its anatomy [*cf.* Zool. Rec. xvii. *Mamm.* p. 25]; A. von Mojsisovics, MT. Ver. Steierm. 1880. [separate copy only seen], pl. vi. Observations on the anatomy of an adult male; F. Plateau and V. Lienard, Bull. Ac. Belg. (3) i. pp. 1–37, pl. Important as having been made on a full-grown individual; Mojsisovics and Forbes [*cf.* Zool. Rec. xvi. *Mamm.* p. 25] having only dissected young ones. Note on the penis; L. Camerano, Zool. Anz. iv. pp. 481–483.

Elephas indicus. Notes on the weight and measurements of four specimens living in the London Zoological Gardens [*cf.* Zool. Rec. xvi. *Mamm.* p. 25]. P. L. Sclater, P. Z. S. 1881, pp. 450, 451. Note on the form and proportions of a fœtal specimen; W. Turner, J. Anat. Phys. xv. pp. 519–522, pl. xxvii.

Elephas primigenius. On the geological age of its remains in the Tarn; A. Caraven-Cachin, Bull. Soc. Géol. Fr. (3) ix. pp. 475–480; also C. R. xcii. pp. 475 & 476. [See also M. Much, *suprà*, p. 7.]

Toxodontidæ.

Cope, E. D. Note on the Structure of the posterior Foot of *Toxodon*. P. Am. Phil. Soc. xix. pp. 402, 403.

The characters observed show that *Toxodon* is probably a Proboscidean, certainly not an Ungulate.

GLIRES.

Cope, E. D. Review of the *Rodentia* of the Miocene period of North America. Bull. U. S. Geol. Surv. vi. No. 2, pp. 361–386.

The *Rodentia* yet found in the American Miocenes belong to 17 genera. The ancient forms differ from their modern representatives by the greater constriction of the skull behind the orbits, and the absence of post-orbital processes. In size they do not exceed, or equal, the living forms [*cf.* also Am. Nat. xv. pp. 586 & 587].

Trouessart, E. L. Die geographische Vertheilung der lebenden und fossilen Nager vom Standpunkte der Entwickelungslehre. Kosmos, ix. pp. 321, 322; also Revue Scientifique, 1881.

[Not seen by the Recorder; *cf.* Zool. Anz. iv. p. 496.]

Sciuridæ.

Sciurus vulgaris. On its distribution and history in Great Britain [*cf.* Zool. Rec. xvii. *Mamm.* p. 22]; J. A. Harvie Brown, P. Phys. Soc. Edinb. vi. pp. 31–63, 115–183, with a map. *S. salæ*, sp. n., F. A. Jen-

tink, Notes Leyd. Mus. iii. p. 63, Liberia. [*S. caniceps*, Temm. (*nec* Gray) is renamed, in a note, p. 65, *S. temminki*, *caniceps* being preoccupied for an Asiatic species. Dr. Jentink has omitted to observe that this change of name has already been proposed by Anderson, in his "Yunnan Expedition" [*cf.* Zool. Rec. xvi. *Mamm.* p. 22].

Sciurus vallovianus, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 177, Oregon.

Rheithrosciurus. Notes on the genus; F. A. Jentink, Notes Leyd. Mus. iii. pp. 169–172.

Castoridæ.

Castor fiber. On its habits in the wild state; J. B. Gilpin, P. N.-Scot. Inst. v. pp. 275–282.

Myoxidæ.

Muscardinus avellanarius. On its hybernation; A. Rabus, Zool. Gart. 1881, pp. 321–325.

Lophiomyidæ.

Lophiomys imhausi. Note on the fourth known specimen, and on its exact locality; H. H. Giglioli, Zool. Anz. iv. p. 45.

Muridæ.

Hydromys beccarii figured; W. Peters & G. Doria, *l. c.* pl. xviii.

Gerbillus auricularis, Sm., is probably a member of the genus *Pachyuromys* [cf. Zool Rec. xvii. *Mamm.* p. 23]; Huet, Naturaliste, i. p. 339.

G. simoni, sp. n., F. Lataste, Naturaliste, i. p. 497, Algeria. This and *G. campestris*, Lev., are made the type of a new "subgenus" *Dipodillus*, ibid. p. 506. *G. garamantis*, sp. n., *id. l. c.* p. 507, Algeria. *G. swinhoii*, sp. n. J. Scully, Ann. N. H. (5) viii. p. 228, Kandahar.

Psammomys roudairii, sp. n., F. Lataste, Naturaliste, i. p. 492, Algeria.

Cricetus frumentarius. On its habits in captivity; P. J. Schneider, Zool. Gart. xxii. pp. 42–47.

Mus. O. Thomas revises the Indian species of this genus, of which he recognizes 19, divisible into four subgenera: *Nesokia*, *Mus* s. s., *Leggada* and *Vandeleuria*. P. Z. S. 1881, pp. 521–557. The generic characters used are illustrated on pl. li. *Mus blanfordi*, sp. n. (figured, *id.* P. Z. S. 1881, pl. l.) O. Thomas, Ann. N. H. (5) vii. p. 24. Madras. *M. erythronotus*, Blanf. [*cf.* Zool. Rec. xii. p. 21] [*nec* Temm.] re-named *M. arianus*; W. T. Blanford, Ann. N. H. (5) vii. p. 162. *M. mollipilosus* (p. 698), *M. ringens* (p. 700), and *M. beccarii* and *M. albertisi* (p. 702), spp. nn., W. Peters & G. Doria, Ann. Mus. Genov. xvi., New Guinea.

Uromys validus, sp. n., W. Peters & G. Doria, *l. c.* p. 703, S. E. New Guinea, *U. bruijni* figured, pl. xvii.

Hesperomys [*Calomys*] *coppingeri*, sp. n., O. Thomas, P. Z. S. 1881, p. 4, Patagonia.

Megalomys (subg. n.); E. L. Trouessart, C. R. xcii. p. 199. Type, "*Hesperomys*" *pilorides*; cf. Naturaliste, i. p. 357.

Arvicola. On the species of this genus, 9 in number, inhabiting the Himalayas, Tibet, and Afghanistan; W. T. Blanford, J. A. S. B. l. pt. 2, pp. 88–117, pls. i. & ii. figs. A–C.

Myodes torquatus. Note on a specimen from Novaya Zemlya; F. A. Jentink, Niederl. Arch. Zool. Supplement, Band i. Lief. 1.

Myospalax fuscicapillus is an *Ellobius*; W. T. Blanford, J. A. S. B. l. pt. 2, pp. 118–123, pl. ii. figs. D, D*a*, D*b*.

Fiber zibethicus. On its habits in the wild state; J. B. Gilpin, P. N.-Scot. Inst. v. pp. 275–282.

Eumys lockingtonianus, sp. n. (foss.), E. D. Cope, Bull. U. S. Geol. Surv. vi. p. 176.

Spalacidæ.

Georychus mechowi, sp. n., W. Peters, SB. Nat. Fr. 1881, p. 133. Malange, Angola.

Dipodidæ.

On the species found in Algeria; F. Lataste, Naturaliste, i. pp. 474–476.

Alactaga euphratica, sp. n., O. Thomas, Ann. N. H. (5) viii. p. 15. Mesopotamia.

Octodontidæ.

Ctenodactylus mzabi, sp. n., F. Lataste, Bull. Soc. Z. Fr. 1881, p. 214. Algerian Sahara.

Hystricidæ.

Erethizon dorsatus occurs in Maryland [*cf.* Zool. Rec. xvi. *Mamm.* p. 24], O. Lugger, P. U. S. Nat. Mus. iii. pp. 161 & 162.

Leporidæ.

Lepus cuniculus and *timidus*: on a curious difference in the structure of the cæcum in these two forms; W. N. Parker, P. Z. S. 1881, pp. 624–626, pl. liii. *L. variabilis*, notes on; H. Goll, Bull. Soc. Vaud. xvii. pp. 391-396.

SIRENIA.

Manatidæ.

Manatus australis. Notes on its habits; W. H. Flower, P. Z. S. 1881, pp. 453–456, and [in captivity] Agnes Crane, *l. c.* pp. 456–460.

Rhytina stelleri. [See A. E. Nordenskiöld, *suprà*, p. 7.]

HALITHERIIDÆ.

Halitherium schinzi. Its structure described at length; G. R. Lepsius, Abh. mittelrhein. geol. Ver. i. [Not seen by the Recorder.]

TILLODONTA ?.

STYLINODONTIDÆ ?.

Psittacotherium aspasiæ, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xx. p. 192, Lowest Eocene of New Mexico. The genus [described in Am. Nat. xvi.] is allied to the Tillodont genera *Tillotherium* and *Anchippodus*, but with two pairs of the superior incisors gliriform.

EDENTATA.

BRADYPODIDÆ.

See H. C. SORBY, *suprà*, p. 9.

Cholœpus. On the disposition of its peritoneal membranes; E. Zörner, *l. c.* [*suprà*, p. 10] pp. 177–179.

MEGATHERIIDÆ.

Scelidotherium. Note on the skeleton in the Geological Museum at Bologna; G. Capellini, Atti Ac. Rcm. v. pp. 304–306. *S. leptocephalum.* On a perfect skeleton; H. Burmeister, MB. Ak. Berl. 1881, pp. 374–381, with plate. The feet show that *Scelidotherium* is not congeneric with Lund's *Platyonyx*.

MYRMECOPHAGIDÆ.

Cycloturus didactylus. On the disposition of the peritoneal membranes; E. Zörner, *l. c.* [*suprà*] pp, 179–181.

MARSUPIALIA.

D. J. CUNNINGHAM describes at length the distribution of the nerves in the hind-limb of *Thylacinus cynocephalus* and *Cuscus maculatus*; J. Anat. Phys. xv. pp. 265–277.

A. H. YOUNG discusses the so-called movements of pronation and supination in the hind limb of Marsupials in which the tibia and fibula are widely separate; J. Anat. Phys. xv. pp. 392–394.

DIDELPYIDÆ.

Amphiperatherium ronzoni, sp. n. (foss.), H. Filhol, Ann. Sci. Géol. xii. p. 65, Miocene of Ronzon.

Dasyuridæ.

Phascologale thorbeckiana, pls. v. & vi. figs. 1–4, figured; W. Peters & G. Doria, Ann. Mus. Genov. xvi. and *dorsalis*, (pl. vii.). *P. pilicauda*, sp. n., *iid. l. c.* p. 668, Fly River, N. Guinea.

Peramelidæ.

Perameles aruensis (pl. viii. fig. 1, & pl. ix. fig. 1) and *P. longicauda* (pl. x.) figured; W. Peters & G. Doria, *l. c.*

Phalangistidæ.

Phascolarctos cinereus. On its anatomy (viscera, brain, and female organs); W. A. Forbes, P. Z. S. 1881, pp. 180–195. *Phascolomys* is considered to be one of the *Phalangistidæ*, which are divided into *Phalangistinæ*, *Phascolarctinæ*, and *Phascolomyinæ*. Notes on its anatomy; A. H. Young, J. Anat. Phys. xv. pp. 466–474. Note on a skull with a premaxillo-frontal suture; H. W. Mackintosh, P. R. Irish Ac. (2) iii. pp. 335–337, pls. x.–xiii.

Phalangista (*Pseudochirus*) *albertisi* (pls. viii., ix. fig. 2, & xi.), *P. bernsteini* (pl. xii.), *P.* (*Distæchurus*) *pennata* (pl. v. figs. 5–10, & pl. xiii.), and *P.* (*Cuscus*) *gymnotis* (pls. viii., ix. fig. 3, and pl. xiv.) figured; W. Peters & G. Doria, *l. c.*

Macropodidæ.

H. C. Chapman describes and figures the fœtal appendages, with notes on the structure of the fœtus, of *Macropus giganteus*; P. Ac. Philad. 1881, pp. 468–471, pl. xx. His observations quite confirm those already made by Owen — practically the only ones ever previously made as to these structures in any implacental Mammal. There is no true placenta at all developed, the chorion lying freely in, and unattached to, the uterine walls. The allantois is small and bud-like, and does not reach the chorion; the umbilical vesicle, on the other hand, is very large, vascular, though not villous, and closely applied to the chorion over a considerable area of its surface.

Cattaneo, C. Contribuzione all' anatomia comparata dello stomaco dei Kanguri. Boll. Scientif. iii. pp. 68–75.

[Not seen by the Recorder; *cf.* Zool. Anz. v. p. 153.]

Lister, J. J., & Fletcher, J. J. On the Condition of the Median Portion of the Vaginal Apparatus in the *Macropodidæ*. P. Z. S. 1881, pp. 976–996.

An exhaustive account, with many new facts, of the condition of these parts in the Kangaroos, with special reference to the existence, and method of formation, of the median communication between the vaginal *cul-de-sac* and the urino-genital passage.

Macropus papuanus figured; W. Peters & G. Doria, *l. c.* pls. xv. & xvi.

PANTOTHERIA.

Docodon striatus, g. & sp. nn. (foss.), O. C. Marsh, Am. J. Sci. (3) xxi. p. 512, Atlantosaurus beds. Nearly allied to *Diplocynodon* [cf. Zool. Rec. xvii. *Mamm.* p. 29].

Dryole[i]stes gracilis, sp. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xxi. p. 513, Atlantosaurus beds.

Triconodon mordax. Notes on a lower jaw of this species (?) from the Purbeck beds (with an introductory note by H. Willett); E. W. Willett, J. G. S. xxxvii. pp. 376–380.

ALLOTHERIA.

Allodon laticeps, g. & sp. nn. (foss.), O. C. Marsh, Am. J. Sci. (3) xxi. p. 511, Atlantosaurus beds. It should probably be placed in the *Plagiaulacidæ*.

Ctenacodon [cf. Zool. Rec. xvi. *Mamm.* p. 27] *nanus*, sp. n. (foss.), O. C. Marsh, Am. J. Sci. (3) xxi. p. 512, Atlantosaurus beds.

Ptilodus mediævus, g. & sp. nn. (foss.), E. D. Cope, Am. Nat. xv. p. 922. "Lowest Eocene" of New Mexico. Allied to *Plagiaulax* and *Ctenacodon*.

MONOTREMATA.

Ornithorrhynchidæ.

Ornithorrhynchus paradoxus.
See Pritchard, U. (*suprà*, p. 7).

Tachyglossidæ.

Tachyglossus hystrix. On its habits; G. T. Bennett, P. Z. S. 1881, pp. 737–739.

AVES.

BY

HOWARD SAUNDERS, F.L.S., F.Z.S., &c.

THE year 1881 has witnessed the appearance of some important contributions to ornithological literature, amongst which may be mentioned two volumes of the Catalogue of Birds in the British Museum, by H. Seebohm, and R. B. Sharpe, respectively. For papers relating to the birds of tolerably defined geographical areas, the following names may be consulted :—

PALÆARCTIC REGION: Büchner (Russia), Dresser, Feilden (Novaya Zemlya), Giglioli (Italy), Marschall & Von Pelzeln (Austria), Newton (Britain), Nordenskiöld (Arctic Siberia), Taczanowski.

ETHIOPIAN: Bocage (Angola), Hartlaub & Sclater, Sharpe, Shelley, Von Pelzeln.

ORIENTAL: Biddulph & Scully (Gilgit), Butler, Kelham, R. G. W. Ramsay, Salvadori, Meyer, Von Pelzeln, Sharpe, Nicholson (Java).

AUSTRALIA AND OCEANIA: E. P. Ramsay, Finsch, Layard, Tristram.

NEARCTIC: Brewster, Drew, Hoffmann, Ridgway, Scott.

NEOTROPICAL: Cory (Haiti), Newton (Jamaica), Salvin & Godman, Sclater.

For Extinct species, see: Cope, Haast, Marsh, Reinhardt, Seeley.

For Anatomical and Physiological papers, see: Acconci, Balfour, Brants, Braun, Budge, Dansky, Dennisenko, Forbes, Fraisse, Fromann, Jeffries, Krukenberg, Morse, Sedgwick, Schulgin, Shufeldt, Waelchili.

THE GENERAL SUBJECT, WITH TITLES OF SEPARATE WORKS AND OF THE MORE IMPORTANT PAPERS PUBLISHED IN PROCEEDINGS OF SOCIETIES, &c.

ACCONCI, L. Nervi laringei inferiori e glosso-faringei negli Uccelli. Atti Soc. Tosc. 1881, p. 162.

ADAMSON, C. M. Some more Scraps about Birds. Newcastle: 1881, 8vo, pp. 273, with illustrations.

This second series [*cf.* Zool. Rec. xvi. *Aves*, p. 1] of the author's practical observations, contains many notes of interest, and some of real value; but there is neither system, arrangement, nor index.

ALLEN, J. A. Insectivorous Birds in their Relation to Man. Bull. Nutt. Orn. Club, vi. pp. 22–27.

Notes on the food of the American *Turdidæ*.

——. Supplementary List [with 12 additional species] of Birds of the Island of Santa Lucia, W. I. *Tom. cit.* p. 128 [*cf.* Zool. Rec. xvii *Aves*, p. 2].

——. On the Migration of Birds. Scribner's Mag., Oct. 1881.

ARNOLD, E. L. On the Indian Hills. London: 1881, 2 vols. 8vo.

These records of the experiences of an observant young coffee-planter in Southern India, make no pretensions to scientific knowledge; his observations on the local fauna are, however, numerous; and those who can recognize the birds from his descriptions will find some interesting facts on geographical distribution.

BALFOUR, F. M. A Treatise on Comparative Embryology. London: 1881. *Aves*, vol. ii. chap. viii. pp. 120–166.

An important recapitulation of all that is known on the subject, mainly based upon the author's personal observation.

BARNES, H. E. A List of Birds observed in the neighbourhood of Chaman, S. Afghanistan. Str. Feath. ix. pp. 449–460.

A second series of notes on the birds of this district. [*Cf.* Zool. Rec. xvii. *Aves*, p. 2.]

BARTLETT, A. D. See *Plotus anhinga* [*Pelecanidæ*].

BAYER, KARL. Beiträge zur Ornis der Herzegowina. MT. orn. Ver. Wien, 1881, pp. 11, 20, 29.

BELL, R. List of Birds from between Norway House and Forts Churchill and York: App. vi. pp. 67–70, of Selwyn's Geol. Surv. Canada, Report of Progress in 1879–80; Montreal: 1880 [received in 1881].

BENNETT, K. H. See *Gypoictinia* [*Falconidæ*].

BERLEPSCH, H. VON. On some necessary Changes in the Nomenclature of South American Birds. Ibis, 1881, pp. 239–245.

For rectifications deemed needful, see *Basileuterus* [*Mniotiltidæ*], *Dacnis*, *Chlorophanes* [*Cœrebidæ*], *Procnias* [*Tanagridæ*], *Thamnophilus* [*Formicariidæ*].

BERRIER, DE L. Notes on a Few Birds observed at Fort Hamilton, Long Island, N.Y. Bull. Nutt. Orn. Club, vi. pp. 11–13.

BESNARD, A. See *Corvus frugilegus* [*Corvidæ*].

Biddulph, John. On the Birds of Gilgit. Ibis, 1881, pp. 35–102.

During a residence of two years in this remote district to the north-west of Cashmere, 245 species were obtained. The exploration of this new ornithological ground throws considerable light upon the lines of migration, and the geographical distribution of Palæarctic species. Some valuable foot-notes are contributed by J. Scully, and bear his initials, and numerous remarks by G. F. L. Marshall are distinguished in a similar manner. [This paper has been reprinted in Str. Feath. vol. ix. (dated 1880!) pp. 301–366, with some characteristic foot-notes by A. O. Hume.]

——. See also *Propasser rhodometopus*, sp. n. [*Fringillidæ*].

Bingham, C. H. T. Additional Notes on the Nidification of Birds in British Burmah. Str. Feath. ix. pp. 471–475.

On the nests and eggs of 6 species, with notes by A. O. Hume.

Blanford, W. T., in J. A. S. B. l. Pt. ii. pp. 265 & 266, gives an estimate of the species of birds found in British India and its Dependencies, including Baluchistan and the Mergui Archipelago: a total of 1681.

Blasius, W., & Nehrkorn, A. Beiträge zur Kenntniss der Vogelfauna von Borneo (nach den Sammlungen des Herrn Dr. Platen). JB. Ver. Braunschweig, 1880–81, pp. 60 [sep. copy].

83 species are enumerated, with collector's notes and authors' remarks; the arrangement being after Salvadori.

Blyth, E. (the late), & Tegetmeier, W. B. See *Gruidæ*.

Bocage, J. V. Barboza du. Ornithologie d'Angola, 2me Partie. [*Cf.* Zool. Rec. xiv. *Aves*, p. 2], Lisbonne: 1881, royal 8vo.

The second and concluding portion of this valuable work. With this volume are issued:—pls. numbered v.-viii., x. & ii., an Introduction (pp. xi.), a Table showing geographical distribution (pp. xxxii.), and pp. 257–576. The Angolan species here noticed amount to 673, and if the coast of Loango be included, the total will swell to 698. This avifauna does not tend to confirm the belief of some ornithologists that Angola forms a distinct sub-division of the Ethiopian region. Two species are described as new, *Turtur ambiguus* [*Columbæ*], *Francolinus finschi* [*Phasianidæ*], and several interesting or recently discovered species are figured, for which see *Cossypha* [*Turdidæ*], *Parus* [*Paridæ*], *Hylypsornis* [*Certhiidæ*], *Lamprotornis*, *Lamprocolius*, *Pholidauges* [*Sturnidæ*], *Anthus* [*Motacillidæ*], *Mirafra* [*Alaudidæ*].

——. Aves das possessões portuguezas d'Africa occidental, xxi lista. J. Sc. Lisb. viii. pp. 120–125 (No. xxx.).

On 34 species (none of them new), sent from Caconda by Anchieta, with that collector's interesting notes.

Bock, Carl, in The Head Hunters of Borneo, &c. (London, 1881, 4to, Appendix iii. pp. 331–333), gives a list of the species obtained by him when collecting for the late Lord Tweeddale; this list being avowedly compiled from papers by the above, and by R. G. Wardlaw Ramsay [*cf.* Zool. Rec. xvii. *Aves*, p. 18].

Bolau, H. Ueber Vögel aus dem Suifun-Gebeit, gesammelt von F. und H. Dörries. J. f. O. 1881, pp. 51–65.

A catalogue of 66 species from Russian Manchuria; more than half being the same as those obtained by the first of the above collectors on the Island of Askold. [*Cf.* Zool. Rec. xvii. *Aves*, p. 4, and see also Taczanowski, infrà, p. 29.]

Booth, E. Rough Notes on the Birds observed during 20 years' shooting and collecting in the British Islands. Pt. I. London: 1881, folio.

"These pages do not profess to diffuse scientific knowledge;" their contents are, however, far more trustworthy than much of the so-called information given in works of loftier pretensions. So far, these interesting notes treat of the British *Accipitres*, with excellent coloured illustrations by E. Neale.

Borggreve, B. Die Wanderung kleiner Vögel. Orn. Centralb. 1881, pp. 49–52.

On small birds being carried on the backs of larger ones during migration. [See also J. Rae, Nature, xxiii. p. 411, and Van Lennep, Zool. 1881, p. 260.]

Borrer, C. See *Galerita cristata* [*Alaudidæ*].

Brants, M. A. De betrekkelige groote der Afdeelingen van het Spijsverteringskanaal bij Zoogdieren en Vogels. Ac. Proef. Utrecht, 1881, pp. 119, & pl.

[Not seen by the Recorder.]

Braun, M. Die Entwickelung des Wellenpapagei's (*Melopsittacus undulatus*, Sh.). II. Theil. III. Abschnitt: Vom Auftreften der Rückenfurche bis zum Schluss des Medullarrohres. IV. Abschn.: Communication zwischen dem Rückenmarksrohr und dem Entoderm. V. Abschn.: Entwickelungsvorgänge am Schwanzende bei Vögeln. Arb. Inst. Würzb. v. pp. 205–341, pls. x.–xiv. [*cf.* Zool. Rec. xvii *Aves*. p. 4].

——. Aus der Entwickelungsgeschichte der Papageien. Thiel III. Die Verbindungen zwischen Rückenmark und Darm bei Vögeln (pp. 120–122). Thiel IV. Weitere Entwickelungsvorgänge an der Schwanzspitze bei Vögeln und Säugethieren (pp. 173–175), Verh. Ges. Würzb. xv. [*Cf.* Zool. Rec. xvii. *Aves*, p. 4.]

Brazier, J. See *Megapodius brazieri* [*Megapodiidæ*].

Brewster, W. With the Birds on a Florida River. Bull. Nutt. Orn. Club, vi. pp. 38–44.

——. Notes on Some Birds from Arizona and New Mexico, with a Description of a supposed New Whip-poor-will. *Tom. cit.* pp. 65–73.

Observations on 17 species obtained by F. Stephens, whose field-notes are incorporated. *Antrostomus vociferus arizonæ* var. n. [*Caprimulgidæ*] is described, and *Callipepla squamata pallida* var. n. ? [*Tetraonidæ*] is hypothetically named, after the objectionable fashion adopted by some ornithologists.

[Brewster, W.] See also *Œstrelata*, *Thalassidroma* [*Procellariidæ*], *Polioptila californica*, sp. n. [*Sylviidæ*], *Nyctale* [*Striges*], *Helmintophaga* [*Mniotiltidæ*].

Brooks, W. E. See *Dumeticola* [*Sylviidæ*].

Brown, J. A. Harvie See Cordeaux, J.; and *Cyanecula wolfi* [*Turdidæ*].

Bruce, D. See *Charadrius morinellus* [*Charadriidæ*].

Büchner, E., & Pleske, T. Beiträge zur Ornithologie des St. Petersburger Gouvernements. Beitr. Russ. Reiches (2) iv. pp. 53–178.

An interesting compendium, comprising 211 species.

Budge, J. Ueber die Harnblase bei Vogelembryonen. Deutsche Medic. Wochenschr, 1881, No. 6.

Buller, W. L. See *Harpa* [*Falconidæ*].

Burmeister, H. See *Tænioptera* [*Tyrannidæ*].

Butler, E. H. A Tentative Catalogue of the Birds of the Deccan and South Mahratta Country. Str. Feath. ix. pp. 367–442, with illustrative map.

The reproduction, in a modified and improved form, of a paper originally contributed to the 'Bombay Gazetteer.' The catalogue comprises 452 species, 3 of which are of doubtful validity, and 20 of questionable occurrence in the district.

Cabanis, J. See *Psaltrites helviventris*, g. & sp. nn. [*Paridæ*], *Butio kutteri*, sp. n. [*Ardeidæ*], *Rallina* (*Euryzona*) *zonaventris*, sp. n. [*Rallidæ*], *Conurus gundlachi*, sp. n. [*Psittaci*].

Clarke, W. E., & Roebuck, W. D. A Handbook of the Vertebrate Fauna of Yorkshire. London & Leeds: 1881, 8vo (Birds by W. E. Clarke, pp. 17–89, and 136 & 137).

A very good county list: the remarks on the extinction of *Otis tarda* [*Otididæ*] are of especial interest.

Collett, R. Zoologisk Literatur i Norge i Aarene 1879 og 1880. Nor. Selsk. Skr. 1880, pp. 1–24 (Birds, pp. 6–8).

An interesting review of Scandinavian papers, containing an abstract of the controversy between the author and L. Stejneger respecting some of the *Laniidæ*. [Cf. Zool. Rec. xvi. *Aves*, p. 45, and xvii. *Aves*, p. 32.]

——. Mindre Meddelelser, vedrörende Norges Fugle-fauna i Aarene 1877–1880. Nyt. Mag. Naturvid. xxvi. pp. 254–394.

A second series [*cf.* Zool. Rec. xiv. *Aves*, p. 6] of valuable notes on the Birds of Norway. On p. 259 is a discussion of the reported occurrence near the North Cape of the American *Turdus labradorius*,

supposed to have been seen by the late Prof. Rougemont (Bull. Soc. Neuchat. xii. p. 97). This statement was intentionally omitted by the Recorder, as unworthy of credence.

[Collett, R.] See also *Oreocincla* [*Turdidæ*], *Ægialitis* [*Charadriidæ*], also Striges (Crania), *Tringa* [*Scolopacidæ*].

Cope, E. D. See *Charadrius sheppardianus*, sp. n. (fossil) [*Charadriidæ*].

Cordeaux, J. On the Spring Migration of Waders along the East Coast in 1881. Zool. 1881, pp. 326–329.

——. In Preston's Report on the Phenological Observations for 1880. Q. J. Meteorol. Soc. 1881, Ornithological, pp. 43–48.

——. See also *Plectrophanes nivalis* [*Fringillidæ*].

——, Brown, J. A. H., & Kermode, P. Report on the Migration of Birds in the Spring and Autumn of 1880. Report of Comm. of Brit. Ass. Sec. D, pp. 120. [For abstract Report, see below.]

These interesting and highly valuable returns have been arranged by J. A. H. Brown, for Scotland; by P. Kermode, for the West Coast of England; the East Coast and the general report being under the charge of the Secretary of Committee, J. Cordeaux.

——, Brown, J. A. H., & Newton, A. Report of the Committee for obtaining observations on the Migrations of Birds at Lighthouses and Lightships. Rep. Brit. Ass. 1881, pp. 189–194.

Cory, C. B. List of the Birds of Haiti, taken in different parts of the Island between January 1 and March 12, 1881. Bull. Nutt. Orn. Club, vi. pp. 151–155.

65 species are enumerated, including many not previously recorded from the island, and 4 recently described as new, for names of which see below.

——. Beautiful and Curious Birds. Pts. ii.–iii. (6 plates). Boston: 1881, folio. [*Cf.* Zool. Rec. xvii. *Aves*, p. 6.]

The species figured are *Alca impennis*, *Cicinurus regius*, *Apteryx australis*, *Menura superba*, *Diphyllodes respublica*, *Machetes pugnax*.

——. See also *Puffinus borealis* [*Procellariidæ*], *Picumnus lawrencii* [*Picidæ*], *Phœnicophilus dominicensis* [*Fringillidæ*], *Parra violacea* [*Parridæ*], *Myiadestes montanus* [*Sylviidæ*], spp. nn.

Cowan, W. D. List of Madagascar Birds, together with the Native Names among a few of the different Tribes. Antananarivo: 1881, rl. 8vo, pp. 6.

Over 200 species are enumerated, but the list savours much of a compilation of the species which *might* be found in that island.

Dalgleish, J. J. Notes on a Collection of Birds and Eggs from Central Uruguay. P. Phys. Soc. Edinb. vi. pp. 232–254, pls. vii. & viii.

Remarks on the habits and nidification of 24 species, with coloured plates of eggs of 10 of them.

[Dalgleish, J. J.] See also *Saxicola deserti* [*Turdidæ*], *Stercorarius* [*Laridæ*].

Dansky, J., & Kostenitsch, J. Ueber die Entwickelungsgeschichte der Keimblätter und des Wolff'schen Ganges im Hühnerei. Mém. Pétersb. (7) xxvii. No. 13.

Dennisenko, G. Ueber den Bau und die Function des Kammes [comb] im Auge der Vögel. Arch. mikr. Anat. xix. pp. 733–740.

Deslongchamps, E. E. Catalogue descriptif des Trochilidés ou Oiseaux-mouches aujourd'hui connus. Revue d'après les exemplaires du Musée de Caen. [*Cf.* Zool. Rec. xvii. *Aves*, p. 7.] Paris: 1881, 8vo, pp. 493, pls. v.

Dixon, Chas. See *Thalassidroma leucorrhoa* [*Procellariidæ*].

Doering, A. Informe oficial de la Comision cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia) en 1879. Buenos Aires: 1881, 4to. Entrega i. Zoologia. ii. Aves, pp. 36–58.

Observations on 110 species of birds observed during this expedition.

Dole, S. B. List of the Birds of the Hawaiian Islands.

A reprint of this list, containing descriptions of 4 new species and 1 new genus, published in the "Hawaiian Annual" [*cf.* Zool. Rec. xvi. *Aves*, p. 8], is now to be found in "From Sword to Share," by H. W. Nicholson, London: 1881, 8vo, pp. 304–319.

Douglass, Arthur. Ostrich Farming in South Africa. London: 1881, rl. 8vo, pp. 251, with map and illustrations.

Contains many original observations of considerable value to the ostrich farmer, but of little scientific pretension.

Dresser, H. E. A List of European Birds, including all species found in the Western Palæarctic Region. London: 1881, 8vo, pp. 40.

——. A History of the Birds of Europe [*cf.* Zool. Rec. xvii. *Aves*, p. 7]. Vol. i. containing Preface, Introduction, Literature, Index, &c. 1881.

The completion of this great work on the Birds of the Western Palæarctic region.

——. See also *Saxicola deserti* [*Turdidæ*], *Picus pubescens* [*Picidæ*].

Drew, F. M. Field Notes on the Birds of San Juan County, Colorado. Bull. Nutt. Orn. Club, vi. pp. 85–91, 138–143.

Observations on 95 species noticed in a district ranging, mainly, from 8500 to 9500 feet in elevation.

Drummond-Hay, H. M. Notes on the Birds of the Basin of the Tay and its Tributaries. Scot. Nat. vi. pp. 4–12. Conclusion. [*Cf.* Zool. Rec. xvii. *Aves*, p. 8.]

DUBOIS, A. Faune Illustrée des Vertébrés de la Belgique. Série ii. Oiseaux. [*Cf.* Zool. Rec. xvii. *Aves*, p. 8.]

42 Parts have been issued to end of 1881.

——. See also *Turdidæ*.

ELWES, H. J. See *Crossoptilon harmani*, sp. n. [*Phasianidæ*].

EWART, J. C. See *Phalacrocorax* [*Pelecanidæ*].

EYTON, T. C. (the late). Osteologia Avium ; or, a Sketch of the Osteology of Birds. Complete with all Supplements. London : 1881, 4to. [Apparently a reprint.]

FEILDEN, H. W. Note on the Birds collected on the cruise of the "Isbjörn" to Novaya Zemlya in 1879, in A. H. Markham's "A Polar Reconnaissance," London : 1881, 8vo, pp. 333-339.

Twenty-six species were obtained: *Cyanecula wolfi* being a straggler. The young in down of *Stercorarius parasiticus* (Linn.), *i.e.*, the Long-tail, or Buffon's Skua, was obtained, probably for the first time.

——. Some Remarks on the Natural History of Franz-Josef Land. Tr. Norw. Sc. iii. pp. 201–211.

FINSCH, O. Ornithological Letters from the Pacific—Nos. v. and vi. Ibis, 1881, pp. 102–115, No. vii. *tom. cit.* pp. 245–249, No. viii. *tom. cit.* pp. 532–540. [*Cf.* Zool. Rec. xvii. *Aves*, p. 8.]

These letters treat of the birds observed at the islands of Kushai (22 species), Ponape (32 species), Nawodo or Pleasant Island, and a small portion of New Britain.

——. See also SCLATER, P. L., and, for plates, *Meliphagidæ*, *Diceidæ*, *Columbæ*.

FONTAINE, A. DE LA. Effet des grands froids de l'hiver 1879-1880 sur [les Oiseaux, pp. 83–89]. Publ. Inst. Luxemb. xviii.

FONTANA, LUIS JORGE. El Gran Chaco. Buenos Aires: 1881, 8vo.

At pp. 191–195 is a list of the birds observed during the author's explorations of the vast and little known district forming part of the Argentine Provinces and Bolivia.

FORBES, S. A. Studies of the Food of Birds, Insects, and Fishes. Illinois State Laboratory of Nat. Hist. Bull. No. 3, November 1880, pp. 1–160. [Not seen by the Recorder: *cf.* Bull. Nutt. Orn. Club, vi. p. 110.]

FORBES, W. A. Contributions to the Anatomy of Passerine Birds Part iv. [*cf.* Zool. Rec. xvii. *Aves*, p. 9]. On some Points in the Anatomy of the Genus *Conopophaga*, and its Systematic Position P. Z. S. 1881, pp. 435–438.

This genus, which has been placed by Sundevall and other authors, among the *Tyrannidæ*, has a tracheophone syrinx and four notches in the posterior organ of the sternum, a very unusual condition in Passerine birds ; the skull, visceral anatomy, myology, pterylosis,

and other characters are, however, Passerine. The peculiarity of its sternum, taken with its tarsal scutellation and the form of the syrinx, induce the author to follow Garrod and place it as a primary division of the Tracheophone Passeres under the name of CONOPOPHAGIDÆ, which he defines as Tracheophonine Passeres, with a holorhinal skull and four-notched sternum, an exaspidian tarsus and a syrinx with no intrinsic muscles, and with the sterno-tracheales not attached to the *processus vocales*.

[FORBES, W. A.] Notes on the Anatomy and Systematic Position of the Jaçanás [*Parridæ*]. *Tom. cit.* pp. 639–647.

The author's dissections of *Parra jacana* and *Metopidius africanus*, and other researches, show that the *Parridæ* are in no degree related to the Rails, but form a separate group to be placed amongst the *Limicolæ* as restricted by Nitzsch. In a foot-note (p. 639) it is proposed to substitute the word *Pluviales* as a name for the non-columbine *Charadriiformes* (the *Limicolæ* of Garrod), to correspond with the other division *Columbæ* (including the *Columbidæ* and *Pteroclidæ*) of that great group. The osteology of the *Parridæ* is discussed, with woodcuts of the sternum, shoulder-girdle, and wing-bones of *Metopidius albinucha*; and the radius in the latter genus is shown to be peculiarly modified, whereas in *Parra* and *Hydrophasianus* it presents the ordinary form.

——. On the Petrel called *Thalassidroma nereis* by Gould, and its Affinities. *Tom. cit.* pp. 735–737.

Dissection shows that this Petrel is not a true *Procellaria*, and it is made the type of a new genus *Garrodia*, which, together with *Oceanites*, *Pelagodroma*, and *Fregetta*, compose a well-marked family of the *Tubinares*, which it is proposed to call *Oceanitidæ*, as distinguished from the remainder of the group, or *Fulmaridæ* of Garrod.

——. On the Conformation of the Thoracic End of the Trachea in the "Ratite" Birds. *Tom. cit.* pp. 778–788.

In the simplicity of the structure of its lower larynx, *Apteryx* stands on the same level as *Struthio*; but in the *Casuariidæ* there are peculiarities in the structure of the bifurcating trachea not existing in the other *Ratitæ*. In *Rhea*, there is a highly-specialized and peculiar syrinx, provided with a pair of intrinsic muscles, in which respect it differs from all the other members of the sub-class. Illustrative woodcuts are given with the text.

——. On the Contributions to the Anatomy and Classification of Birds made by the late Prof. Garrod. Ibis, 1881, pp. 1–32.

——. Letter calling attention to certain desiderata for the study of the Anatomy of Birds. *Tom. cit.* pp. 174–177.

——. Eleven Weeks in North-eastern Brazil. *Tom. cit.* pp. 312–362.

Portions of the provinces of Pernambuco and Parahyba do Norte are graphically described; and notes on the 116 species observed contain some important facts on geographical distribution. The Sertões of Pernambuco appear to be the northern limit of *Cariama cristata*, and also prove to be the habitat of *Rhea macrorhyncha*.

[FORBES, W. A.] In Memoriam. The collected Scientific Papers of the late A. H. GARROD. Edited, with a Biographical Memoir of the Author, by W. A. FORBES. London: 1881, 8vo.

A carefully edited reprint of the late Prof. Garrod's papers, which have already been recorded in these pages.

——. On the Anatomy and Classification of the Petrels, based upon those collected by H.M.S. 'Challenger.' Rep. Brit. Ass. 1881, p. 671.

The group of *Tubinares* is divided into the families *Oceanitidæ*, with 4 genera and about 8 species, and *Procellariidæ* with 3 sub families, *Diomedeinæ*, *Pelecanoidinæ*, and *Procellariinæ*. The Petrels are believed to be descendants of some ancient form related to the Ciconiiform birds of Garrod, and the old supposition that they have any near relationship to the *Laridæ* is not borne out by their anatomy.

——. See also SCLATER, P. L.; and *Trogonidæ* (anatomy), *Eupetes* (anat.), [*Timeliidæ*], *Plotus* [*Pelecanidæ*], *Tubinares*.

FRAISSE, PAUL. Embryonalen Federn in der Mundhöle der Vögel. Zool. Anz. 1881, pp. 310–313.

——. Ueber Zähne bei Vögeln. Verh. Ges. Würzb. xv. SB. pp. iii.–ix.

FREKE, P. E. North-American Birds crossing the Atlantic. P. R. Dubl. Soc. (n.s.) iii. pp. 22–33.

An analysis of the occurrences in various parts of the United Kingdom of 31 species of American land-birds and 16 wading-birds, with remarks on the visits of some of them to the Continent and islands.

——. On Birds observed in Amelia County, Virginia. *Tom. cit.* pp. 61–92.

Interesting notes of observations made during six years' residence near Richmond, Va.

——. On European Birds observed in North America. Zool. 1881, pp. 365–378.

A useful collection of the scattered records of stragglers to North America, amounting to 47 species.

FRENZEL, A. See *Eclectus* [*Psittaci*].

FROMANN, C. Ueber die Structur der Epidermis und des Rete Malpighi an die Zehen von Hühnchen, die eben aus dem Ei geschlüpft oder demselben in den letzten Tagen der Bebrütung entnommen sind. Jen. Z. Nat. xiv. supplement, pp. 56–58.

GALLEWEY, R. PAYNE. See *Fuligula rufina* [*Anatidæ*].

GARRIOCK, J. T. See *Plectrophanes nivalis* [*Fringillidæ*].

GATCOMBE, J. Ornithological Notes from Devon and Cornwall. Zool. 1881, pp. 50–54, 195–198.

GIGLIOLI, E. H. Elenco delle specie di uccelli che trovansi in Italia stazionarie o di passaggio, colle indicazioni delle epoche della nidificazione e della migrazione. Annali di Agricoltura, 1881, No. 36, Roma.

A catalogue of Italian birds, divided into two sections; those resident

during the whole or a considerable portion of the year, 304 species; and those which only occur on regular or irregular migration, 114 species.

[Giglioli, E. H.] Notes on the Avifauna of Italy. Ibis, 1881, pp. 181–222.

These notes are based on the fine collection of Italian birds formed by the author in the Royal Zoological Museum at Florence, comprising 390 species. The total number of species which have occurred on the mainland, and islands of Italy, including Corsica and Malta, is raised to 418.

—— & Mazella, A. Iconografia dell' Avifauna Italica, ovvero Tavole illustrante le specie di Uccelli che trovansi in Italia. Prato (Toscana): 1881, folio, fasc. x.–xiv. [*Cf.* Zool. Rec. xvii. *Aves*, p. 10.]

Gilpin, J. B. On the Birds of Prey of Nova Scotia. P. N.-S. Inst. v. pp. 255–269.

Girtanner, A. See *Gypaetus* [*Falconidæ*].

Göldlin, E. A. Ornithologisches aus Neapel. J. f. O. 1881, pp. 188–196.

See also *Cyanecula* [*Turdidæ*].

Gould, John (the late). Monograph of the *Pittidæ*. Part. i. London: Oct. 1st, 1880, folio.

The illustrations, and apparently the letterpress, are principally, if not entirely, reproduced from the author's 'Birds of Asia,' 'Australia,' and 'New Guinea.'

——. The Birds of New Guinea and the adjacent Papuan Islands, including any new species that may be discovered in Australia. Part xii. 1881, folio. [*Cf.* Zool. Rec. xvii. *Aves*, p. 10.]

For species figured, see *Paradiseidæ*, *Laniidæ*, *Timeliidæ*, *Alcedinidæ*, *Ploceidæ*, *Meliphagidæ*, *Casuariidæ*. The letterpress is by R. B. Sharpe.

——. A Supplement to the *Trochilidæ*, or Humming-Birds. Pt. ii. Folio, 1881. [*Cf.* Zool. Rec. xvii. *Aves*, p. 10.]

For species figured, see *Trochilidæ*. The letterpress is by R. B. Sharpe, under the supervision of O. Salvin.

Gray, Robert. See *Alca impennis* [*Alcidæ*].

Grinnell, G. B. Review of O. C. Marsh's *Odontornithes*. [Cf. Zool. Rec. xvii. *Aves*, p. 49.] Am. J. Sci. (3) xxi. pp. 255–276.

An important review, or rather abstract, of the above voluminous work, with reproductions of many of its illustrations.

Gundlach, J. Nachträge zur Ornithologie Cuba's. J. f. O. 1881, pp. 400 & 401.

4 species are added to his former list of Cuban birds. [*Cf.* Zool. Rec. xii. p. 34.]

Gurney, J. H. Notes on a 'Catalogue of the *Accipitres* in the British Museum,' by R. B. Sharpe (1874).—Ibis, 1881, pp. 118–124, 271–279, 455–472, 547–567. [*Cf.* Zool. Rec. xvii. *Aves*, p. 10.]

The species comprised in the genera *Harpagus*, *Microhierax*, *Poliohierax*, *Spiziopteryx*, and *Cerchneis*, and in the subgenera *Dissodectes* and *Tinnunculus*, are here discussed [*Falconidæ*].

[Gurney, J. H.] A List of Birds collected at or near Mombasa, East Africa. *Tom. cit.* pp. 124–128.

This collection, formed by J. W. Handford, contains 40 species, 12 of which had not previously been recorded from the above locality.

——. See also *Cooperastur*, *Urospizias*, *Onychotes* [*Falconidæ*.]

—— Junr. Ornithological Notes from the neighbourhood of Cromer; Zool. 1881, pp. 330–332. From East Norfolk; *tom. cit.* pp. 484–488.

——. On the Spring Migration of Birds at St. Leonards [Sussex]. Tr. Norw. Sc. iii. pp. 170–177.

——. See also *Berniela ruficollis* [*Anatidæ*].

Guthrie [Mrs.]. Life in Western India. London: 1881, 2 vols. 8vo.

Contains numerous observations on birds: their habits, the legends relating to them, &c. The species are identified by reference to the Nos. in Jerdon.

Haast, Julius V. On *Harpagornis* (third paper) [*cf.* Zool. Rec. ix. p. 38 & xi. p. 40]. Tr. N. Z. Inst. xiii. pp. 232–234, pl. ix.

On some recently discovered bones of *H. assimilis*, supposed to have been a gigantic harrier [*Falconidæ*]. The lower mandible is figured.

Hammonville, C. d'. See *Calandrella* [*Alaudidæ*].

Hargitt, E. Notes on Woodpeckers. No. I. On the Piculets of the Old World. Ibis, 1881, pp. 222–239.

This monographical paper, the first of a projected series, treats of the 5 species comprised in the 3 genera, *Vivia*, *Sasia*, and *Verreauxia*; *Vivia chinensis* being described as new, and figured. [*Picidæ*.]

——. See also *Iyngipicus dærriesi*, *I. ramsayi*, *I. fulvifasciatus*. *I. pumilus*, spp. nn. [*Picidæ*].

Harper, R. P. See *Ardea garzetta* [*Ardeidæ*].

Harting, J. E. The Annals of Irish Zoology. Zool. 1881, pp. 433–445, 473–483.

An interesting collection of the observations, remarks, legends, and folk-lore relating to animals, contained in the works of early writers on Ireland. A large proportion relates to Birds.

——. See also *Hirundo rustica* [*Hirundinidæ*], *Gallinago cœlestis* [*Scolopacidæ*], *Podilymbus podiceps* [*Podicipidæ*], *Agelæus phœniceus* [*Icteridæ*].

Hartlaub, G. Beitrag zur Ornithologie der östlichäquatorialen Gebiete Africa's. Abh. Ver. Brem. vii. pp. 83–128, with Map.

On two further collections made by Emin Bey [*cf.* Zool. Rec. xvii. *Aves*, p. 11], whose exploring stations, extending from 1° N. to 5° N., are indicated on a Map. 154 species are enumerated, many of them recently described: *Phyllolais*, g. n. [*Timeliidæ*] and *Hyphantornis crocata*, sp. n. [*Ploceidæ*] are here recorded. An Appendix raises the total number of species obtained by Emin Bey to 163.

[Hartlaub, G.] On the Birds collected in Socotra and Southern Arabia by Dr. Emil Riebeck. P. Z. S. 1881, pp. 953–959, pl. lxxii.

Socotra yielded 20 species, 7 of which had not been obtained by I. B. Balfour during his short visit, and one, *Rhynchostruthus riebecki* [*Fringillidæ*] is described as new, and figured. South Arabia afforded 12 species, of which the little known *Merops cyanophrys* [*Meropidæ*] and *Chrysospiza cuchlora* [*Fringillidæ*] are re-described.

——. See also Sclater, P. L.; and *Cisticola marginalis*, sp. n. [*Timeliidæ*].

Hatch, P. L. A List of the Birds of Minnesota. Ninth Ann. Rep. Geol. & N. H. Surv. Minn. for 1880–1881, pp. 361–372.

Henshaw, H. W. On some of the Causes affecting the Decrease of Birds. Bull. Nutt. Orn. Club, vi. pp. 189–197.

Storms are considered to be the principal cause: thousands of birds are driven against telegraph wires and lighthouses, and millions are annually swept out over the ocean, in which they fall exhausted and perish.

——. See also *Podicipidæ*.

Hess, W. Beiträge zur einer Fauna der Insel Spiekerooge. Abh. Ver. Brem. vii. (Birds, p. 134).

From this island of the Eastern Frisian group, 19 species of birds are recorded.

Hodek, E. Reise-Erzählungen und Zugvögel-Wanderbericht von der unteren Donau aus dem Vorjahre. MT. orn. Ver. Wien, 1881, pp. 67, 79, 85.

Hoffmann, W. J. Annotated List of the Birds of Nevada. Bull. U.S. Geol. Surv. vi. pp. 203–256, with sketch map and illustrations.

The author's own notes were made in 1871, to which are added the results of observations by Ridgway, Henshaw, and Cooper. The distribution of vegetation in Nevada, as affecting that of the avifauna, is discussed at some length, with illustrations.

Holdsworth, E. W. H. See *Oreocincla varia* [*Turdidæ*].

Holterhoff, E. [*i.e.*, G.], Junr. A Collector's Notes on the Breeding of a few Western Birds [Southern California]. Am. Nat. 1881, pp. 208–219.

Holtz, L. Um und durch Spanien. Reiseskizzen, gesammelt auf einem im Jahre 1879 nach Spanien ausgeführten ornithologischen Reise. Wien: 1881, 8vo.

Homeyer, E. F. v. Die Wanderungen der Vögel mit Rücksicht auf die Zuge der Säugethiere, Fische und Insecten. Leipzig: 1881, 8vo. [Not seen by Recorder.]

[Homeyer, E. F. v.] Ornithologische Briefe. Berlin, 1881, 8vo. pp. 340.

Letters from many well-known ornithologists; amongst the more interesting may be mentioned those from Max, Prince of Wied, the elder Brehm, Thienemann, Gloger, Girtanner, Radde (on the Birds of the Caucasus), Tancré (on the Birds of Hiddensöe near Rügen, with an account of *Haliaetus albicilla* nesting on the ground), &c.

——. Die europäische Ornithologie und The Birds of Europe, by H. E. Dresser. Zool. Gart. 1881, pp. 267–279, 303–308, 326–329.

Humbert, Alois. Les Odontornithes ou Oiseaux fossiles à dents de l'Amérique du Nord décrits par M. Marsh. Arch. Sc. Genève (3) v. pp. 409–430.

Hume, A. O. Novelties? Str. Feath. ix. pp. 461–471.

Callophasis humiæ [sic] g. & sp. n., and *Perdicula manipurensis*, sp. n. [*Phasianidæ*], are described.

——. Notes. *Tom. cit.* pp. 505–507.

——. See also Biddulph, J.; and *Passer pyrrhonotus* [*Fringillidæ*], *Pernis tweedalii*, sp. n. [*Falconidæ*].

Huntemann, J. Zur Fauna und Flora der Insel Arngast im Jadebusen. Abh. Ver. Brem. vii. [For Birds, see pp. 141 & 142.]

Issel, A. Instruzioni scientifiche pei Viaggiatori. Roma: 1881, 8vo. For instructions relating to the collection of Birds, with sketches of the characteristics of the various families, and hints as to the points requiring special attention, see pp. 368–379.

Jäckel, A. J. See *Tetrao intermedius* [*Tetraonidæ*].

Jeffrey, W. Ornithological Notes from West Sussex; Zool. 1881, pp. 47–50.

Jeffries, J. A. On the Fingers of Birds. Bull. Nutt. Orn. Club, vi. pp. 6–11.

The structural evidence of the forearm and hand is considered to point to the existence of fingers I. II. III. & IV., in birds.

——. On the Number of Primaries in Birds. *Tom cit.* pp. 156–163.

The author gives the result of investigations which, so far as they go, promise to assist materially in determining the position of doubtful birds.

Johnston, H. H. See *Phœnicopteridæ*.

Jones, G. E. Illustrations of the Nests and Eggs of the Birds of Ohio. Circleville, Ohio: 1881, 4to, pts. v.–ix. [*Cf.* Zool. Rec. xvii. *Aves*, p. 13].

Kelham, H. R. Ornithological Notes made in the Straits Settlements, and in the Western States of the Malay Peninsula. Ibis, 1881, pp. 362–395, 501–532.

Interesting observations on the Indo-Malayan portion of the Peninsula, where the affinity of the avifauna is with that of India and Ceylon.

KERMODE, P. See CORDEAUX, J.

KOLAZY, JOSEF. Die Vögelparasiten. MT. orn. Ver. Wien, 1881, pp. 41, 49, 71, 89, 95.

This detailed list of various species of European birds and the Parasites to be found on them, really belongs to Entomology; but, as it is published in an ornithological journal, it is noticed here.

KOLLIBAY, PAUL. Ornithologisches aus Oberschlesien. Orn. Centralb. 1881, pp. 132, 161, 185.

——. See also *Vultur cinereus* [*Falconidæ*].

KOLOMBATOVIC, G. Osservazioni sugli Uccelli della Dalmazia. Osservazioni sul lavoro di Michele Stossich, dal titulo "Prospetto della fauna dei vertebrati dell'Adriatico." Spalato: 1880, 8vo.

[Not seen by Recorder: see A. v. Pelzeln in Verh. z.-b. Wien, xxxi. p. 10].

KRUKENBERG, C. F. W. Die Farbstoffe der Federn. Vergleichend-physiologische Studien, Heidelberg. i. Reihe, Abth. v. pp. 72–92, pl. iii.; ii. Reihe, Abth. i. pp. 151–171.

The former of these articles treats of the chemical reactions and spectroscopic characters of turacine, zoonerythrine, and zoofulvine, three colouring substances present in the red and yellow feathers of birds. The second treats of turacoverdine, present in the green feathers of the *Musophagidæ*, being the first green feather pigment that the author has been able to isolate; zoarubine, and other substances. For further details of what are essentially chemical treatises, see 'Ibis' 1881, p. 602, and 1882, p. 336.

KUTTER, —. Die systematische Stellung der Laufhühner (*Turnicidæ*) nach oologischen Merkmalen. Orn. Centralb. 1881, p. 68.

LANGDON, F. W. Ornithological Field Notes [Cincinnati] (p. iii. 121); Summer Birds of an Ohio Marsh (iii. p. 220); Field Notes on Louisiana Birds (iv. p. 145); Zoological Miscellany (iv. p. 336): J. Cincinn. Soc.

LANGTON, HERBERT. See *Œdemia perspicillata* [*Anatidæ*].

LAWRENCE, G. N. See *Icterus oberi*, sp. n. [*Icteridæ*], *Loxigilla portoricensis* var. *grandis*, sub. sp. n. [*Fringillidæ*].

LAYARD, E. L. Letter: asserting that some of E. P. Ramsay's new species are merely old ones renamed; Ibis, 1881, p. 170.

——. See also *Aplonis rufipennis*, sp. n. [*Sturnidæ*].

——. & E. L. C. Notes on the Avifauna of New Caledonia, and the New Hebrides. With Remarks by the Rev. Canon TRISTRAM. Ibis, 1881, pp. 132 139.

Ægotheles savesi, sp. n. [*Podargidæ*] is described and figured; and remarks on some other New Caledonian species are followed by criticisms on E. P. Ramsay's notes respecting the birds of the New Hebrides [*cf.* Zool. Rec. xvi. *Aves*, p. 24].

[Layard, E. L. & E. L. C.] Letter: on some birds and eggs obtained in New Caledonia, and in Norfolk Island; *tom. cit.* p. 171.

Liebe, K. T. Ornithologische Notizen, V. Die Witterung des Frühjahres 1881. Orn. Centralb. 1881, pp. 113–117.

Lilford [Lord]. Ornithological Notes from Northamptonshire. Zool. 1881, pp. 24 & 25, 61.

Littleboy, J. E. Notes on Birds observed [in Hertfordshire] in 1879 (pp. 70–80); in 1880, and first 3 months of 1881 (pp. 239–250). Tr. Herts. N. H. Soc. i.

——. See also *Agelæus phœniceus* [*Icteridæ*].

Liversidge, —. An Analysis of Moa Eggshell. Tr. N. Z. Inst. xiii. p. 225.

Loewis, O. v. See *Tetraonidæ*, and *Otis macqueeni* [*Otididæ*].

Lorenz, Ludwig v. See *Stringops habroptilus*, *Nestor notabilis* [*Psittaci*].

Macoun, John. Report of Exploration [in the Souris River Valley, north of Dakota and Montana] Rep. of Dep. of Interior, Ottawa, 1881? 8vo, pp. 48. [Not seen by the Recorder; *Cf.* Bull. Nutt. Orn. Club, 1882, p. 113].

Madarász, J. Systematische Aufzählung d. Vögel Ungarns, nebst Angabe der Literatur. Budapest: 1881, 8vo, pp. 46.

[Not seen by the Recorder. See Zool. Anz. 1881, p. 491, where 345 species are said to be noticed.]

——. See also *Carduelis* [*Fringillidæ*.]

Marchand, A. Notes sur les Poussins des Oiseaux d'Europe. R. Z. (3) vii 1879 [dated], pls. iv.–vi. [Received in 1881, and all that has been seen by Recorder up to June 1882.]

Only plates, of little or no scientific value: the species are *Stercorarius catarrhactes*, *Pelidna cinclus*, *Scolopax major*, the text of which has already appeared [*cf.* Zool. Rec. xvii. *Aves*, p. 14].

Marschall, A. F. v., & Pelzeln, A. v. Ornis Vindobonensis: die Vogelwelt Wien's und seiner Umgebungen, mit einem Anhang: die Vögel des Neusiedler See's. Vienna [dated 1882; published, and seen by Recorder in 1881], 8vo, pp. 192 & Map.

Marsh, O. C. Discovery of a Fossil Bird in the Jurassic of Wyoming. Ann. N. H. (5) vii. p. 488, and Am. J. Sci. (3) xxi. p. 341.

Various remains, some of them sufficiently characteristic for determination, have enabled the author to describe *Laopteryx priscus*, g. & sp. n. [*Odontornithes*].

——. Jurassic Birds and their Allies. Ann. N. H. (5) viii. pp. 452–455; Am. J. Sci. (3) xxii. pp. 337–340; & Geol. Mag. 1881, pp. 485–487. Also abstract in Rep. Brit. Ass. 1881, p. 661.

The author gives the results of his examination of the three known specimens of *Archæopteryx*, and gives details of their more important characters. The nearest allies to Birds are, he considers, the Dinosaurian Reptiles.

MARSHALL, G. F. L. See BIDDULPH, J.

MATHEW, G. F. See *Otis tetrax* [*Otididæ*].

MEARNS, EDGAR A. A List of the Birds of the Hudson Highlands, with Annotations. Bull. Essex Inst. xii. pp. 10–25, 109–128. [*Cf.* Zool. Rec. xvii. *Aves*, p. 15.]

MERRIAM, C. H. Preliminary List of Birds [177 species] ascertained to occur in the Adirondack Region, North-eastern New York. Bull. Nutt. Orn. Club, vi. pp. 225–235.

MERRILL, J. E. Oölogical Notes from Montana. Bull. Nutt. Orn. Club, vi. pp. 203–207.

During the past season the nests and eggs of the following species were found in the northern part of the Bighorn Mountains: *Regulus calendula*, *Parus montanus*, *Dendræca audubonî*, *Junco annectens*, *Pipilio maculatus arcticus*, *Sphyropicus varius nuchalis*.

MEYER, A. B. Notiz über ein Rackelhahn [*Tetraonidæ*]. MT. orn. Ver. Wien, 1881, p. 72. [See also *tom. cit.* p. 91.]

——. Die Farbstoffe der Federn der Edelpapageien und des Königsparadiesvogels, nach Untersuchungen von Dr. C. F. W. Krukenberg. *Tom. cit.* pp. 83–85. [See also KRUKENBERG, *suprà*, p. 15].

——. [A review of T. Salvadori's Ornithologia della Papuasia e delle Molucche, vol. ii.] J. f. O. 1881, pp. 401–405.

——. Ueber Vögel von einigen der Südöstlichen Inseln des Malayischen Archipels, insbesondere über diejenigen Sumba's. Verh. z.-b. Wien, xxxi. p. 759.

This collection was made by Herr Riedel in 12 distinct localities. *Tanygnathus megalorrhynchus* var. n. *sumbensis* [*Psittaci*], and *Graucalus sumbensis*, sp. n. [*Campophagidæ*], are described, with full notes on other species.

——. See also *Eclectus riedeli*, sp. n. [*Psittaci*]; *Gymnophaps pœcilorrhoa*, *Ptilopus fischeri* (habitats of) [*Columbæ*].

MILNE-EDWARDS, ALPHONSE. Observations sur quelques Animaux de Madagascar. C. R. xci. pp. 1034–1038.

On a collection of 101 species obtained between Fontepointe and Lac Alaoutre. *Anastomus madagascarensis*, sp. n. [*Ardeidæ*], is described.

——. Recherches sur la Faune des Régions australes. Ann. Sc. Nat. (6) ix. Art. 9. Faune Avienne, pp. 21—81, pls. xvii.–xx. [issued with vol. x.] and Map, etc.

The commencement of an essay, not yet concluded, on the distribution of Aquatic Birds in the Southern Ocean. This portion relates to the *Spheniscidæ*, the geographical distribution of each species being reviewed and illustrated by the Map. Two new genera, *Megadyptes* and *Microdyptes*, are instituted, and plates of the characteristics of several species are given. [*Spheniscidæ*.]

—— ——. Observations sur les Oiseaux de la région antarctique. C. R. xcii. p. 211.

Address on presentation of the above treatise.

[Milne-Edwards, A.] & Grandidier, A. Histoire Physique, Naturelle, et Politique de Madagascar. Vol. xii. Hist. Nat. des Oiseaux. [*Cf.* Zool. Rec. xvi. *Aves*, p. 20.]

Vol. xii. Tome i., Texte, 2e partie, dated on cover 1881; Vol. xiv. Tome iii., Atlas ii., 2e partie, dated on cover 1879; Vol. xv. Tome iv., Atlas iii., dated on cover 1881, were received in May, 1882. The circular, which accompanies them, proves that they could not have been issued prior to 15th February, 1882, and, in fact, were not issued until much later—many plates with errors having, moreover, still to be exchanged for rectified ones. All consideration of these works is therefore postponed until the Record of the year in which they really appeared.

Minot, C. S. Studies on the Tongues of Reptiles and Birds. Anniversary Memoir Boston Soc. N. H. 1881, pp. 20.

——. Notes on the Migrations of Birds. Am. Nat. 1881, pp. 870–872.

Mitchell, F. S. Ornithological Notes from Lancashire. Zool. 1881, pp. 185–194.

Mojsisovics, A. Manuel de Zootomie, traduit de l'Allemand, et annoté par J.-L. de Lanessan. Paris: 1881, 8vo.

For Birds, see pp. 149–173; the type selected is the Pigeon.

More, A. G. See *Fuligula rufina* [*Anatidæ*], *Puffinus griseus* [*Procellariidæ*], *Xema sabinii* [*Laridæ*], *Falco islandus* [*Falconidæ*].

Morse, E. S. On the identity of the ascending process of the Astragalus in Birds, with the Intermedium. Anniv. Mem. Boston Soc. N. H. 1881, pp. 10, pl. & 12 woodcuts.

Müller, A. Ein hennenfedriges Vogelmännchen. [*Ruticilla tithys*] J. f. O. 1881, pp. 203–208.

——. See also *Cyanecula* [*Turdidæ*], *Cisticola schœnicola* [*Timeliidæ*], *Falco peregrinus* [*Falconidæ*].

Müller, Carl. See *Lanius collurio* [*Laniidæ*].

Nathusius, W. von. See Opisthocomi.

Nehrkorn, A. Beschreibung yucatanischer Eier. J. f. O. 1881, pp. 65–69.

Descriptions and measurements of the eggs of 24 species of birds, from Yucatan.

——. See also Blasius, W.

Nehrling, H. Beitrage zur Ornis des nördlichen Illinois. J. f. O. 1881, pp. 196–203, 405–416.

Continuation, but not completion, of a list commenced in 1880, species No. 96 being now reached.

——. Ornithologische Beobachtungen aus Texas. Monats. Deutsch. Ver. zum Schutze der Vogelwelt, v. pp. 122–139. II. *op. cit.* vi. pp. 111–121.

——. See also *Nauclerus* [*Falconidæ*], *Xanthocephalus* [*Icteridæ*].

NELSON, E. W. Door-yard Birds of the Far-North [St. Michael's, Alaska]. Bull. Nutt. Orn. Club, vi. pp. 1–6.

— —. See also *Branta* [*Anatidæ*].

NEUMANN, M., & GRÜNEWALD, A. Beobachtungs-Notizen über das Jahr 1879; gesammelt in Grossenhain und Umgegend. Orn. Centralbl. 1881, pp. 25–28, 41–44, 57–60.

The conclusion of this treatise [*cf.* Zool. Rec. xvii. *Aves*, p. 16], which comprises 260 species.

NEWTON, A. A History of British Birds, by the late William Yarrell. 4th Edition, Part xiv. London: 1881, 8vo. [*Cf.* Zool. Rec. xvii. *Aves*, p. 16.]

The *Cuculidæ* are concluded; the British members of the *Upupidæ*, *Coraciidæ*, *Meropidæ*, consisting of one representative each, are discussed; the *Alcedinidæ* follow, and the *Picidæ* are almost completed in this part.

——. See also *Hypherpes* and *Hypositta* [*Sittidæ*], *Dendrocopus leuconotus* [*Picidæ*], *Cariama cristata* [*Cariamidæ*]; and articles Hoactzin, Honey-eater, Honey-guide, Hoopoe, Hornbill, Humming-bird, Ibis, Icterus (vol. xii.), Jabiru, Jacamar, Jacana, Jackdaw, Jay, Kakapo (vol. xiii.), in Encyclopædia Britannica, 9th ed. 1881.

—— & E. List of the Birds of Jamaica. Handbook of Jamaica for 1881 (Kingston: 8vo) pp. 103–117.

In this brief but accurate list, 189 species are enumerated, the 43 species hitherto only found in Jamaica being specially indicated.

NICHOLSON, FRANCIS. List of Birds collected by Mr. H. O. Forbes in the Island of Java. Ibis, 1881, pp. 139–156.

This list, supplementary to a previous communication [*cf.* Zool. Rec. xvi. *Aves*, p. 22], comprises 81 species, the majority of which are from the district of Bantam.

NORDENSKIÖLD, A. E. The Voyage of the Vega round Asia and Europe, translated by A. Leslie. London: 1881, 2 vols., 8vo.

Numerous allusions to the birds of the Arctic regions are scattered through the pages descriptive of the discovery of the North-east passage; but for the species observed on the Chukch peninsula, off which the 'Vega' was imprisoned from 28th Sept. 1878, to 18th July, 1879, see vol. ii. pp. 41–47. In addition to many Palæarctic and Circum-polar species, several American forms made their appearance, such as *Fuligula stelleri*, *Anser pictus* & *A. hyperboreus*, *Somateria V-nigrum*; *Somateria spectabilis* replacing *S. mollissima*, which was either absent or exceedingly rare. On 1st July, a specimen of the rare gull *Rhodostethia rosea* was obtained, and many examples of the singular spoon-billed sandpiper, *Eurynorhynchus pygmæus*, were shot—and eaten—on their way to breeding grounds as yet unknown.

NORGATE, FRANK. Notes on the Food of Birds. Zool. 1881, pp. 313–325, 411–413.

OATES, FRANK, (the late). Matabele Land and the Victoria Falls. London: 1881, 8vo.

Allusions to, and woodcuts of, some of the birds observed, are to be

found in the journal of this enterprising young naturalist, and a full account of his ornithological collection, with his field-notes, illustrated by two coloured plates, and description of a new species, is contained in Appendix II. pp. 294–328, by R. B. Sharpe (*infra*, p. 27).

Oesterreich, Rudolph von. Eine Orientreise. Wien: 1881, 8vo. Ornithologische Reiseskizzen, ii. pp. 216–258.

In this account of the travels of the Crown Prince of Austria, numerous allusions to birds are scattered through the pages of the general work. The "Ornithologische Reiseskizzen" are also published in MT. orn. Ver. Wien, 1881, pp. 57–66, but without any author's name.

Oustalet, E. See *Megapodiidæ*.

Palacky, J. Skizze des Vortrages über die Wanderungen der Vögel. MT. orn. Ver. Wien, 1881, p. 23.

Palmen, J. A. See Sundman, G.; also *Bernicla ruficollis* [*Anatidæ*].

Paolucci, L. Sopra alcune specie rare di uccelli italiani. Atti Acc. Rom. (3) Trans v. pp. 84–86.

The species are *Emberiza cæsia*, *E. melanocephala*, *Cygnus olor*, *Colymbus arcticus*, *Pelecanus onocrotalus*, *Phalacrocorax graculus*, *Anthus cervinus*, *Motacilla melanocephala*, *Petronia stulta*. [Several of these birds can hardly be considered rare in Italy.]

Parker, H. Notes, chiefly Oological, from North-West Ceylon. Str. Feath. ix. pp. 475–491.

Highly interesting observations, supplementary to W. V. Legge's "Birds of Ceylon," of which they may be considered the first fruits.

Pelzeln, A. v. Ueber Fasanbastarde. MT. orn. Ver. Wien, 1881, p. 6.

——. Ueber Dr. Breitstein's zweite Sendung von Säugethieren und Vögeln aus Borneo. Verh. z.-b. Wien, xxx. pp. 26 & 27.

The ♀ of *Polyplectron schleiermacheri* (*Phasianidæ*), is here described for the first time: there being only one other bird (a *Nectarinia*) in the collection.

——. Ueber eine Sendung von Vögeln aus Central-Afrika. Verh. z.-b. Wien, xxxi. pp. 141–155.

On a collection of 150 skins obtained by Emin Bey, in the country between Ladó and the Albert Nyanza. *Eremomela hypoxantha*, sp. n. [*Sylviidæ*] *Icteropsis*, g. n. [*Ploceidæ*] are described, with other sexes and plumages for the first time.

——. Ueber Dr. Emin Bey's zweite Sendung von Vögeln aus Central Afrika. *Tom. cit.* p. 605.

This second collection contains 84 species, many of them of much interest, 21 of them being new to the district although not to science.

——. Bericht über die Leistungen in des Naturgeschichte der Vögel wahrend des Jahres 1880. Arch. f. Nat. 1881, pp. 389–464.

The annual record of ornithological literature, showing the author's customary care and research.

[Pelzeln, A. v.] See also Marschall, A. F., *Casuarius* [*Casuarii*], *Furnarius* [*Dendrocolaptidæ*].

Peters, W. See *Turdus tropicalis* [*Turdidæ*], *Nectarinia olivacina* [*Nectariniidæ*], spp. nn.

Phillips, E. C. The Birds of Breconshire. Zool. 1881, pp. 402–409.

Phillips-Wolley, C. Sport in the Crimea and Caucasus. London: 1881, 8vo, pp. 370 [no index].

Remarks on birds are scattered through the work.

Pleske, T. See Büchner, E.

Pope, A., Junr. Upland Game Birds and Waterfowl of the United States. In x. parts, with 20 coloured plates, folio. New York: 1881.

A handsome picture-book, with letterpress, "compiled by permission from the works of Audubon, Wilson, Baird, Coues, and other well-known authorities."

Potts, T. H. See *Nestor notabilis* [*Psittaci*].

Quistorp, [Dr.]. Zug der Wandervögel durch Neu-Vorpommern im Frühjahr 1881. Orn. Centralbl. 1881, pp. 127–132.

Rae, Edward. The White Sea Peninsula; a Journey in Russian Lapland and Karelia. London: 1881, cr. 8vo, pp. 347, with map, etchings, woodcuts [no index].

Numerous allusions to the birds noticed are scattered through the pages; the most interesting being the discovery of the nest of *Tringa minuta* [*Scolopacidæ*]. For a list of 51 species frequenting the Kola Peninsula and Karelia, see pp. 322-325; and p. 326 for the 13 species said to have been observed about Lake Enara.

Ramsay, E. P. Notes on the Zoology of the Solomon Islands, with descriptions of some new Birds. Part ii. [*Cf.* Zool. Rec. xvi. *Aves*, p. 24.] P. Linn. Soc. N.S.W. vi. pp. 176–181.

On a small collection, principally made by Lieut. Richards, H.M.S. 'Renard.' *Graucalus elegans* [*Campophagidæ*], *Piezorrhynchus richardsi* [*Muscicapidæ*], *Myzomela tristrami* and *M. pulcherrima* [*Meliphagidæ*], *Tephras olivaceus* [*Diccidæ*], *Nasiterna finschi* [*Psittaci*], are described as new.

——. See also *Oriolus affinis* [*Oriolidæ*], *Pycnoptilus floccosus* [*Timeliidæ*], *Piezorrhynchus melanocephalus* [*Muscicapidæ*].

Ramsay, R. G. Wardlaw. The Ornithological Works of Arthur, the Ninth Marquis of Tweeddale, reprinted from the originals by the desire of his widow, edited and revised by his Nephew [the above]. London: 1881, 4to, for private circulation.

Many editorial footnotes are appended to this carefully executed memorial, and an original "revised list of birds known to occur in the Philippine Islands showing their geographical distribution," is to be found in the Appendix (p. 653). The total, excluding doubtful species, amounts to 317.

[Ramsay, R. G. Wardlaw.] See also *Analcipus consanguineus*, sp. n. [*Oriolidæ*], *Edoliosoma alterum*, sp. n. [*Campophagidæ*], *Hydrornis soror*, sp. n. [*Pittidæ*].

Rathbun, F. R. Bright Feathers; or, Some North American Birds of Beauty. Pt. ii. 4to. [*Cf.* Zool. Rec. xvii. *Aves*, p. 19.]

——. A Revised List of Birds of Central New York. Auburn, N.Y.: 1881, 8vo.

Reichenow, A. Vögel der Vorwelt. Orn. Centralbl. 1881, p. 84. Conclusion of this series of papers on Extinct birds and their nearest living representatives. [*Cf.* Zool. Rec. xvii. *Aves*, p. 19.]

——. Vogelbilder aus fernen Zonen [*cf.* Zool. Rec. xvii. *Aves*, p. 19]. Pt. vii. pls. xix.-xxi. Cassel: folio.

——. See also Psittaci; *Habropyga charmosyna*, *Hyphantornis castanosoma* [*Ploceidæ*], *Otis canicollis* [*Otididæ*], *Sarciophorus latifrons* [*Charadriidæ*], spp. nn.

—— & Schalow, H. Compendium der neu-beschreibenen Gattungen und Arten. J. f. O. 1881, pp. 70–102, 417–423.

—— ——. *Aves* in Zool. JB. Neap. 1880. Leipzig: 1881, pt. iv. pp. 185–244.

Reid, G. Birds of the Lucknow Civil Division. Str. Feath. ix. pp. 491-504.

The opening paper of a series which is to treat of some 313–350 species of birds.

Reinhardt, J. Om de formentlige Levninger af en kœmpemæssig, med *Cariama* beslœgt, uddöd Fugl fra Brasiliens knoglehuhler. Vid. Medd. 1881, pp. 141–153.

"On the remains of an extinct gigantic Bird supposed to be allied to *Cariama*, from the ossiferous caves of Brazil." A translation under this title will be found in Ibis, 1882, pp. 321–332.

——. Notitser til Grönlands Ornithologi. *Tom. cit.* pp. 183–189.

8 species of rare occurrence in Greenland are recorded.

——. See also *Loxia leucoptera* [*Fringillidæ*].

Ridgway, R. A Catalogue of the Birds of North America. Pr. U. S. Nat. Mus. iii. pp. 163–246.

In this lengthy catalogue, superseding the former ones issued by the Smithsonian Institution during the last twenty years, many changes are introduced, for analysis of which see pp. 213–234. The total number of species now admitted is 764.

——. Nomenclature of North American Birds, chiefly contained in the United States National Museum. Bull. U. S. Nat. Mus. No. 21, pp. 94.

Essentially a revised edition of the above, modified by numerous alterations and corrections, and with a new introduction.

——. Catalogue of the *Trochilidæ* in the Collection of the United States National Museum. Pr. U. S. Nat. Mus. iii. pp. 308–320.

[Ridgway, R.] List of Species of Middle and South American Birds not contained in the U. S. National Museum. *Op. cit.* iv. pp. 165–23.

——. List of Special Desiderata among North American Birds. *Tom. cit.* pp. 207–223.

——. Revised Catalogue of the Birds Ascertained to Occur in Illinois. Illinois State Laboratory of Nat. Hist., Bull. iv. pp. 163–208.

341 species are recorded, and a list of 42 probable visitors is appended.

——. See also *Fuligula rufina* [*Anatidæ*]; *Amazilia* [*Trochilidæ*]; *Centurus* (review of genus) [*Picidæ*]; *Buteo brachyurus* [*Falconidæ*].

Roberts, T. S. The Water Birds of Minnesota. 9th Ann. Rep. Geol. & N. H. Surv. Minn. for 1880–1881, pp. 373–383.

Rope, G. T. See *Corvus corax* [*Corvidæ*].

Rosenberg, H. v. Vögel von Neu-Guinea's Südküste. Zool. Gart. 1881, p. 26.

116 species are enumerated, 53 of them being also found on the north-west coast.

——. Ein Jäger Eldorado. *Tom. cit.* pp. 164-167.

An account of a collecting-visit to the Lake of Limbotto, on the south side of the northern arm of the island of Celebes: the results being 364 specimens belonging to 50 species, a list of which is given.

Russ, Karl. Die fremländischen Stubenvögel. iv. Erste Lieferung. Hannover: 1881, 8vo.

[Tweedars to be the commencement of a new series. [*Cf.* Zool. Rec. ii. Sandwich Is 20.]

(pls. xxiii. & x T. Prodromus Ornithologiæ Papuasiæ et Moluccarum. Hebrides, & T*uridæ* (1 species), *Certhiidæ* (2 species), *Nectariniidæ* (17 and on the s), *Dicæidæ* (23 species), *Meliphagidæ* (89 species); Ann. Mus. (pls. xxv.—iv. xvi. [for 1880–81, as per title-page, yet dated 1880 below, and (pls. xviii.-lished as a vol. in 1881!] pp. 62–82. x. *Brachypodidæ* (3 species). W. A. Fo*ttidæ* (11 species), *Timeliidæ* (14 species), *Saxicolidæ* (1 species), *lariidæ*, l*yleiidæ* (10 species), *Motacillidæ* (3 species), *Ploceidæ* (12 species), *Muscicat**urnidæ* (14 species), *Oriolidæ* (7 species), *Corvidæ* (9 species); *tom. Turdidæ*, *t.* pp. 183–199.

printer's Part ix., 1 new genus, *Urocharis*; and 1 new species, *Dicæum* ——. A*lorum* [*Dicæidæ*], and 3 new genera, *Meliarchus*, *Philemonopsis*, *bulic**pygius* [*Meliphagidæ*], are characterized; 2 new species of *Ptilotis* p. 22–scribed, and a *Zosterops* is re-named [*Meliphagidæ*]. In Part x., For spec*s* of *Calornis* [*Sturnidæ*] are described as new.

See——. Ornitologia della Papuasia e delle Molucche. ii. Torino: 1881, pp. xi. & 681. [*Cf.* Zool. Rec. xvii. *Aves*, p. 21.]

This volume comprises the *Passeres*. Full particulars of each species and its synonymy are to be found in this highly-important work, an especial feature being the ample details respecting the various members of the *Paradiseidæ*. *Pachycephala innominata*, sp. n [*Laniidæ*], and *Semioptera wallacii* var. *halmaheræ* [*Paradiseidæ*], are described.

[Salvadori, T.] Descrizione di alcune specie nuove o poco conosciute di Uccelli della Nuova Britannia, della Nuova Guinea e delle Isole del Duca di York. Atti Ac. Tor. xvi. pp. 619–625.

Strix aurantia [*Strigidæ*], *Sauromarptis cyanophrys* [*Alcedinidæ*], *Zosterops hypoxantha* and *Myzomela erythromelas* [*Meliphagidæ*], are described as new; and some rare species are noticed.

——. Della vita e delle opere dell' ornitologo inglese John Gould [with a compendium of his works and papers]. *Tom. cit.* pp. 789–810.

——. Letter, on various birds, principally Papuan. Ibis, 1881, p. 286.

——. See also Sclater, P. L., and for plates, *Laniidæ*, *Muscicapidæ*, *Campophagidæ*, *Psittaci*; also *Cypselus horus* [*Cypselidæ*], *Urospizias* [*Falconidæ*].

Salvin, O. See Sclater, P. L.; and *Cistothorus brunneiceps*, *Microcerculus taeniatus*, spp. nn. [*Troglodytidæ*].

—— & Godman, F. D. Biologia Centrali-Americana; or, Contributions to the Fauna and Flora of Mexico and Central America. London: 1881, 4to. Zoology, *Aves*, pt. ix. pp. 129–152, pls. ix. & x.: pt. xii. pp. 153–168, pl. xi.: pt. xiii. pp. 169–184: pt. xiv. pp. 185–200, pl. xii. [*Cf.* Zool. Rec. xvii. *Aves*, p. 21.]

The above parts comprise the remainder of the *Mniotiltidæ* (pls.) and the commencement of the *Vireonidæ* (pls.).

—— ——. See also *Eucephala pyropygia*, *Panychlora ruesata*, spp. nn., *Glaucis dohrni*, *Anthocephala floriceps* [*Trochilidæ*].

Saunders, Howard. See Sclater, P. L.; also *Dromas ard* ara-
driidæ]. pemæssig, n.
huhler. Vid.

Schacht, H. Erscheinungen aus dem Vogelleben des Waldes im Jahre 1881. Orn. Centralbl. 1881, pp. 29, 4 be allied to
109, 124, 141, 153, 171, 187. under this

——. Der Zug der Vögel im Herbst 1880. Zool. Gart. 1881, p

Schalow, H. Ornithologisches aus Nord-China—Nach den A 29.
mingen Dr. O. F. v. Mollendorf's mitgetheilt. Orn. Centralb
pp. 103–107.

——. Ein zweiter Beitrag zur Ornis der Mark Brandenburg. J
1881, pp. 289–323. r. U. S.

The sequel to a former paper [*cf.* Zool. Rec. xiii. *Aves*, p. 26] by the
taining many additional species and much information, with a cor
list of the ornithological literature relating to that province. ages are

——. See also Reichenow, A. mber of

Schöpf, Ad. See *Sarcorrhamphus* [*Cathartidæ*].

Schulgin, M. A. *Lobioptici* der Vögel. Zool. Anz. 1881, pp. 277–281, the
303–308.

Sclater, P. L. On some Birds collected by E. F. im Thurn in British Guiana. P. Z. S. 1881, pp. 212–214.

The collection contains 6 species, one of which, *Agelæus imthurni*, is described as new.

[Sclater, P. L.] Exhibition of and remarks upon 5 bird-skins (4 species) from the Island of Rotumeh, which had accidentally been omitted from the report on the 'Challenger' collections. *Tom. cit.* p. 451.

Three species, viz., *Pinarolestes vitensis*, *Lalage pacifica*, and *Strepsilas interpres*, are now added to the list of known birds of Rotumeh, as given by W. A. Forbes. [*Cf.* Zool Rec. xv. *Aves*, p. 10.]

——. On the Birds of the Vicinity of Lima, Peru. *Tom. cit.* pp. 484–488, pl. xlvi. Part vi. [*Lege* Part v., *cf.* Zool. Rec. viii. p. 43].

This collection consists of 12 species from the western side of the Cordillera, and from altitudes ranging from 8000 to 15,000 feet. *Buarremon nationi* [*Tanagridæ*] and *Leptasthenura pileata* [*Dendrocolaptidæ*] are described as new. Notes on the species are supplied by W. Nation, of Lima.

——. The Zoology of the Voyage of H.M.S. 'Challenger.' Vol. II. Part viii. Report on the Birds. London: 4to. Published by order of H.M.'s Government.

The Introduction states that the collection consisted of about 900 skins of birds, besides some specimens in salt and spirits, chiefly available for anatomical purposes, and some eggs, which, as shown by the Appendix (pp. 150–152), are referred to 50 species, principally oceanic. The volume contains 11 Reports, all of which have already appeared in P. Z. S., but the following are now reprinted with corrections and additions by P. L. Sclater, and with coloured plates: B. Philippine Islands, by the late Lord Tweeddale (pls. i.—vi.); B. Admiralty Islands (pls. vii.—xi.), B. Sandwich Islands (pls. xxi. & xxii.), B. Atlantic Islands, Kerguelen, &c. (pls. xxiii. & xxiv.), by P. L. Sclater; B. Tongatabu, Fiji Islands, New Hebrides, & Tahiti (pls. xii.—xvii.), by O. Finsch; B. Antarctic America, and on the *Steganopodes* and *Impennes*, by P. L. Sclater & O. Salvin (pls. xxv.—xxx.). The Reports on B. Moluccas and Arrou Islands, &c. (pls. xviii.—xx.), by T. Salvadori; B. Cape York, Australia, &c., by W. A. Forbes; On the *Laridæ*, by H. Saunders, and On the *Procellariidæ*, by O. Salvin, are reprinted unamended. For special plates see *Muscicapidæ*, *Meliphagidæ*, *Columbæ*, *Megapodidæ*, *Falconidæ*, *Anatidæ*, *Turdidæ*, *Fringillidæ*. In this Government reprint, some inexcusable printer's errors occur which are not in the originals in P. Z. S.

——. A Monograph of the Jacamars and Puff-birds, or Families *Galbulidæ* and *Bucconidæ*. Parts v. & vi. [*Cf.* Zool. Rec. xvii. *Aves*, p. 22.]

For species figured see *Bucconidæ*.

See also *Conurus egregius*, sp. n., *Trichoglossus rubrigularis*, sp. n., *Chrysotis* [*Psittaci*]; *Hylophilus* [*Vireonidæ*]; *Erythrura regia* and *E. serena*, *Poospiza erythrophrys*, spp. nn. [*Fringillidæ*]; *Synallaxis whitii*, sp. n. [*Dendrocolaptidæ*]; *Nonnula brunnea*, sp. n., *Micromonacha*, g. n., *Hapaloptila*, g. n., *Nonnula cinereacea*, sp. n. [*Bucconidæ*]? *Mergus australis* [*Anatidæ*], *Opisthocomus cristatus* [*Opisthocomidæ*], *Ortygocichla rubiginosa*, g. & sp. n. [*Timeliidæ*].

[Sclater, P. L.] & Hartlaub, G. On the Birds collected in Socotra by Prof. I. B. Balfour. P. Z. S. 1881, pp. 165–175, pls. xv.–xvii.

This collection was made between Feb. 11th and March 30th, 1880, and consisted of 126 skins, referable to 36 species. Seven *Passeres* are described as new, viz., *Cisticola incana*, *Drymœca hasitata* [*Timeliidæ*], *Lanius uncinatus* [*Laniidæ*], *Cinnyris balfouri* [*Nectariniidæ*], *Passer insularis*, *Rhynchostruthus* (g. n.) *socotranus* [*Fringillidæ*], *Amydrus frater* [*Sturnidæ*], and several are figured. The avifauna is similar to that of North-eastern Africa, but sufficient time appears to have elapsed since the separation of the island from Cape Guardafui to allow of some of the species becoming differentiated.

—— & Salvin, O. See *Todirostrum signatum*, sp. n, *Euscarthmus pelzelni*, sp. n., *Tyranneutes brachyurus*, g. & sp. n., *Myiarchus apicalis*, sp. n. [*Tyrannidæ*]; *Myrmotherula gutteralis*, sp. n., *Terenura spodioptila*, sp. n. [*Formicariidæ*]; *Pelecanidæ*, *Spheniscidæ* (plates).

Scott, W. E. D. On Birds observed in Sumpter, Levy, and Hillsboro' Counties, Florida. Bull. Nutt. Orn. Club, vi. pp. 14–21.

——. Some Observations on the Migration of Birds. *Tom. cit.* pp. 97–100; also in Nature, xxiv. p. 274.

Attention having been drawn, accidentally in the first instance, to the flights of migrants passing between the disc of the full moon and the telescope at the Princeton Observatory, it would appear that the elevation attained is from 1 to 2 miles; with other interesting facts.

Scully, John. A Contribution to the Ornithology of Gilgit. Ibis, 1881, pp. 415 & 567 *et seqq.*

A very interesting series of notes supplementary to those of J. Biddulph (*supra*, p. 3). *Syrnium biddulphi*, sp. n. [*Striges*], is described and figured, and the specific distinctness of *Otocorys pencillata* and *O. longirostris* is asserted and illustrated. The total number of species observed was 249.

——. See also Biddulph, J.

Sedgwick, A. On the Early Development of the Anterior Part of the Wolffian Duct and Body in the Chick, together with some remarks on the Excretory System of the Vertebrata. Q. J. Micr. Sci. 1881, pp. 432–468.

Seebohm, H Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum. *Cichlomorphæ*: Part ii., containing the family *Turdidæ* (Warblers and Thrushes). [Vol. v. of series; *cf.* Zool. Rec. xvi. *Aves*, p. 32.]

In this highly conscientious work, the author expresses his opinion that the pattern of the colour in the subfamily *Turdinæ* is a character more trustworthy, as showing community of origin, than such structural differences as the shape of the wings, tail, or bill. He proceeds to explain his mode of treating "conspecies," or forms between which the difference is only sub-specific. The family *Turdidæ* is divided into two sub-families, *Sylviinæ*, with 104 species, and *Turdinæ*, with 237 species. In the

former, the following 7 genera are admitted and characterized :—*Sylvia*, *Phylloscopus*, *Hypolais*, *Acrocephalus*, *Lusciniola*, *Cettia* ; in the latter, *Geocichla*, *Turdus*, *Merula*, *Mimocichla*, *Catharus*, *Erithacus*, *Monticola*, *Sialia*, *Ruticilla*, *Myrmecocichla*, and *Saxicola*. *Ruticilla moussieri* is considered to be "undoubtedly a *Pratincola*," and as R. B. Sharpe has treated the species which he considered as belonging to *Pratincola* in vol. iv. under the *Muscicapidæ*, this bird is omitted altogether. For species described as new, renamed, and figured, see *Turdidæ* and *Sylviidæ*.

[Seebohm, H.] See also *Scolecophagus ferrugineus* [*Icteridæ*], *Lanius major* [*Laniidæ*].

Seeley, H. G. Professor Carl Vogt on the *Archæopteryx*. Geol. Mag. 1881, pp. 300–309.

A review of the paper already recorded. [*Cf.* Zool. Rec. xvi. *Aves*, p. 35, and xvii. p. 28].

——. On some Differences between the London and Berlin Specimens referred to *Archæopteryx*. Tom. cit. p. 454, with plate of the Berlin example.

Sharpe, R. B. Account of the Zoological Collections made during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. Birds. P. Z. S. 1881, pp. 6–18.

This collection, carefully prepared and labelled by Dr. Coppinger, was principally obtained from the rainy districts on the west coast of Patagonia, and thence up to Coquimbo in Chili. It consists of 80 species [misprinted 81].

——. On the Birds of Sandakan, North-east Borneo. *Tom. cit.* pp. 790–800.

Three large collections sent by W. B. Pryer consist of 134 species, several of which had not hitherto been recorded from Borneo, and one, *Dicæum pryeri* [*Dicæidæ*], is described as new.

——. Appendix ii. (Ornithology) to F. Oates's (*suprà*, p. 20) Matabele Land and the Victoria Falls, pp. 294–328, pls. A, B.

This important and carefully made collection from the previously almost unknown district between Tati and the Zambesi seems to show that the birds have their nearest affinities with those of South-western Africa. The species recorded are 213 in number, *Bradyornis oatesi* (*Laniidæ*) being described as new and figured, with *Saxicola shelleyi* (*Turdidæ*).

——. Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum. *Cichlomorphæ* : Part iii., containing the first portion of the *Timeliidæ* (Babbling Thrushes). Vol. vi. of series. [*Cf.* Seebohm, H., *suprà*, p. 26.]

This portion treats of 5 sub-families, viz., *Brachypodiinæ*, with 27 genera ; *Troglodytinæ*, with 18 genera, one of which is *Cinclus* ; *Mimina*, or American Mocking Thrushes, 12 genera ; *Myiadectinæ*, 3 genera ; and *Ptilorhynchinæ*, or Bower-birds, 6 genera. *Pinarocichla*, *Chlorocichla* [*Pycnonotidæ*], *Urocichla* [*Troglodytidæ*], are proposed as new generic

names, and several species and subspecies are described as new, or are renamed, for which see *Æthorrhynchus*, *Criniger*, *Xenocichla*, *Pycnonotus*, *Tylas* [*Pycnonotidæ*]; *Cinnicerthia*, *Campylorrhynchus*, *Thryothorus*, *Troglodytes*, *Cyphorrhinus*, *Pnoepyga* [*Troglodytidæ*]; *Mimus* [*Turdidæ*]. Numerous coloured illustrations are given, with important woodcuts showing generic characters, in text. In consequence of a criticism by the late Marquis of Tweeddale [*cf.* Zool. Rec. xv. *Aves*, p. 32], the genus *Irena*, Horsfd., which had previously been placed by the author (Pt. iii.) amongst the *Dicruridæ* in the group *Coliomorphæ*, is now included (pp. 174–179) amongst the *Brachypodiidæ*.

[Sharpe, R. B.] A Guide to the Gould Collection of Humming Birds in the British Museum. London: 1881, 8vo, pp. 22, with Map showing geographical distribution. For author's name, see p. 8.

——. See also J. Gould; and *Laniarius* [*Laniidæ*], *Cinclosoma* [*Timeliidæ*], *Podilymbus* [*Podicipidæ*]; *Neomixis striatigula*, g. & sp. n., *Oxylabes cinereiceps*, sp. n.; *Schœnicola* [*Timeliidæ*]; *Gallinago cœlestis* var. *sabinii* [*Scolopacidæ*], *Malurus cyanochlamys*, sp. n., *Rhipidura macgillivrayi*, sp. n., *Rhipidura preissi*, *Siphia obscura*, sp. n. [*Muscicapidæ*].

Shelley, G. E. List of Birds recently collected by Dr. Kirk in Eastern Africa. P. Z. S. 1881, pp. 561–602, pl. lii.

In this important paper seven collections are noticed: one from Lamo in 2° S. lat.: one from Melinda, in 3° S. lat.: three from the Usambara country: one from Ugogo: and one from Dar-es-Salaam, containing altogether 192 species. *Urobrachya zanzibarica* [*Ploceidæ*], and *Coccystes albo-notatus* [*Cuculidæ*] are described as new; several rectifications in synonymy are made, and *Phyllostrephus sharpii*, Shelley [*Timeliidæ*] is cancelled. *Sigmodus scopifrons* [*Laniidæ*], is figured.

——. See also *Parus albiceatris* [*Paridæ*], *Cosmopsarus unicolor* [*Sturnidæ*], *Schizorrhis leopoldi*, *Gallirex chlorochlamys* [*Musophagidæ*], spp. nn.

Shufeldt, R. W. Osteology of *Speotyto cunicularia* var. *hypogæa* [*Striges*]. Bull. U. S. Geol. Surv. vi. pp. 87–117, pls. i.–iii.

The plates illustrating this valuable memoir have already been noticed [Zool. Rec. xvii. *Aves*, p. 42], and the detailed description of the osteology of this somewhat specialized type is now given.

——. Osteology of *Eremophila alpestris* [*Alaudidæ*]. Tom. cit. pp. 119–147, pl. iv.

——. Osteology of the North American *Tetraonidæ*. Tom. cit. pp. 309–350, pls. v.–xiii.

The osteological features of the six genera found in North America, *Tetrao*, *Centrocercus*, *Pediœcetes*, *Cupidonia*, *Bonasa*, and *Lagopus*, are discussed at length, and illustrated by plates (especially *Centrocercus*). Considered merely from the osteological point of view, there appears to be no good reason why *Pediœcetes* and *Cupidonia* should not be thrown into the same genus.

[Shufeldt, R. W.] Osteology of *Lanius ludovicianus excubitorides*. Tom. cit. pp. 351–359, pl. xiv.

This is practically an essay on the osteology of the typical *Laniidæ*.

——. On the Ossicle of the Antibrachium as found in some of the North American *Falconidæ*. Bull. Nutt. Orn. Club, vi. pp. 197–203.

The author states that the very existence of this bone appears to have been overlooked by Owen, Morse, Huxley, and, naturally, by minor naturalists; so far, it has only been discovered in the *Falconidæ*, but not in the American *Strigidæ*.

——. Notes on a few of the Diseases and Injuries in Birds. Am. Nat. 1881, pp. 283–285.

——. The Claw on the Index Digit of the *Cathartidæ*. Tom. cit. pp. 906–908.

The author considers that his discovery of a claw at the end of the first finger of *Catharista atrata* is novel, and that it is an important distinction between the Old and New World Vultures. [Nitzsch appears to have known of this claw, and of its existence in the vultures of both hemispheres.]

Sim, G. Occurrence of Rare Birds. Scot. Nat. vi. p. 13.

Numenius borealis, *Ibis falcinellus*, *Upupa epops*, and *Sylvia curruca* are recorded; the last rare so far north as Aberdeen.

Slater, H. H. The Island of Rodriguez and its Fauna. Yorksh. Nat. vii.

For remarks on its 24 species of existing Birds, see pp. 4 & 5: for the extinct ones, see pp. 5, 6, 25 & 26.

Smith, Cecil. Remarks on the Breeding of certain Waterfowl in Confinement. Zool. 1881, pp. 446–451.

These observations show that owing to the freedom with which *Chenalopex ægyptica* and other species breed, the unpinioned young escape, even in some numbers, and are then supposed to be migrants to this country.

Stearns, W. A., & Coues, E. New England Bird Life, being a Manual of New-England Ornithology. Part i. *Oscines*. Boston: 1881, 8vo.

Steineger, L. Zweiter Beitrag zur Ornithologie Madagascar's. N. Mag. Naturvid. xxvi. pp. 1–11.

See also *Lanius major* [*Laniidæ*].

Sundman, G. Finska Fogelägg. Med Text af J. A. Palmen [*cf.* Zool. Rec. xvi. *Aves*, p. 34]. Pts. iii.–iv. Helsingfors: 1881, folio.

Taczanowski, L. Bericht über die Ornithologische Fauna der Insel Askold. J. f. O. 1881, pp. 177–188.

A list, with the notes of collector M. Jankowski, on 41 species not recorded from the Island of Askold by H. Bolau. [*Cf.* Zool. Rec. xvii. *Aves*, p. 4.]

—— & Stolzmann, J. See *Loddigesia mirabilis Trochilidæ*].

TALSKY, JOSEF. Ornithologische Notizen aus Mähren. MT. orn. Ver. Wien, 1881, pp. 53, 73.

TEGETMEIER, W. B. Pheasants: their Natural History and Practical Management. 2nd Ed. greatly enlarged. London: 1881, 8vo.

——. On the Convolution of the Trachea in Birds. [Issued with *Gruidæ*, but some separate copies were distributed.]

——. See also *Gruidæ*.

TRISTRAM, H. B. Letter, stating that on the rarely visited Island of St. Ambrose in the South Pacific, no land birds were observed during a recent visit. Ibis, 1881, p. 1881, p. 177.

——. Note on a Collection of Birds from the Marquesas Islands. Ibis, 1881, pp. 249–252.

On 14 species sent home in spirits; only 4 of them being land-birds.

——. See also LAYARD, E. L. & E. L. C.; and *Plotus* [*Pelecanidæ*], *Carpophaga salvadorii*, sp. n. [*Columbæ*].

TSCHUSI ZU SCHMIDHOFFEN, V. v. Ornithologische Mittheilungen aus Oesterreich-Ungarn, 1880. J. f. O. 1881, pp. 209–212.

——. Aufzeichnungen über den Vogelzug im Jahre 1880. MT. orn. Ver. Wien, 1881, pp. 75–79.

TWEEDDALE, (the late) MARQUIS OF. See RAMSAY, R. G. W.; SCLATER, P. L.; and for plates, *Psittaci*, *Podargidæ*, *Bucerotidæ*, *Dicruridæ*, *Dicæidæ*, *Nectariniidæ*, *Columbæ*.

USSHER, R. J. See *Bubo virginianus* [*Striges*].

WAELCHILI, G. Mikrospektralanalytische Untersuchungen der gefärbten Kugeln in der Vogelretina. Onderz. phys. Lab. Utrecht (3) vi. pp. 297–314, with 1 pl.

WARREN, R. Ornithological Notes from Mayo and Sligo. Zool. 1881, pp. 131–137, 254–256.

WHARTON, H. T. On the proper Generic Designation of the European Woodpeckers. Ibis, 1881, pp. 253–258. [The writer says that "it seems clear that Linnæus took *P. martius* to be the bird most typically a *Picus*."]

CARINATÆ.

PASSERES.

TURDIDÆ.

See SEEBOHM, H.

Catharus birchalli, subsp. n., between *C. melpomene* and *C. aurantiirostris*; H. Seebohm, Cat. B. Brit. Mus. v. p. 289, Oronoco Valley.

Cassypha bocagii and *C. barbata* figured; J. V. B. du Bocage, Orn. Angola, ii. pl. ii.

Cyanecula: on the species comprised in this genus; A. Müller, Orn. Centralbl. 1881. pp. 89–92. Remarks on above; E. A. Göldlin, *tom. cit.* pp. 122–124. Reply; A. Müller, *tom. cit.* pp. 155–157. *Cyanecula*

wolfi obtained in the Firth of Forth; J. A. Harvie Brown, Zool. 1881, pp. 451–455. In Novaya Zemlya; H. W. Feilden, in Markham's "Polar Reconnaissance," p. 333.

Erithacus sibilans figured; H. Seebohm, Cat. B. Brit. Mus. v. pl. xvii.

Geocichla papuensis, sp. n., H. Seebohm, Cat. B. Brit. Mus. v. p. 158, figured pl. ix., S.E. New Guinea. *Geocichla dixoni*, sp. n., near *G. mollissima*; id. *tom. cit.* p. 161, Nepal and Himalayas generally. *Geocichla horsfieldi* (pl. x.), *G. piaggii* (pl. xi.), *G. princii* (pl. xii.), *id. tom. cit.*

Merula maxima, sp. or subsp. n.; H. Seebohm, Cat. B. Brit. Mus. v. p. 405, the large blackbird found at great elevations in Turkistan and Cashmere. *Merula bourdilloni*, sp. n., *id. tom. cit.* p. 251, figured pl. xv., Travancore. *Merula ulietensis* figured, *id. tom. cit.* pl. xvi.

Mimocichla bryanti, n. n. for *Turdus plumbeus*, Linn. 1758, *nec* L. 1766. H. Seebohm, Cat. B. Brit. Mus. v. p. 280, Bahamas.

Mimus elegans, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. vi. p. 339, Bahamas group.

Nesocichla eremita figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xxiii.

Oreocincla varia obtained near Ashburton, Devon, and exhibited; E. W. H. Holdsworth, P. Z. S., 1881, p. 260; also Zool. 1881, p. 108. Obtained in the Stavanger Amt, Norway, 10th Oct. 1879; R. Collett, Förh. Selsk. Chr. 1881, No. 10 [sep. copy]. *O. varia*, distinguished from *O. horsfieldi*, and the synonymy of the genus as set forth by Vian, Sharpe, Dresser, is rectified [?]: A. Dubois, Bull. Soc. Zool. Fr. 1881, pp. 142–150.

Saxicola lugentoides, sp. n., H. Seebohm, Cat. B. Brit. Mus. v. p. 372, Sennaar. *Saxicola persica*, sp. n., *id. tom. cit.* p. 372, Shiraz, *Saxicola sennaarensis*, sp. n., *id. tom. cit.* p. 391, Sennaar. *S. layardi* figured, *id. tom. cit.* pl. xviii. *S. deserti* obtained on 26th Nov. 1880, near Clackmannanshire; J. J. Dalgleish, P. R. Phys. Soc. Edinb. vi. p. 64; this specimen exhibited; H. E. Dresser, P. Z. S. 1881, p. 453. [The species has already been obtained on two occasions in Heligoland.] *S. shelleyi*, figured; R. B. Sharpe, Appendix II., F. Oates's Matabele Land, pl. A. Ramaquaban River, Zambesi district. [*Cf.* Zool. Rec. xiv. *Aves*, p. 45.] Along with *S. arnotti* and allied species it is a member of the *Timeliidæ*; H. Seebohm, Cat. B. Brit. Mus. v. p. 406. [It must remain here for the present, until some responsible person gives it another generic name.]

Turdus tropicalis, sp. n., distinguished from *T. libonyanus*, Smith; W. Peters, J. f. O. 1881, p. 50, Inhambane, Africa. *Turdus chiguancoides*, sp. n., near *T. pelios*; H. Seebohm, Cat. B. Brit. Mus. v. p. 231, Gambia. *Turdus phæopygoides*, subsp. n., *id. tom. cit.* p. 404, Island of Tobago [Not in index or table of contents]. *T. falklandicus* (pl. xiii.), *T. magellanicus* (pl. xiv.); figured *id. tom. cit.*

Sylviidæ.

See Seebohm, H.

Cettia ussuriana, sp. n., H. Seebohm, Cat. B. Brit. Mus. v. p. 143, valley of the Ussuri, Eastern Siberia. *C. major* (pl. vii.) and *C. brunneifrons* (pl. viii.) figured; *id. tom. cit.*

Dumeticola brunneipectus, Blyth, = *D. affinis*, and *D.* [*Tribura*] *intermedia*, Oates, = *T. taczanowskia*, Swinhoe; W. E. Brooks, Str. Feath. ix. p. 445.

Eremomela hypoxantha, sp. n., A. v. Pelzeln, Verh. z.-b. Wien, xxxi. p. 145, Kiri, Central Africa; only ♀ described.

Locustella fasciolata figured; H. Seebohm, Cat. B. Brit. Mus. v. pl. v.

Lusciniola thoracica figured; *id. tom. cit.* pl. vi.

Myiadestes montanus, sp. n., C. B. Cory, Bull. Nutt. Orn. Club, vi. p. 130, Haiti.

Polioptila californica, sp. n. (p. 103), California, with remarks on and rectifications of the synonymy of other species of the genus; W. Brewster, Bull. Nutt. Orn. Club, vi. pp. 101–107.

Phylloscopus humii (fig. 1) and *P. subviridis* (fig. 2) figured; H. Seebohm, Cat. B. Brit. Mus. v. pl. iv.

Sylvia minuscula (pl. i.), *S. blanfordi* (pl. ii.), *S. deserticola* (pl. iii.), figured; H. Seebohm, Cat. B. Brit. Mus. v.

Thamnobia munda figured; J. Cabanis, J. f. O. 1881, pl. iv. fig. 3.

Timeliidæ.

Cinclosoma erythrothorax is the amended name for *C. castaneothorax*, Gould; R. B. Sharpe, Ibis, 1881, p. 605. [Change unnecessary, κάστανον being Greek.] *Cinclosoma ajax* figured; J. Gould, B. New Guinea, pl. xii.

Cisticola marginalis, sp. n., G. Hartlaub, Orn. Centralbl. 1881, p. 12, Ladó, Equatorial Africa. *Cisticola incana*, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 166, figured pl. xv. fig. 1, Island of Socotra. *Cisticola marginalis*, sp. n., J. Cabanis & A. Reichenow, Orn. Centralbl. 1881, p. 12, Ladó,. *Cisticola schœnicola*: on its distribution, &c., with plate showing the variation in its eggs; A. Müller, Ber. Offenbach. Ver. 1880 [received 1882], pp. 116–121.

Drymœca hæsitata, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 166, Island of Socotra.

Eupetes macrocercus: W. A. Forbes, P. Z. S. 1881, pp. 837–838, shows that this genus is certainly Passerine, and has consequently no affinities with *Mesites*, which the author would locate near *Eurypyga* and *Rhinochetus* in his group *Pluviales*.

Neomixis striatigula, g. & sp. nn., R. B. Sharpe, P. Z. S. 1881, p. 195, figured pl. xix., Fianarantsoa, Madagascar.

Ortygocichla rubiginosa, g. & sp. nn.; P. L. Sclater, P. Z. S. 1881, p. 452, figured with egg, pl. xxxix., New Britain.

Oxylabes cinereiceps, sp. n., R. B. Sharpe, P. Z. S. 1881, p. 197, Fianarantsoa, Madagascar.

Phyllolais, g. n., type *Prinia pulchella*, Rüpp.; G. Hartlaub, Abh. Ver. Brem. vii. p. 90.

Phyllostrephus sharpii, Shelley [*cf.* Zool. Rec. xvii. *Aves*, p. 31] is identical with and sinks to a synonym of the previously described *Criniger strepitans*, Reichenow; G. E. Shelley, P. Z. S. 1881, p. 575.

Pycnoptilus floccosus, Gould; E. P. Ramsay, P. Z. S. 1881, p. 839, states that its habitat is in the Coast ranges near Sydney, N. S. Wales.

Schœnicola : note on this genus and on *Catriscus*; R. B. Sharpe, P. Z. S. 1881, pp. 919–921.

Timeliidæ from Madagascar, with description of a new genus and species, *Neomixis striatigula*; also *Oxylabes cinereiceps*, sp. n., and a rearrangement of the genus *Bernieria* and its allies; R. B. Sharpe, P. Z. S., 1881, pp. 195–197, pl. xix.

Paridæ.

Parus albiventris, sp. n., G. E. Shelley, Ibis, 1881, p. 116, Ugogo.

Parus rufiventris figured; J. V. B. du Bocage, Orn. Angola, ii. pl. x. fig. 1.

Psaltrites helviventris, g. & sp. nn., J. Cabanis, J. f. O. 1881, p. 333, Tehuantepec ?, figured pl. iv. fig. 1.

Troglodytidæ.

Anorthura fumigata (fig. 1), *A. pacifica* (fig. 2) figured; R. B. Sharpe, Cat. B. Brit. Mus. vi. pl. xvi.

Campylorrhynchus couesi, new name for *C. brunneicapillus*, Coues, *nec* Lafr.; R. B. Sharpe, Cat. B. Brit. Mus. vi. p. 196, Southern United States and N. Mexico. *C. pardus* (fig. 1), *C. gularis* (fig. 2) figured, *id. tom. cit.*, pl. xii.

Cinnicerthia olivascens, sp. n., *id. tom. cit.* p. 184, figured pl. xi., Colombia.

Cistothorus brunneiceps, sp. n., O. Salvin, Ibis, 1881, p. 129, figured pl. iii. fig. 1, Sical, Ecuador.

Cyphorinus salvini, sp. n. (p. 292, figured pl. xviii. fig. 1), Ecuador; *C. brunnescens*, sp. n. (p. 293), Cauca valley; *C. modulator* figured (pl. xviii. fig. 2): R. B. Sharpe, Cat. B. Brit. Mus. vi.

Microcerculus tæniatus, sp. n., O. Salvin, Ibis, 1881, p. 130, figured pl. iii. fig. 2, Balzar, eastern Ecuador.

Pnoepyga rufa, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. vi. p. 304, mountains of Java.

Sphenocichla roberti = *S. humii*, ♀; *id. tom. cit.* p. 283.

Thryophilus costaricensis, sp. n., distinguished from *T. castaneus* of Panama; *id. tom. cit.* p. 217, Costa Rica.

Thryothorus melanogaster, sp. n. (figured pl. xiv. fig. 2), distinguished from *T. fasciativentris*, Lafr. (figured pl. xiv. fig. 2); *id. tom. cit.* p. 230, Veragua and Costa Rica. *Thryothorus amazonicus*, sp. n. (p. 235, figured pl. xv. fig. 1, Sarayacu, Peru); *T. griseipectus*, sp. n. (p. 236, figured pl. xv. fig. 2, Upper Amazons); *T. paucimaculatus*, sp. n. (p. 238, Balzar Mountains, Ecuador, *id. tom. cit.*; *T. bairdi* figured; *id. tom. cit.* pl. xiii.

Troglodytes frater, subsp. n. of *T. solstitialis* (p. 261, Bolivia); *T. rufociliatus*, subsp. n. of *T. brunneicollis* (p. 262, Guatemala), *id. tom. cit.*

Uvocichla, g. n. Type *Pnoepyga longicaudata*, Moore; *id. tom. cit.* pp. 181 (Key) & 263.

Uropsila leucogastra figured; *id. tom. cit.* pl. xvii.

Sittidæ.

Hypositta: new generic name to replace *Hypherpes*, which proves to have been pre-occupied in Entomology; A. Newton, P. Z. S. 1881, p. 438.

Certhiidæ.

Hylypsornis salvadorii figured; J. V. B. du Bocage, Orn. Angola, ii. pl. x. fig. 2.

Mniotiltidæ.

Basileuterus auricapillus (Swains.) is the proper name for *B. vermivorus* (Vieill.) auctt. plur.; H. v. Berlepsch, Ibis, 1881, p. 240. *B. melanogenys* figured; O. Salvin & F. D. Godman, Biol. Centr. Amer. *Aves*, pl. x. fig. 3.

Dendroica decora figured; *iid. op. cit.* pl. x. fig. 1.

Ergaticus versicolor figured; *iid. op. cit.* pl. xi. fig. 1.

Geothlypis chiriquensis (fig. 1), *G. caninucha* (fig. 2), *G. poliocephala* (fig. 3) figured; *iid. op. cit.* pl. ix.

Helminthophaga leuco-bronchialis and *H. lawrencii*: on their relationship; W. Brewster, Bull. Nutt. Orn. Club, vi. pp. 218–225. [The characters of these supposed species are shown to be inconstant, and are doubtless due to interbreeding with *H. pinus* and other allies.]

Setophaga torquata (pl. x. fig. 2), *S. lacrymosa* (pl. xi. fig. 2) figured; O. Salvin & F. D. Godman, Biol. Centr. Amer. *Aves*.

Vireonidæ.

Hylophilus: on the genus; P. L. Sclater, Ibis, 1881, pp. 293–311, with history, synopsis of the 19 species recognized by the author, geographical distribution, &c. *Hylophilus luteifrons*, sp. n., *id. l. c.* p. 308, British Guiana; *H. muscicapinus* (fig. 1), and *H. fuscicapillus* (fig. 2), figured, *l. c.* pl. x.; *H. brunneiceps* (fig. 1), and *H. furrugineifrons* (fig. 2), figured, *l. c.* pl. xi.

Vireo amauronotus, sp. n., from Orizaba, Mexico, intermediate between *V. gilvus* and *V. josephæ*; O. Salvin & F. D. Godman, Biol. Centr. Amer. Zool. xiv. *Aves*, p. 193. *V. ochraceus* (fig. 1), *V. pallens* (fig. 2), *V. carmioli* (fig. 3), figured; *iid. tom. cit.* pl. xii.

Motacillidæ.

Anthus pallescens figured; J. V. B. du Bocage, Orn. Angola, ii. pl. viii. fig. 2.

Laniidæ.

See Shufeldt, R. W., for Anatomy.

Bradyornis oatesi, sp. n., R. B. Sharpe, Appendix ii. to F. Oates's Matabele Land, p. 314, Zambesi road, figured pl. B; Modification of "Key to species," p. 315.

Laniarius melanothorax is the amended name for *L. nigrithorax*, Sharpe; R. B. Sharpe, Ibis, 1881, p. 605.

Lanius uncinatus, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 166, with woodcut of head, Island of Socotra. *L. major*, Pall.; exhi-

bition of a specimen obtained last April near Cardiff; H. Seebohm, P. Z. S. 1881, p. 968. On its specific value; L. Stejneger, J. f. O. 1881, p. 106. *L. collurio*; observations on; C. Müller, J. f. O. 1881, p. 398.

Pachycephala innominata, sp. n., T. Salvadori, Orn. Papuasia e Moll. ii. p. 222, Island of Teste, Papuasia. *Pachycephala phæonota* figured; *id.* Voy. 'Challenger,' pl. xviii.

Pachycephalopsis, g. n., type *Pachycephala hattamensis*, Meyer; T. Salvadori, Ann. Mus. Genov. xv. p. 48. [Omitted from Zool. Rec. xvii.]

Rectes uropygialis and *R. jobiensis* figured; J. Gould, B. New Guinea, pt. xii.

Sigmodus scopifrons figured; G. E. Shelley, P. Z. S. 1881, pl. li. fig. 1.

Campophagidæ.

Edoliosoma alterum, sp. n., R. G. W. Ramsay, Ibis, 1881, p. 34, Island of Zebu.

Graucalus elegans, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 176, Guadalcanar, Solomon Islands. *Graucalus sumbensis*, sp. n., A. B. Meyer, Verh. z.-b. Wien, xxxi. p. 765, Sumba Island. *Graucalus pollens* figured; T. Salvadori, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xix.

Muscicapidæ.

Chloromyias laglaizii, Oust. [*cf.* Zool. Rec. xvii. *Aves*, p. 33] = *Oreocharis arfaki* (Meyer); T. Salvadori, Ann. Mus. Genov. xvi. p. 70.

Malurus cyanochlamys, sp. n., R. B. Sharpe, P. Z. S. 1881, p. 788, Moreton Bay, Australia.

Monarcha infelix figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. vii.

Piezorrhynchus richardsi, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 177, Ugi, Solomon Islands. *P. melanocephalus*, Rams. [*cf.* Zool. Rec. xvii. *Aves*, p. 33] = young of *P. vidua*, Tristram; *id.* 'Nature,' xxiv. p. 239.

Rhipidura macgillivrayi, sp. n., R. B. Sharpe, P. Z. S. 1881, p. 789, figured pl. lxvii., Lord Howe's Island. *R. semirubra* figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. vii. *R. squamata* figured; T. Salvadori, *tom. cit.* pl. xviii. *R. preissi*, Cab.: remarks on a recently examined specimen of this rare West Australian species, with modification of previous arrangement and characters of the group in Cat. B. Brit. Mus.; R. B. Sharpe, P. Z. S. 1881, pp. 387 & 388.

Siphia obscura, sp. n., *id. tom. cit.* p. 789, Borneo.

Pycnonotidæ.

Ægithina viridis (Bp.) is the Indo-Malayan form of *Æ. tiphia* (L.), and *Æ. scapularis*, with both sexes alike, is confined to Java. R. B. Sharpe, Cat. B. Brit. Mus. vi. pp. 11–13.

Æthorrhynchus xanthotis, sp. n., described from ♀, the ♂ being as yet unknown; *id. tom. cit.* p. 15, Cambodia.

Andropadus gracilis figured; J. Cabanis, J. f. O. 1881, pl. iv. fig. 2. *A. flavistriata* is a *Xenocichla*; R. B. Sharpe, Cat. B. Brit. Mus. vi. p. 100.

Chlorocichla, g. n., type *Trichophorus flaviventris*, Smith; R. B. Sharpe, Cat. B. Brit. Mus. vi. pp. 3 & 112, with woodcut in text. *Chlorocichla occidentalis*, sp. n., *id. tom. cit.* p. 113, figured pl. viii., Angola and Damara Land.

Chloropsis viridis (Horsf.) is the Java bird, replaced by *C. zosterops* (Vig.) in the rest of Malaisia, *id. tom. cit.* pp. 23 & 24. *C. viridinucha* [Zool. Rec. xiv. *Aves*, p. 42], figured, *id. tom. cit.* pl. i.

Criniger cabanisi, n. n. for *Trichophorus flaveolus*, Cabanis (*nec* Gould); *id. tom. cit.* p. 83. *C. verreauxi* (pl. iv.), *C. frater* (pl. v.), *C. finschi* (pl. vi. fig. 1), *C. palawanensis* (pl. v. fig. 2), figured; *id.* tom. cit. *C. everetti* is referred to the genus *Iole*; id. *tom. cit.* p. 57. *C. fischeri* is a *Phyllostrophus*; id. *tom. cit.* p. 118.

Hemixus cinereus figured; *id. tom. cit.* pl. ii.

Iole rufigularis figured; *id. tom. cit.* pl. iii.

Ixocincla, Blyth, is distinct from *Hypsipetes*, Vig.; *id. tom. cit.* p. 44.

Micropus, Swains., supersedes *Microtarsus*, Eyton, and *Brachypodius*, Blyth; *id. tom. cit.* p. 64.

Pinarocichla, g. n., type *Brachypus euptilosus*, Jard. & Selb., *id. tom. cit.* pp. 2 & 61, with woodcut in text.

Pycnonotus burmanicus, sp. n., *id. tom. cit.* p. 125, Burma, from Cachar to Pegu. *Pycnonotus gabonensis*, "is, in fact, only a darker race of *P. barbatus*"; id. *tom. cit.* p. 148. *Pycnonotus salvadorii*, n. n. for *P. pusillus*, Salvad., preoccupied; *id. tom. cit.* pp. 155 & 401, figured (as *P. pusillus*) pl. x. *P. simplex* figured; *id. tom. cit.* pl. ix.

Trichophorus flavigula figured; J. Cabanis, J. f. O. 1881, pl. iii. fig. 1.

Tylas alfredi and *T. fulviventris*, spp. nn., R. B. Sharpe, Cat. B. Brit. Mus. vi. p. 165, south-west Madagascar.

Xenocichla albigularis, sp. n., *id. tom. cit.* vi. p. 103, figured pl. vii. fig. 1 Fantee. *X. olivacea* figured; *id. tom. cit.* pl. vii.

Xenocichla, Cass., is distinct from *Criniger*; id. *tom. cit.* p. 94.

Oriolidæ.

Analcipus consanguineus, sp. n., Sumatra, distinguished from *A. cruentus*; R. G. W. Ramsay, Ibis, 1881, pp. 32–34, and both species figured, pl. i.

Oriolus affinis, Gould, affirmed to be a good species; E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 576.

Dicruridæ.

Dicrurus striatus figured; Lord Tweeddale (late), Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. iv.

Hirundinidæ.

Hirundo rustica: on occurrences in England during November and December, 1880; J. E. Harting, Zool. 1881, p. 62.

Nectariniidæ.

Cinnyris balfouri, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 169, figured pl. xv. fig. 2, Island of Socotra.

Nectarinia olivacina, sp. n., distinguished from *N. olivacea*; W. Peters, J. f. O. 1881, p. 50, Inhambane, Africa.

Nectarophila juliæ ♂ ♀ figured; Lord Tweeddale (late), Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. v.

Meliphagidæ.

Meliarchus, g. n., near *Melirrhop-he-tes*; type *Philemon sclateri*; T. Salvadori, Ann. Mus. Genov. xvi. p. 75.

Myzomela tristrami (p. 178, Solomon Islands) & *M. pulcherrima* (p. 179, Ugi, Solomon Islands), spp. nn., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. *Myzomela erythromelas*, sp. n., T. Salvadori, Atti Ac. Tor. xvi. p. 624. New Britain. *Myzomela sclateri* & *M. cineracea* figured; J. Gould, B. New Guinea, pt. xii. *M. pammelæna* figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. vii.

Philemonopsis, g. n., type *Philemon meyeri*, Salvad.; T. Salvadori, Ann. Mus. Genov. xvi. p. 79.

Ptilotis flavirictus (p. 76, Fly river) and *P. montana* (p. 77, Mt. Arfak), spp. nn., *id. tom. cit.*, New Guinea. *Ptilotis carunculata* (pl. xii. fig. 1), *P. procerior* (pl. xii. fig. 2), *P. provocator* (pl. xiii. figs. 1, 2), figured, *id.* Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xii.

Pycnopygius, g. n., type *P. stictocephalus* (Salvad.); T. Salvadori, Ann. Mus. Genov. xvi. p. 78.

Zosterops hypoxantha, sp. n., *id.* Atti Ac. Tor. xvi. p. 623, New Britain. *Zosterops brunneicauda*, n. n. for *Z. rufifrons*, Salvad.; *id.* Ann. Mus. Genov. xvi. p. 82. *Z. flaviceps* and *Z. explorator* figured, O. Finsch, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xiv. *Z. kittlitzi*, n. n. for *Z. cinereus*, Kittl.; *id.* J. f. O. 1880, p. 300. [Omitted from Zool. Rec. xvii.]

Dicæidæ.

Dicæum layardorum, sp. n., T. Salvadori, Ann. Mus. Genov. xvi. p. 67, Orn. Pap. & Moll. ii. p. 272, New Britain. *Dicæum pryeri*, sp. n., R. B. Sharpe, P. Z. S. 1881, p. 795, Sandakan, North-east Borneo. *Dicæum mindanense* figured; Lord Tweeddale (late), Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. v.

Tephras olivaceus, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 180, Solomon Islands.

Urocharis, g. n., between *Melanocharis* and *Pristorrhamphus*, type *Melanocharis longicauda*, Salv.; T. Salvadori, Ann. Mus. Genov. xvi. p. 69.

Cœrebidæ.

Chlorophanes spiza (Linn.) is the proper name for *C. atricapilla* (Vieill.) auctt. plur.; H. v. Berlepsch, Ibis, 1881, p. 242.

Dacnis cyanomelas (Gm.) is the proper name for *D. cyana* (Linn.) auctt. plur.; and *D. bicolor* (Vieill.) for *D. plumbea* (Lath.) auctt. plur.; *id. l. c.* pp. 240–242.

Tanagridæ.

Buarremon nationi, sp. n., P. L. Sclater, P. Z. S. 1881, p. 485, figured pl. xlvi., Cordillera above Lima, alt. 10,000 to 14,000 feet.

Procnias cærulea (Vieill.) is the proper name for *P. tersa* (Linn.) auctt. plur.; H. v. Berlepsch, Ibis, 1881, p. 243.

Ploceidæ.

Donacicola spectabilis and *D. nigriceps* figured; J. Gould, B. New Guinea, pt. xii.

Habropyga charmosyna, sp. n., A. Reichenow, Orn. Centralbl. 1881, p. 78, & J. f. O. 1881, p. 333, Berdera, E. Africa.

Hypargus niveiguttatus figured; G. E. Shelley, P. Z. S. 1881, pl. lii. fig. 2.

Hyphantica cardinalis, Hartl., ♂ & ♀ figured [*cf.* Zool. Rec. xvii. *Aves*, p. 35], G. Hartlaub, J. f. O. 1881, pl. i. figs. 1, 2.

Hyphantornis castanosoma, sp. n., A. Reichenow, Orn. Centralbl. 1881, p. 79, & J. f. O. 1881, p. 334, Berdera, E. Africa.

Hyphantornis dimidiata, ♀ described for the first time, A. v. Pelzeln, Verh. z.-b. Wien, xxxi. p. 148. *Hyphantornis crocata*, sp. n., G. Hartlaub, Abh. Ver. Brem. vii. p. 100, Magungo, Equatorial Africa. Made the type of .

Icteropsis, g. n., A. v. Pelzeln, Verh. z.-b. Wien, xxxi. p. 149.

Munia forbesi figured, J. Gould, B. New Guinea, pt. xii.

Sorella emini figured, and name corrected from *S. emini bey* [*cf.* Zool. Rec. xvii. *Aves*, p. 35); G. Hartlaub, J. f. O. 1881, pl. i. figs. 3, 4.

Urobrachya zanzibarica, sp. n., distinguished from *U. axillaris* (Smith); G. E. Shelley, P. Z. S. 1881, p. 586, Lamo, Melinda, Pagani, Usambara mountains in East Africa.

Fringillidæ.

Carduelis elegans albigularis [sub-sp. n.?]; J. Madarász, Term. füzetek, v. p. 88. [Not seen by the Recorder; see Zool. Anz. 1881, p. 492.]

Chrysospiza euchlora (Licht.) redescribed; G. Hartlaub, P. Z. S. 1881, p. 958.

Emberiza rustica obtained at Easington, Yorkshire (its second occurrence in Britain); W. E. Clarke, Yorksh. Nat. vii. p. 57, and Zool. 1881, p. 465; exhibited, A. Newton, P. Z. S. 1881, p. 827.

Erythrura regia (pl. xv. fig. 2) and *Erythrura serena* (pl. xv. fig. 1), spp. nn., New Hebrides; P. L. Sclater, Ibis, 1881, p. 544, and figured: with notes on the 8 species of the genus recognized as valid; *tom. cit.* pp. 545–546. *E. trichroa*: its eggs are pure white; O. Finsch, *tom. cit.* p. 112.

Loxia leucoptera: in two of the alleged occurrences of this North American species in Denmark the examples are really the Palæarctic *L. bifasciata*; J. Reinhardt, Vid. Medd. 1881, pp. 1–6.

Loxigilla portoricensis var. grandis, subsp. n.; G. N. Lawrence, Pr. U. S. Nat. Mus. iv. p. 204, Island of St. Christopher, West Indies.

Nesospiza acunhæ figured, P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xxiv.

Passer insularis, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 169, figured pl. xvi., Island of Socotra. *Passer pyrrhonotus* fully described from notes by S. Doig; A. O. Hume, Str. Feath. ix. pp. 442–445.

Phœnicophilus dominicensis, sp. n., C. B. Cory, Bull. Nutt. Orn. Club, vi. p. 129, Haiti.

Plectrophanes nivalis: on its habits and migration; J. Cordeaux, Zool. 1881, pp. 1–7, pl. i. The nest, with 3 eggs and female taken in the island of Yell, Shetland; J. T. Garriock, *tom. cit.* p. 423.

Poospiza erythrophrys, sp. n., P. L. Sclater, Ibis, 1881, p. 599, figured pl. xvii. fig. 1, Sierra de Totoral, Catamarca, Argentine Republic.

Propasser rhodometopus, sp. n., distinguished from *P. rhodochlamys*; J. Biddulph, Ibis, 1881, p. 156, ♂ & ♀ figured pl. vi., Yarkund.

Rhynchostruthus socotranus, g. & sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, pp. 170 & 171, figured pl. xvii., and woodcut of head, wing and right foot, in text, Island of Socotra. *Rhynchostruthus riebecki*, sp. n., G. Hartlaub, P. Z. S. 1881, p. 954, figured pl. lxxii., Karegnigi, Island of Socotra.

Alaudidæ.

Calandrella reboudia [*C. minor*, Cab.]: its occurrences in Europe discussed, and the species [wrongly] identified with *C. baetica*; C. d'Hammonville, Bull. Soc. Zool. Fr. 1881, pp. 16–20.

Eremophila alpestris: its osteology; R. W. Shufeldt, Bull. U. S. Geol. Surv. vi. pp. 119–147, pl. iv.

Galerita cristata obtained in Sussex; W. Borrer, Zool. 1881, p. 494.

Mirafra nigricans figured; J. V. B. du Bocage, Orn. Angola, ii. pl. viii. fig. 1.

Otocorys pencillata and *O. longirostris*: their specific distinctions pointed out, and illustrated by a woodcut; J. Scully, Ibis, 1881, pp. 580–582.

Sturnidæ.

Aplonis rufipennis, sp. n., E. L. Layard, Ibis, 1881, p. 542, Vaté, New Hebrides; but H. B. Tristram, in an appended note (p. 543) expresses his doubts as to its specific distinctness.

Amydrus frater, sp. n., P. L. Sclater & G. Hartlaub, P. Z. S. 1881, p. 171, Island of Socotra.

Calornis inornata (Mysori) and *Calornis fusco-virescens* (Sorong & Salwatti), spp. nn.; T. Salvadori, Ann. Mus. Genov. xvi. p. 194, Papuasia.

Cosmopsarus unicolor, sp. n., G. E. Shelley, Ibis, 1881, p. 116, Ugogo.

Lamprocolius acuticauda figured; J. V. B. du Bocage, Orn. Angola, ii. pl. vi.

Lamprotornis purpureus figured; *id. tom. cit.* pl. vii.

Pholidauges verreauxi figured; *id. tom. cit.* pl. v.

Icteridæ.

Agelæus imthurni, sp. n., P. L. Sclater, P. Z. S. 1881, p. 213, head figured in text, p. 214, interior of British Guiana. *Agelæus phœniceus* obtained in Hertfordshire; J. E. Littleboy, Zool. 1881, p. 64. Again, near Falmouth; J. E. Harting, Zool. 1881, p. 384.

Icterus oberi, sp. n., G. N. Lawrence, Pr. U. S. Nat. Mus. iii. p. 351, Island of Montserrat, West Indies.

Scolecophagus ferrugineus: exhibition of a specimen shot on 4th Oct. 1881 near Cardiff; H. Seebohm, P. Z. S. 1881, p. 968.

Xanthocephalus icterocephalus: notes on; H. Nehrling, J. f. O. 1881, pp. 81, 97.

Corvidæ.

Corvus corax: on its breeding in captivity; G. T. Rope, Zool. 1881, p. 421. *Corvus frugilegus*: A. Besnard, Bull. Soc. Zool. Fr. 1881, pp. 169–171, gives particulars of a nest belonging to a single pair of Rooks, and which contained 15 eggs from which 12 young were hatched; nests containing 9 and 10 eggs being frequent in the part of France of which he writes [!].

Paradiseidæ.

Ælurædus stonii figured; J. Gould, B. New Guinea, pt. xii.

Seleucides nigricans, ♂, ♀ and juv. figured; *id. tom. cit.*

Semioptera wallacii var. *halmaheræ* described; T. Salvadori, Orn. Papuasia e Moll. ii. p. 573, Island of Halmahera.

Pittidæ.

Hydrornis soror, sp. n., R. G. W. Ramsay, Ibis, 1881, p. 496: locality uncertain probably Malay Peninsula; and it may prove to be immature *H. nipalensis*.

Tyrannidæ.

Euscarthmus pelzelni, sp. n., P. L. Sclater & O. Salvin, Ibis, 1881, p. 268, Cuyaba, Brazil.

Myiarchus apicalis, sp. n., *iid. tom. cit.* p. 269, Colombia.

Tanioptera australis: notes on; H. Burmeister, Arch. f. Nat. 1881, pp. 133–135.

Tyranneutes brachyurus, g. & sp. nn., P. L. Sclater & O. Salvin, Ibis, 1881, p. 269, British Guiana.

Todirostrum signatum, sp. n., *iid. tom. cit.* p. 267, Upper Amazon.

Dendrocolaptidæ.

Furnarius: on the genus, with description of 11 recognized species; A. v. Pelzeln, Ibis, 1881, pp. 402–411.

Leptasthenura pileata, sp. n., P. L. Sclater, P. Z. S. 1881, p. 487, Western side of Cordillera above Lima, alt. 8000 feet.

Synallaxis whitii, sp. n., P. L. Sclater, Ibis, 1881, p. 600, Oran, prov. Salta [Jujuy], Argentine Republic.

Formicariidæ.

Myrmotherula gutteralis, sp. n., P. L. Sclater & O. Salvin, Ibis, 1881, p. 269, British Guiana.

Terenura spodioptila, sp. n., *iid. tom. cit.* p. 270, British Guiana; figured pl. ix. fig. 1; also *T. humeralis*, pl. ix. fig. 2.

Thamnophilus cirrhatus (Gmel.) is the proper name for *Th. atricapillus* (Gmel), auctt. plur.; H. v. Berlepsch, Ibis, 1881, p. 244.

Conopophagidæ.

Fam. n. See Forbes, W. A.

PICARIÆ.

Picidæ.

See Hargitt, E.

Centurus, Swainson: review of this genus; R. Ridgway, Pr. U. S. Nat. Mus. iv. pp. 93–119 (11 species, and 4 subspecies of *C. aurifrons*, are treated in detail).

Dendrocopus leuconotus: the specimen obtained by the late H. Saxby in Shetland, and determined as this species by the late J. Gould, proves to be *D. major*: therefore *D. leuconotus* has no claim to be considered a British bird; A. Newton, Zool. 1881, pp. 399–401.

Iyngipicus doerriesi, sp. n., distinguished from *I. scintilliceps*, E. Hargitt, Ibis, 1881, p. 398, Island of Askold, Eastern Siberia. *Iyngipicus ramsayi*, sp. n., from N.E. Borneo, distinguished from *I. temminckii* of Celebes; and *Iyngipicus fulvifasciatus* proposed as a new specific name for the bird found in Basilan and Mindanao, *id. tom. cit.* p. 598. *Iyngipicus pumilus*, sp. n., *id. tom. cit.* p. 509, Southern Tenasserim.

Picumnus lawrencii, sp. n., C. B. Cory, Bull. Nutt. Orn. Club, vi. p. 129, figured pl. i., Haiti.

Picus pubescens: exhibition of an adult ♂ shot by M. Noury at Elbœuf [misprinted Elban], Seine-Inférieure; H. E. Dresser, P. Z. S. 1881, p. 453.

Vivia chinensis, sp. n., E. Hargitt, Ibis, 1881, p. 228, figured pl. vii. May-chee, China.

Trochilidæ.

See Ridgway, R.

Amazilia yucatanensis and *A. cervinirentris*: on their differential characteristics; R. Ridgway, Pr. U. S. Nat. Mus. iv. p. 25.

Androdon æquatorialis figured; J. Gould, Supp. Trochil. pt. ii.

Anthocephala floriceps, on the first ♀, and second known specimen, obtained in the Sierra Nevada de Santa Marta; O. Salvin & F. D. Godman, Ibis, 1881, pp. 595 & 596.

Chaterocercus bombus figured; J. Gould, Supp. Troch. pt. ii.

Doricha lyrura and *D. bryantæ* figured; *id. op. cit.* pt. ii.

Eucephala pyropygia, sp. n., O. Salvin & F. D. Godman, Ibis, 1881, p. 596, figured pl. xvi., believed to come from Ecuador.

Eupherusa poliocerca figured; J. Gould, Supp. Troch. pt. ii.

Eustephanus leyboldi and *E. fernandensis* figured; *id. op. cit.* pt. ii.

Glaucis dohrni and *G. spixi* are identical; O. Salvin & F. D. Godman, Ibis, 1881, p. 595.

Helianthea dichrura figured; J. Gould, Supp. Troch. pt. ii.

Hypuroptila melanorrhoa figured; *id. op. cit.* pt. ii.

Loddigesia mirabilis: a full account of the habits of this rare and rediscovered species, by L. Taczanowski & J. Stolzmann, as observed by the latter, P. Z. S. 1881, pp. 827–834.

Panychlora russata, sp. n., O. Salvin & F. D. Godman, Ibis, 1881, p. 597, Sierra Nevada de Santa Marta.

Spathura solstitialis figured, J. Gould, Supp. Troch. pt. ii.

Cypselidæ.

Cypselus horus, H. & F.; its synonymy discussed, and the subsequently described *C. sharpii*, Bouvier, and *C. finschi*, Bocage, asserted to be identical with it; T. Salvadori, Ibis, 1881, pp. 540–542.

Caprimulgidæ.

Antrostomus vociferus arizonæ var. n.; W. Brewster, Bull. Nutt. Orn. Club, vi. p. 69, Chiracahua Mountains, Arizona.

Alcedinidæ.

Clytoceyx rex figured, J. Gould, B. New Guinea, pt. xii.

Melidora jobiensis, sp. n., T. Salvadori, Mem. Acc. Tor. (2) xxxiii. p. 502, Jobi.

Sauromarptis cyanophrys, sp. n., T. Salvadori, Atti Acc. Tor. xvi. p. 621. New Guinea.

Bucerotidæ.

Buceros mindanensis figured ; (the late) Lord Tweeddale, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. iii.

Meropidæ.

Merops cyanophrys, Cab., redescribed ; G. Hartlaub, P. Z. S. 1881, p. 957.

Podargidæ.

Ægotheles savesi, sp. n., E. L. & E. L. C. Layard, Ibis, 1881, p. 132, figured pl. iv., Tongué, New Caledonia.

Batrachostomus septimus figured; (the late) Lord Tweeddale, *l. c.* Zool. ii. pt. viii. *Aves*, pl. ii.

Trogonidæ.

Trogonidæ : W. A. Forbes, P. Z. S. 1881, pp. 836–837, maintains that the structure of the palate, as shown by the woodcut of that of *Pharomacrus mocinno*, proves that the Trogons are not desmognathous, as supposed by Huxley, but schizognathous.

Bucconidæ.

See Sclater, P. L.

Bucco radiatus figured, P. L. Sclater, Mon. Buccon. pl. xxxvi.

Hapaloptila, g. n., type *Malacoptila castanea*, Verr. ; *id.* P. Z. S. 1881, p. 777, with woodcut in text. *Hapaloptila castanea* figured ; *id.* Mon. Buccon. pl. xlvii.

Malacoptila fusca, *M. rufa*, *M. torquata*, *M. panamensis*, *M. inornata*, *M. fulvigularis*, *M. substriata*, figured ; *id. op. cit.*, pls. xxxviii.–xliii.

Micromonacha, g. n., type *Bucco lanceolatus*, Deville ; P. L. Sclater, P. Z. S. 1881, p. 777, with woodcuts p. 776. *Micromonacha lanceolata* figured ; *id.* Mon. Buccon. pl. xliv.

Monacha nigra, *M. flavirostris*, *M. morpheus*, *M. peruana*, *M. grandior*, *M. pallescens*, *M. nigrifrons* figured ; *id. op. cit.* pls. xlviii.–liv.

Nonnula brunnea, sp. n., from Colombia, Ecuador, and north-eastern Peru, distinguished from *N. frontalis* of Colombia and Panamá ; P. L. Sclater, Ibis, 1881, p. 600. *Nonnula cineracea*, sp. n., P. L. Sclater, P. Z. S. 1881, p. 778, Upper Amazons district. *N. rubecula*, *N. cineracea*, *N. ruficapilla*, *N. frontalis*, *N. brunnea*, figured ; *id.* Mon. Buccon. pl. xlv. & xlvi.

Cuculidæ.

Coccystes albo-notatus, sp. n., distinguished from *C. serratus*, Sparrm. ; G. E. Shelley, P. Z. S. 1881, p. 594, Usambara Hills in East Africa.

Urodynamis, g. n. [un-characterized], type *Cuculus taitensis*, Sparrm. ; T. Salvadori, Orn. Pap. in Mem. Acc. Tor. (2) xxxiii. p. 370.

Musophagidæ.

Gallirex chlorochlamys, sp. n., G. E. Shelley, Ibis, 1881, p. 118, Ugogo and Dar-es-Salaam.

Schizorhis leopoldi, sp. n., *id. tom. cit.* p. 117, figured pl. ii., Ugogo.

PSITTACI.

Reichenow, A. Conspectus Psittacorum. Systematische Uebersicht aller bekannten Papageienarten. J. f. O. 1881, pp. 1–49, 113–177, 225–289, 337–398, pl. v.

After reviewing the literature of the subject, the author describes at length the various families, genera, and species, with keys. The families recognized are *Stringopidæ* (4 species); *Plissolophidæ* (32 species); *Platycercidæ* (66 species) with *Aprosmictus sulaensis*, subsp. n., close to *A. amboiensis*, Sula islands (p. 128); *Micropsittacidæ* (18 species); *Trichoglossidæ* (86 species); *Palæornithidæ* (54 species); *Psittacidæ* (6 species); *Conuridæ* (93 species); *Pionidæ* (80 species), with *Eucinetus* g. n. (p. 353) and sub. g. n. (p. 354) [sic !], type *Ps. histrio*, Bodd.; *Euchroura*, amended generic name for *Urochroma*, Bp., g. n. (p. 357), type *Ps. purpuratus*, Gm. Pl. v. is a table showing the relationship and relative position of the above families and their omponent genera.

Chrysotis: on the proper names and habitats of the four species now known in the Lesser Antilles; P. L. Sclater, P. Z. S. 1881, p. 627. Remarks on 6 recently described species of this genus; P. L. Sclater, Ibis, 1881, pp. 411–414.

Conurus egregius, sp. n., *id. tom. cit.* pp. 130 & 131, figured pl. iv., supposed to come from Demerara. *Conurus gundlachi*, sp. n., J. Cabanis, J. f. O. 1881, p. 107, Mona islet, off Porto Rico, distinguished from *C. euops* of Cuba.

Eclectus: remarks on the genus; A. Frenzel, Ver. Schutze d. Vogelwelt, 1881, pp. 22–27. *Eclectus riedeli*, sp. n.; A. B. Meyer, P. Z. S. 1881, pp. 917–919, Timorlaut & Cera.—*E. polychlorus* green ♂ and *E. grandis* red ♀, have produced living young at Freiburg; A. Frenzel, *tom. cit.* p. 916.

Loriculus panayensis ♂ ♀ figured; (late) Lord Tweeddale, Voy. 'Challenger,' Zool. ii., pt. viii., *Aves*, pl. i.

Nasiterna finschi, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. vi. p. 180, St. Cristoval.

Nestor notabilis: on its habits; T. H. Potts, Zool. 1881, pp. 290–301. [A very interesting paper, with full details of its carnivorous propensities.] See also under *Stringops*, infrà.

Pionus: remarks on 5 species of this genus; A. Reichenow, J. f. O. 1881, p. 109. *Pionus rubrigularis*, subsp. n., close to *P. menstruus*, J. Cabanis, Orn. Centralbl. 1881, p. 70 & J. f. O. 1881, p. 222, Central America.

Stringops habroptilus and *Nestor notabilis*: remarks on their skeletons, with illustrative plates; L. v. Lorenz, SB. Ak. Wien, lxxxiv., Abth. 1, pp. 624–633, pls. i.–iii.

Tanygnathus megalorrhynchus var. n. *sumbensis*, A. B. Meyer, Verh. z.-b. Wien, xxxi. p. 762, Sumba.

Trichoglossus rubrigularis, sp. n., P. L. Sclater, P. Z. S., 1881, p. 451, New Britain. *T. nigrigularis* figured, T. Salvadori, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xx.

STRIGES.

Strigidæ: R. Collett, Förh. Selsk. Chr. 1881, No. 3, pp. 1–38, discusses the crania of the North European species, 10 in number, and illustrates his remarks by 3 plates and woodcuts. A table of arrangement shows that these 10 species fall into 6 groups, 4 of which have symmetrical skulls, whilst in group 5, comprising *Syrnium uralense* and *S. lapponicum*, the skull is slightly, and in group 6, *Nyctale tengmalmi*, it is highly, asymmetrical.

Bubo virginianus: a bird obtained in the County of Waterford in 1851, identified as belonging to this species; R. J. Ussher, Zool. 1881, p. 308.

Nyctale acadica: on its nesting in Massachusetts; W. Brewster (pp. 143–145) and N. A. Francis (p. 185), Bull. Nutt. Orn. Club, vi.

Speotyto cunicularia var. *hypogæa*: its osteology; R. W. Shufeldt, Bull. U. S. Geol. Surv. vi. pp. 87–117, pls. i.-iii.

Strix aurantia [sic], sp. n., T. Salvadori, Atti Ac. Tor. xvi. p. 619, New Britain.

Syrnium biddulphi, sp. n., J. Scully, Ibis, 1881, p. 423, figured, pl. xiv. Gilgit.

ACCIPITRES.

Cathartidæ.

See Shufeldt, R. W., for Anatomy.

Sarcorrhamphus gryphus: on its breeding in the Dresden Zoological Gardens; A. Schöpf, Zool. Gart, 1881, pp. 161–163.

Falconidæ.

Falconidæ. See Shufeldt, R. W., for Anatomy.

Aquila chrysaetus: its habits in Scotland described (pp. 6) and 4 progressive stages of plumage figured; E. Booth, 'Rough Notes,' pt. i.

Buteo brachyurus and *B. fulginosus* [the question as to whether the latter is a melanistic phase of the former is discussed at great length, in consequence of specimens of this tropical form having recently been obtained in Florida]; R. Ridgway, Bull. Nutt. Orn. Club, vi. pp. 207–214.

Buteo solitarius figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xxi.

Cerchneis: the species included by R. B. Sharpe under this genus are considered to belong to the subgenera *Dissodectes*, *Tinnunculus*, and *Erythropus*; J. H. Gurney, Ibis, 1881, p. 277.

Cooperastur poliogaster: on a second specimen of this rare species from the Amazon Valley, and on *C. pectoralis*; id. *tom. cit.* pp. 258–259.

Dissodectes: on this subgenus and its species; *id. tom. cit.* pp. 277–279.

Falco islandus: an undoubted example obtained near Belmullet, West Ireland; A. G. More, Zool. 1881, p. 488. *F. peregrinus*: remarks on; A. Müller, Ber. Offenbach. Ver. 1880, pp. 122–127.

Gypaetus barbatus: notes with regard to its habits in Switzerland and Tyrol; A. Girtanner, MT. orn. Ver. Wien, 1881, pp. 17.

Gypoictinia melanosternon: note on; K. H. Bennett, P. Linn. Soc. N. S. W. iv. p. 146.

Haliaetus albicilla: its habits in the British Islands described (pp. 10) and adult figured; E. Booth, Rough Notes, pt. i.

Harpagornis assimilis (fossil); see Haast, J.

Harpagus: remarks on the species comprised in this genus; J. H. Gurney, Ibis, 1881, pp. 118–124.

Harpa nova-zealandiæ: note on; W. L. Buller, Ibis, 1881, p. 453.

Microhierax: on the species comprised in this genus; J. H. Gurney, Ibis, 1881, pp. 271–275.

Milvus regalis: its habits in Britain described (pp. 12) and nestling and half-grown stages figured; E. Booth, Rough Notes, pt. i.

Nauclerus forficatus: notes on; H. Nehrling, Orn. Centralbl. 1881, p. 9.

Onychotes grueberi: notes on this rare species, with figures of the two only known specimens; J. H. Gurney, Ibis, 1881, pp. 396–398, pl. xii.

Pandion haliaetus: its habits in Britain described (pp. 6), and nestling figured; E. Booth, Rough Notes, pt. i.

Pernis tweedalii, sp. n., distinguished from *P. ptilorrhynchus*, and named by A. O. Hume in note appended to a paper by J. H. Gurney, Str. Feath. ix. pp. 446–448, Malay Peninsula.

Poliohierax: on the members of this genus; J. H. Gurney, Ibis, 1881, p. 275.

Spiziapteryx circumcinctus: remarks on this genus and species; J. H. Gurney, Ibis, 1881, pp. 275 & 276.

Tinnunculus: on the species comprised in this subgenus; J. H. Gurney, Ibis, 1881, pp. 455–472, 547–567.

Urospizias: remarks on some species of this genus; J. H. Gurney, Ibis, 1881, pp. 259–267, with figure of *U. albo-gularis*, pl. viii. Criticisms on the above: T. Salvadori, *tom. cit.* pp. 605–607.

Vultur cinereus obtained in Schleswig, 18th June, 1880: P. Kollibay, Orn. Centralbl. 1881, p. 34.

STEGANOPODES.

Pelecanidæ.

Phalacrocorax carbo: note on the shape of the nostrils; J. C. Ewart, J. L. S. xv. p. 455. *Phalacrocorax imperialis* (pl. xxv. fig. 1) figured; P. L. Sclater & O. Salvin, and *P. albiventris* (pl. xxv. fig. 2), Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xxv., *P. verrucosus* (pl. xxvi.).

Plotus anhinga: on a living example, apparently in perfect health, casting up the epithelial lining of the gizzard after the fashion already observed in the *Bucerotidæ*; A. D. Bartlett, P. Z. S. 1881, p. 247, followed by note from W. A. Forbes, *tom. cit.* p. 248, confirming the above.

Plotus vaillanti: exhibition of skins and eggs obtained on the Lake of Antioch, Syria; H. B. Tristram, P. Z. S. 1881, p. 826.

HERODIONES.

Ardeidæ.

Anastomus madagascarensis, sp. n., distinguished from *A. lamelliger*; A. Milne-Edwards, C. R. xci. p. 1037, Madagascar.

Ardea garzetta obtained in Yorkshire in January; R. P. Harper, Zool. 1881, p. 213.

Butio kutteri, sp. n., J. Cabanis, J. f. O. 1881, p. 425, Philippine islands.

Plataleidæ.

Ibis religiosa: its occurrence on 21st Oct. 1880 in Pommerania; v. Homeyer, Orn. Centralbl. 1881, p. 4.

Plegadis falcinellus: exhibition of a ♂ obtained in Hampshire; P. L. Sclater, P. Z. S. 1881, p. 827.

ODONTOGLOSSÆ.

Phœnicopteridæ.

Phœnicopterus antiquorum: on its nesting in the Lake of Tunis; H. Johnston, Ibis, 1881, p. 173.

ANSERES.

Anatidæ.

Anas wyvilliana figured, P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xxii.

Bernicla ruficollis obtained on the coast of Holland; J. H. Gurney, Jr., Ibis, 1881, p. 495. In Finland; J. A. Palmen, Med. Soc. Fenn. vii. p. 144.

Branta nigricans: on its habits in Alaska; E. W. Nelson, Bull. Nutt. Orn. Club, vi. pp. 131–138.

Fuligula rufina obtained for the first time in North America (Long Island Sound?); R. Ridgway, Pr. U. S. Nat. Mus. iv. p. 22; at Tralee, Kerry, apparently its first recorded occurrence in Ireland: R. Payne Gallewey, Zool. 1881, p. 143; exhibited, A. G. More, P. Z. S. 1881, p. 409.

Mergus australis: exhibition of a skin of this rare species from the Auckland Islands; P. L. Sclater, P. Z. S. 1881, p. 1.

Œdemia perspicillata; on a specimen obtained in Orkney, with description of its trachea as compared with that of *Œ. fusca*; H. Langton, Zool. 1881, p. 59.

COLUMBÆ.

Carpophaga salvadorii, sp. n., distinguished from *C. pinon*; H. B. Tristram, P. Z. S. 1881, p. 996, St. Aignân's Island, Louisiade Archipelago. *C. rhodinolæma* figured; P. L. Sclater, Voy. 'Challenger,' Zool. pt. viii., *Aves*, pl. ix. *C. latrans* figured; O. Finsch, *tom. cit.* pl. xvii.

Chrysœnas victor ♂ (pl. xv.) and *C. viridis* (pl. xvi.) figured; O. Finsch, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*.

Gymnophaps pœcilorrhoa: its correct habitat is North Celebes; A. B. Meyer, Ibis, 1881, p. 169.

Phabotreron brevirostris figured; (late) Lord Tweeddale, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. vi.

Philemon albitorques figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. viii.

Phlegœnas kubarii, sp. n., O. Finsch, J. f. O. 1880, p. 292, Island of Ponapé. [Omitted from Zool. Rec. xvii.]

Ptilopus fischeri occurs in both North and South Celebes; A. B. Meyer, Ibis, 1881, p. 170. *P. johannis* ♂ ♀ figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. x.

Turtur ambiguus, sp. n., J. V. B. du Bocage, Orn. Angola, ii. p. 386, Dombe, South Benguela.

GALLINÆ.

TETRAONIDÆ.

See SHUFELDT, R. W., for Osteology.

Callipepla squamata pallida subsp. n.; W. Brewster, Bull. Nutt. Orn. Club, vi. p. 72, Rio San Pedro, Arizona.

Tetraonidæ [on the roosting-places and habits of the European species]; O. v. Loewis, Zool. Gart. 1881, pp. 129–137; W. Wurm, *tom. cit.* pp. 237–241.

Tetrao intermedius: remarks on this hybrid; A. B. Meyer, MT. orn. Ver. Wein, 1881, p. 72; see also *tom. cit.* p. 91; A. J. Jäckel, Zool. Gart. 1881, p. 103.

PHASIANIDÆ.

Callophasis humiæ [sic], g. & sp. n., A. O. Hume, Str. Feath. ix. pp. 461–467, Manipur; ♂ only described, ♀ still unknown.

Crossoptilon harmani, sp. n., H. J. Elwes, Ibis, 1881, pp. 399–401, figured pl. xiii., Eastern Tibet.

Francolinus finschi, sp. n., J. V. B. du Bocage, Orn. Angola, ii. p. 406, Caconda.

Francolinus (*Scleroptera*) *schuetti* Cab. [*cf.* Zool. Rec. xvii. *Aves*, p. 45], figured; J. Cabanis, J. f. O. 1881, pl. ii.

Perdicula manipurensis, sp. n., A. O. Hume, Str. Feath. ix. pp. 467–471, Manipur.

Polyplectron schleiermacheri: the ♀ described for the first time; A. v. Pelzeln, Verh. z.-b. Wien, xxx. p. 27, Teweh, Central Borneo.

Megapodiidæ.

E. Oustalet, Ann. Sc. Nat. (6) x. Art. 5, pp. 60, pls. xx.–xxii., vol. ix. Art. 2, pp. 182, pls. ii. & iii., contributes an important Monograph. The systematic relationship of the *Megapodiidæ* is discussed at length, and the structural anatomy is examined in detail and illustrated. Four genera, *Megacephalon* (1 species), *Lipoa* (1 species), *Talegallus* (7 species), *Megapodius* (19 species), are admitted, and the habits of each species fully described. Plates of skeleton of *Megacephalon maleo*, *Megapodius duperreyi*, coloured figures of *Talegallus bruijni*, and of the heads of the latter and 2 other species are given.

Megapodius eremita figured; P. L. Sclater, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*, pl. xi. *Megapodius brazieri*: remarks on, correcting an erroneous statement by E. P. Ramsay; J. Brazier, P. Linn. Soc. N. S. W. vi pp. 150–154.

OPISTHOCOMI.

Opisthocomidæ.

Opisthocomus cristatus: six eggs exhibited, obtained at Obidos, Amazons, are essentially Ralline in general character; P. L. Sclater, P. Z. S. 1881, p. 259. Remarks on its egg and its systematic position: W. V. Nathusius, J. f. O. 1881, pp. 334–336.

Hemipodiidæ.

See Kutter.

FULICARIÆ.

Rallidæ.

Hypotænidia suturata (Salvadori, MS.), sp. n., P. L. Sclater, Ibis, 1880, p. 310, Salwatti. [See Zool. Rec. xvii. p. 46.]

Rallina (*Euryzona*) *zona*[*ti*]*ventris*, sp. n., J. Cabanis, J. f. O. 1881, p. 425, Malacca.

ALECTORIDES.

Gruidæ.

In 'A Natural History of the Cranes: a Monograph by the late Edward Blyth, enlarged and reprinted with illustrations by W. B. Tegetmeier,' London 1881, 8vo, pp. 92; 15 species are recognized; the synonymy of several species is amended; figures are given of the heads of *Grus viridirostris*, *G. communis*, *G. americana*, *G. monachus*: and full figures of *G. leucauchen* and *G. nigricollis* (the latter after Prjevalsky)—the whole forming a very complete Monograph.

Cariamidæ.

Cariama cristata: exhibition of an egg laid in the Jardin des Plantes, Paris; A. Newton, P. Z. S. 1881, p. 1.

Otididæ.

Otis canicollis, sp. n., A. Reichenow, Orn. Centralbl. 1881, p. 79, and J. f. O. 1881, p. 334, Berdera, E. Africa. *O. tetrax*: two specimens obtained in North Devon; G. F. Mathew, Zool. 1881, p. 59. *O. tarda*: an account of its gradual extinction on the Yorkshire Wolds; W. E. Clark, Handbk. Vertebrate Fauna of Yorkshire, pp. 65–68. *O. macqueeni* obtained in Livonia; O. v. Loewis, Zool. Gart. 1881, p. 156.

LIMICOLÆ.

Parridæ.

See Forbes, W. A., for Anatomy.

Parra violacea, sp. n., C. B. Cory, Bull. Nutt. Orn. Club, vi. p. 130, Haiti.

Charadriidæ.

Ægialitis alexandrinus [*Æ. cantianus* (Lath.)] obtained in Norway; R. Collett, Förh. Selsk. Chr. 1881, No. 10 [sep. copy].

Charadrius sheppardianus, sp. n. (fossil); E. D. Cope, Bull. U. S. Geol. Surv. vi. pp. 83-85, Amyzon shales of Colorado, a Tertiary deposit.

Charadrius morinellus: details of its nesting in the Grampians; D. Bruce, Macmillan's Mag. 1881, pp. 347-352.

Dromas ardeola: exhibition of its eggs, which are pure white; H. Saunders, P. Z. S. 1881, p. 259 [*cf.* Zool. Rec. xvi. *Aves*, p. 60].

Sarciophorus latifrons, sp. n., distinguished from *S. pileatus*; A. Reichenow, Orn. Centralbl. 1881, p. 79, and J. f. O. 1881, p. 334, Berdera, E. Africa.

Scolopacidæ.

Gallinago cœlestis: [i.e., Common Snipe] on the "humming" of this species; J. E. Harting, Zool. 1881, pp. 121–131; — Altum, Orn. Centralbl. 1881, p. 10. Exhibition of the melanoid variety often called *G. sabinii*, shot in Hampshire; R. B. Sharpe, P. Z. S. 1881, p. 409.

Tringa temminckii and *T. minuta*: on their breeding in Norway; R. Collett, J. f. O. 1881, pp. 323–332; on the breeding of *T. minuta* in the Kola Peninsula; E. Rae, "White Sea Peninsula," pp. 85–87.

GAVIÆ.

Laridæ.

Stercorarius pomatorrhinus and other Skuas in unusual numbers on the coasts of Scotland; J. J. Dalgleish, P. N. H. Soc. Glasg. iv. pt. ii. pp. 274–280.

Xema sabinii obtained near Dublin; A. G. More, Zool. 1881, p. 472.

TUBINARES.

Procellariidæ.

See Forbes, W. A.

Garrodia, g. n., type *Thalassidroma nereis*; W. A. Forbes, P. Z. S. 1881, p. 736.

Oceanitidæ: family name to include *Oceanites*, *Garrodia*, *Pelagodroma*, and *Fregetta*; id. *ibid.*

Œstrelata gularis (Peale) is the proper name for an Antarctic species referred to by E. Coues as *Œ. mollis*, a specimen of which has recently been obtained in the State of New York: also remarks on *Œ. defilippiana*; W. Brewster, Bull. Nutt. Orn. Club, vi. pp. 91–97.

Puffinus borealis, sp. n., C. B. Cory, Bull. Nutt. Orn. Club, vi. p. 84, Chatham Island, Cape Cod, Massachusetts. *Puffinus griseus* obtained off the Coast of Kerry; A. G. More, Zool. 1881, p. 334; also R. Warren, *tom. cit.* p. 420.

Thalassidroma leucorrhoa: three examples obtained on the Lincolnshire Coast; C. Dixon, Zool. 1881, p. 491. The males do most of the incubating; W. Brewster, Bull. Nutt. Orn. Club, vi. p. 125.

PYGOPODES.

Podicipidæ.

Podiceps occidentalis and *P. clarkii*: their specific distinctions pointed out; H. W. Henshaw, Bull. Nutt. Orn. Club, vi. pp. 214–218.

Podilymbus podiceps of North America, stated to have been killed near Weymouth in January, 1881, exhibited; R. B. Sharpe, P. Z. S. 1881, p. 734. The appearance of the specimen indicates that it was brought over in a preserved state; J. E. Harting, Zool. 1881, p. 334.

Alcidæ.

Alca impennis: R. Gray, P. R. Soc. Edinb. x. pp. 668–582, on two unrecorded eggs discovered in an Edinburgh collection, with remarks on the former existence of the bird in Newfoundland.

IMPENNES.

Spheniscidæ.

A. Milne-Edwards, Ann. Sc. Nat. (6) ix.–x. art. 9, discusses the geographical distribution of all the known *Spheniscidæ*. *Megadyptes* (p. 56), g. n., type *Catarrhactes antipodes*[*-dum*], and *Microdyptes* (p. 58), g. n., type *Eudyptula serresiana* are characterized, and the latter bird is figured illustrations of heads of species or races of *Eudyptes* are also given, with a map showing distribution.

Eudyptes chrysolophus (pl. xxix.), *E. chrysocome* (pl. xxx.), figured; P. L. Sclater & O. Salvin, Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*.

Spheniscus demersus (pl. xxvii.) figured, P. L. Sclater & O. Salvin. *S. magellanicus* (pl. xxviii.), Voy. 'Challenger,' Zool. ii. pt. viii. *Aves*.

RATITÆ.

See FORBES, W. A., for Anatomy.

CASUARII.

Casuarius beccarii, Sclater: note on its egg; A. v. Pelzeln, Ibis, 1881, p. 401.

Casuarius bicarunculatus figured; J. Gould, B. New Guinea, pt. xii.

ODONTORNITHES.

See MARSH, O. C., SEELEY, H. G., and HUMBERT, A.

Laopteryx priscus, g. & sp. n., O. C. Marsh, Ann. N. H. (5) vii. p. 488, from the Upper Jurassic of Wyoming. The foundation of the present species is the posterior portion of a skull, indicating a bird rather larger in size than *Ardea herodias*, and resembling the skull of the *Ratitæ* more than that of any existing birds. Other parts of the skeleton are expected to show still stronger reptilian characters. As a single tooth resembling that of *Ichthyornis* was found in the matrix attached to this skull, it appears probable that *Laopteryx* possessed teeth; it is also probable that it had bi-concave vertebræ.

REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

For a general account of the development of the Reptiles and Batrachians, see the late F. M. Balfour's Treatise on Comparative Embryology (London: 1881, 8vo), vol. ii.; pp. 99–119 refer to the Batrachians, pp. 167–176 to the Reptiles.

FAUNÆ.

EUROPE.

Germany.

FRANKE, A. Die Reptilien und Amphibien Deutschlands. Leipzig: 8vo. [Not seen by the Recorder.]

Spain, Portugal, and Balearic Islands.

BOSCÁ, E. Correcciones y adiciones al Catálogo de los Reptiles y Anfibios de España, Portugal y las Islas Baleares. An. Soc. Esp. x. pp. 89–112.

BÖTTGER, O. Beitrag zur Kenntniss der Reptilien und Amphibien Spaniens und der Balearen. Abh. senck. Ges. xii. pp. 371–392.

Contains a list of Reptiles and Batrachians collected by Hr. Hans Simon in the South of Spain, and by Lieut. F. Will in the Balearic Islands. Remarks are appended to the species, all of which are well known.

Greece.

BEDRIAGA, J. v. Die Amphibien und Reptilien Griechenlands. Bull. Mosc. lv. pt. 1, pp. 242–310, and pt. 2, pp. 43–103.

A catalogue of the Batrachians and Reptiles of Greece, the number of which is stated to be 45, viz.:—5 *Chelonia*, 15 *Lacertilia*, 14 *Ophidia*, 7 *Batrachia Ecaudata*, and 4 *Batrachia Caudata*.

Asia.

Persia.

Blanford, W. T. On a Collection of Persian Reptiles added to the British Museum. P. Z. S. 1881, pp. 671–682.

This collection consists of 6 species of *Lacertilia*, two of which are new, and 12 species of *Ophidia*, one being new.

India.

W. T. Blanford gives the following numerical estimate of the species of *Reptilia* and *Batrachia* recorded from British India and its dependencies:—54 *Chelonia*, 4 *Crocodilia*, 182 *Lacertilia*, 274 *Ophidia*, and 100 *Batrachia*. J. A. S. B. l. pt. 2, p. 266.

W. Theobald enumerates the Reptiles and Batrachians of British Burma, the number of which is stated to be 173; the Orders, Families, Genera, and Species are shortly characterized. British Burma Gazetteer (by H. R. Spearman, Rangoon: 1880, 8vo), i. pp. 605–640.

Blanford, W. T. On a Collection of Reptiles and Frogs, chiefly from Singapore. P. Z. S. 1881, pp. 215–227.

2 snakes and 1 frog are described as new.

Africa.

West Africa.

W. Peters enumerates the Reptiles and Frogs collected in West Africa by Major v. Mechow. SB. nat. Fr. 1881, pp. 147–150.

Böttger, O. Aufzählung der von Frhrn. H. und Frfr. A. von Maltzan im Winter 1880–81, am Cap Verde in Senegambien gesammelte Kriechthiere. Abh. senck. Ges. xii. pp. 393–419, 1 pl.

This extensive contribution to the knowledge of the Herpetological Fauna of West Africa contains remarks upon 27 species, 2 of which are described as new, 1 being considered the type of a new genus.

Socotra.

Blanford, W. T. On the Lizards collected in Socotra by Prof. J. B. Balfour. P. Z. S. 1881, pp. 464–469.

6 species were found in Socotra, 3 being new.

Günther, A. Descriptions of the Amphisbænians and Ophidians collected by Prof. J. B. Balfour in the Island of Socotra. P. Z. S. 1881, pp. 461–463, pls. xl. & xli.

1 new genus and species of Amphisbænians, and 1 new genus and 2 species of Snakes are described.

Madagascar.

Günther, A. Seventh Contribution to the Knowledge of the Fauna of Madagascar. Ann. N. H. (5) vii. pp. 357–360, pl. xix.

3 new species (a Chameleon and 2 Snakes) are described

Böttger, O. Die Reptilien und Amphibien von Madagascar; Dritter Nachtrag. Abh. senck. Ges. xii. pp. 435–558, 5 pls.

This contribution contains descriptions of, and remarks upon, a great number of species and varieties, a systematic list of those hitherto recorded as inhabiting Madagascar, and remarks on their geographical distribution.

O. Böttger also enumerates the Reptiles and Batrachians collected in Madagascar by the late Dr. C. Rutenberg; 1 Lizard and 3 Frogs are described as new. Abh. Ver. Brem. vii. pp. 177–190.

America.

California.

E. T. Cox has notes on the Tortoises of Tucson. Am. Nat. xv. pp. 1003 & 1004.

West Indies.

Gundlach, J. Apuntes para la Fauna Puertô Riquena, iii. Anfibios. An. Soc. Esp. x. pp. 305–317.

4 *Chelonia*, 12 *Lacertilia*, 4 *Ophidia*, and 3 *Batrachia Ecaudata* occur in Porto Rico.

Central America.

Bocourt, F. Mission Scientifique au Mexique et dans l'Amérique Centrale; IIIe partie, Études sur les Reptiles et les Batraciens. Paris: 1881, fo. 7e livr. pp. 441–448, pls. xxii.*e*–xxii.*j*.

This part contains the conclusion of the *Scincidæ* and a part of the *Amphisbænidæ*.

Brocchi, P. Mission Scientifique au Mexique et dans l'Amérique Centrale; IIIe partie, 2e sect., Études sur les Batraciens. Paris: 1881, fo. 1re livr. pp. 1–56, pls. i.–x.

Contains a part of the *Ecaudata*.

Sumichrast, F. Note additionnelle à la première contribution à l'histoire naturelle du Mexique. Bull. Soc. Z. Fr. 1881, pp. 231 & 232.

Ecuador.

O'Shaughnessy, A. W. E. [the late]. An Account of the Collection of Lizards made by Mr. Buckley in Ecuador. P. Z. S. 1881, pp. 227–245, pls. xxii.–xxv.

10 species are described as new.

Patagonia.

Doering, A. Informe oficial de la Comision cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia). Entrega 1, Zoologia. Buenos Aires: 1881, fo.

Pp. 59 & 60 contain a list of the (10) Reptiles and Batrachians, taken during General Roca's campaign in 1879.

Asia.

Persia.

Blanford, W. T. On a Collection of Persian Reptiles added to the British Museum. P. Z. S. 1881, pp. 671–682.

This collection consists of 6 species of *Lacertilia*, two of which are new, and 12 species of *Ophidia*, one being new.

India.

W. T. Blanford gives the following numerical estimate of the species of *Reptilia* and *Batrachia* recorded from British India and its dependencies:—54 *Chelonia*, 4 *Crocodilia*, 182 *Lacertilia*, 274 *Ophidia*, and 100 *Batrachia*. J. A. S. B. l. pt. 2, p. 266.

W. Theobald enumerates the Reptiles and Batrachians of British Burma, the number of which is stated to be 173; the Orders, Families, Genera, and Species are shortly characterized. British Burma Gazetteer (by H. R. Spearman, Rangoon: 1880, 8vo), i. pp. 605–640.

Blanford, W. T. On a Collection of Reptiles and Frogs, chiefly from Singapore. P. Z. S. 1881, pp. 215–227.

2 snakes and 1 frog are described as new.

Africa.

West Africa.

W. Peters enumerates the Reptiles and Frogs collected in West Africa by Major v. Mechow. SB. nat. Fr. 1881, pp. 147–150.

Böttger, O. Aufzählung der von Frhrn. H. und Frfr. A. von Maltzan im Winter 1880–81, am Cap Verde in Senegambien gesammelte Kriechthiere. Abh. senck. Ges. xii. pp. 393–419, 1 pl.

This extensive contribution to the knowledge of the Herpetological Fauna of West Africa contains remarks upon 27 species, 2 of which are described as new, 1 being considered the type of a new genus.

Socotra.

Blanford, W. T. On the Lizards collected in Socotra by Prof. J. B. Balfour. P. Z. S. 1881, pp. 464–469.

6 species were found in Socotra, 3 being new.

Günther, A. Descriptions of the Amphisbænians and Ophidians collected by Prof. J. B. Balfour in the Island of Socotra. P. Z. S. 1881, pp. 461–463, pls. xl. & xli.

1 new genus and species of Amphisbænians, and 1 new genus and 2 species of Snakes are described.

Madagascar.

Günther, A. Seventh Contribution to the Knowledge of the Fauna of Madagascar. Ann. N. H. (5) vii. pp. 357–360, pl. xix.

3 new species (a Chameleon and 2 Snakes) are described

BÖTTGER, O. Die Reptilien und Amphibien von Madagascar; Dritter Nachtrag. Abh. senck. Ges. xii. pp. 435–558, 5 pls.

This contribution contains descriptions of, and remarks upon, a great number of species and varieties, a systematic list of those hitherto recorded as inhabiting Madagascar, and remarks on their geographical distribution.

O. BÖTTGER also enumerates the Reptiles and Batrachians collected in Madagascar by the late Dr. C. Rutenberg; 1 Lizard and 3 Frogs are described as new. Abh. Ver. Brem. vii. pp. 177–190.

AMERICA.

California.

E. T. COX has notes on the Tortoises of Tucson. Am. Nat. xv. pp. 1003 & 1004.

West Indies.

GUNDLACH, J. Apuntes para la Fauna Puerto Riquena, iii. Anfibios. An. Soc. Esp. x. pp. 305–317.

4 *Chelonia*, 12 *Lacertilia*, 4 *Ophidia*, and 3 *Batrachia Ecaudata* occur in Porto Rico.

Central America.

BOCOURT, F. Mission Scientifique au Mexique et dans l'Amérique Centrale; IIIe partie, Études sur les Reptiles et les Batraciens. Paris: 1881, fo. 7e livr. pp. 441–448, pls. xxii.*e*–xxii.*j*.

This part contains the conclusion of the *Scincidæ* and a part of the *Amphisbænidæ*.

BROCCHI, P. Mission Scientifique au Mexique et dans l'Amérique Centrale; IIIe partie, 2e sect., Études sur les Batraciens. Paris: 1881, fo. 1re livr. pp. 1–56, pls. i.–x.

Contains a part of the *Ecaudata*.

SUMICHRAST, F. Note additionnelle à la première contribution à l'histoire naturelle du Mexique. Bull. Soc. Z. Fr. 1881, pp. 231 & 232.

Ecuador.

O'SHAUGHNESSY, A. W. E. [the late]. An Account of the Collection of Lizards made by Mr. Buckley in Ecuador. P. Z. S. 1881, pp. 227–245, pls. xxii.–xxv.

10 species are described as new.

Patagonia.

DOERING, A. Informe oficial de la Comision cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia). Entrega 1, Zoologia. Buenos Aires: 1881, fo.

Pp. 59 & 60 contain a list of the (10) Reptiles and Batrachians, taken during General Roca's campaign in 1879.

Günther, A. Reptiles and Batrachians collected during the Survey of H.M.S. 'Alert' on the Coast of Patagonia. P. Z. S. 1881, pp. 18 & 19.

3 Batrachians are described as new.

Polynesia.

W. Peters enumerates 7 species of Reptiles collected by Dr. Finsch in the Marshall, Gilbert, and Caroline Islands. SB. nat. Fr. 1881, p. 72.

REPTILIA.

Bronn, H. G. Klassen und Ordnungen des Thierreichs. vi. Abth. iii. pp. 401–672, pls. xlix.–lxxii. *Reptilia* by C. K. Hoffman.

Contains the palæontological and biological chapters of the *Chelonia*, and the anatomy of the *Crocodilia* and *Lacertilia*.

Gadow, H. Untersuchungen über die Bauchmuskeln der Krokodile, Eidechsen und Schildkröten. Morph. JB. 1881, pp. 57–100, pl. vi.

Rabl-Rückhard, H. Ueber das Vorkommen eines Fornixrudiments bei Reptilien. Zool. Anz. iv. pp. 281–284.

Salle, O. Untersuchungen über die Lymphapophysen von Schlangen und Schlangenähnlichen Sauriern. Inaug.-Diss. Göttingen. Leipzig: 1881, 8vo, 44 pp. [Not seen by the Recorder.]

CHELONIA.

Haddon, A. C. On the Extinct Land-Tortoises of Mauritius and Rodriguez. Tr. Linn. Soc. (2) ii. Zool. pp. 155–163, pl. xiii.

Contains remarks on bones preserved in the Museum of the University of Cambridge.

Parker, W. K. The Development of the Green Turtle [*Chelone viridis*] in Scientific Results of the Voyage of H.M.S. 'Challenger,' Zoology, i. part v. [1880], 58 pp. 13 pls.

[Omitted from the preceding Record.]

Sabatier, A. Du mécanisme de la Respiration chez les Chéloniens. Rev. Montp. ii. pp. 417–437.

Testudo. A. A. W. Hubrecht makes remarks on some gigantic Land-Tortoises, and especially on the type specimen of *T. vosmæri*, Schoepff, in the Leyden Museum. Notes Leyd. Mus. iii. pp. 41–44.

Testudo græca bettai, subsp. n., Lataste, Le Nat. 1881, p. 396, habitat unknown.

Geoclemys macrocephala, Gray, = *Emys subtrijuga*, Schleg. & Müll.; Hubrecht, *l. c.* iii. p. 48.

Cyclemys giebeli, sp. n., *id. l. c.* p. 45, Borneo.

Batagur borneensis (Schleg. & Müll.), described by Hubrecht, *l. c.* p. 47.

Sternotherus derbianus, Gray, and *Pelomedusa galeata* (Schoepff). Remarks upon specimens from Senegambia; Böttger, Abh. senck. Ges. xii. pp. 412 & 413.

CROCODILIA.

D. G. Burmeister has notes on the *Crocodilia* (*Alligator latirostris* and *sclerops*) of the Argentine Republic. An. Soc. Arg. ix. pp. 241–251.

LACERTILIA.

Strahl, H. Ueber die Entwickelung des Canalis myelocentericus und der Allantois der Eidechse. Arch. Anat. Phys. 1881, pp. 122–160, pls. vi. & vii.

Chamæleontidæ.

Parker, W. K. On the Structure of the Skull in the Chamæleons Tr. Z. S. xi. pp. 77–105, pls. xv.–xix.

Chamæleon campani, Grandid., described by Böttger, Abh. Ver. Brem. vii. p. 183, and Abh. senck. Ges. xii. p. 479.

Chamæleon ebenaui, Böttg., described and head figured by Böttger; Abh. senck. Ges. xii. p. 482, pl. iii. fig. 12.

Chamæleon oshaughnessyi, sp. n., Günther, Ann. N. H. (5) vii. p. 358, pl. xix., Madagascar.

Chamæleon brevicornis, Gthr., head of male figured; *id. ibid.*

Chamæleon monachus, Gray, is an inhabitant of Socotra; Blanford, P. Z. S. 1881, p. 464.

Geckotidæ.

Rhacodactylus aubryanus, Bocage, is perhaps not specifically distinct from *R. leachianus* (Cuv.); Barboza du Bocage, J. Sc. Lisb. xxx. p. 127.

Chamæleonurus chahoua (Bavay). Remarks on the synonymy and characters of this species; *id. l. c.* p. 128.

Ceratolophus auriculatus (Bavay) is provided with a prehensile tail; *id. l. c.* p. 130.

Pachydactylus cepedianus, var. *madagascariensis*, Gray, described and head figured by Böttger, Abh. senck. Ges. xii. p. 458, pl. ii. fig. 5; *P. laticauda*. Böttg., described and head figured, *id. l. c.* p. 461, pl. ii. fig. 6.

Pachydactylus dubius, sp. n., Böttger, Zool. Anz. iv. p. 46, and Abh. Ver. Brem. vii. p. 179, and Abh. senck. Ges. xii. p. 464, Madagascar.

Scalabotes madagascariensis, sp. n., Böttger, Zool. Anz. iv. p. 360, and Abh. senck. Ges. xii. p. 469, pl. ii. fig. 8, Madagascar.

Hemidactylus (*Liurus*) *homœolepis*, sp. n., Blanford, P. Z. S. 1881, p. 464, pl. xlii. fig. 2, Socotra.

Phyllodactylus stumpffi, Böttg., figured by Böttger, Abh. senck. Ges. xii. pl. ii. fig. 9.

Phyllodactylus oviceps, sp. n., Böttger, Zool. Anz. iv. p. 359, and Abh. senck. Ges. xii. p. 474, pl. iii. fig. 10, Nossi Bé, Madagascar.

Goniodactylus concinnatus, p. 237, pl. xxiii. fig. 2, and *buckleyi*, p. 238, pl. xxiii. fig. 3, spp. nn., O'Shaughnessy, P. Z. S. 1881, Ecuador

Pristurus rupestris, Blanf. Remarks upon specimens from Socotra; compared with *P. longipes*, Ptrs., and *P. flavipunctatus* (Rüpp.), Blanford, P. Z. S. 1881, p. 465.

Pristurus insignis, sp. n., *id. l. c.* p. 466, pl. xlii. fig. 1, Socotra.

Agamidæ.

Agama. W. T. Blanford discusses the characters upon which *A. agilis*, Olivier, and *A. sanguinolenta*, Pallas, have been specifically separated, and comes to the conclusion that the latter is only a variety of the former; P. Z. S. 1881, pp. 671–674.

Agama persica, sp. n., Blanford, *l. c.* p. 674, pl. lix., Persia.

Grammatophora isolepis, sp. n., Fischer, Arch. f. Nat. xlvii. p. 232, pl. xii. figs. 10–12, West Australia.

Phoxophrys, g. n., for *P. tuberculata*, sp. n., Hubrecht, Notes Leyd. Mus. iii. p. 51, West Sumatra.

Iguanidæ.

Anolis nummifer, O'Sh., = *A.* (*Draconura*) *chrysolepis*, D. & B.; O'Shaughnessy, P. Z. S. 1881, p. 241.

Anolis nasicus, D. & B., is probably the male of *A. punctatus*, Daud.; *id. l. c.* p. 242.

Anolis boulengeri, id. *l. c.* p. 242, pl. xxiv. fig. 1, Ecuador; *A. beckeri*, Boulenger, P. Z. S. 1881, p. 921, Yucatan: spp. nn.

Xiphosurus oculatus, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 274, Dominica. [Omitted from Zool. Rec. xvi.]

Enyalius microlepis, p. 238, pl. xxiv. fig. 2, and *præstabilis*, p. 240, pl. xxv. fig. 1, O'Shaughnessy, l. c.; *E. oshaughnessyi*, Boulenger, *l. c.* p. 246, pl. xxvi., spp. nn., Ecuador.

Liocephalus aculeatus, O'Sh. Additional remarks upon this species by O'Shaughnessy, *l. c.* p. 243.

Hoplocercus annularis, sp. n., *id. l. c.*, p. 244, pl. xxv. fig. 2, Ecuador.

Varanidæ.

Varanus macrolepis, sp. n., Blanford, J. A. S. B. l. pt. 2, p. 239, pl. xvi., Tenasserim.

Tejidæ.

Amiva surinamensis tobaganus, subsp. n., Cope. P. Am. Phil. Soc. xviii. p. 276, Tobago. [Omitted from Zool. Rec. xvi.]

Monoplocus dorsalis, Gthr., is a *Centropyx*; O'Shaughnessy, P. Z. S. 1881, p. 228.

Lacertidæ.

Remarks by the Recorder on the Lizards of the genera *Lacerta* and *Acanthodactylus* in the British Museum; P. Z. S. 1881, pp. 739–747.

Lacerta. 17 species of this genus appear to be perfectly characterized; they are arranged in a synopsis; *id. l. c.* p. 743.

Zootoca derbiana, Gray, = *Lacerta galloti*, D. & B.; *id. l. c.* p. 740.

Lacerta danfordi (Gthr.) described; *id. l. c.* p. 741.

Podarcis judaica, Camerano, = *Lacerta laevis*, Gray; *id. l. c.* p. 742.

Lacerta muralis. Th. Eimer makes an extensive contribution to the study of the numerous varieties of this species; Arch. f. Nat. xlvii. pp. 239-517, pls. xiii.–xv.

Algira microdactyla, sp. n., Böttger, Zool. Anz. iv. p. 571, Morocco.

Eremias (*Mesalina*) *balfouri*, Blanford, P. Z. S. 1881, p. 467, Socotra; *E.* (*M.*) *simoni*, Böttger, Zool. Anz. iv. p. 571, Morocco: spp. nn.

Acanthodactylus. The Recorder distinguishes 10 species in this genus; the synonymy and principal characters of these are given; P. Z. S. 1881, pp. 744–747.

Acanthodactylus bedriagæ, sp. n. (= *A. savignyi*, Gray, *nec* Aud., = *Zootoca deserti*, Gthr.), Lataste, Le Nat. 1881, p. 357; Boulenger, *l. c.* p. 746, pl. lxiii. fig. 1.

Acanthodactylus tristrami (= *Zootoca tristrami*, Gthr., = *A. dorsalis*, Ptrs.). figured, *ibid.* pl. lxiv. fig. 1.

Acanthodactylus syriacus (= *A. boskianus*, var. *syriacus*, Böttg.), and *schreiberi* (= *A. savignyi*, var. *schreiberi*, Blgr.), spp. nn., *id. l. c.* pp. 745 & 746.

Acanthodactylus inornatus, Gray, = *A. scutellatus*, Aud.; *id. l. c.* p. 744.

Acanthodactylus boskianus figured by Eimer, Arch. f. Nat. xlvii. pl. xv.

Acanthodactylus capensis, Smith (= *Podarces* [*Scaptira*] *cuneirostris*, Strauch), belongs to the genus *Scaptira*; Boulenger, *l. c.* p. 744.

Zonuridæ.

Tachydromus amurensis, sp. n., Peters, SB. nat. Fr. 1881, p. 71, Kissakewitsch, Amurland.

Gerrhosaurus (*Cicigna*) *rufipes*, sp. n., Böttger, Zool. Anz. iv. p. 358, and Abh. senck. Ges. xii. p. 450, pl. i. fig. 3, Nossi Bé, Madagascar.

Pseudopus apus (Pall.), var. n. *ornata*, Böttger, Zool. Anz. iv. p. 571, Morocco.

Cercosauridæ.

Emminia olivacea. Gray, is a *Cercosaura* closely related to *C. ocellata*, Wagl.; O'Shaughnessy, P. Z. S. 1881, p. 228.

Cercosaura (*Pantodactylus*) *argulus*, Peters, described; *id. l. c.* p. 229.

Cercosaura (*P.*) *reticulata*, sp. n., id. *l. c.* p. 230, pl. xxii. fig. 1, Ecuador.

Cercosaura (*Prionodactylus*) *manicata*, subg. & sp. nn., *id. l. c.* p. 231, pl. xxii. fig. 2, Ecuador.

Leposoma buckleyi, sp. n., *id. l. c.* p. 233, pl. xxii., fig. 2, Ecuador.

Ecpleopus (*Euspondylus*) *guentheri*, sp. n., *id. l. c.* p. 235, pl. xxiii. fig. 1, Ecuador.

Scincidæ.

F. Bocourt has proposed a new classification of this family, based

chiefly on the presence or absence and the structure of the osteo-dermal plates, a character not used before for the division of this large family. 39 genera are divided into two large groups, each of which is again split into numerous groups of minor importance. Miss. Sc. Mex., Zool. iii. pp. 476–482.

I. Skin with osteo-dermal plates, ASPIDOSCINCUS.

A. These plates regular, with longitudinal canals anastomosing in the middle with a transverse one.

1. Three canals anteriorly; a pair of supero-nasals. *Euprepisidæ* (gg. *Euprepis*, *Mabuya*, *Otosaurus*, *Riopa*, *Hagria*).
2. Three canals anteriorly; no supero-nasals. *Eumorphusidæ* (gg. *Tropidolepisma*, *Liolepisma*).
3. Four canals anteriorly; a pair of supero-nasals. *Scincidæ* (gg. *Scincus*, *Gongylus*, *Eumeces*, *Amphiglossus*, *Morethia*, *Seps*, *Scelotes*).
4. Four canals anteriorly; no supero-nasals. *Somadrosidæ* (g. *Keneuxia*).

B. The plates irregular; a transverse canal anastomosing with the longitudinal ones; no supero-nasals.

1. Rostral normal. *Lygosomidæ*, (gg. *Lygosoma*, *Mocoa*, *Hinulia*, *Omolepida*, *Heteropus*, *Ablepharus*, *Menetia*, *Cryptoblepharus*, *Lerista*, *Tetradactylus*, *Soridia*).
2. Rostral large. *Acontiadæ* (g. *Acontias*).

C. The plates irregular, without transverse canal; the principal canals radiating from the centre. *Diploglossidæ* (gg. *Diploglossus*, *Celestus*, *Sauresia*, *Ophiodes*, *Anguis*.)

II. Skin without osteo-dermal plates, ANASPIDOSCINCUS.

A. Body normal, covered with large scales; infra-maxillary scutes much developed. *Tretioscincidæ* (gg. *Tretioscincus*, *Gymnophthalmus*, *Epaphelus*).

B. Body much elongate, covered with small, keeled scales; no anterior limbs. *Pygopidæ* (g. *Pygopus*).

C. Body much elongate, covered with small, smooth scales; no limbs; ear-openings. *Lialisidæ* (g. *Liasis*).

D. Body much elongate, covered with small, smooth scales; no limbs; no ear-openings; rostral small. *Aniellidæ* (g. *Aniella*).

E. Body much elongate, covered with small, smooth scales; no limbs; no ear-openings; rostral large. *Typhlinidæ* (g. *Typhline*).

Euprepis perroteti. Remarks upon a variety of this lizard from Socotra; Blanford, P. Z. S. 1881, p. 469.

Mabuya cepedii, Gray, = *Tiliqua ænea*, Gray; O'Shaughnessy, P. Z. S. 1881, p. 236.

Scincus conirostris, sp. n., Blanford, *l. c.* p. 677, Persia.

Eumeces obsoletus (Baird & Gir.), redescribed by Bocourt, Miss. Sc. Mex. p. 443, pl. xxii.*a*, fig. 4, & xxii.*d*, fig. 4. *E. obtusirostris*, sp. n., Bocourt, *l. c.* p. 441, pl. xxii.*d*, fig. 1, Texas.

Sphenops meridionalis, Günther, described and figured by Böttger, Abh. senck. Ges. xii. p. 104, pl. i. fig. 1.

Lygosoma (*Mocoa*) *lateralis* (Say), p. 446, pl. xxii.*f*, fig. 3, *gemmingeri* (Cope), p. 449, and *assata* (Cope), p. 450, pl. xxii.*f*, fig. 7, redescribed by Bocourt, *l. c.*

Lygosoma (*M.*) *guttulatum*, p. 83, and *platynotum*, p. 84, spp. nn., Peters, SB. nat. Fr. 1881, Adelaide.

Ablepharus boutoni, redescribed by Bocourt, *l. c.* p. 464, pl. xxii. *h*, fig. 1.

Ablepharus boutoni, var. n. *cognatus*, Böttger, Zool. Anz. 1881, p. 359, and Abh. senck. Ges. xii. p. 454, pl. ii. fig. 4, Nossi Bé, Madagascar.

Celestus rugosus, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 272, San Domingo. [Omitted from Zool. Rec. xvi.]

Sauresia sepsoides, Gray, described and figured by Bocourt, *l. c.* p. 455, pl. xxii.*g*, fig. 5.

Ophiodes striatus (Spix), redescribed by Bocourt, *l. c.* p. 458, pl. xxii.*g*, fig. 4; *O. vertebralis*, sp. n., *id. l. c.* p. 459, pl. xxii.*g*, fig. 3, S. Brazil and Uruguay.

Tretioscincus bifasciatus (A. Dum.), redescribed by Bocourt, *l. c.* p. 453, pl. xxii.*f*.

Gymnophthalmus maximiliani, Rhdt. & Ltk., p. 467, pl. xxii.*h*, fig. 5, *quadrilineatus* (L.), p. 468, pl. xxii.*h*, fig. 4, *nitidus*, Rhdt. & Ltk., p. 470, and *sumichrasti* (Cope), p. 471, pl. xxii.*h*, fig. 2, described by Bocourt, *l. c.*

Gymnophthalmus plei, p. 473, pl. xxii.*h*, fig. 3, and *luetkeni*, p. 474, spp. nn., *id. l. c.*

Phaneropis, g. n. (*Gymnophthalmidæ*) for *P. muelleri*, sp. n., Fischer, Arch. f. Nat. xlvii. p. 236, pl. xii. figs. 13–15, W. Australia.

Aniella pulchra, Gray, redescribed by Bocourt, *l. c.* p. 460, pl. xxii.*g*, fig. 2.

Lipinia virens, sp. n., Peters, SB. Nat. Fr. 1881, p. 81, New Guinea. *Lipinia* is a genus of Scincids in which the toes are dilated, as in the Geckos and Anoles.

Amphisbænidæ.

A. Strauch publishes a revision of the Lizards of this family, the total number of which is stated to be 49; these are referred to 4 genera, as proposed by Duméril & Bibron. Mél. biol. xi. pp. 355–479.

Chirotes canaliculatus, redescribed by Bocourt, Miss. Sc. Mex. p. 487.

Amphisbæna mertensi, p. 385, habitat unknown, *muelleri*, p. 389, W. Africa, *gracilis*, p. 391, habitat unknown, *steindachneri*, p. 407, Brazil, spp. nn., Strauch, *l. c.*

Pachycalamus, g. n., allied to *Baikia* and *Geocalamus*, Günther, P. Z. S. 1881, p. 461; *P. brevis*, sp. n., *id. l. c.* p. 462, Socotra.

Lepidosternon rostratum, p. 433, Bahia, *petersi*, p. 438, Brazil, *crassum*, p. 443, Brazil, *guentheri*, p. 449, habitat unknown, *dumerili*, p. 467 (= *Phractogonus galeatus*, A. Dum., *nec* Hallow.), W. Africa, and *koppenfelsi*, p. 469, W. Africa, spp. nn., Strauch, *l. c.*

OPHIDIA.

W. Peters makes remarks on the shield-like expansion of the neural spine in several genera of Snakes; SB. nat. Fr. 1881, pp. 49–50.

Typhlopidæ.

W. Peters characterizes this family, and gives a synopsis of the genera; SB. nat. Fr. 1881, pp. 69 & 70.

Typhlops (*Ophthalmidion*) *mucronatus*, Böttger, described and figured by Böttger, Abh. senck. Ges. xii. p. 438, pl. i. fig. 1.

Typhlops (*Onychocephalus*) *riparius*, p. 50, Zambesi, *crassatus*, p. 50, Chinchoxo, and *buchholzi*, p. 71, Mungo, W. Africa, spp. nn., Peters, *l. c.*

Stenostomi.

W. Peters characterizes this family, which includes but two genera, viz., *Stenostoma*, Wagler, and *Siagnodon*, Peters (= *Catodon*, D. & B., *nec* Linn.); SB. nat. Fr. 1881, p. 71.

Catodon dugesi, sp. n., Bocourt, Bull. Soc. Philom. (7) iv. p. 81, Mexico.

Tortricidæ.

Cylindrophis lineatus, sp. n., Blanford, P.Z.S. 1881, p. 217, pl. xx. Singapore.

Boidæ.

Python curtus, Schleg. A specimen from Singapore described by Blanford, P. Z. S. 1881, p. 222.

Colubridæ.

Xenocalamus mechowi, sp. n., Peters, SB. nat. Fr. 1881, p. 147; Malange, W. Africa.

Microsoma collare, sp. n., *id. l. c.* p. 148, Malange.

Adelophis, g. n., distinguished from *Tropidoclonium* in the absence of loreal plate; for *A. copii*, sp. n. (Dugès, MS.), Cope, P. Am. Phil. Soc. xviii. p. 265; Mexico. [Omitted from Zool. Rec. xvi.]

Catachlæna (= *Chataclein*, Jan) *diadema* (D. & B.); a variety from Southern Persia described by Blanford, P. Z. S. 1881, p. 678.

Simotes dennysi, sp. n., Blanford, *l. c.* p. 218, pl. xxi. fig. 1, Singapore.

Ablabes homeyeri, Peters, = *Amphiophis angolensis*, Bocage; Peters, *l. c.* p. 149.

Coronella tritæniata, sp. n., Günther, in Oates's "Matabele Land" (London: 1881, 8vo), p. 329, pl c, S. E. Africa.

Liophis quinquelineatus, sp. n., Günther, Ann. N. H. (5) vii. p. 359, Madagascar.

Pliocercus sargi, sp. n., Fischer, Arch. f. Nat. xlvii. p. 225, pl. xi. figs. 1–3, Guatemala.

Tropidonotus natrix, L. Ninni writes on the varieties observed in the Veneto. Atti Soc. Ital. xxiii. [1880] pp. 70–75.

Aporophis juliæ, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 274, Dominica. [Omitted from Zool. Rec. xvi.]

Alsophis sibonius, sp. n., *id. l. c.* p. 275, Dominica. [Omitted from Zool. Rec. xvi.]

Ungualia hætiana, sp. n., *id. l. c.* p. 273, San Domingo. [Omitted from Zool. Rec. xvi.]

Rhinechis amaliæ, sp. n., Böttger, Zool. Anz. iv. p. 570, Morocco.

Dromicus stumpffi, sp. n., Böttger, *l. c.* p. 358, and Abh. senck. Ges. xii. p. 441, pl. i. fig. 2, Nossi Bé, Madagascar.

Zamenis socotræ, sp. n., Günther, P. Z. S. 1881, p. 463, pl. xli., Socotra.

Herpetodryas lævis, sp n., Fischer, *l. c.* p. 227, pl. xi. figs. 4–6, Guatemala.

Thrasops (*Ahætulla*) *sargi*, sp. n., *id. l. c.* p. 229, pl. xi. figs. 7–9, Guatemala.

Dryophis oatesi, sp. n., Günther, in Oates's "Matabele Land," p. 330, pl. D, S. E. Africa.

Hypsirrhina maculata, Blanf.; the specific name being preoccupied, is changed into *H. maculosa*; Blanford, *l. c.* p. 226.

Ditypophis, g. n., allied to *Tachymenis*, Günther, P. Z. S. 1881, p. 462; *D. vivax*, sp. n., pl. xl., Socotra.

Psammophis biseriatus, p. 88, Taita, E. Africa, and *brevirostris*, p. 89, Xa Matlale, S. E. Africa, spp. nn., Peters, *l. c.*

Dinodon cancellatum, D. & B., = *Lycodon rufozonatus*, Cantor, *id. l. c.* p. 89.

Lycodon napei, D. & B., = *L. striatus* (Shaw); *id. l. c.* p. 90.

Nymphophidium subannulatum (D. & B.) redescribed by Blanford, *l. c.* p. 219.

Pseudoxyrhopus microps, sp. n., Günther, Ann. N. H. (5) vii. p. 359, Madagascar.

Ophites subcinctus. A variety noticed, and the head figured by Blanford, *l. c.* pl. xxi. fig. 2.

Hydrophididæ.

Hydrophis semperi, Garman, Bull. Mus. C. Z. viii. p. 86, Luzon (a fresh-water species); *H. temporalis*, Blanford, P. Z. S. 1881, p. 680, Persian Gulf: spp. nn.

Elapidæ.

Elaps. On its poisonous properties: H. v. Ihering, Zool. Anz. iv. pp. 409–412.

Elaps melanotus, p. 51, and *heterozonus*, p. 52, spp. nn., Peters, SB. nat. Fr. 1881, Ecuador.

Callophis bilineatus, sp. n., Peters, *l. c.* p. 109, Palawan Island, Philippines. The first poisonous Snake recorded from the Philippines.

Naia tripudians. Note on a variety approaching *N. oxiana* (Eichw.); Blanford, J. A. S. B. l. pt. 2, p. 241.

Viperidæ.

In a paper entitled, "Études sur les Vipères du groupe *ammodytes—aspis—berus*," A. Tourneville describes with great details *Vipera berus seoanii*, Lataste, and *V. latastii*, Boscá, and compares these forms with the other European Vipers. A variety of *V. berus seoanii* and the heads of the other species, figured. Bull. Soc. Z. Fr. 1881, pp. 38–72, pl. i.

Rhinocerophis nasus, sp. n., Garman, Bull. Mus. C. Z. viii. p. 86, Eastern Patagonia.

BATRACHIA.

Parker, W. K. On the Structure and Development of the Skull in the Batrachia. Pt. iii. Phil. Tr. clxxii. pp. 1–266, pls. i.–44.

The skulls of 73 species of *Ecaudata* are figured and described, some in the larval as well as the perfect state; these skulls are compared with that of *Rana temporaria*, taken as the "norma" or pattern form. The author also makes remarks on the likeness and unlikeness of the skulls of the *Caudata* and *Ecaudata*.

Retzius, G. Das Gehörorgan der Wirbelthiere. I. Das Gehörorgan der Fische und Amphibien. Stockholm: 1881, 4to, 222 pp., 35 pls.

Pp. 151–213 and pls. xxv.-xxxv. refer to the *Batrachia*.

ECAUDATA.

P. Brocchi (Miss. Sc. Mex. iii. 2, Batr.) criticises the classifications of Duméril, Günther, Cope, and Mivart, and proposes the following arrangement:—

I. Tongue distinct (*Phaneroglossa*).
- A. Teeth in the upper jaw.
  - Fingers not dilated ..... *Raniformes.*
  - Fingers dilated ..... *Hylæformes* [*Hyli-*].
- B. Teeth in both jaws ..... *Hemiphractiformes.*
- C. Teeth none.
  - Sacral vertebra dilated ..... *Bufoniformes.*
  - Sacral vertebra not dilated ..... *Hylaplesiformes.*

II. Tongue not distinct (*Phrynaglossa s. Aglossa*).
- Teeth in the upper jaw ..... *Dactylethriformes.*
- Teeth none ..... *Pipæformes* [*Pipi-*].

Boulenger, G. A. Sur les larves des genres *Pipa* et *Dactylethra*. Bull. Soc. Z. Fr. 1881, pp. 27–29.

Contrary to what has been suspected by Lataste [see Zool. Rec. xvi. *Rept.* p. 14], the larvæ of the *Aglossa* are provided with two spiracula or opercular slits, and are therefore not *Mediogyrines*.

Camerano, L. Osservazioni intorno ad un individuo monstruoso di *Hyla viridis* (Laur.). Atti Acc. Tor. xvi. pp. 83–87.

Héron-Royer, —, & Van Bambeke, C. Sur les caractères fournis par la bouche des têtards des Batraciens Anoures; Communication préliminaire. Bull. Soc. Z. Fr. 1881, pp. 75–81.

The principal characters taken from the structure of the mouth of the European *Ecaudata* are arranged in a synopsis.

Héron-Royer writes on the effects of shade on the development of the tailless Batrachians; Le Nat. 1881, p. 380.

Jourdain, S. Sur les sacs sous-cutanés et les sinus lymphatiques de la région céphalique dans la *Rana temporaria*. C. R. xciii. pp. 597–600.

Klug, F. Ueber die Herznerven des Frosches. Arch. Anat. Phys. 1881, pp. 330–345, pl. xiii.

Lessona, M. Dello Albinismo nei Girini della *Rana temporaria*. Atti Acc. Tor. xvi. pp. 94–98.

Stöhr, P. Zur Entwicklungsgeschichte des Anurenschädels. Z. wiss. Zool. xxxvi. pp. 60–103, pls. ii. & iii.

——. Ueber die Haftorgane der Anurenlarven. SB. Ges. Würzb. 1881, p. 118.

Yung, E. De l'influence de la nature des aliments sur le développement de la Grenouille. C. R. xcii. pp. 1525–1527.

——. De l'influence de la nature des aliments sur la sexualité. *Op. cit.* xciii. pp. 854–856.

Ranidæ.

Rana. W. Peters makes remarks on the African species which are provided with slits for the external vocal sacs, and expresses the opinion that *R. nilotica*, Seetzen, *R. mossambica*, Ptrs., *R. bibroni*, Hallow., and *R. porosissima*, Stdchr., are specifically distinct from *R. mascareniensis*, D. & B.; SB. nat. Fr. 1881, p. 162. *R. abyssinica*, sp. n., *id. l. c.* p. 163, Abyssinia.

According to Böttger, Abh. senck. Ges. xii. p. 113, *Rana bibroni* is distinct from *R. mascareniensis*, as it is said to lack the external vocal vesicles. *R. trinodis*, sp. n., Böttger, *l. c.* p. 114, pl. i. fig. ii., Senegambia.

J. v. Bedriaga considers *Rana fusca*, Rösel, *R. iberica*, Blgr., *R. arvalis*, Nilss., *R. agilis*, Thomas, and *R. latastii*, Blgr., severally as subspecies of *R. temporaria*; Bull. Mosc. lv. pt. 1, p. 300.

Rana fusca honnorati, subsp. n., Héron-Royer, Bull. Ac. Belg. (3) i. p. 139, 2 pls., France.

Rana nigricans, Hallow., pl. iv. fig. 3, *lecontii*, Gir., pl. iv. fig. 1, *vaillanti*, Brocchi (= *R. palmipes*, Spix), pl. ii., *maculata*, Brocchi, pl. iii. fig. 2, *macroglossa*, Brocchi, pl. iii. fig. 1, and *montezumæ*, Bd., pl. iv. fig. 2, figured by Brocchi, Miss. Sc. Mex., Batr.

Rana liebigi, Gthr. Peters describes the copulatory excrescences of the male of this species, for which he uses the name *R. gigas*, Blyth (*nec* Spix); SB. nat. Fr. 1881, p. 162. [These excrescences have been alluded to by Anderson, P. Z. S. 1871, p. 204.—Rec.]

Rana guttulata, sp. n., Boulenger, Ann. N. H. (5) vii. p. 360, Madagascar.

Rana macrodon, Kuhl. Specimens from Singapore described by Blanford, P. Z. S. 1881, p. 225, pl. xxi. fig. 4.

Maltzania, g. n. (= *Pyxicephalus*, Tschudi) for *M. bufonia*, sp. n., Böttger, Abh. senck. Ges. xii. pp. 417 & 418, pl. i. fig. 3, Senegambia.

Limnodytes granulatus, sp. n., Böttger, Zool. Anz. iv. p. 361, and Abh. senck. Ges. xii. p. 499, pl. iv. fig. 16, Nossi Bé, Madagascar.

Limnodytes ulcerosus, Böttg., described and figured; *id. l. c.* p. 502, pl. iv. fig. 17.

Polypedates tephræomystax, A. Dum., redescribed; *id. l. c.* p. 505.

Polypedates dispar, var. n. *leucopleura*, Böttger, Zool. Anz. iv. p. 47, Abh. Ver. Brem. vii. p. 185, and Abh. senck. Ges. xii. pl. v. fig. 18, Madagascar.

Rhacophorus dennysi, sp. n., Blanford, P. Z. S. 1881, p. 224, pl. xxi. fig. 3, China ?.

Hemimantis horrida, Böttg., described and figured by Böttger, Abh. senck. Ges. xii. p. 492, pl. iii. fig. 14.

Rappia. *Hyperolius reuifer* and *rutenbergi*, spp. nn., Böttger, Zool. Anz. 1881, pp. 46 & 47, Abh. Ver. Brem. vii. pp. 187 & 189, and Abh. senck. Ges. xii. pp. 78 & 80, Madagascar.

Hyperolius cinctiventris, Cope. Note by Böttger, Abh. senck. Ges. xii. p. 112.

Megalixalus infra-rufus, Gthr., = *Eucnemis seychellensis*, D. & B.; Peters, SB. nat. Fr. 1881, p. 163.

Hylambates microtympanum, sp. n., Böttger, Zool. Anz. iv. p. 47, Abh. Ver. Brem. vii. p. 185, and Abh. senck. Ges. xii. p. 82, Madagascar.

Dendrobatidæ.

Dendrobates ebenavi, Böttg., described and figured by Böttger, Abh. senck. Ges. xii. p. 519, pl. v. fig. 20.

Stumpffia, g. n., allied to *Dendrobates*, for *S. psologlossa*, sp. n., Böttger, Zool. Anz. iv. p. 360, and Abh. senck. Ges. xii. p. 521, pl. v. fig. 21, Nossi Bé, Madagascar.

Engystomatidæ.

Hypopachus variolosus, Cope, fig. 2, and *inguinalis*, Cope, figs. 3 & 4, figured by Brocchi, Miss. Sc. Mex., Batr., pl. x.

Engystoma ustum, Cope, figured; *id. l. c.* pl. x. fig. 1.

Rhombophryne testudo, Böttg., described and figured by Böttger, Abh. senck. Ges. xii. p. 494, pl. iv. fig. 15.

Dyscophidæ.

Dyscophus sanguineus, Böttg. (= *D. insularis*, var. *antongilii*, Grand.), described and figured; *id. l. c.* p. 489, pl. iii. fig. 13.

Cophyla phyllodactyla, Böttg., described and figured; *id. l. c.* p. 516, pl. v. fig. 19.

Cystignathidæ.

Cystignathus macrodactylus, sp. n. (= *Batrachyla longipes*, Bell), Günther, P. Z. S. 1881, p. 18, Puerto Bueno, Patagonia.

Cystignathus perlævis, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 269, Tehuantepec. [Omitted from Zool. Rec. xvi.]

Leptodactylus caliginosus, Gir., and *albilabris*, Gthr., described by Boulenger, Bull. Soc. Z. Fr. 1881, pp. 30 & 33. The same species figured by Brocchi, Miss. Sc. Mex., Batr., the former as *L. echinatus*, Brocchi, pl. v. fig. 4, the latter as *L. caliginosus*, pl. v. fig. 1. *L. fragilis*, Brocchi, figured; *id. l. c.* pl. v. fig. 2.

Liuperus mexicanus, Brocchi, figured; *id. l. c.* pl. v. fig. 3.

Syrrhopus leprus, sp. n., Cope, *l. c.* p. 268, Tehuantepec. [Omitted from Zool. Rec. xvi.]

Cacotus coppingeri and *calcaratus*, spp. nn., Günther, *l. c.* p. 19, West Coast of Patagonia.

Bufonidæ.

Rhinophrynus rostratus, Brocchi, figured by Brocchi, *l. c.* pl. ix. fig. 1.

Hylidæ.

Hyla perezi, Boscá, figured; Boscá, An. Soc. Esp. x. pl. ii. figs. 7–10.

Hylella platycephala, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 267, Tehuantepec [Omitted from Zool. Rec. xvi.] Remarks on the habits and life coloration of this species by Sumichrast, Bull. Soc. Z. Fr. 1881, p. 232.

Agalychnis moreleti. The skeleton figured by Brocchi, *l. c.* pl. i. fig. 1.

Pelobatidæ.

Scaphiopus solitarius, Holbr., and *dugesi*, Brocchi, figured by Brocchi, *l. c.* pl. ix. figs. 2–4.

Pelodytes punctatus. Remarks upon the copulatory asperities of the breeding male; Boulenger, Bull. Soc. Z. Fr. 1881. pp. 73 & 74, woodcuts.

Discoglossidæ.

Ammoryctis cisternasi. Adult and larva figured by Boscá, An. Soc. Esp. x. pl. ii. figs. 1–6.

CAUDATA.

Blanchard, R. Sur les glandes cloacale et pelvienne et sur la papille cloacale des Batraciens Urodèles. Zool. Anz. iv. pp. 9–14 & 34–39.

Camerano, L. Della scelta sessuale degli Anfibi Urodeli. Atti Acc. Tor. xvi. pp. 214–225.

Fraisse, P. Beiträge zur Anatomie von *Pleurodeles waltli*. Diss. Inaug. Würzburg: 1880, 8vo.

[Omitted from the preceding Record.—Not seen by the Recorder.]

F. Gasco has renewed on the Axolotl his successful investigations on the fecundation of the Newts. During the night the male deposits his spermatophores on the ground. These spermatophores are conical, adhering to the ground by their base; at their summit is a group of spermatozoa. The spermatozoa are then gathered by the gaping lips of the female's cloaca, as in the newts, and fecundation takes place. In one instance the female took five days to deposit her ova; these were 1047 in number. The author is inclined to admit that, contrary to what has been hitherto believed, no cloacal contact takes place in any tailed Batrachian, and that, in those species in which the male clings to the female, this is done only with the object of stimulating her. Zool. Anz. iv. pp. 313–334, and Bull. Soc. Z. Fr. 1881, pp. 151–162.

Hertwig, O. Die Entwicklung des mittleren Keimblattes der Wirbelthiere. 1. Theil. Die holoblastischen Eier. Das mittlere Keimblatt der Amphibien. A. *Triton taeniatus*. Jen. Z. Nat. (n.s.) viii. pp. 288–340, pls. xii.–xv.

F. Lataste brings out a paper on the fecundation in the tailed Batrachians. He particularly analyses Gasco's important memoir on the fecundation of the newts [*cf.* Zool. Rec. xvii. *Rept.* p. 12], and retraces all that is known on copulation in these Batrachians. Copulation takes place normally in the genera *Euproctus*, *Triturus*, *Pleurodeles*, and *Salamandra*. He also adds some observations made by the Recorder on a case of copulation between *Salamandra atra* ♂ and *S. maculosa* ♀; in that case the male lay underneath the female, and not above as stated, probably by mistake, by Schreibers, and quite recently by Pfitzner. Rev. Int. Sci. iv. pp. 158–163.

Schöbl, J. Ueber die Blutgefässe des cerebrospinalen Nervensystems der Urodelen. Arch. mikr. Anat. xx. pp. 87–92, pl. v.

Stirling, W. On some Points in the Histology of the Newt. J. Anat. Phys. xvi. pp. 94 & 95.

——. On the Nerves of the Lungs of the Newt. *L. c.* pp. 96–105, pls. iii. & iv.

J. v. Bedriaga observes that, in 1864, Nauck made remarks on the copulation of newts; Zool. Anz. iv. p. 157.

Euproctus. Camerano remarks upon *E. rusconii* and *E. montanus*, and admits they are distinct species; Zool. Anz. iv. p. 183.

Glossoliga hagenmuelleri, sp. n., Lataste, Le Nat. 1881, p. 371.

Siredon lichenoides. Observations on this species by W. E. Carlin, P. U. S. Nat. Mus. iv. p. 120, and Ann. N. H. (5) viii. p. 235.

APODA.

Uraeotyphlus oxyurus (D. & B.): remarks on the skull of this species by Peters, SB. nat. Fr. 1881, p. 90.

Ichthyophis glutinosus occurs in the Himalayas; Blanford, J. A. S. B. I. pt. 2. p. 243.

PISCES.

BY

G. A. Boulenger.

PHYSIOLOGICAL, ANATOMICAL, AND GENERAL.

For a general account of the development of Fishes, see the late F. M. Balfour's Treatise on 'Comparative Embryology,' vol. ii. (London: 1881, 8vo).

Berger, E. Beiträge zur Anatomie des Fischauges. Vorläufige Mittheilung. Zool. Anz. iv. pp. 258–262.

Cattie, J. T. Vergelijkend-anatomische en histologische Onderzoekingen van de Epiphysis cerebri der *Plagiostomi*, *Ganoidei* en *Teleostei*. Leyden: 1881, 8vo, 104 pp. 3 pls.

[Not seen by the Recorder.]

Gauckler, P. Les Poissons d'eau douce et la Pisciculture. Paris: 1880, 8vo, 299 pp. 37 figs.

[Not seen by the Recorder.]

Hartmann, R. Ueber die Brustflossenmuskeln einiger Fische. SB. nat. Fr. 1881, pp. 150–154.

Klein, —. Beiträge zur Osteologie der Fische. JH. Ver. Württ. xxxvii. pp. 326–360, pl. ii.

Leydig, F. Die augenähnlichen Organe der Fische. Bonn: 1881, 8vo, 100 pp. 10 pls.

In this important work Leydig describes and figures the arrangement of the so-called "eye-like" organs in the following species:—*Gonostoma denudatum*, Raf., *Ichthyococcus ovatus* (Cocco), *poweriæ* (Cocco), *Argyropelecus hemigymnus* (Cocco), *Scopelus rissoi*, Cocco, *humboldti*, Risso, *benoiti*, Cocco, *bonapartii*, C. & V., *rafinesquii*, C. & V., and ? *metopoclampus*, Cocco.

The author's conclusions are:—

1. In certain Fishes, particular organs are arranged so as to resemble the organs of the lateral line.

F. Gasco has renewed on the Axolotl his successful investigations on the fecundation of the Newts. During the night the male deposits his spermatophores on the ground. These spermatophores are conical, adhering to the ground by their base; at their summit is a group of spermatozoa. The spermatozoa are then gathered by the gaping lips of the female's cloaca, as in the newts, and fecundation takes place. In one instance the female took five days to deposit her ova; these were 1047 in number. The author is inclined to admit that, contrary to what has been hitherto believed, no cloacal contact takes place in any tailed Batrachian, and that, in those species in which the male clings to the female, this is done only with the object of stimulating her. Zool. Anz. iv. pp. 313–334, and Bull. Soc. Z. Fr. 1881, pp. 151–162.

Hertwig, O. Die Entwicklung des mittleren Keimblattes der Wirbelthiere. 1. Theil. Die holoblastischen Eier. Das mittlere Keimblatt der Amphibien. A. *Triton taeniatus*. Jen. Z. Nat. (n.s.) viii. pp. 288–340, pls. xii.–xv.

F. Lataste brings out a paper on the fecundation in the tailed Batrachians. He particularly analyses Gasco's important memoir on the fecundation of the newts [*cf.* Zool. Rec. xvii. *Rept.* p. 12], and retraces all that is known on copulation in these Batrachians. Copulation takes place normally in the genera *Euproctus*, *Triturus*, *Pleurodeles*, and *Salamandra*. He also adds some observations made by the Recorder on a case of copulation between *Salamandra atra* ♂ and *S. maculosa* ♀; in that case the male lay underneath the female, and not above as stated, probably by mistake, by Schreibers, and quite recently by Pfitzner. Rev. Int. Sci. iv. pp. 158–163.

Schöbl, J. Ueber die Blutgefässe des cerebrospinalen Nervensystems der Urodelen. Arch. mikr. Anat. xx. pp. 87–92, pl. v.

Stirling, W. On some Points in the Histology of the Newt. J. Anat. Phys. xvi. pp. 94 & 95.

——. On the Nerves of the Lungs of the Newt. *L. c.* pp. 96–105, pls. iii. & iv.

J. v. Bedriaga observes that, in 1864, Nauck made remarks on the copulation of newts; Zool. Anz. iv. p. 157.

Euproctus. Camerano remarks upon *E. rusconii* and *E. montanus*, and admits they are distinct species; Zool. Anz. iv. p. 183.

Glossoliga hagenmuelleri, sp. n., Lataste, Le Nat. 1881, p. 371.

Siredon lichenoides. Observations on this species by W. E. Carlin, P. U. S. Nat. Mus. iv. p. 120, and Ann. N. H. (5) viii. p. 235.

APODA.

Uraeotyphlus oxyurus (D. & B.): remarks on the skull of this species by Peters, SB. nat. Fr. 1881, p. 90.

Ichthyophis glutinosus occurs in the Himalayas; Blanford, J. A. S. B. I. pt. 2, p. 243.

PISCES.

BY

G. A. Boulenger.

PHYSIOLOGICAL, ANATOMICAL, AND GENERAL.

For a general account of the development of Fishes, see the late F. M. Balfour's Treatise on 'Comparative Embryology,' vol. ii. (London: 1881, 8vo).

Berger, E. Beiträge zur Anatomie des Fischauges. Vorläufige Mittheilung. Zool. Anz. iv. pp. 258–262.

Cattie, J. T. Vergelijkend-anatomische en histologische Onderzoekingen van de Epiphysis cerebri der *Plagiostomi*, *Ganoidei* en *Teleostei*. Leyden: 1881, 8vo, 104 pp. 3 pls.

[Not seen by the Recorder.]

Gauckler, P. Les Poissons d'eau douce et la Pisciculture. Paris: 1880, 8vo, 299 pp. 37 figs.

[Not seen by the Recorder.]

Hartmann, R. Ueber die Brustflossenmuskeln einiger Fische. SB. nat. Fr. 1881, pp. 150–154.

Klein, —. Beiträge zur Osteologie der Fische. JH. Ver. Württ. xxxvii. pp. 326–360, pl. ii.

Leydig, F. Die augenähnlichen Organe der Fische. Bonn: 1881, 8vo, 100 pp. 10 pls.

In this important work Leydig describes and figures the arrangement of the so-called "eye-like" organs in the following species:—*Gonostoma denudatum*, Raf., *Ichthyococcus ovatus* (Cocco), *poweriæ* (Cocco), *Argyropelecus hemigymnus* (Cocco), *Scopelus rissoi*, Cocco, *humboldti*, Risso, *benoiti*, Cocco, *bonapartii*, C. & V., *rafinesquii*, C. & V., and ? *metopoclampus*, Cocco.

The author's conclusions are:—

1. In certain Fishes, particular organs are arranged so as to resemble the organs of the lateral line.

2. In spite of this, they do not belong to the system of the lateral line, nor can they be considered as representatives of it.

3. In their structure, they show such differences between one another, that they must be referred to different forms which are termed "eye-like," "pearl-like," and "luminous" organs.

4. The first form, though resembling the eyes of certain Invertebrates, cannot, on closer investigation, be considered as true eyes.

5. The second and third forms, which are quite unlike eyes, cannot, on any account, be associated with these organs of sense.

6. The structure of all these organs is such as to cause hesitation as to whether they have anything to do with organs of sense, as generally understood.

7. On the contrary, there are reasons to believe that these organs should be referred to the group of pseudo-electric, or even truly electric apparatus.

8. Through the "tapetum," these organs can incidently produce light; from an observation on the living animal, it may be surmised that they are phosphorescent. They should consequently be considered simply as luminous organs, or as objects capable of producing light.

LÜTKEN, C. F. Spolia Atlantica. A translation of this memoir in Ann. N. H. (5) vii. pp. 1–14, 107–123.

M'KENDRICK, J. G. On the Respiratory Movements of Fishes (No. 1). J. Anat. Phys. xiv. pp. 461–466, pl. xxviii.

[Omitted from the preceding Record.]

RETZIUS, G. Das Gehörorgan der Wirbelthiere. I. Das Gehörorgan der Fische und Amphibien. Stockholm: 1881, 4to, 222 pp. 35 pls.

Pp. 1–150, and pls. i.–xxiv. refer to the Fishes.

RYDER, J. A. Preliminary Notice of the more important scientific results obtained from a Study of the Embryology of Fishes. Bull. U. S. Fish. Comm. 1881, pp. 22 & 23.

TILLIER, L. Note sur les lois qui régissent la distribution géographique des Poissons de mer. Mém. Soc. Cherb. xxiii. pp. 5–28.

VINCIGUERRA, D. L'Esposizione internazionale di Pesca tenuta in Berlino nel 1880. Relazione a S. E. il Ministro de la Publica Istruzione. Ann. Mus. Genov. xvi. pp. 348–392.

——. Le Emimetamorfosi dei Pesci; cenni bibliografici. Boll. scient. 1880. [Recorded from separate copy.]

On the destruction of Fish by poisonous water in the Gulf of Mexico; J. Y. Porter, P. U. S. Nat. Mus. iv. pp. 121-123.

An analysis of water destructive to Fish in the Gulf of Mexico; F. M. Endlich, *l. c.* p. 124.

On the Fish mortality in the Gulf of Mexico; E. Ingersoll, *l. c.* pp. 74–80; and M. A. Moore, *l. c.* pp. 125 & 126; S. H. Johnson, *l. c.* p. 205.

On the destruction of Fish by polluted waters in the Gulf of Mexico; W. C. W. Glazier, *l. c.* pp. 126 & 127.

Directions for collecting and preserving Fish; T. H. Bean, *l. c.* pp. 235-238.

FAUNÆ.

Arctic Regions.

Hubrecht, A. A. W. List of Fishes collected during the two Cruises of the 'Willem Barents,' 1878–79. Niederl. Arch. Zool. Suppl. i. 5 pp.

A list of 11 species.

Europe.

Lütken, C. Korte Bidrag til nordisk Ichthyographi, iv. & v. Vid. Medd. 1881, pp. 190–256.

Day, F. The Fishes of Great Britain and Ireland.

Two fascicles, pp. 65–240, pls. xxvii.-lxviii., were issued in the course of 1881. They contain the conclusion of the *Cottidæ*, the *Cataphracti*, *Pediculati*, *Trachinidæ*, *Scombridæ*, *Stromateidæ*, *Coryphænidæ*, *Carangidæ*, *Cyttidæ*, *Xiphiidæ*, *Sciænidæ*, *Trichiuridæ*, *Gobiidæ*, *Callionymidæ*, *Discoboli*, *Gobiesocidæ*, *Blenniidæ*, *Cepolidæ*, *Trachypteridæ*, *Atherinidæ*, *Mugilidæ*, and a part of the *Gastrosteidæ*.

——. Observations on some British Fishes. J. L. S. xv. pp. 310–318.

Moreau, E. Histoire naturelle des Poissons de la France. Paris: 1881, 8vo, 3 vols.

A complete systematic work on the Fish-fauna of France.

Klunzinger, C. B. Die Fische in Württemberg, faunistisch-biologisch betrachtet, und die Fischerei-verhältnisse daselbst. JH. Ver. Württ. xxxvii. pp. 172–304.

Blanck, A. Die Fische der Seen und Flüsse Mecklenburgs. Schwerin: 1881, 8vo, 62 pp.

[Not seen by the Recorder.]

Doderlein, P. Manuale ittiologico del Mediterraneo. Palermo: 1881, 8vo.

[Not seen by the Recorder.]

Ninni, P. Gli Anacanthini del Mare Adriatico. Atti Soc. Ital. xxiii. pp. 75-96.

[Omitted from the preceding Record.]

Asia.

Bergroth, E. Anmärkingen om fiskfauna i nedra Irtisch och Ob. Œfv. Ak. Förh. xxii.

A list of, with remarks upon, 18 species of fresh-water Fishes from North-Western Siberia.

SAUVAGE, H. E. Sur une collection de Poissons de Swatow (S. China). Bull. Soc. Philom. (7) v. pp. 104–107.

A list of 68 species, with description of 3 new ones.

——. Recherches sur la Faune Ichthyologique de l'Asie et Description d'espèces nouvelles de l'Indo-Chine. N. Arch. Mus. (2) iv. pp. 123–193, pls. v.–viii.

In the first chapter the author discusses at great length the geographical distribution of Fishes in Asia.

The 'British Burma Gazetteer,' i. pp. 641–697, contains a Catalogue of the Fishes of Burma, compiled from F. Day's 'Fishes of India.'

VINCIGUERRA, D. Prima contribuzione alla Fauna Ittiologica dell' Isola di Borneo. Siluroidei raccolti durante il viaggio dei Signori Mse G. Doria e Dr. O. Beccari. Ann. Mus. Genov. xvi. pp. 161–182.

18 species of *Siluridæ* are enumerated, 2 being described as new.

AFRICA.

HUBRECHT, A. A. W. On a collection of Fishes from the St. Paul's River, Liberia, with description of three new species. Notes Leyd. Mus. iii. pp. 66–71.

A. R. PEREIRA GUIMARAES gives a list of 8 species of Fishes from the interior of Angola. J. Sc. Lisb. 1881, pp. 133–136.

SAUVAGE, H. E. Etude sur la Faune Ichthyologique de l'Ogôoué N. Arch. Mus. (2) iii. [1880] pp. 1–56, pls. i.–iii.

The author discusses the geographical distribution of the fresh-water Fishes in Africa.

LUNEL, G. Liste de quelques espèces de poissons, nouvelles pour la Faune de l'Ile Maurice. Mém. Soc. Phys. Genèv. xxvii. pp. 266–303, 1 pl.

AUSTRALIA AND POLYNESIA.

MACLEAY, W. Descriptive Catalogue of the Fishes of Australia. P. Linn. Soc. N.S.W. v. pp. 302–444, & vi. pp. 1–138, & 202–387.

GÜNTHER, A. Fische der Südsee. vii. J. Mus. Godeffr. xv. pp. 217–256, pls. cxxi.–cxl.

Contains the conclusion of the *Mugilidæ*, the *Fistulariidæ*, *Centriscidæ*, *Gobiesocidæ*, *Trachypteridæ*, *Pomacentridæ*, and *Labridæ*.

NORTH AMERICA.*

GOODE, G. B. Fishes from the deep water of the South Coast of New England obtained by the U. S. Fish. Commission in the summer of 1880. P. U. S. Nat. Mus. iii. pp. 467–486 (also pp. 337–350).

This paper enumerates 51 species.

* The Recorder has the pleasure of acknowledging help received from Professor D. S. Jordan, who has kindly assisted him with a list of the Ichthyological works published in the United States.

HOBBS, O. A List of Ohio River Fishes sold in the markets. Bull. U. S. Fish. Comm. 1881, pp. 124 & 125.

HAY, O. P. On a Collection of Fishes from Eastern Mississippi. P. U. S. Nat. Mus. iii. pp. 488–515.

56 species, 15 being described as new.

JORDAN, D. S. Notes on a Collection of Fishes from St. John's River, Florida, obtained by Mr. A. H. Curtiss. P. U. S. Nat. Mus. iii. p. 22 [1880].

——. Notes on a Collection of Fishes from East Florida, obtained by Dr. J. A. Henshall. P. U. S. Nat. Mus. iii. pp. 17–21 [1880].

COPE, E. D. On the Zoological position of Texas. Bull. U. S. Nat. Mus. No. 17 [1880].

[Not seen by the Recorder.]

JORDAN, D. S., & GILBERT, C. H. Notes on a Collection of Fishes from Utah Lake. P. U. S. Nat. Mus. iii. pp. 459–465.

Remarks on 13 species, 4 being new.

——, & JOUY, P. L. Check-List of Duplicates of Fishes from the Pacific Coast of North America, distributed by the Smithsonian Institution in behalf of the United States National Museum, 1881. *Op. cit.* iv. pp. 1–18.

A list of 245 species, with localities and numbers.

JORDAN, D. S., & GILBERT, C. H. List of the Fishes of the Pacific Coast of the United States, with a table showing the distribution of the species. *Op. cit.* iii. pp. 452–458.

The number of species amounts to 270.

——, ——. Notes on the Fishes of the Pacific Coast of the United States. *Op. cit.* iv. pp. 29–70.

A list of the species of Fishes known to occur along the Pacific Coast, between the Mexican boundary and the boundary of British Columbia, together with notes on the distribution, size, value, &c., of each species. This list is presented in advance of the publication of a general descriptive work.

BEAN, T. H. Check-List of Duplicates of North-American Fishes distributed by the Smithsonian Institution in behalf of the United States National Museum, 1877–80. *Op. cit.* iii. pp. 75–116 [1880].

——. Descriptions of (14) new Fishes from Alaska and Siberia. *Op. cit.* iv. pp. 144–159.

——. A Preliminary Catalogue of the Fishes of Alaskan and adjacent Waters. *L. c.* pp. 239–272.

CAMPBELL, J. B. Notes on M'Cloud River, California, and some of its Fishes. Bull. U. S. Fish. Comm. 1881, pp. 44–46.

JORDAN, D. S., & GILBERT, C. H. Notes on a Collection of Fishes from San Diego, California. P. U. S. Nat. Mus. iii. pp. 23–34 [1880].

2 new genera and 3 new species are described.

——, ——. Notes on Sharks from the Coast of California. *L. c.* pp. 51 & 52 [1880].

LOCKINGTON, W. N. List of the Fishes collected by Mr. W. J. Fisher upon the Coast of Lower California, 1876–77. P. Ac. Philad. 1881, pp. 113–120.

4 species described as new.

JORDAN, D. S., & GILBERT, C. H. Notes on a Collection of Fishes, made by Lieut. H. E. Nicholls, U.S.N., on the West Coast of Mexico, with descriptions of (5) new species. P. U. S. Nat. Mus. iv. pp. 225–233.

WEST INDIES.

F. POEY, in Gundlach's Apuntes para la Fauna Puerto-Riqueña, iv. Peces, An. Soc. Esp. x. pp. 317–350, enumerates the (106) species of Fishes of Porto-Rico. 1 genus and 2 species are described as new.

SOUTH AMERICA.

STEINDACHNER, F. Beiträge zur Kenntniss der Flussfische Südamerika's, ii. Denk. Ak. Wien, xliii. pp. 103–146, pls. i.–vii.

This contribution contains descriptions of 16 new species.

GÜNTHER, A. List of the Fishes collected during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. P. Z. S. 1881, pp. 19–22, pls. i. & ii.

PALÆICHTHYES.

CHONDROPTERYGII.

BALFOUR, F. M. [the late]. On the Development of the Skeleton of the Paired Fins of *Elasmobranchii*, considered in relation to its Bearings on the Nature of the Limbs of the Vertebrata. P. Z. S. 1881, pp. 656–671, pls. lvii. & lviii.

BENDA, C. Die Dentinbildung in den Hautzähnen der Salachier. Arch. mikr. Anat. xx. pp. 246–270, pl. xvi.

HERMANN, G. Sur la spermatogénèse chez les Sélaciens. C. R. xciii. pp. 858–860.

MARSHALL, A. M. On the Head-cavities and Associated Nerves of Elasmobranchs. Q. J. Micr. Soc. (n.s.) xxi. pp. 72–97.

——, & SPENCER, W. B. Observations on the Cranial Nerves of *Scyllium*. Q. J. Micr. Soc. (n.s.) xxi. pp. 469–499.

TURNER, W. The Structure of the comb-like Branchial Appendages and of the Teeth of the Basking Shark (*Selache maxima*). J. Anat. Phys. xiv. pp. 273–286, pl. xii.

Galeorrhinus galeus. (*Galeus canis*, Rond.) On its occurrence on the Coast of Southern California; Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 42 [1880].

Galeus australis, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 354, Port Jackson.

Mustelus vulgaris?, Müll. & Henle, described by Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 283.

Hexanchus corinus, sp. n., Jordan & Gilbert, *l. c.* p. 352 [1880], Pacific Coast of the United States.

Chiloscyllium furvum, sp. n., Macleay, *l. c.* p. 364, Port Jackson.

Cephaloscyllium laticeps (Dum.). On its occurrence on the Coast of California, Jordan & Gilbert, *l. c.* p. 40 [1880].

Heptranchias maculatus. Two young specimens from Soquel described by Jordan and Gilbert, *l. c.* p. 353 [1880]. The jaws of the adult, from Humboldt Bay, described, *ibid.* p. 354.

Acanthias megalops, sp. n., Macleay, *l. c.* p. 367, Port Jackson.

S. Garman gives a synopsis and descriptions of the American *Rhinobatidæ*, P. U. S. Nat. Mus. iii. pp. 516–523.

Discobatus (= *Platyrrhina*) is considered as forming a new family, *Discobatidæ*, or sub-family of the *Rhinobatidæ*; Garman, *l. c.* p. 523.

Platyrrhina triseriata, sp. n, Jordan & Gilbert, *l. c.* p. 36 [1880], Santa Barbara, California.

Platyrrhina exasperata, sp. n., Jordan & Gilbert, *l. c.* p. 32 [1880], San Diego, California.

Zapteryx, g. n., *iid. l. c.* p. 53, for the last named species.

Platyrhinoidis, g. n. for *P. triseriata*, Jordan & Gilbert, 1880; S. Garman, *l. c.* p. 552.

Raia inornata. Note by Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 73.

Raia stellulata, p. 133, and *rhina*, p. 251, spp. nn., Jordan & Gilbert, *l. c.* iii. [1880], California; *R. parmifera*, sp. n., Bean, *op. cit.* iv. p. 157, Alaska.

Dasybatis dipterurus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 31 [1880], San Diego, California.

Myliobatis australis, sp. n., Macleay, *l. c.* p. 380, Port Jackson.

GANOIDEI.

PARKER, W. K. On the Structure and Development of the Skull in Sturgeons (*Acipenser ruthenus* and *A. sturio*). Abstract in P. R. Soc. 1881, pp. 142–145.

SALENSKY, W. Recherches sur le développement du Sterlet (*Acipenser ruthenus*). Arch. biol. ii. pp. 233–341, pls. xv.–xviii.

A translation of the memoir published in Russian in Mem. Soc. Nat. Kasan, 1879.

SCHNEIDER, H. Ueber die Augenmuskelnerven der Ganoiden. Jen. Z. Nat. (n.s.) viii. pp. 215–242, pls. vii. & viii.

TELEOSTEI.

BENNETT, F. W. On a Communication between the Air-bladder and the Cloaca in the Herring. J. Anat. Phys. xiv. pp. 405 & 406.

[Omitted from the preceding Record.]

GENSCH, H. Die Blutbildung auf dem Dottersack bei Knochenfischen. Vorläufige Mittheilung. Arch. mikr. Anat. xix. pp. 144–146.

HOFFMANN, C. K. Zur Ontogenie der Knochenfische. Verh. Ak. Amst. xxi. pp. 1–168, pls. i.–vii.

JOURDAN, E. Sur les organes du gout des Poissons osseux. C. R. xcii. pp. 743–745.

MACLEOD, J. Recherches sur la Structure et le Développement de l'Appareil reproducteur de la Femelle des Téléostéens. Arch. biol. ii. pp. 497–530, pls. xxix. & xxx.

MAYSER, P. Vergleichend anatomische Studien über das Gehirn der Knochenfische mit besonderer Berücksichtigung der Cyprinoiden. Z. wiss. Zool. xxxvi. pp. 259–364, pls. xiv.–xxiii.

NUSBAUM, J. Ueber das anatomische Verhältniss zwischen dem Gehörorgane und der Schwimmblase bei den Cyprinoiden. Zool. Anz. iv. pp. 552–556.

RIESS, J. A. Der Bau der Kiemenblätter bei den Knochenfischen. Arch. f. Nat. 1881, pp. 518–550, pls. xvi.–xviii.

VIGNAL, W. Note sur l'Anatomie des centres nerveux du Mole, *Orthagoriscus mola*. Arch. Z. expér. ix. pp. 370–386, pl. xxi.

ZELINKA, C. Ueber die Nerven in der Cornea der Knochenfische. Vorläufige Mittheilung. Zool. Anz. iv. pp. 338 & 339.

ACANTHOPTERYGII.

PERCIDÆ.

Lates ramsayi, sp. n., Macleay, P. Linn. Soc. N. S. W. v. p. 306, Parramatta River.

Boleosoma phlox, sp. n., Cope, Bull. U. S. Nat. Mus. xvii. [1880], p. 30, Trinity River.

Pœcilichthys artesiæ, p. 494, and *saxatilis*, p. 495, spp. nn., Hay, P. U. S. Nat. Mus. iii., E. Mississippi.

Vaillantia chlorosoma, sp. n., *id. l. c.* p. 495, E. Mississippi.

Ammocrypta gelida, sp. n., *id. l. c.* p. 490, E. Mississippi.

Microperca præliaris, sp. n., *id. l. c.* p. 496, E. Mississippi.

Hadropterus spillmani, sp. n., *id. l. c.* p. 491, E. Mississippi.

Nanostoma elegans, sp. n., *id. l. c.* p. 493, E. Mississippi.

Serranus zanana, C. & V., var. ?, described by Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 289.

Plectropoma sebastoides (Casteln.), described and figured by Steindachner, SB. Ak. Wien, 1881, p. 201, pl. i.

Mesoprion obscurus, Endeavour River, *roseigaster*, Rockingham Bay, spp. nn., Macleay, *l. c.* p. 331.

Lutjanus (*Mesoprion*) *maltzani*, sp. n., Steindachner, Anz. Ak. Wien, p. 158, Goree & Rufisque.

Dentex canariensis, sp. n., Steindachner, *l. c.* p. 99, Canary Islands.

Glaucosoma fauveli, sp. n., Sauvage, Bull. Soc. Philom. (7) v. p. 104, S. China.

Ambassis elevatus, sp. n., Macleay, *l. c.* p. 338, Endeavour River.

Pseudoambassis castelnaui, p. 339, Murrumbidgee, *ramsayi*, p. 340, Port Jackson, and *jacksoniensis*, p. 340, Port Jackson, spp. nn., Macleay, *l. c.*

Apogon ellioti, Day. On its geographical range; Day, P. Z. S. 1881, p. 650.

Apogon pandionis, sp. n., Goode & Bean, P. U. S. Nat. Mus. iv. p. 160, off Chesapeake Bay.

Apogonichthys roseo-brunneus, sp. n., Macleay, *l. c.* p. 348, N. Queensland.

Nannoperca riverinæ, sp. n., *id. l. c.* p. 342, Australia.

Micropterus salmoides, Lacép., and *dolomieus*, Lacép., Book of the 'Black Bass,' by J. A. Henshall, Cincinnati, 1881, 8vo, 463 pp. [Not seen by the Recorder.]

A review of the genera and species of the family *Centrarchidæ*, by C. L. McKay, P. U. S. Nat. Mus. iv. pp. 87–93.

Lepomys euryorus, sp. n., McKay, *l. c.* p. 89, Fort Gratiot, Michigan.

Dules haswelli, sp. n., Macleay, *l. c.* p. 359, Rockingham Bay.

Therapon truttaceus, p. 366, Endeavour River, *nigripinnis*, p. 366, Rockingham Bay, and *longulus*, p. 367, Port Darwin, spp. nn., Macleay, *l. c.*

Pristipoma kneri, Stdchr., = *P. cantharinum*, Jen.; Steindachner, SB. Ak. Wien, 1881, p. 216.

Squamipinnes.

Chætodon hæfleri, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 158 Goree.

Tilodon, g. n., (Guichenot, MS.) Thominot, Bull. Soc. Philom. (7) v. p. 140. *T. australis*, sp. n., *id. ibid.*, Australia.

Loidyxodon, g. n., allied to *Pimelepterus*, (Guichenot, MS.) Thominot, *l. c.* p. 141. *D. australis*, sp. n., *id. l. c.* p. 142, Australia.

Mullidæ.

Mullus erythræus, sp. n., Sauvage, Bull. Soc. Philom. (7) v. p. 101, Red Sea.

Sparidæ.

Girella cyanea and *ramsayi*, spp. nn., Macleay, P. Linn. Soc. N. S. W. v. p. 409, Port Jackson.

Sargus pourtalesi, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 160, Galapagos Islands. *Sargus holubi*, sp. n., *id.* SB. Ak. Wien, 1881, p. 208, Algoa Bay.

Sparus brachysomus, sp. n., Lockington, P. U. S. Nat. Mus. iii. p. 284 [1880], Lower California.

Pagrus filamentosus: C. & V., described by Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 291.

Pagrus laticeps, C. & V., described by Steindachner, *l. c.* p. 205.

Pagrus (*Chrysophrys*) *holubi*, sp. n., *id. l. c.* p. 203, pl. ii., Algoa Bay.

Pimelepterus lutescens, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 229, off the W. Coast of Mexico.

Cirrhitidæ.

Mendosoma allporti, sp. n., Johnston, Papers, Pr. & Rep. R. Soc. Tasm. 1880, p. 54, Derwent River.

Scorpænidæ.

Scorpæna senegalensis, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 159, Rufisque.

Sebastes oculatus, C. & V., = *S. capensis* (L.); *id.* SB. Ak. Wien, 1881, p. 216.

Sebastichthys mystinus, J. & G., redescribed by Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 70.

Sebastichthys chrysomelas, sp. n., *iid. l. c.* p. 465, California.

Sebastichthys serriceps, p. 38, *miniatus*, p. 70, *carnatus*, p. 73, *entomelas*, p. 142, *rhodochloris*, p. 144, *atro-virens*, p. 289, *rubricinctus*, p. 291, *vexillaris*, p. 292, *chlorostictus*, p. 294, *constellatus*, p. 295, *rastrelliger*, p. 296, *fasciolaris*, p. 297, *maliger*, p. 322, and *proriger*, p. 327, spp. nn., *iid. op. cit.* iii. [1880], California.

Berycidæ.

Trachichthys macleayi, sp. n., Johnston, Papers, Pr. & Rep. R. Soc. Tasm. 1880, p. 56, Derwent River.

Polynemidæ.

Polynemus melanopus, p. 101, Saigon, and *astrolabi*, p. 102, Isle de France, spp. nn., Sauvage, Bull. Soc. Philom. (7) v.

Sciænidæ.

Micropogon ornatus, Gthr., = *Genyanemus brasiliensis*, Stdchr.; Steindachner, SB. Ak. Wien, 1881, p. 215.

Sciæna aluta, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 232, San Salvador.

Corvina fauveli, sp. n., Sauvage, Bull. Soc. Philom. (7) v. p. 105, S. China.

Roncador, g. n. for *Corvina stearnsi*, Stdchr.; Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 28 [1880].

Monosira, g. n., for *M. stahli*, sp. n., Poey, An. Soc. Esp. x. p. 326, pl. vi., Porto Rico.

Carangidæ.

Notes on the *Carangidæ* of the United States by G. B. Goode, Bull. U. S. Fish. Comm. 1881, pp. 30–44.

Caranx beani, sp. n., Jordan, P. U. S. Nat. Mus. iii. p. 486, Beaufort, North Carolina.

Caranx orthogrammus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 226, off W. Coast of Mexico.

Caranx lugubris, Poey, described; *iid. l. c.* p. 227.

Caranx melampygus, C. & V., described; *iid. l. c.* p. 230.

Caranx affinis, Rüpp. (= *C. hasselti*, Blkr.), var., described; Steindachner, SB. Ak. Wien, 1881, p. 211.

Seriola lalandii ?, C. & V., described; Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 271.

Seriola peruana, sp. n., Steindachner, *l. c.* p. 100, Callao.

Porthmeus argenteus = *Lichia amia*, juv.; Lütken, Vid. Selsk. Skr. 1881, pp. 507 & 600.

Sparactodon nalnal, Rochebrune, = *Temnodon saltator*; Steindachner, *l. c.* p. 160.

Coryphænidæ.

Schedophilopsis, g. n., allied to *Schedophilus*; Steindachner, Anz. Ak. Wien, 1881, p. 100. *S. spinosus*, sp. n., *id. ibid.* California.

Scombridæ.

Auxis rochii. Note on the 'Frigate Mackerel' on the New England Coast; G. B. Goode, P. U. S. Nat. Mus. iii. pp. 532–535.

Cybium maculatum. An account of its development by J. A. Ryder, Bull. U. S. Fish. Comm. 1881, pp. 135–173, pls. i.–iv.

Trachinidæ.

Triclodon japonicus, sp. n., Steindachner, SB. Ak. Wien, 1881, p. 182, pl. iv. fig. 1, Sea of Japan.

Note on the Latiloid genera by T. Gill, P. U. S. Nat. Mus. iv. pp. 162–164. A defence of the use of *Caulolatilus* instead of *Dekaya*, the latter being pre-occupied in Corals.

Lopholatilus chamæleonticeps, Goode & Bean. Notes upon colour and internal structure by Goode, P. U. S. Nat. Mus. iii. p. 482.

Psychrolutidæ.

Neophrynichthys latus, Hutton, figured by Günther, P. Z. S. 1881, pl. i.

Pediculati.

Mancalias uranoscopus (Murray). Remarks by Goode, P. U. S. Nat. Mus. iii. p. 469.

Antennarius inops, sp. n., Poey, An. Soc. Esp. x. p. 340, Porto Rico.

Halieutæa senticosa, sp. n., Goode, *l. c.* p. 467, South Coast of New England.

Cottidæ.

Cottus labradoricus (Gir.) described by Bean, P. U. S. Nat. Mus. iv. p. 128.

Cottus humilis, p. 149, *niger*, p. 151, and *verrucosus*, p. 152, E. Siberia, Arctic Ocean, spp. nn., Bean, *l. c.*

Centridermichthys elegans, p. 185, pl. vi. fig. 1, *elongatus*, p. 186, pl. vi. fig. 2, and *japonicus*, p. 187, pl. vii. fig. 1, spp. nn., Steindachner, SB. Ak. Wien, 1881, Japan.

Chitonotus, g. n., allied to *Artedius*, Girard. *C. megacephalus*, sp. n., Lockington, P. U. S. Nat. Mus. iv. pp. 141 & 142, California.

Prionotus stephanophrys, sp. n., *id. op. cit.* iii. p. 529, Coast of California.

Potamocottus bendirii, sp. n., Bean, *l. c.* p. 27, Rattlesnake Creek, Oregon.

Hemilepidotus jordani, sp. n., *id. l. c.* p. 153, E. Siberia.

Gymnacanthus galeatus, sp. n., *id. ibid.* E. Siberia.

Uranidea microstoma, Lockington, P. U. S. Nat. Mus. iii. p. 58 [1880], Alaska, and *marginata*, Bean, *l. c.* iv. p. 26, Walla Walla River: spp. nn.

Oligocottus analis, Gir., described by Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 25 [1880].

Ascelichthys, g. n., distinguished from all the known genera of the family by the absence of the ventral fins. *A. rhodorus*, sp. n., Jordan & Gilbert, *l. c.* p. 264, Neah Bay, Washington Territory.

Amitra, g. n., considered to form one of the most abnormal types of *Cottidæ*, approached through *Cottunculus* and *Psychrolutes*, and also closely allied to *Liparidæ*. *A. liparina*, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 478, South Coast of New England.

Cataphracti.

Agonus vulsus, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 330 [1880], Coast of California.

Agonus barkani, Stdchr., = *Brachyopsis verrucosus*, Lock.; *A. annæ*, Stdchr., = *B. xyosternus*, Jordan: Steindachner, SB. Ak. Wien, 1881, p. 184.

Setarches parmatus, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 480, South Coast of New England.

Brachyopsis verrucosus, sp. n., Lockington, P. U. S. Nat. Mus. iii. p. 60 [1880], Coast of California; *B. xyosternus*, sp. n., Jordan & Gilbert, *l. c.* p. 152, Monterey Bay, California.

Peristedium miniatum, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 349 [1880], Southern New England Coast.

Discoboli.

Cyclopterichthys, g. n., forming a link between the *Cyclopterina* and *Liparidina*, for *C. glaber*, sp. n., Steindachner, SB. Ak. Wien, 1881, p. 192, pl. viii. "Ochotskisches Meer."

Liparis gibbus, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 148, Bering Strait.

Gobiidæ.

Gobius minutus, var. *minor*. Note on the eggs of this fish by De Saint-Joseph, Bull. Soc. Philom. (7) v. p. 30.

Gobius sella, sp. n. (Heck. MS.), Steindachner, SB. Ak. Wien, 1881, p. 212, Borneo.

Gobius canalæ, sp. n., Sauvage, *l. c.* p. 102, Canala, New Caledonia.

Tridentiger bifasciatus, sp. n., Steindachner, *l. c.* p. 191, pl. vii. fig. 2, Sea of Japan.

Othonops eos, sp. n., Rosa Smith, P. U. S. Nat. Mus. iv. p. 19, San Diego, California (= *Typhlogobius californiensis*, Stdchr., according to a later note, *l. c.* p. 140).

Periophthalmus. On the mode of locomotion of these fish; E. von Martens, SB. nat. Fr. 1881, p. 160.

Heterolepidotidæ.

Chirus. Remarks on the (four) species of this genus found in San Francisco market, including one hitherto undescribed, *C. maculo-seriatus*, sp. n., p. 55; Lockington, P. U. S. Nat. Mus. iii. pp. 53–57 [1880].

Hexagrammus scaber, sp. n. (?), Bean, P. U. S. Nat. Mus. iv. p. 154, Alaska.

Xiphister chirus, p. 135, and *rupestris*, p. 137, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. iii. [1880], Monterey, California.

Myriolepis, g. n., forming a distinct sub-family in the *Chiridæ*, differing especially in the shorter anal fin without distinct spines; *M. zonifer*, sp. n., Lockington, *l. c.* p. 248, Monterey Bay, California.

Blenniidæ.

Blennius trigloides, C. & V., described and figured by L. Facciola, Ann. Soc. Mod. (2) xiv. p. 209, fig. 1.

Blennius canestrinii, sp. n., *id. l. c.* p. 212, fig. 2, Sea of Messina.

Blennius castaneus, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 5, Port Jackson.

Petroscirtes fasciolatus, p. 8, *guttatus*, p. 9, *rotundiceps*, p. 9, and *cristiceps*, p. 9, spp. nn., Port Jackson; Macleay, *l. c.*

Salarias reuteri, sp. n., H. Lenz, Zool. Anz. iv. p. 506, Nossi Bé.

Salarias cheverti, sp. n., Macleay, *l. c.* p. 12, Darnley Island.

Lepidoblennius geminatus, sp. n., *id. l. c.* p. 13, Port Jackson.

Cristiceps fasciatus, p. 19, Port Jackson, *pictus*, p. 25, Port Jackson, *pallidus*, p. 26, King George's Sound, spp. nn., *id. l. c.*

Cremnobates integripinnis, sp. n., Rosa Smith, P. U. S. Nat. Mus. iii. p. 147 [1880], San Diego, California.

Cremnobates altivelis, sp. n., Lockington, P. Ac. Philad. 1881, p. 116, La Paz, Lower California.

Stichæus enneagrammus, Kner, described by Steindachner, SB. Ak. Wien, 1881, p. 188.

Stichæus? rothrocki, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 146, Siberia and Alaska, Arctic Ocean.

Apodichthys fucorum, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 139, Monterey, California.

Apodichthys univittatus, sp. n., Lockington, *l. c.* p. 119, Gulf of California.

Pholidichthys anguilliformis, sp. n., *id. l. c.* p. 118, Gulf of California.

Opisthocentrus reticulatus, sp. n., Steindachner, SB. Ak. Wien, 1881, p. 189, pl. v. fig. 2, Sea of Japan.

Murænoides maxillaris, n. (?) sp., Bean, P. U. S. Nat. Mus. iv. p. 147, St. Paul Island, Bering Sea.

Icosteus, g. n., referred with doubt to the *Blenniidæ*; Lockington, P. U. S. Nat. Mus. iii. p. 63 [1880], for *I. enigmaticus*, sp. n., *id. ibid.*, Coast of California.

Icichthys, g. n., allied to *Icosteus*, Lockington, but distinguished by a scaly body. *I. lockingtoni*, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 305 [1880], Coast of California.

Mastacembelidæ.

Mastacembelus marchii, Sauv., figured by Sauvage, N. Arch. Mus. (2) iii. pl. i. fig. 1 [1880].

Ptilichthys, g. n., ? Mastacembelid, Bean, P. U. S. Nat. Mus. iv. p. 157; *P. goodii*, sp. n., *id. ibid.*, Alaska.

Atherinidæ.

Leuresthes, g. n. for *Atherina tenuis*, Ayres; Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 29 [1880].

Mugilidæ.

Mugil compressus, Gthr., pl. cxxiii. fig. A, and *crenilabris*, Forsk., pl. cxxii. fig. A, figured by Günther, Fische der Südsee, vii.

Myxus leuciscus, Gthr., figured; *id. l. c.* pl. cxxi. fig. C.

Gastrosteidæ.

Gastrosteus quadracus. Notes on its development, spinning habits, and structure; J. A. Ryder, Bull. U. S. Fish. Comm. 1881, pp. 24–29.

Fistulariidæ.

Aulostoma chinense, Schleg., figured by Günther, Fische der Südsee, vii. pl. cxxiii. figs. B C.

Aulichthys, Gill, = *Aulorrhynchus*; Steindachner, SB. Ak. Wien, 1881, p. 179.

Aulichthys japonicus (Brev.), described; *id. ibid.*

Centriscidæ.

Amphisile strigata, Gthr., figured by Günther, Fische der Südsee, vii. pl. cxxv. fig. G.

Gobiesocidæ.

Gobiesox rhessodon, sp. n., Rosa Smith, P. U. S. Nat. Mus. iv. p. 140, San Diego, California.

Labyrinthici.

Osphromenus microlepis, Gthr., described; Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 299.

Micracanthus marchii, Sauv., figured; Sauvage, N. Arch. Mus. (2) iii. pl. iii. fig. 4 [1880].

Trichopus parvipinnis, Sauv., figured; *id. op. cit.* iv. pl. vi. fig. 3.

Trachypteridæ.

Trachypterus arcticus. Notes by Lütken, Vid. Medd. 1881, p. 190.

Notacanthidæ.

Notacanthus, Bloch. The genus characterized with *N. phasganorus*, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 535, Newfoundland.

ACANTHOPTERYGII PHARYNGOGNATHI.

Pomacentridæ.

Amphiprion ephippium, Bloch, pl. cxxii. figs. C, D, and *percula* (Lacép.), pl. cxxiv. fig. A, figured by Günther, Fische der Südsee, vii.

Pomacentrus semifasciatus, sp. n., Günther, *l. c.* p. 226, pl. cxxv. fig. F, Boston Island.

Pomacentrus pavo (Bloch), pl. cxxiv. fig. E; *scolopsis*, G. & G., pl. cxxv. figs. A, B; and *lividus* (Forst), pl. cxxiv. fig. F, figured, *id. ibid.*

Pomacentrus dolii, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 65, pl. i. fig. 1, Port Jackson.

Dascyllus aruanus (L.), fig. B, *melanurus*, Blkr., fig. D, and *xanthosoma*, Blkr., fig. C, figured by Günther, *l. c.* pl. cxxiv.

Glyphidodon saxatilis (L.), pl. cxxvi., *dicki*, Lien., pl. cxxv. fig. C, *lacrymatus*, G. & G., pl. cxxv. fig. D, *browneriggii* (Benn.), pl. cxxvii., *uni-ocellatus*, G. & G., pl. cxxviii. fig. A, and a hybrid between *browneriggii* and *uni-ocellatus*, pl. cxxviii. fig. B; figured by Günther, *l. c.*

Glyphidodon hœfleri, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 159, Goree.

Heliastes dimidiatus, Klunz., p. 125, fig. B, and *lepidurus*, pl. cxxviii. figs. C, D, figured by Günther, *l. c.*

Labridæ.

Labrus maculatus, Bloch. Remarks on its varieties by F. Day, J. L. S. xv. p. 312.

Labrichthys dorsalis, p. 87, Port Jackson, *labiosa*, p. 88, pl. i. fig. 2, Port Jackson, *maculata*, p. 89, King George's Sound, *melanura*, p. 89, Port Jackson, and *rubicunda*, p. 89, King George's Sound, spp. nn., Macleay, P. Linn. Soc. N. S. W. vi.

Cossyphus axillaris (Benn.), pl. cxxviii. fig. E, *macrurus* (Lacép.), pl. cxxix. fig. A, *bilunulatus* (Lacép.), pl. cxxx., and *modestus* (Garrett), pl. cxxix. fig. B, figured by Günther, Fische der Südsee, vii.

Chilinus trilobatus, Lacép., pl. cxxxi., *chlorurus* (Bloch), pl. cxxxii., *undulatus*, Rüpp., pl. cxxxiii., *fasciatus* (Bloch), pl. cxxxiv., and *radiatus* (Bloch), pl. cxxxv. fig. A, figured; *id. l. c.*

Chilinus hexagonatus, sp. n., *id. l. c.* p. 247, pl. cxxxv. fig. B, Sandwich Islands.

Pseudochilinus hexataenia, Blkr., figured; *id. l. c.* pl. cxxxvi. fig. B.

Epibulus insidiator (Pall.), figured; *id. l. c.* pl. cxxxvii.

Anampses cæruleo-punctatus, Rüpp., pl. cxxxviii., *cuvieri*, G. & G., pl. cxxxvi. fig. A, and *diadematus*, Rüpp., pl. cxxxix., figured; *id. l. c.*

Anampses godeffroyi, sp. n., *id. l. c.* p. 252, pl. cxl., Sandwich Islands.

Platyglossus nicholsi, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 231, off the W. Coast of Mexico.

Stethojulis axillaris (Q. & G.), pl. cxxxvi. fig. C, *casturi* (Ren.), pl. cxli. fig. A, and *albo-vittata* (Bonnat), pl. cxli. fig. B, figured by Günther, *l. c.*

Novacula jacksoniensis, sp. n., Ramsay, P. Linn. Soc. N. S. W. vi. p. 198, Port Jackson.

Pseudoscarus hœfleri, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 159, Goree.

Embiotocidæ.

Ditrema atripes, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 320 [1880], Coast of California.

Abeona aurora, sp. n., *iid. l. c.* p. 299, Monterey, California.

Brachyistius frenatus, Gill, (=*Ditrema brevipinne*, Gthr.), described; *iid. l. c.* p. 300.

Dacentrus lucens, Jordan, is the young of *Hysterocarpus traskii*; Jordan, P. U. S. Nat. Mus. iii. p. 327 [1880].

Sema signifer, Jordan, is a fœtal Embiotocoid, apparently *Cymatogaster aggregatus*; id. *ibid.*

Cymatogaster rosaceus, sp. n., Jordan & Gilbert, *l. c.* p. 303, Coast of California.

Chromides.

Chromis buttikoferi, sp. n., Hubrecht, Notes Leyd. Mus. iii. p. 66, St. Paul's River, Liberia.

Hemichromis bimaculatus, Gill, figured by Sauvage, N. Arch. Mus. (2) iii. pl. ii. fig. 1 [1880].

Hemichromis rolandi, sp. n., Sauvage, Bull. Soc. Philom. (7) v. p. 103, Sahara, Province Constantine.

Acara maronii, sp. n., Steindachner, Denk. Ak. Wien, xliii. p. 141, pl. ii. fig. 4, Maroni, Guiana.

ANACANTHINI.

Lycodidæ.

Lycodes coccineus, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 144, Big Diomede Island.

Gymnelis. Remarks on the Scandinavian forms by Lütken, Vid. Medd. 1881, p. 205.

Gymnelis pictus, figured by Günther, P. Z. S. p. 881, pl. ii. fig. B.

Maynea patagonica, Cunningh., figured, *id. ibid.* figs. C & D.

Melanostigma, g. n., distinguished from *Gymnelis* and *Maynea* in the much more elongate teeth, which in the jaws, as well as on the vomer and palatines, stand in a single series; Günther, *l. c.* p. 20. *M. gelatinosum*, sp. n., *id. l. c.* p. 21, pl. ii. fig. A, Straits of Magellan.

Leurynnis, Lockington (1880), = *Lycodopsis*, Collett (1879); T. Gill, P. U. S. Nat. Mus. iii. p. 247 [1880].

Gadidæ.

Gadus. Remarks on some Arctic species of this genus, by Lütken, Vid. Medd. 1881, p. 253.

Hypsicometes, g. n., related to *Merluccius*. *H. gobioides*, sp. n., Goode, P. U. S. Nat. Mus. iii. pp. 347 & 348 [1880], Southern New England Coast.

Læmonema longifilis, Gthr., = *Phycis brasiliensis*, Kaup ; Steindachner, SB. Ak. Wien, 1881, p. 215.

Phycis regius (Walb.). On its occurrence in North Carolina ; T. H. Bean, P. U. S. Nat. Mus. iii. p. 69 [1880].

Phycis earlli, sp. n., *id. l. c.* p. 68, South Carolina.

Motella. Remarks on some species of this genus : Lütken, *l. c.* p. 228.

Ophidiidæ.

Scytalina, g. n., allied to *Congrogadus*, Gthr., from which it differs in the presence of canines and in the short dorsal fin ; *S. cordule*, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. pp. 266 & 267 [1880], Neah Bay, Washington Territory.

Macruridæ.

Macrurus carminatus, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 346 [1880], Southern New England Coast.

Pleuronectidæ.

Rhombus diaphanus, Raf. Remarks by S. Richiardi, Zool. Anz. iv. pp. 502–504.

Hippoglossoides exilis, p. 154, and *elassodon*, p. 278, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. iii. [1880], California.

Hippoglossina microps, sp. n., Günther, P. Z. S. 1881, p. 21, W. Coast of Patagonia.

Xystreurys, g. n., allied to *Hippoglossina*, *Hippoglossoides*, and *Paralichthys* ; Jordan & Gilbert, *l. c.* p. 35. *X. liolepis*, sp. n., *iid. ibid.*, Santa Catilina Island, California.

Arnoglossus bleekeri, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 124, Endeavour River.

Terator [*r*] *hombus*, g. n., for *T. excisiceps*, sp. n., Macleay, *l. c.* p. 126, pl. ii., Port Jackson.

Rhomboidichthys spiniceps, sp. n., *id. l. c.* p. 127, Port Jackson.

Citharichthys, Bleek. The genus characterized, p. 340, and two new species described, *C. arctifrons*, p. 341, and *unicornis*, p. 342, from Southern New England Coast; Goode, P. U. S. Nat. Mus. iii. [1880].

Lepidopsetta isolepis, sp. n. (= *L. umbrosa*, Lockn.; *nec* Gir.), Lockington, P. U. S. Nat. Mus. iii. p. 325 [1880].

Lepidopsetta umbrosa (Gir.) = *L. bilineata* (Ayres) ; *id. ibid.*

Pleuronichthys verticalis, sp. n., Jordan & Gilbert, *l. c.* p. 49, Coast of California.

Parophrys ischyrus, sp. n., *iid. l. c.* p. 276, Puget's Sound.

Limanda beani, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 473, South Coast of New England.

Synaptura punctatissima, Ptrs., described by Steindachner, SB. Ak. Wien, 1881, p. 207.

Aphoristia atricauda, sp. n., Jordan & Gilbert, *l. c.* p. 23, San Diego, California.

Plagusia unicolor, sp. n., Macleay, *l. c.* p. 138, Port Jackson.

Monolene, g. n., for *M. sessilicauda*, sp. n., Goode, P. U. S. Nat. Mus. iii. p. 338 [1880], Southern New England Coast.

Thyris, g. n. (?). *T. pellucidus*, sp. n., *id. l. c.* p. 344, Southern New England Coast.

PHYSOSTOMI.

SILURIDÆ.

Clarias. Vinciguerra figures the heads of *C. teysmanni*, *liacanthus*, *melanoderma*, and *batrachus*; Ann. Mus. Genov. xvi. p. 165.

Clarias gabonensis, Gthr. (= *C. megapogon*, Sauv., 1878), described and figured by Sauvage, N. Arch. Mus. (2) iii. p. 39, pl. i. fig. 2 [1880].

Clarias salæ, sp. n., Hubrecht, Notes Leyd. Mus. iii. p. 68, St. Paul's River, Liberia.

Copidoglanis longifilis, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 207, Long Island, Torres Straits.

Eutropius liberiensis, sp. n., Hubrecht, *l. c.* p. 69, St. Paul's River, Liberia.

Helicophagus hypophthalmus, Sauv., figured by Sauvage, N. Arch. Mus. (2) iv. pl. vii. fig. 1.

Pangasius (*Pseudopangasius*) *bocourti*, Sauv., figured, *id. ibid.* pl. viii. fig. 4.

Amiurus brachyacanthus, Medina River, and *bolli*, Little Wichita River, spp. nn., Cope, Bull. U. S. Nat. Mus. xvii. [1880], p. 35.

Chrysichtis nigritus (C. & V.) is distinct from *C. cranchii*; recharacterized by Sauvage, N. Arch. Mus. (2) iii. p. 40 [1880].

Atheresthes, g. n., for *Platystomatichthys stomias*, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. ii. [1880], pp. 51 & 301, Coast of California.

Arius doriæ, sp. n., Vinciguerra, Ann. Mus. Genov. xvi. p. 174, Borneo.

Hemiarius harmandi, Sauv., figured by Sauvage, N. Arch. Mus. (2) iv. pl. viii. fig. 3.

Hemipimelodus siamensis, Sauv., figured; *id. l. c.* pl. viii., fig. 5.

Hemipimelodus intermedius, sp. n., Vinciguerra, Ann. Mus. Genov. xvi. p. 178, Borneo.

Atopochilus savorgnani, Sauv., figured by Sauvage, N. Arch. Mus. (2) iii. pl. iii. fig. 3 [1880].

Doumea typica, Sauv., figured; *id. l. c.* pl. iii. fig. 1.

Doras (*Rhinodoras*) *depressus*, sp. n., Steindachner, Denk. Ak. Wien, xliii. p. 103, pl. i. fig. 3, Lago Alexo, Amazons.

Oxydoras nattereri, p. 104, pl. ii. fig. 1, Teffe, Amazons, and *morei*, p. 106, pl. i. fig. 2, Rio Negro, spp. nn., *id. l. c.*

Oxydoras affinis, sp. n.? (? = *O. orestes*, var.), *id. l. c.* p. 107, pl. i. fig. 1, Rio Puty.

Malapterurus electricus, var. *ogooensis*, Sauv., figured by Sauvage, *l. c.* pl. i. fig. 3.

Chætostomus punctatus (Gthr.), p. 113, *gibbiceps* (Kner.), p. 114, pl. iv. fig. 1, *stanni* (Kner), p. 120, pl. v. fig. 4, *nudirostris*, Lütk., p. 120, pl. v. fig. 2, *depressus*, Gthr., p. 123, pl. v. fig. 1, and *macrops*, Lütk., p. 125, pl. v. fig. 3, described by Steindachner, *l. c.*

Chætostomus vittatus, p. 115, pl. ii. fig. 5, Amazons, *braniekii*, p. 118, pl. vi. fig. 1, Callacate, Peru, *punctatissimus*, p. 119, pl. iii. fig. 3, Amazons, and *guairensis*, p. 121, pl. iii. fig. 1, Guaire, Caracas, spp. nn., *id. l. c.*

Plecostomus carinatus, p. 108, pl. iv. fig. 2, Amazons, and *annæ*, p. 112, pl. iii. fig. 2, Para, spp. nn., *id. l. c.*

Plecostomus bicirrhosus (Gron.) and *pardalis* (Cast.), described; *id. l. c.* pp. 109 & 110.

Loricaria opixi, sp. n., *id.* Anz. Ak. Wien, 1881, p. 97, Rio Parahyba.

Breitensteinia, g. n., for *B. insignis*, sp. n., *id.* SB. Ak. Wien, 1881, p. 213, Borneo.

Heptapterus colletti, sp. n., *id.* Anz. Ak. Wien, 1881, p. 98, La Plata?

Scopelidæ.

Cf. Leydig, *suprà*, p. 1.

Scopelus heideri, sp. n., Steindachner, Anz. Ak. Wien, 1881, p. 99, Messina.

Myctophum crenulare, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 274 [1880], and Bean, *op. cit.* iv. p. 28, Santa Barbara Channel, California. The authors observe that *Myctophum* has priority over *Scolepus*.

Paralepis coruscans, sp. n., Jordan & Gilbert, *l. c.* p. 411, Straits of Juan de Fuca.

Sudis ringens, sp. n., *iid. l. c.* p. 273 [1880]; Santa Barbara Channel, California.

Cyprinidæ.

Catostomus fecundus, Cope & Yarrow, described by Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 463.

Catostomus ardens, sp. n., *iid. l. c.* p. 464, Utah Lake; *C. nebuliferus*, sp. n., Garman, Bull. Mus. C. Z. viii. p. 89, Nazas River.

Barbus deauratus, C. & V., head figured by Sauvage, N. Arch. Mus. (2) iv. pl. vi. fig. 5.

Cosmochilus harmandi, Sauv., figured; *id. l. c.* pl. vii. fig. 2.

Puntius (*Barbodes*) *camptacanthus*, Blkr., figured; *id. op. cit.* iii. pl. iii. fig. 2 [1880].

Puntius (*Barbodes*) *pierrii*, Sauv., figured; *id. op. cit.* iv. pl. vii. fig. 3.

Puntius montanoi, sp. n., *id.* Bull. Soc. Philom. (7) v. p. 103, Mindanao.

Probarbus jullieni, Sauv., figured; *id. l. c.* pl. v. fig. 1.

Lobocheilus pierrei, Sauv., figured ; *id. ibid.* fig. 2.

Rohita barbatula, Sauv., pl. v. fig. 3, and *pectoralis*, Sauv., pl. viii. fig. 1, figured by Sauvage, *l. c.*

Hybognathus (*Dionda*) *punctifer*, sp. n., Garman, Bull. Mus. C. Z. viii. p. 39, Parras and Saltillo.

Hybognathus flavipinnis, Llano River, and *nigro-tæniata*, Medina River, spp. nn., Cope, Bull. U. S. Nat. Mus. xvii. [1880] p. 36.

Cochlognathus biguttata, sp. n., *id. ibid.*, Trinity River.

Rhinichthys. A monographic review by S. Garman (15 species described) ; Science Observer, iii. pp. 57–63.

Rhinichthys ocella, p. 59, Montana and Wyoming, *badius*, p. 60, Clinch River, and *simus*, p. 61, Coahuila, spp. nn., *id. l. c.*

Rhinichthys meleagris, Ag., p. 87, and *R.* (*Eritrema*) *rhinichthyoides* (Cope), p. 88, described by Garman, Bull. Mus. C. Z. viii.

Rhinichthys arenatus, p. 87, North Minnesota, and *luteus*, p. 88, Utah, spp. nn., *id. l. c.*

Cirrhina microlepis, Sauv., pl. viii. fig. 2, *jullieni*, Sauv., pl. vi. fig. 2, and *lineata*, Sauv., pl. vi. fig. 1, figured by Sauvage, N. Arch. Mus. (2) iv.

Barynotus compinii, Sauv., figured; *id. op. cit.* iii. pl. i. fig. 4 [1880].

Luciosoma harmandi, Sauv., figured ; *id. op. cit.* iv. pl. vi. fig. 1.

Nuria longimana, sp. n., Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 296, fig. 2, Gamboja.

Leuciscus taczanowskii, sp. n., Steindachner, SB. Ak. Wien, 1881, p. 194, Japan.

Squalius cruoreus, p. 460, *copii* (= *Hybopsis egregius*, Cope, *nec* Gir.), p. 461, *rhomaleus*, p. 462, spp. nn., Jordan & Gilbert, P. U. S. Nat. Mus. iii., Utah Lake.

Squalius aliciæ, sp. n., P. L. Jouy, P. U. S. Nat. Mus. iv. p. 19, Utah Lake.

Pogonichthys inæquilobus, Bd. & Gir. (Aug. 1861), = *Leuciscus macrolepidotus*, Ayres (May, 1861); Jordan, P. U. S. Nat. Mus. p. 326 [1880].

Leuciscus gibbosus, Ayres (1861), = *Telestes* (*Siboma*) *crassicauda*, B. & G.; *id. l. c.* p. 326 [1880].

Opsopœodus, g. n., apparently related to *Myloleucus*, Cope, for *O. emiliæ*, sp. n., Hay, P. U. S. Nat. Mus. iii. p. 507, E. Mississippi.

Bola harmandi, Sauv., figured by Sauvage, N. Arch. Mus. (2) iv. pl. vi. fig. 6.

Alburnops taurocephalus, p. 503, and *longirostris*, p. 504, spp. nn., Hay, *l. c.*, E. Mississippi.

Parachela, g. n., allied to *Chela*; Steindachner, Anz. Ak. Wien, 1881, p. 100. For *P. breitensteini*, sp. n., *id. ibid.*, Borneo.

Chasmistes liorus, Jord., described by Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 462.

Cyprinella rubripinna, sp. n., Garman, Bull. Mus. C. Z. xiii. p. 91, Parras.

Hemitremia maculata, sp. n., Hay, *l. c.* p. 505, E. Mississippi.

Ptychochilus harfordi, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 72, Sacramento River.

Luxilus chickasawensis, sp. n., Hay, *l. c.* p. 506, E. Mississippi.

Minnilus punctulatus, p. 508, *rubripinnis*, p. 509, and *bellus*, p. 510, spp. nn., *id. l. c.*, E. Mississippi.

Zygonectes brachypleurus, sp. n., Cope, Bull. U. S. Nat. Mus. xvii. [1880] p. 34, Trinity River.

Zygonectes lineatus, sp. n., Garman, *l. c.* p. 88, N. E. Wyoming.

Stypodon, g. n., for *S. signifer*, sp. n., *id. l. c.* p. 90, Parras.

Characinidæ.

Curimatus cyprinoides (L.), p. 134, *latior*, Spix, p. 136, and *laticeps*, Val., p. 137, described by Steindachner, Denk. Ak. Wien, xliii.

Curimatus nageli, sp. n., *id.* Anz. Ak. Wien, 1881, p. 98, Rio Janeiro.

Prochilodus scrofa, sp. n., *id.* Denk. Ak. Wien, xliii. p. 129, pl. vi. fig. 2, Rio Janeiro.

Prochilodus lineatus, Val., p. 130, *taniurus*, Val., p. 131, *nigricans*, Ag., p. 132, and *oligolepis*, Gthr., p. 133, described; *id. l. c.*

Myletes nigripinnis, Cope, described and figured; *id. l. c.* p. 125, pl. vii. fig. 1.

Myletes kneri, sp. n., *id. l. c.* p. 127, pl. vii. fig. 2, Maroni, Guiana.

Elopomorphus elongatus (Spix), described; *id. l. c.* p. 138.

Distichodus marnoi, sp. n., *id.* SB. Ak. Wien, 1881, p. 200, Nile.

Cyprinodontidæ.

Haplochilus marnoi, p. 198, and *bifasciatus*, p. 199, spp. nn., Steindachner, SB. Ak. Wien, 1881, Nile.

Cynolebias bellottii, *maculatus*, and *elongatus*, spp. nn., *id.* Anz. Ak. Wien, 1881, p. 98, La Plata.

Scomberesocidæ.

Belone. Jordan & Gilbert point out the absence of gill-rakers in *B. exilis*, *longirostris*, *latimana*, *melanochira*, *notata*, *hians*, and probably in *B. cantraini*, and propose to unite these species in one genus, *Tylosurus*, Cocco; P. U. S. Nat. Mus. iii. p. 459.

Belone gracilis, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 243, Port Jackson.

Hemirrhamphus rosæ, sp. n., Jordan & Gilbert, *l. c.* p. 335 [1880], Coast of California.

Galaxiidæ.

Galaxias planiceps, p. 233, Rankin's Lagoon, near Bathurst, *bong-bong*, p. 233, Mose Vale and Bong-Bong, *nebulosa*, p. 234, Sydney, spp. nn., Macleay, P. Linn. Soc. N. S. W. vi.

Galaxias coppingeri, sp. n., Günther, P. Z. S. 1881, p. 21, Alert Bay.

Mormyridæ.

Mormyrus (*Petrocephalus*) *marchii*, Sauv., fig. 5, *simus*, Sauv., fig. 3, and *affinis*, Sauv., fig. 2, figured by Sauvage, N. Arch. Mus. (2) iii. pl. ii. [1880].

Mormyrops sphekodes, Sauv., figured; *id. ibid.* fig. 4 [1880].

Salmonidæ.

Miescher-Rüsch, F. Ueber das Leben des Rheinlachses im Süsswasser. 1. Abhandlung. Die Milz des Rheinlachses und ihre Veränderungen. Arch. Anat. Phys. 1881, pp. 193–218, pls. viii. & ix.

Jordan, D. S., & Gilbert, C. H. Observations on the Salmon of the Pacific. Am. Nat. xv. pp. 177–186.

Notes on *Salmonidæ* of the Upper Columbia, by C. Bendire, P. U. S. Nat. Mus. iv. pp. 81–87. Valuable notes on *Oncorrhynchus nerka*, with figure; and on other Salmon and Trout. *Salmo kennerlii* shown to be young male of *O. nerka*.

Osmerus attenuatus, sp. n., Lockington, P. U. S. Nat. Mus. iii. p. 66 [1880], Coast of California.

Hypomesus olidus. Remarks on this fish and on the method of taking them by the Quillehute Indians, West Coast of Washington Territory; J. G. Swan, P. U. S. Nat. Mus. iii. pp. 43–46 [1880].

Thaleichthys pacificus. Extensive remarks on its habits, fishing operations, economic uses, &c.; *id. l. c.* pp. 257–264 [1880].

Coregonus laurettæ, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 157, Alaska.

Argentina sphyræna. On the occurrence of a specimen on the shore of the Moray Firth, Banffshire; T. Edwards, J. L. S. xv. p. 334.

Hyphalonedrus, g. n., for *H. chalybeius*, sp. n., Goode, P. U. S. Nat. Mus. iii. pp. 483 & 484, South Coast of New England.

Haplochitonidæ.

Saurida truculenta, p. 219, Port Jackson, and *argentea*, p. 220, Endeavour River, spp. nn.; Macleay, P. Linn. Soc. N. S. W. vi.

Clupeidæ.

Clupea harengus. F. Heincke publishes an extensive contribution to the study of the varieties of the Herring, entitled, "Die Varietäten des Herrings. ii. Thiel. Zugleich ein Beitrag zur Descendenztheorie und Systematik." vii. Bericht der Commission zur Untersuchung der deutschen Meere (Berlin: 1881, 4to), 85 pp. 3 pls.

Alosa sapidissima. On the retardation of the development of the ova; J. A. Ryder, Bull. U. S. Fish. Comm. 1881, pp. 177–190.

Pristigaster sinensis, sp. n., Sauvage, Bull. Soc. Philom. (7) v. p. 107, S. China.

NOTOPTERIDÆ.

Notopterus (*Xenomystus*) *nili*, sp. n., Steindachner, SB. Ak. Wien, 1881, p. 196, pl. iv. fig. 2, Nile.

GYMNOTIDÆ.

SACHS, C., & DU BOIS REYMOND, E. Untersuchungen am Zitteraal, *Gymnotus electricus*. Leipzig: 1881, 8vo, 446 pp. 8 pls.

Sternarchus schotti, Stdchr., figured by Steindachner, Denk. Ak. Wien, xliii. pl. ii. fig. 2.

Sternarchus macrolepis, sp. n., *id.* Anz. Ak. Wien, 1881, p. 98, Amazons.

S. (*Rhamphosternarchus*) *muelleri*, sp. n., *id. l. c.* p. 99, Pará.

Sternopygus obtusirostris, sp. n., *id.* Denk. Ak. Wien, xliii. p. 143, pl. ii. fig. 3, Amazons.

SYMBRANCHIDÆ.

WEYENBERGH, H. Ueber den Kiemenapparat der *Symbranchidæ*. Zool. Anz. iv. pp. 407–409.

MURÆNIDÆ.

Anguilla vulgaris. C. ROBIN describes the sexual differences of the common Eel; C. R. xcii. pp. 378–383. Translated in Ann. N. H. (5) vii. pp. 386–392.

GOODE, G. B. Notes on the Life-history of the Eel, chiefly derived from a study of recent European authorities. Bull. U. S. Fish. Comm. 1881, pp. 71–124.

O. HERMES gives an account of the male organs of *Conger vulgaris*, and also remarks on the male *Anguilla vulgaris*. Zool. Anz. iv. pp. 39–44, with woodcuts. Translated in Bull. U. S. Fish. Comm. 1881, pp. 126–130.

BROCK, J. Untersuchungen über die Geschlechtsorgane einiger Murænoiden. MT. z. Stat. Neap. ii. pp. 415–494, pls. xviii.–xx.

These researches have been made on *Muræna helena*, L., *Myrus vulgaris*, Kaup., *Conger vulgaris*, Cuv., and *Anguilla vulgaris*, Flem.

Nemichthys avocetta, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iii. p. 409, Puget Sound.

Muræenichthys australis, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 272, Port Jackson.

Myrophis chrysogaster, sp. n., *id. l. c.* p. 271, Port Darwin.

Gymnothorax mordax (Ayres), described by Jordan & Gilbert, *l. c* p. 30 [1880].

LOPHOBRANCHII.

RYDER, J. A. A Contribution to the Development and Morphology of the Lophobranchiates; *Hippocampus antiquorum*. Bull. U. S. Fish. Comm. 1881, pp. 191–199.

Syngnathus conspicillatus, Jen., described by Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 291.

Syngnathus (*Belonichthys*) *zambezensis*, Ptrs., and S. (*B.*) *mento*, Blkr. Peters points out the specific differences between these two forms; SB. nat. Fr. 1881, p. 108.

Penetopteryx, g. n., for *P. taniocephalus*, sp. n., Lunel, *l. c.* p. 275, fig. 1, Mauritius.

Leptichthys cristatus, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 296, W. Australia.

Stigmatophora depressiuscula, King George's Sound, and *gracilis*, Tasmania, spp. nn., *id. l. c.* p. 299.

PLECTOGNATHI.

Balistes mento, sp. n., Jordan & Gilbert, P. U. S. Nat. Mus. iv. p. 228, off the W. Coast of Mexico.

Monacanthus macrurus, sp. n., Macleay, P. Linn. Soc. N. S. W. vi. p. 330, Port Jackson.

Ostracion concatenatus?, L., described by Lunel, Mém. Soc. Phys. Genèv. xxvii. p. 280.

Tetrodon oxyrrhynchus, sp. n. (= *T. punctatissimus*, Cuvier?), Lockington, P. Ac. Philad. 1881, p. 114, Angeles Bay, Gulf of California.

CYCLOSTOMATA.

Nuel, J. P. Quelques phases du développement du *Petromyzon planeri*. Première Communication. Arch. biol. ii. pp. 403–454, pls. xxiv. & xxv.

Scott, W. B. Preliminary Account of the Development of the Lampreys. Q. J. Micr. Sci. (n.s.) xxi. pp. 146–153.

Ammocœtes aureus, sp. n., Bean, P. U. S. Nat. Mus. iv. p. 159, Alaska.

LEPTOCARDII.

Hatschek, B. Studien über Entwickelung des *Amphioxus*. Arb. z. Inst. Wien, iv. pp. 1–88, 9 pls.

Krukenberg, C. F. W. Zur Kenntnis des chemischen Baues von *Amphioxus lanceolatus* und der Cephalopoden. Zool. Anz. iv. pp. 64–66.

Rectifications to this paper by F. Hoppe-Seyler, *l. c.* pp. 185–187.

MOLLUSCA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

APOSTOLIDÈS, N. C., & DELAGE, YVES. Les Mollusques d'après Aristote. Arch. Z. expér. ix. pp. 405–420.

ARANGO, R. Descriptions of new species of Terrestrial *Mollusca* of Cuba. P. Ac. Philad. 1881, pp. 15 & 16.

ASHFORD, C. Notes from the Isle of Wight. J. of Conch. iii. pp. 132–135.

BARFURTH, D. Der Kalk in der Leber der Helicinen und seine biologische Bedeutung. Zool. Anz. iv. pp. 20–23.

BAUDON, A. Troisième Supplément à la Monographie des Succinées françaises. J. de Conch. xxix. pp. 139–154, pl. v.

BERGH, R., in SEMPER'S "Reisen im Archipel der Philippinen," zweiter Theil, malacologische Untersuchungen, Supplement 1 [1880], pp. 1–78, pls. A–F, and Suppl. 2, 1881, pp. 79–128, pls. G–L.

——. Über die Gattung *Idalia* (Leuck.). Arch. f. Nat. xlvii. pp. 140–181, pls. vi.–viii.

——. Beiträge zur Kenntniss der japanischen Nudibranchien. ii. Verh. z.-b. Wien, xxxi. [for 1881, published in 1882] pp. 219–254, pls. vi.–x.

BERTIN, V. Revision des Donacidées du Muséum d'Histoire naturelle. N. Arch. Mus. (2) iv. pp. 57–121, pls. iii. & iv.

BLAND, T. Description of a new species of *Triodopsis* from New Mexico. On the relations of the Flora and Fauna of Santa Cruz, West Indies. Notes on *Macroceramus kieneri*, Pfr., and *M. pontificus* (Gould). Ann. N. York Ac. ii. pp. 115–128.

BLANFORD, W. T. Land, Fresh-water, and Estuarine *Mollusca*. British Burma Gazetteer (Rangoon: 1880), i. pp. 698–716.

BLOCHMANN, F. Über die Entwicklung von *Neritina fluviatilis*, i. Z. wiss. Zool. xxxvi. pp. 125–174, pls. vi.–viii.

BLUM, J. Schnecken von Weissenstein bei Solothurn. Nachr. mal. Ges. 1881, pp. 138–141.

BOCK, CARL. List of Land and Fresh-water Shells collected in Sumatra and Borneo, with descriptions of new species. P. Z. S. 1881, pp. 628–635. [See also BROT, *infrà*].

BÖTTGER, O. Sechstes Verzeichniss transkaukasischer, armenischer und nordpersischer Mollusken. JB. mal. Ges. viii. pp. 167–261, pls. vii.–ix.

——. Sectiones speciesque novæ Clausiliarum Caucasiarum. *L. c.* pp. 341–346.

BORCHERDING, F. Beitrag zur Molluskenfauna der nordwestdeutschen Tiefebene. Mal. Bl. (2) iii. pp. 142–149.

——. *Hyalina draparnaldi* (Beck) im nordwestlichen Deutschland. *Op. cit.* iv. pp. 1–10, pl. i.

——. Fünf Tage im Teutoburger Walde. *L. c.* pp. 11–31.

BOURGUIGNAT, J. R. Mollusques terrestres et fluviatiles recueillis en Afrique dans le pays Çomalis Medjourtins. St. Germain: 1881, 8vo, 19 pp.

——. Monographie du nouveau genre *Filholia*. St. Germain: 1881, 8vo, 31 pp.

——. Monographies des genres *Pechaudia* and *Hagenmulleria*. [All three not accessible to the Recorder.]

BOURQUELOT, É. Recherches relatives à l'action des sucs digestifs des Céphalopodes sur les matières amylacées. C. R. xciii. pp. 978–980.

BRAZIER, J. Notes on recent *Mollusca* found in Port Jackson. P. Linn. Soc. N. S. W. v. p. 481.

BREVIÈRE, L. Tableau des Limaciens des environs de St. Saulge. J. de Conch. xxix. pp. 306–315, pl. xiii.

BROT, A. Note sur quelques Coquilles fluviatiles recoltées à Bornéo et à Sumatra par M. Carl Bock. J. de Conch. xxix. pp. 154–160, pl. vi.

BROWN, A. D. Notes on the Land Shells of Dominica. Am. Nat. xv. pp. 56 & 57.

BRUSINA, S. Le *Pyrgulinæ* dell' Europa orientale. Bull. Soc. mal. Ital. vii. 229–292.

CARRIÈRE, J. Das Wassergefäss-system der Lamellibranchiaten und Gastropoden. Zool. Anz. iv. pp. 433–435; additional note, p. 666.

CHEESEMAN, T. F. On some new species of Nudibranchiate *Mollusca*. Tr. N. Z. Inst. xiii. pp. 222–224.

——. On a new genus of Opisthobranchiate *Mollusca*. L. c. p. 224.

CLESSIN, S. Die Gruppe *Limnæa truncatula*. Mal. Bl. (2) iii. pp. 77–85.

[Clessin, S.] Beitrag zur Kenntniss der Molluskenfauna des Caucasus. *L. c.* pp. 129–135.

——. Mollusken aus Taurien. *L. c.* pp. 136–141.

——. Die *Ancylus*-arten Griechenlands. *L. c.* pp. 150–158.

——. Diagnoses novarum specierum generis *Ancyli*. L. c. p. 159.

——. Mollusken aus dem Ahrenthal in Tirol. *L. c.* pp. 184–188.

Crosse, H. Faune malacologique du Lac Tanganyika. J. de Conch. xxix. pp. 105–139, pl. iv.; Supplement, *l. c.* pp. 277–306.

——. Contribution à la faune malacologique de Nossi-Bé et de Nossi-Comba. *L. c.* pp. 189–212, pl. viii.

Dall, W. H. Preliminary Report on the *Mollusca*, in: Reports on the Results of Dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico, and in the Caribbean Sea, 1877–79, by the United States Steamer 'Blake.' Bull. Mus. C. Z. ix. (No. 2) pp. 33–144.

Diemar, F. H. Die Mollusken-Fauna von Cassel. Ber. Ver. Cassel, xxvii. [1880] pp. 91–122.

Doering, A. Moluscos, in: Informe oficial de la Comision científica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia) realizada en...1879, bajo los órdenes del General D. Julio A. Roca. Entrega 1. Zoologia. Buenos Aires: 1881, gr. 4to, pp. 61–75, pl. i.

Dohrn, H. *Helix* in Küster's Conch. Cab. part 304, pp. 595–610, pls. clxxiii.–clxxvii.

——. Neue ostasiatische Landconchylien. Nachr. mal. Ges. 1881, p. 65–67.

Drouet, H. *Unionidæ* de la Russie d'Europe. Dijon & Paris: 1881, 8vo, 35 pp.

——. *Unionidæ* nouveaux ou peu connus. J. de Conch. xxix. p. 22–31, 244–254.

Dupuy, D. De la recherche des Mollusques terrestres et d'eau douce, et des moyens de se les procurer. 2me édition. Paris: 1881, 8vo, 32 pp.

Fagot, P. Histoire malacologique des Pyrenées Françaises. Bull. Soc. Toulouse, 1880, also separately, 8vo, 24 pp.

—— & Malafosse, G. de. Catalogue des Mollusques terrestres et fluviatiles vivants observés dans le Département de la Lozère. Toulouse: 1881, 8vo, 32 pp.

——. Diagnoses des Mollusques nouveaux pour la faune française. Bull. Soc. Z. Fr. 1881, pp. 137–141.

Fischer, Paul. Manuel de Conchyliogie. Fasc. 1–3. Paris: 1881, 8vo, 304 pp., 104 woodcuts and map.

——. Note sur le genre *Olivella*. J. de Conch. xxix. pp. 31–35.

Fraisse, P. Ueber Mollusken-Augen mit embryonalem Typus. Z. wiss. Zool. xxxv. pp. 461–477, pls. xxv. & xxvi.

FURTADO, FRANCOIS D'ARRUDA. On *Vignesnelia atlantica* (Morelet). Ann. N. H. (5) vii. pp. 250–255, pl. xiii.

GARRETT, A. The Terrestrial *Mollusca* inhabiting the Cook's or Harvey Islands. Philadelphia [1880?], 4to, 31 pp.

GIROD, P. Structure et texture de la poche du noir de la Sépia. C. R. xcii. pp. 364–367.

——. Structure et texture comparée de la poche du noir, chez les Céphalopodes des côtes de France. *L. c.* pp. 966–968.

——. Les vaisseaux de la poche du noir des Céphalopodes. *L. c.* pp. 1241–1243.

GODWIN-AUSTEN, H. H. On the Land-Molluscan genus *Durgella* Blanf., with notes on the anatomy and description of a new species. J. L. S. xv. pp. 291–296, pls. xx. & xxi.

——. Description of the animal of *Durgella christianæ*. Ann. N. H. (5) viii. pp. 377–379.

——. Notes on and Drawings of the Animals of various Indian Land *Mollusca* (Pulmonifera). J. A. S. B. xlix. [1880] pt. 2, pp. 151–158, pls. x. & xi.

GRABAU, H. Über die Naumann'sche Conchospirale. SB. Ges. Leipzig, viii. pp. 23–32.

GREDLER, V. Zur Conchylienfauna von China. II. JB. mal. Ges. viii. pp. 10–33, pl. i.; III., *l. c.* pp. 110–132, pl. vi.

HALLER, B. Vorläufige Mittheilung über das Nervensystem und Mund-Epithel niederer Gastropoden. Zool. Anz. iv. pp. 92–94.

HAREN, NOMAN VAN. Die Lamellibranchiaten gesammelt während der Fahrten des 'Willem Barents.' Niederl. Arch. Zool. Suppl. i. 1881, 51 pp. 3 pls.

HARTMAN, W. DELL. Observations on the species of the genus *Partula*. Bull. Mus. C. Z. ix. (No. 5) pp. 171–196, with 2 maps.

——. A Catalogue of the genus *Partula* (Fér.). West Chester, Pa.: 1881, 8vo, 14 pp., with woodcuts.

HAZAY, J. Die Molluskenfauna von Budapest. Mal. Bl. (2) iii. pp. 1–69, 160–183, pls. i.–ix. & iv. pp. 43–221, pls. ii.–vii.

——. Die Succineen Englands. JB. mal. Ges. viii. pp. 160–165.

——. Ein Ausflug nach Ober-Ungarn. *L. c.* pp. 262–275.

HEILPRIN, A. Remarks on the Molluscan genera *Hippagus*, *Verticordia*, and *Pecchiolia*. P. Ac. Philad. 1881 [Pt. 3, published in 1882], pp. 423–428.

HEMPHILL, H. Liste des Mollusques terrestres recueillis dans la partie septentrionale de la Basse Californie (Mexique). J. de Conch. xxix. pp. 35–38.

HESSE, P. Zur Molluskenfauna von Thüringen. Nachr. mal. Ges. 1881, pp. 3–9.

HUBRECHT, A. A. W. *Proneomenia sluiteri.* Niederl. Arch. Zool. Suppl. i. 1881, 75 pp. 4 pls.

IHERING, H. v. Zur Kenntniss der recenten und der diluvialen Mollusken-fauna der fränkischen Schweiz. Mal. Bl. (2) iii. pp. 69–77.

JEFFREYS, J. GWYN. On the *Mollusca* procured during the 'Lightning' and 'Porcupine' Expeditions, 1868–1870. Part iii., P. Z. S. 1881, pp. 693–724, pl. lxi. ; part iv. *l. c.* pp. 922–952 [1882], pls. lxx. & lxxi.

JICKELI, CARL F. Land- und Süsswasser-Conchylien Nordost-Afrikas. JB. mal. Ges. viii. pp. 336–340.

JORDAN, H. Einfluss des bewegten Wassers auf die Gestaltung der Muscheln aus der Familie Najades. Biol. Centralbl. i. pp. 392–399.

——. Die Mollusken des Spreewaldes. Nachr. mal. Ges. 1881, pp. 89-93.

JOUSSEAUME, F. Descriptions de nouvelles espèces. Bull. Soc. Z. Fr. 1881, pp. 172–176.

JOYEUX-LAFFUIE, J. Recherches anatomiques sur les appareils digestif, nerveux et reproducteur de l'Onchidie. C. R. xcii. pp. 144–146.

KELLER, C. Ueber den Farbensinn der Mollusken. Viert. Ges. Zürich, xxvi. pp. 100–102.

KOBELT, W. Illustrirtes Conchylienbuch, pts. 10 & 11, pp. 313–391, pls. xci.–cxii. (finished).

——. Catalog der im europäischen Faunengebiet lebenden Binnen-conchylien. 2 Aufl. Cassel: 1881, 8vo, 294 pp.

——. Synopsis novorum generum, specierum et varietatum Molluscorum viventium testaceorum anno 1879 promulgatorum. Cassel: 1881, 8vo, 200 pp.

——. *Eburna* and *Buccinum*, in Küster's Conch. Cab. pts. 301 & 310, pp. 1–40, pls. lxxi.–lxxxii.

——. *Cancellaria.* L. c. pt. 309, pp. 1–16, pls. i.–v.

——. Excursionen in Süditalien. JB. mal. Ges. viii. pp. 50–67.

——. Catalog der Gattungen *Neptunea*, *Monoceros*, and *Myadora.* L. c. pp. 313–325.

——. Die mauritanischen *Iberus.* L. c. pp. 327–336.

——. Reisebriefe. Nachr. mal. Ges. 1881, pp. 81–89, 97–115, 149–159, & 165–178.

KÜSTER, H. C. Systematisches Conchylien-Cabinet, fortgesetzt von Kobelt und Weinkauff. Lieferung 300–313. Nürnberg: 1881, 4to, 270 pp., 61 pls. [See WEINKAUFF, KOBELT, DOHRN, v. MARTENS.]

LANKESTER, E. RAY. On the originally bilateral character of the renal organ of *Prosobranchia*, and on the Homologies of the yelk-sac of *Cephalopoda.* Ann. N. H. (5) vii. pp. 432–437, with a woodcut.

LESSONA, M. Sugli *Arion* del Piemonte. Atti Acc. Tor. xvi. pp. 185–197.

Livoro, C. Organes digestifs des Céphalopodes dibranches. J. de l'Anat. Phys. xvii. pp. 97–123, 2 pls.

Locard, A. Études sur les variations malacologiques d'après la faune vivante et fossile de la partie centrale du bassin du Rhone. ii. Lyon & Paris: 1881, 8vo, 560 pp.

——. Catalogue des Mollusques vivants du Département de l'Ain. Lyon & Paris: 1881, 8vo, 151 pp.

——. Contributions à la faune malacologique française. i. Monograghie des genres *Bulimus* et *Chondrus*. ii. Catalogue des Mollusques terrestres et aquatiques des environs de Lagny. Lyon: 1881, gr. 8vo, 29 & 33 pp., the former with 1 plate.

Macdonald, J. D. On the classification of *Gastropoda*. ii. J. L. S. xv. pp. 241–244.

Mark, E. L. Maturation, fecundation, and segmentation of *Limax campestris* (Binn.). Bull. Mus. C. Z. vi. No. 12, pp. 173–625, 5 pls.

Martens, E. von. Conchologische Mittheilungen. i., pts. 5 & 6, pp. 73–101, pls. xiii.–xviii., and ii., pts. 1 & 2, pp. 103–128, pls. xix.–xxiv.

——. *Navicella*, in Küster's Conch. Cab. pt. 311, pp. 1–40, pls. i.–vi.

——. Land-Schnecken von Sokotora. Nachr. mal. Ges. 1881, pp. 134–134.

——. Einige Landschnecken des nördlichen Norwegens. SB. nat. Fr. 1881, pp. 34–38.

Melvill, J. C. List of *Mollusca* obtained in South Carolina and Florida, principally at the island of Key West. J. of Conch. iii. pp. 155–173.

Milachevich, C. Études sur la faune des Mollusques vivants terrestres et fluviatiles de Moscou. Bull. Mosc. lvi. pp. 215–241.

Mitsukuri, K. On the structure and significance of some aberrant forms of Lamellibranchiate Gills. Q. J. Micr. Sci. xxi. pp. 595–608.

Möllendorff, O. F. von. Zur Binnenmolluskenfauna von Nord-China. JB. mal. Ges. viii. pp. 33–43, pl. i. figs. 8–10.

——. Beiträge zur Molluskenfauna von Süd-China. *L. c.* pp. 302–312.

Monterosato, M. di. Nota sopra alcune conchiglie coralligene del Mediterraneo. Bull. Soc. mal. Ital. vi. pp. 243–259.

——. Conchiglie del Mediterraneo. i. Nat. Sicil. i. p. 2.

Morelet, A. Malacologie des Comores, Récolte de M. Marie à l'île Mayotte. J. de Conch. xxix. pp. 212–241, pls. ix. & x.

Morse, E. The gradual dispersion of certain Mollusks in New England. Bull. Essex Inst. xii. pp. 171–176.

Nevill, G. Note on little-known *Mollusca* of the Indo-Malayan Fauna. J. A. S. B. l. pt. 2, pp. 125–167, pls. v.–vii.

Owen, R. Descriptions of some new and rare *Cephalopoda*. Tr. Z. S. xi. pp. 131–170, pls. xxiii.–xxxv.

PALMEN, J. A. Tvenne Opistobranchiater fran finska viken. Medd. Soc. Fenn. vii. pp. 129–131.

PAULUCCI [MME.]. Comunicazioni malacologiche. VI. Studio sulla *Helix* (*Campylæa*) *cingulata* (Stud.) e forme affini. Bull. Soc. mal. Ital. vii. pp. 5–55, pls. i. & ii.

——. VII. Descrizione di una nuova specie del genere *Acme*. L. c. pp. 221–225.

——. Contribuzione alla fauna malacologica Italiana. Specie raccolte dal Dr. G. Cavanna. *L. c.* pp. 69–180, pls. 1 *bis* –5.

PFEIFFER, L. Nomenclator Heliceorum viventium, ed. S. Clessin. Cassel : 1881, 8vo, 617 pp.

POIRIER, J. Description de quelques espèces nouvelles du Cambodge, appartenant aux genres *Lacunopsis*, *Julliena*, et *Pachydrobia*. J. de Conch. xxix. pp. 1–19, pls. i.–iii.

REINHARDT, O. Eine Anzahl griechischer Schnecken. SB. nat. Fr. 1881, pp. 135–137.

ROCHEBRUNE, A. T. DE. Diagnoses specierum novarum familiæ Chitonidarum. J. de Conch. xxix. pp. 42–46.

ROGERS, T. On the Land and Fresh-water Shells of Tasmania. P. Manch. Soc. xix. [1880] pp. 101–103.

ROLLE, F. Ueber einige Landschnecken aus einer römischen Aufgrabung bei Homburg. JB. mal. Ges. viii. pp. 44–50.

SCHACKO, G. Radula-Untersuchungen. In Von Martens's "Conchologische Mittheilungen," ii. pp. 122–127, pl. xxiv.

SCHMIDT, G. Zur Molluskenfauna von Weimar. JB. mal. Ges. viii. pp. 68–82.

SCHUMANN, E. Die Binnen-Mollusken der Umgebung von Danzig. Schr. Ges. Danz. v. pp. 321–330.

SERVAIN, G. Histoire malacologique du lac Balaton en Hongrie. Poissy : 1881, 126 pp., 8 pls.

SIDEBOTHAM, J. On some specimens of *Helices* and *Bulimi* from Mentone. P. Manch. Soc. xix. [1880] p. 155.

ST. SIMON, A. Note sur l' *Helix chelonitis*—les Hélices carnassiers et phytophages de la Nouvelle Calédonie. Bull. Soc. Toulouse, 1880, 8 pp., also separately. Abstr. J. de Conch. xxix. p. 185.

——. Anatomie de l'*Helix cantabrica*. L. c. 4 pp., also separately. Abstr. J. de Conch. xxix. p. 260.

SIMROTH, H. Über die Bewegung und das Bewegungsorgan von *Cyclostoma elegans* und der einheimischen Schnecken überhaupt. Z. wiss. Zool. xxxvi. pp. 1–67, pl. i.

——. Die Fussdrüsen der *Valvata piscinalis*. Zool. Anz. iv. pp. 527 & 528.

Smith, E. A. *Mollusca*, in Account of the Zoological collections made during the Survey of H.M.S. 'Alert,' in the Straits of Magellan, and on the Coast of Patagonia. P. Z. S. 1881, pp. 22–44, pls. iii.–v.

——. On a collection of Shells from Tanganyika and Nyassa, and other localities in East Africa. *L. c.* pp. 276–300, pls. xxxii.–xxxiv.

——. On the genus *Gouldia* (C. B. Ad.) and on a new species of *Crassatella*. L. c. pp. 489 & 490.

——. Notes on the genus *Chilina*, with a list of the known species. P. Z. S. 1881 [1882] pp. 840–846.

——. Observations on the genus *Astarte*, with a list of the known recent species. J. of Conch. iii. pp. 196–232.

Sowerby, G. B. Description of eight new species of Shells. P. Z. S. 1881, pp. 635–639, pl. lvi.

Stearns, R. E. C. Observations on *Planorbis*. P. Ac. Philad. 1881, pp. 92–110, with woodcuts.

——. On *Helix aspersa* in California. Ann. N. York Ac. 1881, pp. 129–139.

——. *Mya arenaria* in San Francisco Bay. Am. Nat. xv. pp. 362–366.

Steenstrup, J. *Sepiadarium* og *Idiosepius* to nye Slægter af Sepiernes Familie. Med Bemærkninger om de to beslægtede Former *Sepioloidea*, D'Orb., og *Spirula*, Lmk. Dan. Selsk. Skr. (6) i. pp. 213–242, with 1 pl.

——. Professor A. E. Verrills to nye Cephalopodslægter *Sthenoteuthis* og *Lestoteuthis*. Overs. Dan. Selsk. 1881, pp. 1–27, pl. i.

Sterki, V. Zwischen Jura und Schwarzwald. Nachr. mal. Ges. viii. pp. 33–42.

Study, E. Verzeichniss der von mir in der Umgebung von Coburg und in den angrenzenden Theilen des fränkischen Jura gefundenen Mollusken. Mal. Bl. (2) iv. pp. 31–42.

Tapparone-Canefri, C. Glanures dans la Faune malacologique de l'île Maurice. Catalogue de la famille des Muricidées. Bruxelles : 1881, 99 pp., 2 pls. (Ann. mal. Belg. xv.)

Taylor, J. W. Descriptions of new species of land Shells from the East coast of Africa. J. of Conch. iii. pp. 142–144. [A plate to this paper, indicated in the letterpress, has not been published.]

——. Life histories of British *Helices*. No. 1. *Helix arbustorum*. J. of Conch. iii. pp. 241–256, pl. i.

Theobald, W. List of *Mollusca* from the hills between Mari and Tandiani. J. A. S. B. l. pt. 2, pp. 44–49.

Tryon, G. W. Manual of Conchology. Vol. iii. *Tritonidæ*, *Fusidæ*, *Buccinidæ*. Philadelphia: 1881, 8vo, 310 pp., 87 plates.

Tschapeck, H. Einige Süsswasser-Mollusken des Sanngebietes in Unter-Steiermark. JB. mal. Ges. viii. pp. 101–109.

[Tschapeck, H.] Von den steirischen Abhängen der Ursula. Nachr. mal. Ges. 1881 pp. 69–74.

Vaniot, E. Mollusques recueillis au sud d'Amiens. Mém. Soc. L. N. Fr. 1881; also separately, 55 pp.

Verkrüzen, T. A. Bericht über meinen Besuch der grossen Bank von Neufundland im Sommer 1880. JB. mal. Ges. viii. pp. 82–100.

——. *Buccinum* (L.). *L. c.* pp. 279–301.

Verrill, A. E. Report on the Cephalopods, and on some additional species dredged by the United States Fish Commission Steamer, 'Fish-Hawk.' Bull. Mus. C. Z. viii. No. 5, pp. 99–116, 8 pls.

——. Notice of the remarkable marine Fauna occupying the outer banks of the Southern Coast of New England. Am. J. Sci. (3) xxii, pp. 292–303.

——. Notice of recent Additions to the marine *Invertebrata* of the North-eastern Coast of America. Part III. Catalogue of *Mollusca* recently added to the Fauna of Southern New England. P. U. S. Nat. Mus. iii. p. 465 *et seq.*

——. Giant Squids. Am. J. Sci. (3) xxi. pp. 251 & 252.

——. Regeneration of lost parts in the Squid. Tr. Conn. Ac. v. p. 318.

Vigelius, W. J. Über das sogenannte Pancreas der Cephalopoden. Zool. Anz. iv. pp. 431–433.

Watson, R. B. *Mollusca* of H.M.S. 'Challenger' Expedition. Part vii. J. L. S. xv. pp. 245–274; part viii. pp. 388–412; part ix. pp. 413–455; part x. pp. 457–475.

Wattebled, G. Catalogue des Mollusques testacés terrestres et fluviatiles observés aux environs de Moulins. J. de Conch. xxix. pp. 316–333.

Weinkauff, H. C. *Cypræa* and *Ovula* in Küster's Conch. Cab. Pts. 300, 303, 306, 308, & 313, pp. 81–230, pls. xxv.–liii., concluding the 3rd division of vol. v.

——. *Rissoina*, op. cit., pts. 302, 303, & 312, pp. 41–80, pls. xiii., xiv. xv., xv.*a*, xv.*b*, xv.*c*.

——. *Mactra*, op. cit., pts. 302 & 305, pp. 37–68, pls. xiii.–xxiv.

——. *Crassatella*, op. cit., pt. 307, pp. 1–16, pls. i.–vi.

——. Catalog der Gattung *Cypræa*. JB. mal. Ges. viii. pp. 133–157.

Weinland, F. Nachtrag zur Molluskenfauna von Haiti. JB. mal. Ges. viii. pp. 158 & 159.

Westerlund, C. A. Malakologisk Bidrag. Œfv. Ak. Forh. 1881, No. 4, pp. 35–69.

——. Kleine kritische Bemerkungen. JB. mal. Ges. viii. pp. 1–9.

Witter, M. F. M. *Unio luteolus* and its allied forms. J. of Conch. iii. pp. 173–175.

WOLFSON, W. Die embryonale Entwickelung des *Lymnaeus stagnalis*. Bull. Pétersb. xxvi. pp. 79–97, woodcuts (also in Mél. Biol. x. pp. 351–377).

WOOD-MASON, J. Notes on Indian Land and Fresh-water Mollusks. No. 1. On the Discrimination of the Sexes in the genus *Paludina*. Ann. N. H. (5) viii. pp. 85–88, with woodcuts.

YUNG, E. Recherches expérimentales sur l'action des poisons chez les Céphalopodes. MT. z. Stat. Neap. iii. pp. 97–120.

——. De l'innervation du cœur et de l'action des poisons chez les Mollusques Lamellibranches. Arch. Z. expér. ix. pp. 421–444, and C. R. xciii. pp. 562–564.

CONCHOLOGICAL JOURNALS.

Journal de Conchyliologie, par H. CROSSE & P. FISCHER, vol. xxix. or (3) xxi. Paris : 386 pp. 13 pls. (No. 4, pp. 277–386, pls. xi.–xiii., was published in April, 1882.)

Malakozoologische Blätter, continued by S. CLESSIN, (2) iii. Cassel : 192 pp., 9 pls., and iv., 224 pp. 7 pls.

Jahrbücher der deutschen malakozoologischen Gesellschaft, viii. Frankfurt-a.-M. : 354 pp. 10 pls.

Nachrichtsblatt der deutschen malakozoologischen Gesellschaft, xiii., 180 pp.

Bullettino della Società malacologica Italiana, vol. vii. Pisa : 294 pp. 5 pls. (The contents of the last part of vol. vi., viz., pp. 225–278, which appears to have been published in 1881, are also included in this volume of Zool. Rec.)

Journal of Conchology, vol. iii. London : Nos. 5–8, January–October, 1881, pp. 129–256, 1 pl.

RECORDS.

J. BROCK & W. KOBELT have given a record of the literature of the *Mollusca*, recent and fossil, for the year 1880, in Zool. JB. Neap. ii. pt. 3, pp. 3–112.

W. KOBELT has collected into one volume (Synopsis generum specierum, &c.) nearly 600 diagnoses of new species of shells, published in 1879.

W. H. DALL gives a Record of the 'American Work in the Department of recent *Mollusca* during the year 1880,' in Am. Nat. xv. pp. 704–718.

MANUALS.

P. FISCHER has commenced a very valuable Manual of Conchology in French. The first three parts, published in 1881, discuss the general anatomy and physiology of the *Mollusca*, including the composition and growth of the shell, and also (at great length) the geographical distribution ; the author admits 18 geographical provinces for the marine and 30 regions for the land and fresh-water *Mollusca*, and illustrates them

by a coloured geographical map.—A short recapitulation in J. de Conch. xxix. pp. 182–184.

W. Kobelt has finished his popular treatise on Conchology, "Illustrirtes Conchylienbuch," the last two parts containing the Bivalves and Brachiopods.

The first part of vol. iii. of Tryon's Manual of Conchology, containing the *Tritonidæ* and part of the *Fusidæ*, 64 pp. 20 pls., was published in 1881.

Aristotle's observations on the *Mollusca*, chiefly their external and internal structure, are compiled and arranged in systematic order with the addition of some explanations by N. C. Apostolidès & Yves Delage; Arch. Z. expér. ix. pp. 405–420. [They think that Aristotle's second genus of *Nautilus* cannot be any other than *Nautilus pompilius*, but they are certainly wrong in translating the Greek *Aporrhais* by *Pterocera*.—Rec.]

Anatomy and Physiology.

1. *General Morphology.*

E. Ray Lankester criticises some statements made by J. W. Spengel and W. K. Brooks concerning the general morphology and the development of the *Mollusca*, with special regard to his own previous observations, and suggests that the contractile posterior appendage of the embryo of the slug is homologous to the yelk-sac of the Cephalopods, the latter being also rhythmically contracted at a very early period. Ann. N. H. (5) vii. pp. 432–437, woodcut.

Critical remarks on this paper by J. W. Spengel as to his own observations; Zool. Anz. iv. pp. 435 & 436.

2. *Muscular System and Movement.*

K. Simroth maintains his theory that locomotion in snails is effected by extension of the muscular fibres and periodical coagulation of their contents [see Zool. Rec. xv. *Moll.* p. 8, and xvi. *Moll.* p. 13]; the aquatic non-air-breathing snails progress 2–3 centimètres in a minute; the aquatic air-breathers, whose body is specifically lighter from the air contained in the respiratory cavity, 7–8 centimètres in the same time. The progression of land snails is rendered more difficult by the greater weight of the same body in air than in water. *Cyclostoma elegans* overcomes the difficulty by lifting up one lateral half of the foot before it is extended forwards, thus avoiding the resistance caused by close contact with the soil, and by accessory fixation of the snout; foot and snout are for that purpose moistened by the secretion of numerous mucous glands; nevertheless the animal progresses scarcely one centimètre in a minute. The inoperculate land snails overcome the difficulties by having a well developed network of sympathic nerves which continue their action without direct influence of the will, creating a row of distinct waves in the sole, and by converting the gliding motion on the front of the foot into a rolling one; *Limax* is therefore able to progress 13–14 centi-

mètres in a minute. Z. wiss. Zool. xxxvi. pp. 1-67, pl. i.; abstracts in J. R. Micr. Soc. (2) i. p. 878, and Arch. Z. expér. ix. p. lx.

Inosit found in the muscles of the Cephalopods, it is wanting in all other *Evertebrata*, and also in the fishes and *Amphibia dipnoa*; Krukenberg, Zool. Anz. iv. p. 66.

3. *Digestion.*

D. Barfurth states that in autumn the liver of *Helix*, *Arion*, and *Limax* contains a considerable quantity of phosphate of lime, the phosphoric acid alone forming about half of the inorganic substances in it; this quantity is diminished when the animal has formed its epiphragma or restored a lost part of the shell. In *Limnæa*, the quantity of phosphate is remarkably less. Zool. Anz. iv. pp. 21–23.

É. Bourquelot states that the secretions of the liver and pancreas in the *Cephalopoda* are able to change amidon into sugar. C. R. xciii. pp. 979 & 980; abstract in J. R. Micr. Soc. (2) ii. p. 30.

The digestive organs of the dibranchiate *Cephalopoda* are described with special regard to histology by C. Livero. J. de l'Anat. Phys. xvii. pp. 97–123, with 2 pls.; abstract in J. R. Micr. Soc. (2) i. pp. 433–435.

Anatomical notes on the so-called pancreas of the Cephalopods, it being in *Octopus* more intimately connected with the liver, only distinct in colour, in *Loligo* a thickening of the wall of the hepatic ducts, in *Sepia*, *Rossia*, and *Sepiola* acinose appendages of the same, by W. J. Vigelius, Zool. Anz. iv. pp. 431–433.

Digestive organs of *Onchidium* described by J. Joyeux-Laffuie, C. R. xcii. p. 144.

The crystalline stalk in the intestine of the Bivalves is regarded as the remains of undigested food and a stock of nourishment for the winter, by F. Hazay, Mal. Bl. (2) iv. pp. 201 & 202.

4. *Respiration and Circulation.*

C. Mereschikowsky thinks that the red pigment in many Invertebrates, *e.g.*, in the foot of the Bivalves, which he calls "tetronerythrine," corresponds to hæmoglobine in the higher animals, and serves for cutaneous respiration from its great affinity to oxygen. C. R. xciii. pp. 1029–1032; abstract in Nature, xxv. p. 276, and J. R. Micr. Soc. (2) ii. p. 178.

Gills of the Bivalves. The distinction of four different kinds of structures [see Zool. Rec. xvi. *Moll.* p. 14] confirmed, and new examples of them given by Haren-Noman, Niederl. Arch. Zool. Suppl. i. 1881.

The gills of *Nucula proxima* and *Yoldia limatula* (Say) are described by K. Mitsukuri; they are confined to the hinder part of the animal, and consist of a longitudinal row of folds or leaves; the author recapitulates the more recent statements of other authors as to the morphology and development of the gills in the Bivalves, and comes to the conclusion that the gills of these *Nuculidæ* represent a rather primitive condition.

Q. J. Micr. Sci. xxi. pp. 595–608; abstract in Arch. Z. expér. ix. pp. lix. & lx.

F. G. Penrose states that no red blood-corpuscle could be found in the pericardial cavity of *Solen legumen*, in the only individual which allowed a favourable examination. Rep. Brit. Ass. 1881, p. 183.

Chemical note on the hæmolymph of *Planorbis corneus*, *Limnæa stagnalis*, and *Paludina vivipara*, the former owing its colour to hæmoglobin; C. F. W. Krukenberg, Verh. Ver. Heidelb. (2) iii. pp. 86–88.

5. *Excretion and Secretion.*

J. Carrière denies the existence of a special system of vessels for the reception of water from outwards in the Gastropods and Bivalves; the opening attributed to it by authors is the opening of a mucous gland, according to his observations in 12 genera of marine Gastropods. Zool. Anz. iv. p. 433.

The excretory function of the venous appendages in the *Cephalopoda* is confirmed by chemical experiments by B. Solger, Zool. Anz. iv. p. 379.

Glands opening in a median slit at the front end of the foot in *Valvata piscinalis* described by H. Simroth, *tom. cit.* p. 328.

H. Simroth maintains that land snails take water into their body, not only by the mouth, but the whole skin; *l. c.* p. 528.

6. *Nervous System.*

The commissures and net-like communications between the pedal nerves of *Chiton*, *Patella*, *Fissurella*, and *Haliotis* are described by B. Haller, Zool. Anz. iv. pp. 92 & 93; they are more numerous in *Chiton* than stated by Ihering, and the author concludes that *Chiton* is in this respect not so very isolated, but really allied to the other-mentioned genera.

Abstract of Simroth's paper on the pedal nervous system of *Paludina* [Zool. Rec. xvii. *Moll.*, p. 13] in Arch. Z. expér. ix. p. xxv.

Nervous system of *Onchidium* described by J. Joyeux-Laffuie, C. R. xcii. pp. 144 & 145.

7. *Action of Poisons.*

E. Yung states that poisonous substances act in the Cephalopods very slowly and feebly by subcutaneous absorption; crystalloid poisons are absorbed rapidly by the gills, colloid poisons must be injected into the cephalic artery. Young specimens of *Sepia* survive in fresh-water only 1 minute, adult ones about 20 minutes, and in a mixture of equal parts of sea and fresh-water about 45 minutes. Acids and alkaline substances do not act on the Cephalopods in proportion to their chemical energy; both cause acceleration of the respiratory movements. Chloride of mercury first attacks the muscular contractility. Curare, strychnine, and veratrine act on the Cephalopods nearly in the same manner as on the Vertebrates.

Curare paralyzes the nerves of the mantle and arms, but, in moderate doses, not those of the heart and the intestine; strychnine tetanizes the muscles of the mantle and arms; veratrine provokes convulsive cramps in them. MT. z. Stat. Neap. iii. pp. 97–120.

YUNG also describes the effect of various poisonous substances on the heart of the Bivalves. Curare seems to have no direct action on it. Strychnine has only a temporary effect, provoking some convulsive movements in the muscles. Nicotine in strong doses kills, increasing its volume considerably. Digitaline diminishes the number of pulsations. *Upas antiar* produces paralysis. Sulpho-cyanide of potassium stops the heart in diastole, and completely kills it. Injection of fresh-water kills, by causing the muscles to flag. Arch. Z. expér. ix. pp. 421–444; previous note in C. R. xciii. pp. 562–564; abstract in J. R. Micr. Soc. (2) i. p. 879.

8. *Organs of Sense.*

The eyes of *Patella cærulea* var. *fragilis* (Phil.), of *Haliotis tuberculata* (L.), *Fissurella græca* (L.), and *costaria* (Defr.), are described by P. FRAISSE. That of *Patella* exhibits the lowest organization; it is small, consists only of one layer of slender retina-cells, without cornea, lens, and vitreous fluid, and without a distinct optic nerve, and is a simple invagination of the skin, the retina-cells being transformed epidermic cells. In *Haliotis*, the eye is of somewhat higher organization, it is also open in front, and consists of a simple row of retina-cells, but it has a voluminous gelatine-like lens, and a well-developed optic nerve dilated into a ganglionous expansion at its meeting with the eye-ball. The eye of *Fissurella* is closed in front, and has two distinct sorts of retina-cells; otherwise it resembles that of *Haliotis*. Z. wiss. Zool. xxxv. pp. 461–477, pls. xxv. & xxvi. Abstract in J. R. Micr. Soc. (2) i. pp. 724 & 725.

J. W. SPENGEL's paper on the olfactory organs and nervous system of the *Mollusca*, Z. wiss. Zool. xxxv. pp. 332–384, pls. xvii.–xix., noticed by anticipation in Zool. Rec. xvii. *Moll.*, p. 14, being published in 1881, is abstracted in J. R. Micr. Soc. (2) i. pp. 583–586, and in Arch. Z. expér. ix. pp. xli.–xlv.

Abstracts of SOCHACZEWER's paper on the olfactory organ of the *Pulmonata* [Zool. Rec. xvii. *Moll.*, p. 14] in Arch. Z. expér. ix. p. xxv., and Am. Nat. xv. p. 655. H. SIMROTH incidentally opposes Sochaczewer's view that the opening of the pedal gland is the olfactory organ in land snails, thinking that similar sensitive cells are scattered throughout the whole of the soft skin of the animal, Z. wiss. Zool. xxxvi. pp. 41–43. SOCHACZEWER answers these objections, *l. c.* pp. 540 & 541.

'Gustatory buds' (Geschmacks-knospen) in the epithelium of the mouth of *Chiton*, *Patella*, *Haliotis*, *Fissurella*, *Trochus*, and *Turbo*, and another somewhat doubtful sensitive epithelium, indicating, perhaps, a sixth sense, beneath the radula in *Chiton*, and perhaps also in *Patella*, stated by B. HALLER, Zool. Anz. iv. pp. 93 & 94.

9. *Propagation and Development.*

Observations on the propagation, development, and growth of the

fresh-water Bivalves by F. Hazay, Mal. Bl. (2) iv. pp. 132–160. *Unio pictorum*, *tumidus*, and *batavus* reach, in the second year of their life, a length of 7–25 millimètres, in the third 8–34, in the fourth 29–73, in the fifth 36–83. *Anodonta* grows more quickly in the first year.

Note on the breeding habits of the European and American Oyster; Am. Nat. xv. pp. 57 & 58.

Self-fecundation of fresh-water Bivalves probable according to F. Hazay, Mal. Bl. (2) iv. p. 164 and following.

Mutual fecundation in *Planorbis spirorbis*, *carinatus*, and *corneus*, observed; *id. l. c.* p. 50.

Eggs of *Limnæa* and *Physa*, with 2–10 yelks; *id. l. c.* pp. 52–56.

Generative organs and spawn of *Onchidium* described; J. Joyeux-Laffuie, C. R. xcii. p. 146.

Hybrids of some species of *Partula*; Hartman, Bull. Mus. C. Z. ix. p. 173.

The first stages of development in *Neritina fluviatilis*, from the segmentation of the yelk to the shutting of the blastopore, are described by F. Blochmann, Z. wiss. Zool. xxxvi. pp. 125–174, pls. vi.–viii. Abstract in J. R. Micr. Soc. (2) i. pp. 877 & 878.

The development of *Limax campestris* (Binn.), with special regard to the first changes in the egg, pro-nucleus and cleavage, &c., described by E. L. Mark, Bull. Mus. C. Z. vi. pp. 173–625, 5 pls. Abstract in J. R. Micr. Soc. (2) ii. pp. 178 & 179.

The first stages of development in the egg of *Limnæa stagnalis*, from the disappearance of the germinal vesicle to the first appearance of the chief organic systems, is described and discussed, with criticisms on the statements of Lereboullet, Ganin, E. R. Lankester, and others, by W. Wolfson, Bull. Pétersb. xxvi. pp. 79–97, or Mél. Biol. x. pp. 351–377, with numerous woodcuts. It is the abstract of a larger paper, published in 1879 in Russian.

Young individuals of *Limnæa* coming from the same string of eggs exhibit great differences in time and degree of growth; the relation of growth to the volume of water in which they are bred, as surmised by Semper, is not confirmed. Hazay, Mal. Bl. (2) iv. pp. 220 & 221.

10. *Growth of Shell.*

H. Grabau discusses the spiral line, and states with regard to the objections made by J. F. Blake (Phil. Mag. and J. of Sci. vi. 1878) that the curve termed by Naumann 'Conchospiral,' after simplifying some equations, is a most apt expression; he exemplifies it by measurements in an Ammonite, *Arcestes intus-labiatus*; the deviations of the measurements from the calculation are only trifling, and compensate each other. SB. Ges. Leipzig, viii. pp. 23–32 [*cf.* Zool. Rec. ix. 1872, p. 112].

11. *Biology.*

Notes on the sea *Mollusca* kept alive in the Aquarium at Frankfort by F. Richters, 'Das Aquarium des zoologischen Gartens zu Frankfurt-a.-M.,' Schulprogramm, 1881.

Numerous observations on the biology, adaptation to soil and water, variation, &c., of the European land and fresh-water *Mollusca*, with hypotheses concerning their phylogeny, by F. Hazay, Mal. Bl. (2) iv. pp. 43–221. The lifetime of *Vitrina* is probably only 1 year; that of *Hyalina nitens* 2 years (pp. 115 & 116); of *Helix pomatia* 6–8; of *H. candicans* 2–3 (pp. 117 & 118); *Paludina* 8–10; *Limnæa* and *Planorbis* 3–4 (p. 73).

H. Jordan discusses the variations of shape in several species of European *Unionidæ*, with regard to the localities in which they live; specimens from rivers have generally a heavier shell, and are more thickened in front and more lengthened and sometimes bent downwards at the hinder end, in comparison with those from lakes; the cardinal teeth become stronger and the muscular impressions deeper where the water is much agitated; rays of green colour are found only in specimens from rivers, &c. Biol. Centralbl. i. pp. 392–399.

Some instances of association of fresh-water shells by Butterell, J. of Conch. iii. p. 177.

Thermal springs of 20°–26° near Buda-Pest; the common fresh-water-shells, as *Bythinia tentaculata*, *Planorbis marginatus*, and *Limnæa lagotis* remain in them remarkably smaller than elsewhere. *Limnæa peregra* alone is plentiful and of ordinary size. Hazay, Mal. Bl. (2) iii. p. 7.

Land and fresh-water snails perish when exposed to — 7° to — 10 °C. for half-an-hour or somewhat longer, or to —5° C. for two days; those of larger size resist somewhat longer, young specimens of the same perish at —4° C. or less; Rödel, "Über das vitale Temperatur-minimum wirbelloser Thiere," Diss. inaug. Halle: 1881, pp. 11–14 & 34.

Helix aspersa living 13 months without food; Lockwood, Am. Nat. xiv. [1880] p. 214.

Some specimens of *Limnæa* survived a dessication of about two months; J. L. Hawkins, Sci. Goss. 1881, p. 23; J. of Conch. iii. p. 181.

H. Leder has observed that *Daudebardia lederi* produces a strange feeling, somewhat like that of electricity, in the hand of man; Böttger, JB. mal. Ges. viii. pp. 276 & 277.

Instance of a snail recognizing and distinguishing the human voice; W. H. Dall, Am. Nat. xv. pp. 976 & 977.

Land snails broken and eaten by thrushes; Ashford, J. of Conch. iii. p. 134.

A large number of the young of *Succinea putris* swept from their winter moorings by a flood, and destroyed by insects; *id. l. c.* pp. 195 & 196.

The rather frequent occurrence of larvæ of *Distomidæ* in terrestrial snails, stated by G. Ercolani; Mem. Ac. Bologn. (4) ii.

12. *Abnormities.*

Several monstrosities of marine shells; Tryon, Man. Conch. iii. pp. 112 & 113, pl. xliv. figs. 238–242.

15–25 specimens per thousand of *Melantho* are sinistral, if the

embryonic shells are reckoned, but only one-tenth per cent. of them survive to maturity; R. Ellsworth Carl, Am. Nat. xiv. [1880] p. 207.

Sinistral specimens are the majority in *Partula otaheitana* (Boug.), 1 to 50 in *P. vexillum*, 1 to several hundred in *P. affinis*, and *P. spadicea* (Rve.) is constantly sinistral; Hartman, Bull. Mus. C. Z. ix. p. 175.

Sinistral specimen of *Bulimus* (*Placostylus*) *fibratus* (Martyn), Crosse, J. de Conch. xxix. p. 340, pl. xi. fig. 2; of *Gibbus lyonetianus* (Pall.), Nevill, J. A. S. B. l. pt. 2, p. 129.

Reversed specimen of *Planorbis complanatus*; (Miss) F. M. Hele, J. of Conch. iii. p. 232.

Keeled deformity of *Bulimus* (*Placostylus*) *fibratus* (Martyn); Crosse, J. de Conch. xxix. p. 341, pl. xi. fig. 3.

Frequent occurrence of albino specimens of *Clausilia laminata* (Mont.), *varians* (Ziegl.), *ornata* (Ziegl.), and *vetusta* (Ziegl.), in Styria, Ursula Alp, and an albino specimen of *Helix phalerata*; Tschapeck, Nachr. mal. Ges. 1881, pp. 71–73.

White variety of *Succinea elegans*; Butterell, J. of Conch. iii. pp. 148 & 240.

Whitish specimen of *Limnæa truncatula* and *palustris* at Folkestone and Sandwich; (Mrs.) J. Fitzgerald, J. of Conch. iii. pp. 232 & 240.

Pale coloured specimens of *Planorbis corneus*, animal bright pink, shell reddish tinged, from Spring Dyke, near Hull; Butterell, *tom. cit.* p. 137.

Abnormities of shells caused by preceding fractures, Hazay, Mal. Bl. (2) iv. pp. 103–105, pl. iii. fig. 11, & pl. iv. fig. 5. Abnormal expansion of the peristome in *Limnæa* said to be caused by the invasion of a leech; *id. l. c.* p. 102, pl. ii. fig. 8. A pale-coloured spiral band in normally one-coloured shells is caused by a wound in the mantle-edge; *id. l. c.* p. 103, pl. iii. fig. 7.

Abnormities in the shells of *Limnæa stagnalis*, *palustris* and *ovata*, figured; *id. l. c.* pls. iv. & v.

Restoration of a hole in the shell of *Limnæa elodes* (Say) in six weeks; Bunker, Am. Nat. xiv. [1880] pp. 520–522.

A monstrosity of *Limnæa ovata* with a second lip inside the aperture; F. Borcherding, Mal. Bl. (2) iii. p. 145.

GEOGRAPHICAL DISTRIBUTION.

a. Land and Fresh-water Mollusca.

1. *Palæarctic Province generally.*

W. Kobelt has published a new and enlarged edition of his "Catalog der im europäischen Faunengebeit lebenden Binnenconchylien," a list of all terrestrial and fresh-water *Mollusca* of Europe, and the neighbouring parts of Asia and Africa, in systematic order, with quotations of figures and general indications of occurrence. An alphabetical index, containing also synonyms, concludes the volume.

A. Locard, in vol. ii. of his "Études sur les variations malacolo-

giques" (560 pp.), discusses first the question of species and variety, and enumerates the known genera and numbers of species living in the Valley of the Rhone, near Lyons, noting their distribution with regard to plains and mountains, and land and fresh-water; also their scarceness and frequency, and the colonial association of individuals of the same, or nearly allied species; he also distinguishes a number of peculiar "faunulæ," as those of river-banks, rocks, stone-walls, woods, gardens, &c., and mentions different examples of acclimatization and gradual extension of geographical distribution. He then proceeds to discuss the palæontological representation of the same genera, subgenera, and species, chiefly in the quaternary beds, and tries to sketch a history of them from those times to the present. In discussing the "centres of appearance," he approves not only of the three "centres" proposed by Bourguignat, viz., the Spanish, Alpine, and Tauric centres for the European land and fresh-water shells generally, but also proposes a larger number of subordinate centres for distinct species, or groups of nearly allied species, as for example the French alps for *Helix fontenilli*, *alpina*, and *glacialis*, and adopts the subdivision of the European malacological fauna into 5 regions, as proposed by G. Fischer, viz. (1) the septentrional or Germanic region; (2) occidental or Atlantic; (3) meridional or circum-Mediterranean; (4) central or Pontic, extending to Austria; and (5) oriental or Caspian. The variations of species are studied in detail both for themselves and their causes, which are divided into physical (stations, wind, humidity, &c.), chemical (quality of soil, saltness of water), mechanical (hibernation, depth and movement of water, vegetation), and physiological (nourishment, light, starvation and deprivation of air). Finally, the different anomalies and monstrosities of shells are discussed. All this is exemplified by a large number of very valuable observations, partly made by the author himself in the Rhone Valley and its neighbourhood, partly borrowed from other French and some foreign authors concerning the same or nearly allied species. The author begins and concludes by protesting against the proneness to see "new species" in mere gradual variations, and to overlook attributes possessed in common, in favour of subordinate differences [a warning which ought to be addressed chiefly to some of his compatriot conchologists]. This work may, in short, be called a very useful text-book of the more interesting geographical, topographical, and other external relations of the European land and fresh-water mollusks generally, though purposely limited to those of one country, and it would merit this appellation still more, if the author had been acquainted with some English and German treatises with the like purpose.

2. *Scandinavia and Russia.*

Sweden and Norway. 39 species or varieties, new for the fauna of these countries, enumerated by A. Westerlund, Œfv. Ak. Förh. 1881, pp. 35–50.

Northern Norway. 14 terrestrial shells found near Bodö, 67° 37′ N. lat., by the brothers Krause, including *Balea perversa* (L.) and *Clau-*

silia nigricans (Jeffr.), not before found so far north, with a table of the known land and fresh-water shells of Trondhjem-stift, Norland and Finmarken; there is a remarkable difference between the land shells of the Norwegian coast and those of Lapland in these latitudes, the former being an advanced post of the central European fauna, the latter rather Arctic. E. v. Martens, SB. nat. Fr. 1881, pp. 34–39.

Moscow. 54 terrestrial and 55 fresh-water species enumerated by C. Milachevich (title *suprà*); 11 of them belong to alpine, 17 to the boreal province of Europe, and the rest are more generally distributed; all species of *Helix* of large size are wanting, not only *H. pomatia*, but also *nemoralis*, *hortensis*, and *arbustorum*. The author thinks that the isotherm of 4° R. forms the southern limit of the boreal zoological province in Russia. Bull. Mosc. lvi. pp. 215–241.

Russia. H. Drouet (Unionid. Russ. pp. 31–35) enumerates 33 Russian species of *Unionidæ*; 16 of them live also in central and western Europe, 7 are proper to Southern Russia north of the Caucasus, 9 to Transcaucasia, and 1 is common to the Crimea and Transcaucasia. The peculiar species begin to make their appearance in the inferior parts of the Dnieper, Bug, and Dniester, at about 50° N. lat.; several species and varieties found in the Dnieper are characterized by their elevated sickle-shaped hinder extremity; the Trancaucasian species are generally distinct from, but similar to the European.

3. *British Fauna.*

A new British variety of *Clausilia dubia* from Northumberland described by Westerlund, Œfv. Ak. Forh. 1881, p. 58.

Succinea pfeifferi (Rossm.) and *Hyalina draparnaldi* (Beck), said to be new for England, by Fitzgerald, J. of Conch. iii. pp. 149 & 177, both from Folkestone [probably confounded heretofore with *S. putris* and *H. cellaria*, Rec.]

List of 5 species and 16 varieties of *Succinea* collected by Mrs. Fitzgerald in various parts of the United Kingdom; Hazay, J B. mal. Ges. viii. pp. 160–165.

Scotland. Cyclostoma elegans in the lake district, Scharff, J. of Conch. iii. p. 178. *Vertigo pusilla* in Scotland, Rimmer, Scot. Nat. vi. p. 61.

Isle of Man. 12 terrestrial and 4 fresh-water species by Nelson, J. of Conch. iii. pp. 145 & 146. See also T. Talbot, Zool. (2) v. pp. 378–382.

Yorkshire. Land and fresh-water shells enumerated by R. M. Christ, Zool. v. pp. 175–185 & 242–249. 11 terrestrial and 6 fresh-water species mentioned by W. C. Hey, J. of Conch. iii. p. 178. 17 terrestrial and 10 fresh-water species from Burlington, Bempton, Spreton, and Flamborough Head, by J. S. Gibbons, *tom. cit.* p. 238.

Hornsea, near Hull. List of 22 terrestrial and 14 fresh-water species by J. D. Butterell, J. of Conch. iii. pp. 136 & 137.

Nottinghamshire. Some rarer land shells mentioned by R. A. P. Rolfe, Sci. Goss. 1879, p. 22, J. of Conch. iii. p. 185.

Peterborough. 13 terrestrial and 15 fresh-water species by T. W. Bell, J. of Conch. iii. pp. 146 & 147.

Maidenhead. 23 fresh-water and 24 terrestrial species collected after a Thames flood by L. E. Adams, Sci. Goss. 1881, p. 118 (J. of Conch. iii. p. 194).

Bristol. 3 species mentioned by Cundall, J. of Conch. iii. p. 137.

Isle of Wight. Note on several land shells by C. Ashford, J. of Conch. iii. pp. 132–135.

4. *France.*

New French species of *Unio* and *Anodonta* by Drouet, J. de Conch. xxix. pp. 25, 30 & 248.

Département du Nord. M. A. de Norguet's "Catalogue des Mollusques terrestres et fluviatiles du Département du Nord," published apparently at Lille in 1873, 30 pp., 8vo, enumerating 131 species, may be mentioned here.

Amiens. Mollusks collected by E. Vaniot; Mém. Soc. L. Nord Fr. 1881, 55 pp. [Not seen by the Recorder.]

Lagny, Dép. Seine-et-Marne. 72 terrestrial and 34 fresh-water species, the former including several critical ones, enumerated by A. Locard; Contrib. faune mal. française, ii. 33 pp.

St. Saulge, Dép. Nièvre. 16 species of slugs, 1 new, enumerated by L. Brevière; J. de Conch. xxix. pp. 306–315, pl. xiii.

Moulins, Dép. Allier. 45 terrestrial and 38 fresh-water enumerated by G. Watterbled, J. de Conch. xxix. pp. 316–333. To be mentioned among them *Bythinella opaca, Helix variabilis, carthusiana, striata, Bulimus detritus, Clausilia rolphii.*

Dép. Ain (Burgundy). 140 terrestrial and 79 fresh-water species enumerated by A. Locard, *op. cit.*, including several more or less disputed species of Bourguignat's; occurrence and varieties are carefully noted; the author distinguishes 21 distinct faunulæ, according to the physical conditions of the localities, for example, *Faunula riparia, rupestris, muralis, hortensis, arborum, lacustris, palustris,* and *fontana,* and assigns to each of them a number of species. Concerning Locard's second volume of the *Mollusca* of the valley of the Rhone, see *suprà*, 1. Palæarctic Province generally.

Western and Southern France. Some new species described by P. Fagot, Bull. Soc. Z. Fr. 1881, pp. 137–141.

Département de la Lozère. List of land and fresh-water mollusks by P. Fagot & G. de Malafosse in a pamphlet not seen by the Recorder.

Pyrenees. Bibliographical notes on the malacological fauna of Ariège and the Dép. Basses Pyrénées by P. Fagot, Bull. Soc. Toulouse, 1880, 24 pp.; abstract in J. de Conch. xxix. pp. 273 & 274. A. Granger has published notes on a conchological excursion to the frontier of Spain; Le Nat. iii. p. 420. [Not seen by the Recorder.]

5. *Central Europe.*

Between *Hague* and *Scheveningen.* 8 species collected by J. Gwyn Jeffreys, Ann. N. H. (5) viii. p. 447.

Northern Germany. Localities of *Hyalina draparnaldi* (Beck); Borcherding, Mal. Bl. (2) iv. pp. 1–5.

Arngast Island (Jade Inlet, Northern shore of Germany). Only *Vitrina pellucida*, *Succinea oblonga*, and *Pupa muscorum* have been found here; Huntemann, Abh. Ver. Bremen, vii. p. 143.

Danzig. E. Schumann enumerates 63 terrestrial and 59 fresh-water species observed near Danzig; among them are 8 species of *Pupa*, 11 of *Clausilia*, and 12 of *Pisidium*. Schr. Ges. Danzig, vi. pp. 321–330; preliminary notes on the same subject, *l. c.* pp. 303 & 304.

Ost-Friesland. 12 terrestrial and 36 fresh-water species found in the 'Artland' on the banks of the Hase, by F. Borcherding; Mal. Bl. (2) iii. pp. 142–149.

Westfalia. 61 terrestrial and 20 aquatic species found in the so-called 'Teutoburger Wald,' or Osning Mountains, enumerated; *id. op. cit.* iv. pp. 11–31.

Spreewald (Mark Brandenburg). 18 terrestrial and 21 fresh-water species enumerated by H. Jordan, Nachr. mal. Ges. 1881, pp. 89–93.

Halle a. S. Land and fresh-water *Mollusca* mentioned by O. Goldfuss, Nachr. mal. Ges. 1881, pp. 160–163.

Cassel. 65 terrestrial and 43 fresh-water species enumerated by F. H. Diemar, Ber. Ver. Cassel, xxvii. [1880] pp. 91–122, with some critical notes on the species mentioned sixty years ago by C. Pfeiffer from the same country. 15 species of land shells from Spangenberg, near Cassel; *id.* Nachr. mal. Ges. 1881, pp. 51–53.

Thuringia (Eisenach, Friedrichsroda, and Sondershausen). Notes on its malacological fauna, with special regard to the geognostical quality of the soil, by P. Hesse, Nachr. mal. Ges. 1881, pp. 3–6. Where the soil contains no limestone, the mollusks are remarkably scarce, and their shells thin.

Weimar. 63 terrestrial species, with special reference to the character of the localities, by O. Schmidt, JB. mal. Ges. viii. pp. 68–82. *Cochlicopa* [*Azeca*] *menkeana* (Pfr.) has not been before known so far eastwards.

Environs of Coburg. 62 terrestrial and 24 aquatic species enumerated by E. Study, Mal. Bl. (2) iv. pp. 31–42.

Fränkische Schweiz [in Northern Bavaria]. 42 terrestrial and only 4 fresh-water species enumerated by H. v. Ihering, Mal. Bl. (2) iii. pp. 71–73.

Homburg and the Taunus Mountains. Incidental remarks on their malacological fauna by Böttger & Rolle, JB. mal. Ges. viii. pp. 47–49.

Jura District and Schwarzwald, in Southern Baden. 73 terrestrial and 22 fresh-water species enumerated by V. Sterki, Nachr. mal. Ges. 1881, pp. 33–39. *Helix rupestris* and *nemoralis*, *Bithynia tentaculata*, and some other species common elsewhere are wanting.

Switzerland, Weissenstein near Solothurn. 36 terrestrial species, 1 new?, enumerated by J. Blum, Nachr. mal. Ges. 1881, pp. 138–141. *Pisidium*, in the small lake of the St. Gothard, at 2154 mètres above the sea, and *Limnæa auricularia*, in the lake of Ritom, Piora valley, 1829 mètres; Asper, Arch. Sci. Nat. iv. [1880] p. 406.

Tirol. C. Heller gives some notes on the distribution of the *Mollusca* in the higher Alps of Tirol, chiefly from V. Gredler's observations; SB. Ak. Wien, 1881, p. 20.—*Ahrenthal.* 48 terrestrial species, 1 new, and only 2 fresh-water shells, *Limnæa peregra* and *Pisidium fossarinum*, collected by G. Treffer, enumerated by S. Clessin, Mal. Bl. (2) iii. pp. 184–188.

Styria. Notes on the occurrence of *Campylæa planospira* (Lam.), *Vitrella tschapecki* (Clessin), and *Hyalina hiulca* (Jan), by H. Tschapeck, Nachr. mal. Ges. 1881, pp. 11–14; a new variety of *Clausilia ornata*, id. *l. c.* p. 22; 17 terrestrial species from the Styrian slope of Mount Ursula, *id. l. c.* pp. 69–74.—*Melania*, *Melanopsis*, and *Neritina*, in Lower Styria, *id.* JB. mal. Ges. viii. pp. 101–109.

Upper Hungary, Nadaska and thermal waters of Tapolcza. Malacological notes by J. Hazay, JB. mal. Ges. viii. pp. 262–275; *Hemisinus thermalis* and *Neritina prevostiana* found in the latter.

Buda-Pest. J. Hazay, in a rather lengthy paper, enumerates 60 terrestrial and 54 fresh-water *Mollusca*, some new, with special regard to the varieties, and several interesting notes on their occurrence, and the influence of localities upon the shells, Mal. Bl. (2) iii. pp. 1–37, and 179 descriptions of new species and varieties, pp. 37, 47, 169–179. Generally, the fauna agrees with that of Central Europe; the following may be mentioned as more remarkable: *Helix* (*Xerophila*) *candicans* and *costulata* (Ziegl.), (*Tachea*) *austriaca* (Mhlf.), 2 new species of *Succinea*, 4 spp. of *Paludina*, 2 new *Bythinella*, 1 *Lithoglyphus*, 1 *Hemisinus*, 2 *Neritina*.

Lake Balaton, Hungary. G. Servain enumerates in a separate pamphlet (title, see above) 50 terrestrial and 87 fresh-water shells from the banks of this lake; he describes 45 of them as new species, following the idea of Bourguignat in urging the slightest differences as specific.

6. *Italy.*

Lombardy. Some additions to Adami's list of land and fresh-water mollusks of the valley of the Oglio (1876) by P. Strobel, Bull. Soc. mal. Ital. vi. pp. 261 & 262.—Italian varieties of *Helix cingulata* and allied species by Mme. Paulucci, *l. c.* pp. 5–55, pls. i. & ii. *Helix planospira*, *Clausilia dubia*, and *stentzii* found at Cortona; Fitzgerald, J. of Conch. iii. p. 149 [probably Cortina, in Southern Tirol.—Rec.].

Middle Italy, Umbria, Abruzzi, and Terra di Lavoro. 80 terrestrial and 19 fresh-water shells collected by G. Cavanna, enumerated by Mme. Paulucci, Bull. Soc. mal. Ital. vii. pp. 69–180, pls. i.*b*–v.

Sicily. Very interesting remarks on the topographical distribution of *Helix scabriuscula* (Desh.) and allied forms, establishing a nearly uninterrupted series connecting them with *H. platychela*, by W. Kobelt; JB. mal. Ges. viii. p. 50–67, pl. ii.

7. *South-east Europe.*

New *Unionidæ* from South-eastern Europe by H. Drouet, J. de Conch. xxix. pp. 22–31 & 244–254.

Greece. Some land shells from the islands *Amorgos*, *Syra*, and *Paros*, collected by T. v. Heldreich, mentioned by O. Reinhardt, SB. nat. Fr. 1881, pp. 135 & 136.

Crimea. Some land shells, including 4 new, by Clessin, Mal. Bl. (2) iii. pp. 136–141. (See also Russia.)

8. *Western Asia.*

Transcaucasia, incl. *Russian Armenia*. 103 terrestrial and 24 fresh-water species, several new, or with new varieties, enumerated and discussed by O. Böttger, JB. mal. Ges. viii. pp. 167–261. The genus *Pomatias*, and some well-known European species, as *Pupa avenacea* and *Patula rupestris*, were heretofore not known from that country. New species of *Clausilia*; id. *l. c.* pp. 341–346. 38 terrestrial and 4 fresh-water species, including 2 new, found from Poti to Tiflis, enumerated by S. Clessin, Mal. Bl. (2) iii. pp. 129–135. *Pupa* (*Leucochilus*) *theeli* (Westerl.), hitherto only known from Siberia, has been found on the banks of the Rion.

Lake of Tiberias. Fresh-water shells collected by Lortet, Nachr. mal. Ges. 1881, p. 27, and J. of Conch. iii. p. 180.

Country of the Mijjertain Somalis, near Aden. Terrestrial and fluviatile shells described by J. R. Bourguignat (title *suprà*).

9. *Northern Africa.*

Oran, and Northern coast of *Morocco*. Very valuable notes on their land-snails, made by Kobelt on his voyage in these countries, Nachr. mal. Ges. 1881, pp. 81–89, 97–115, 149–159, and 165–178. Especially he points out the analogy of the land shells from Oran with those from Murcia in Spain, and again the analogy of those from Tetuan, in Morocco, with those from Sicily; JB. mal. Ges. viii. pp. 278 & 327 & 328, and Zool. Anz. iv. p. 522.

Algerian Sahara. Some recent and subfossil species by L. Morlet, in Roudaire's "Rapport sur l'Expédition des Schotts," 1881, pp. 168–170, and J. de Conch. xxix. pp. 343–346, pl. xii. Several fresh-water shells from Wady-Rir, Wargla, and the Zab river, mentioned by G. Rolland, C. R. xciii. p. 1090.

10. *Tropical Africa.*

Abyssinia. 3 terrestrial and 15 fresh-water species collected in the "hunting grounds of the Anseba," by J. Piroth, enumerated and 2 new described by C. Jickeli, JB. mal. Ges. viii. pp. 336–340.

Socotra Island. Its malacological fauna has been explored by Prof. I. Bayley Balfour, in February and March, 1880, and by Riebeck and G. Schweinfurth, in April and May, 1881. The shells collected by the former have been described by H. H. Godwin-Austen, P. Z. S. 1881 [Aug. 1, 1881] pp. 251–257, pls. xxvii. & xxviii. *Cyclostomidæ*, and pt. 4 [published April 1, 1882] pp. 801–812, pls. lxviii. & lxix., *Pulmo-*

nata inoperculata (also a note on them in Rep. Exit. Ass. for 1881, pp. 196 & 197); those collected by the German travellers, by the Recorder, Nachr. mal. Ges. [Oct.] 1881, pp. 134-138. The character of the land shells is rather peculiar, distinctly nearer African than Indian types, but without doubt nearest to, and partially identical with, the few-known land shells of Southern Arabia (genera *Otopoma*, *Lithidion*, *Buliminus*). Godwin-Austen states a nearer alliance to Madagascar, on account of the genus *Tropidophora*, but the Recorder thinks that what he describes as Socotran species of this genus, belong rather to *Lithidion*. Only 2 fresh-water shells known, *Melania tuberculata*, Indian and African; and *Planorbis exustus*, only Indian.

Zanzibar. 5 new land shells by J. W. Taylor, J. of Conch. iii. pp. 142–144.

Lake region. New or little-known land shells from between the East Coast and the great lakes, generally resembling those known from the coast, and fresh-water shells from the lakes Tanganyika and Nyassa, mostly very peculiar [see Zool. Rec. xvii. *Moll.* p. 25], but including also *Melania tuberculata*, *Lanistes purpureus* and *ovum*, *Limnæa natalensis*, and *Unio niloticus*, described and most of them figured by E. A. Smith, P. Z. S. 1881, pp. 276–300, pls. xxxii.–xxxiv.; additions subgen. *Paramelania*, id. *l. c.* pp. 558–561. This author has also published a list of 16 terrestrial and 31 fresh-water species from the lakes Tanganyika and Nyassa, with some general observations, in J. Thomson's "To the Central African Lakes and Back" (London: 1881, cr. 8vo), vol. ii. pp. 295–298. H. Crosse gives a recapitulation of Smith's papers of this and the preceding year in J. de Conch. xxix. pp. 105–139, & pp. 277–306, pl. iv. Only the figured species will be mentioned below, with the names of those which are changed. [Crosse is no doubt right in the conclusion that the resemblance of the fresh-water shells of this lake to marine genera is not so great as was presumed.]

Mayotte Island, Comores. 27 inoperculated, 12 operculated land shells, 2 *Auriculidæ* and 1 *Assiminea*, including many new species and 1 new genus (*Cyclosurus*), collected by M. Marie, described by A. Morelet, J. de Conch. xxix. pp. 212–241, pls. ix. & xvi.

Nossi-Bé and *Nossi-Comba*, islands on the N.W. shore of Madagascar, 17 species of inoperculated and 4 operculated land shells, 3 *Limnæidæ*, 5 *Auriculidæ* and 8 fresh-water operculated snails, enumerated by H. Crosse, J. de Conch. xxix. pp. 189–212.

Mascarene and *Seychelle Islands.* G. Nevill points out that their land snails agree generally more with those of the Andamans, Nicobars, Sumatra, and the Moluccas, than with those of Cis-gangetic India, or with European fossils; J. A. S. B. l. pt. 2, pp. 125–127.

Ascension Island. Helix similaris (Fér.), E. A. Smith, Ann. N. H. (5) viii. pp. 430 & 431. [See Zool. Rec. xiv. *Moll.* p. 19].

11. *Eastern and Southern Asia.*

China and *Japan.* Comparative table of the known species of the subgenus *Ægista*; Martens, Conchol. MT. i. p. 101.

North China, province *Chili*, including *Peking*. 21 terrestrial and 33 fresh-water species with several new and emendations of synonymy, enumerated by O. v. MÖLLENDORFF, JB. mal. Ges. viii. pp. 33–43, pl. i. figs. 8–10.

Lake Kuku-nor. *Limnæa plicatula* (Bens.); Martens, SB. nat. Fr. 1881, p. 63.

Central China, province *Hunan*. Notes on 26 species of land shells, and 11 fresh-water species, some new, collected by P. Fuchs, on isolated groups of rocks, by P. V. GREDLER, JB. mal. Ges. viii. pp. 10–33, pl. i. figs. 1–7, & pp. 110–124, pl. vi.

Southern China, province of *Canton*. The known land snails enumerated, with critical notes on the localities, and 11 new species described by O. v. MÖLLENDORFF, JB. mal. Ges. viii. pp. 302–312. Several species (2 new) by GREDLER, *tom. cit.* pp. 124–132. Critical note on the land shells of Hongkong by O. v. MÖLLENDORFF in Martens's Conchol. MT. i. p. 74.

British India. G. NEVILL makes several interesting additions and corrections to his "Hand List" [Zool. Rec. xv. *Moll.* p. 21], concerning the land and fresh-water shells of India and adjacent countries; J. A. S. B. l. pt. 2, pp. 125–161, pls. v.–vii. W. T. BLANFORD estimates the number of land and fresh-water species of *Gastropoda* to be about 900, that of fresh-water Bivalves about 100; Rep. Brit. Ass. for 1881, p. 678, and J. A. S. B. l. pt. 2, pp. 267 & 271.

Notes and drawings of the animals of various Indian Land, *Pulmonata*, left by the late Dr. STOLICZKA, have been published by GODWIN-AUSTEN, J. A. S. B. xlix. [1880] pt. 2, p. 151.

Species and varieties of *Limnæa* found in India and the Malayan Archipelago, discussed and figured by E. v. MARTENS, Conchol. MT. i. pp. 75–91, pls. xiv.-xvi.

Himalaya: hills between Mari and Tandiani. 20 species of land shells (2 new) enumerated by W. THEOBALD, J. A. S. B. l. pt. 3, pp. 44–49.

Ceylon. "Une journée malacologique à Colombo," A. Craven, Ann. Mal. Belg. P.v., Dec. 1880, pls. cxiv.-cxix.

Burma. 76 operculated and 130 non-operculated terrestrial species, 37 fresh-water Gastropods and 20 fresh-water Bivalves, enumerated by W. T. BLANFORD, British Burma Gazetteer (Rangoon: 1880), i. pp. 698–713; he distinguishes in Burma 4 well-marked molluscan faunæ, viz., (1) that of Arakan and Southern Pegu, (2) Upper Burma and Thayet district, (3) Limestone hills near Maulmain, and (4) Tenasserim, and names the most characteristic species of each of them.

Cambodia. New species of *Lacunopsis*, *Julliena*, and *Pachydrobia*, by J. POIRIER, J. de Conch. xxix. pp. 1–19, pls. i.–iii.

Sumatra, highlands of *Padang*. 19 terrestrial and 15 fresh-water species, among the former some new, enumerated by C. BOCK, P. Z. S. 1881, pp. 628–633, pl. lv. Some new terrestrial species also by H. DOHRN, Nachr. mal. Ges. 1881, pp. 65 & 66; some fresh-water species enumerated by A. BROT, J. de Conch. xxix. pp. 154–160, pl. vi.

Borneo, districts Koetei, Amontai, and Banjermassin (heretofore not explored). 14 terrestrial and 8 aquatic (fresh or brackish water) species,

among the former 2 new, enumerated by C. Boeck, P. Z. S. 1881, pp. 633–635, pl. lv. Some new land shells from Northern Borneo, by H. Dohrn, Nachr. mal. Ges. 1881, pp. 66 & 67; a fresh-water shell by A. Brot, J. de Conch. xxix. p. 159.

12. *Australia and Polynesia.*

Tasmania. 115 known species of land and 36 of fresh-water shells; 79 of the former belong to *Helix*, and these are generally small, thin, finely-sculptured species of uniform character, except *H. launcestonensis*; besides them the genera *Bulimus*, *Vitrina*, *Succinea*, and *Truncatella* are represented. The Tasmanian fresh-water species are, according to E. Collier, *l. c.* p. 103, with two exceptions entirely different from those of Australia; they belong to the genera *Limnæa*, *Physa*, *Planorbis*, *Ancylus*, *Gundlachia*, *Pomatiopsis*, *Bythinia*, *Amnicola*, *Unio*, *Cyclas*, and *Pisidium*. Rogers, P. Manch. Soc. xix. [1880] pp. 101–103.

New Caledonia. Some little-known or new *Helix* and *Placostylus*, by E. Marie, J. B. Gassies, and H. Crosse, J. de Conch. xxix. pp. 241–244, & 336–342, pls. xi. & xii.

Cook's, or *Hervey Archipelago.* 39 inoperculated land shells, 3 *Auriculidæ*, 10 operculated land shells and 2 *Assimineidæ*, all of small size, some new, enumerated by A. Garrett in a separate paper (title above) [not seen by the Recorder]; abstract in J. de Conch. xxix. pp. 348 & 349.

The genus *Partula* culminates in the Society Islands, it ranges northwards to Guam, but is wanting on the Sandwich group; Hartman, Bull. Mus. C. Z. ix. p. 172. The local distribution of the single species on the 5 principal Society Islands is represented on two maps by A. Garrett, *ibid.*

13. *North America.*

United States. Localities of some species of *Unio* and *Succinea* by R. Ellsworth Call, Am. Nat. xv. p. 391.

Muscatine County, Iowa. List of land and fresh-water mollusks by F. M. Witter, 1879. [Not seen by the Recorder.]

Utah. 107 species enumerated by H. Hemphill in a catalogue published at Oakland, California, 1878, 4 pp. [Not seen by the Recorder.]

Northern part of Lower or Spanish California. 1 *Limax*, 8 *Helix*, and 1 *Succinea* enumerated by H. Hemphill, J. de Conch. xxix. pp. 35–38.

14. *West Indies and Central America.*

Florida. Notes on its land shells by W. Calkins, J. Cincinn. Soc. 1879 [not seen by the Recorder]. Note on some species of *Unio* by the same, Valley Nat. ii. [Sept. 1880].

Key West, South Florida. 13 terrestrial species enumerated, *Melaniidæ* and *Unionidæ* absent; Melvill, J. of Conch. iii. pp. 166, 167, & 173.

Cuba. 5 new terrestrial shells by R. Arango, P. Ac. Philad. 1881, pp. 15 & 16, with woodcuts.

Hayti. New varieties of *Macroceramus* and *Cylindrella*; Weinland, J B. mal. Ges. viii. pp. 158 & 159.

Santa Cruz [*St. Croix*]. Note on its living and extinct subfossil land snails, the former 10, the latter 11 species, some of which live in Porto Rico or the Virgin Islands; its malacological fauna distinctly exhibits more likeness to that of the great Antilles (Porto Rico, Cuba) than to the more southern small Caribbean Islands. Bland, Ann. N. York Ac. ii. pp. 121–126.

Dominica. 20 species of land shells, enumerated with special regard to their distribution in height, by A. D. Brown, Am. Nat. xv. pp. 56 & 57; abstract in J. of Conch. iii. pp. 182 & 183.

Mexico. Some new species of *Physa* by Crosse & Fischer, J. de Conch. xxix. pp. 334 & 335.

15. *South America.*

Brazil. Specimen of *Tebennophorus* on the Amazon, 300 miles inland from Pará; Binney, Ann. Ac. Philad. i. p. 355.

Southern Argentine States. 1 *Agriolimax*, 3 *Succinea*, 2 *Eudioptus*, 1 new, 1 *Borus*, 2 *Plagiodontes*, 1 new, 1 *Papilla*, 1 *Ancylus*, 3 *Chilina*, 2 *Planorbis*, 1 *Paludestrina*, 1 *Unio*, 1 *Anodonta*, collected on the Argentine Expedition of General Julio de Roca to the Rio Negro, and discussed by A. Döring, Informe Comis. R. Negro, Zool. i. pp. 61–74, pls. i.–iii.

West Coast of Patagonia. 3 small species of *Helix*, 1 *Succinea*, and 1 *Chilina*, all new, described by E. A. Smith, P. Z. S. 1881, pp. 36 & 37, pl. iv. figs. 14–18.

b. Marine Mollusca.

J. Gwyn Jeffreys's lecture on Deep Sea Exploration, London, 20 pp., may be mentioned here; a German abstract of it by W. Kobelt in Nachr. mal. Ges. 1881, pp. 53–57.

Gwyn Jeffreys continues and finishes his discussion of the bivalve *Mollusca* procured during the 'Lightning' and 'Porcupine' expeditions, 1868–1870, in the Atlantic and Western Mediterranean; he enumerates 19 species of *Kelliidæ*, 16 *Lucinidæ*, 3 *Carditidæ*, 12 *Cardiidæ*, 1 *Chama*, 11 *Astartidæ*, 15 *Veneridæ*, 21 *Tellinidæ*, 14 *Mactridæ*, 6 *Solenidæ*, 12 *Pandoridæ*, 5 *Anatinidæ*, 25 *Corbulidæ*, 2 *Myidæ*, 2 *Saxicavidæ*, and 2 *Pholadidæ*, among which are 33 new species. It is to be regretted that the localities and depths of them are not expressly stated, but only indicated by the numbers of the stations, without corresponding explanation in the same paper. The author adds, however, many very valuable notes on the general distribution, varieties, and synonomy of most of the species, and also much new information concerning their mode of life. P. Z. S. 1881, pp. 693–724, pl. lxi. and [published in 1882] pp. 922–952, pls. lxx. & lxxi.

'*Challenger*' *Expedition.* 5 species of *Pyramidellidæ*, 11 *Naticidæ*, 1 *Oniscia*, 3 *Tritonidæ*, and 64 *Pleurotomidæ*, all new, dredged chiefly in the tropical and southern parts of the Atlantic, near Kerguelen, and in

the Pacific, with exact notes on localities, depths, and quality of the ground, described by R. B. WATSON, J. L. S. xv. pp. 245–274 & 388–475.

1. *Arctic Seas.*

Some previous notes on the *Mollusca* of the Siberian glacial sea, a species of *Yoldia* being very common in the Kara Sea, 70°–74° N. lat., 3–12 fath., &c., A. STUXBERG, Sv. Ak. Handl. Bih. v. No. 22, p. 58: also, p. 48, *Modiolaria* sp.; p. 50, *Astarte* and *Fusus* sp.; p. 51, *Pecten grœnlandicus*; p. 52, *Tellina* and *Trochus* sp.; p. 55, *Saxicava* plentiful, and 2 Cephalopods; p. 58, *Natica* sp.

Barents Sea. Some Bivalves, including 2 new, mentioned by HAREN-NOMAN, Niederl. Arch. Zool. v. Suppl. i.

G. O. SARS has pointed out that in the northern part of Norway from the polar circle nearly to the North Cape, the marine fauna of the deep inland fjords is rather Arctic, that of the open sea and of the Lofoten Islands, on the contrary, agrees more with that of the temperate seas of Northern Europe. Tromsö Museums Aarshefter, ii. [1879].

2. *Northern Seas of Europe.*

Northern Norway, Bodö. List of 60 marine Gastropods and 36 Bivalves collected by the brothers A. KRAUSE, the presence of *Venus casina* (L.) confirmed; SB. nat. Fr. 1881, pp. 39–42. *Throndhjemsfjord.* 14 species enumerated by V. STORM, Nor. Selsk. Skr. 1880, p. 73.

Baltic Sea, Bay of Finland. 2 species of *Nudibranchiata*, *Pontolimax capitatus* (O. F. Müll.) and *Embletonia pallida* (A. & H.), have been observed at Helsingfors by J. A. PALMÉN, Medd. Soc. Fenn. vi. p. 276, & vii. pp. 129–131.

Skagerrack, Bohuslän. Several larvæ of *Mollusca* caught in comparatively large numbers during December, 1880, and January, 1881, with herring-nets, and 30 species of mollusks dredged in the same months on the ground at 12–135 fath. F. TRYBOM, Œfv. Ak. Förh. 1881, No. 3, pp. 37, 38, 42, & 43.

Firth of Forth. Mollusks enumerated by G. LESLIE & W. A. HERDMAN. P. Phys. Soc. Edinb. vi.

Isle of Man. Its *Mollusca* enumerated by T. TALBOT, Zool. (2) v. pp. 378–382.

Scheveningen. 19 species of Bivalves and 8 of Gastropods, including *Montacuta bidentata* (Mont.), not before known from the Dutch Coast, collected by J. GWYN JEFFREYS, Ann. N. H. (5) viii. p. 447.

Gironde. Occurrence of *Panopæa aldrovandi.* Fischer, J. de Conch. xxix. pp. 255 & 256.

Atlantic Coast of Spain and Portugal. Previous note on the shells dredged during the Expedition of the French ship 'Travailleur,' by A. MILNE EDWARDS, C. R. xciii. p 934; some new species are named, but not described.

3. *Mediterranean.*

Notes on several critical species living in the coral zone of the Mediterranean Sea, including two heretofore only known as fossil, by A. DI MONTEROSATO, Bull. Soc. mal. Ital. vi. pp. 243–259.

N. TIBERI finishes his list of the Mediterranean *Nudibranchia*, discussing the *Æolididæ*, *Hermæidæ*, *Caliphyllacea*, and *Elysiidæ*; Bull. Soc. mal. Ital. vi. pp. 224–242.

Bivalves of the 'Porcupine' Expedition; *vide suprà*.

Note on some marine shells from Cannes, Southern France, by DAUTZENBERG, in Feuil. Nat. 1881, pp. 117–121 (*Purpura lapillus* and *Bela turricula*, here enumerated, are not known else from the Mediterranean), and some additions to them by MONTEROSATO, Nat. Sicil. i. pp. 2–4.

4. *East Coast of North America.*

Great Bank of Newfoundland. Account of a visit to it, and list of 36 species of Gastropods and 38 of Bivalves found there, by T. A. VERKRÜZEN, JB. mal. Ges. viii. pp. 82–100.

Southern Coast of New England. List of *Mollusca* obtained chiefly by dredging on the outer banks, among which are nearly fresh shells of *Argonauta argo* and several new species; A. E. VERRILL, P. U. S. Nat. Mus. iii. p. 465 *et seq.*, and Am. J. Sci. (3) xxii. pp. 297–303. See also descriptions and notes on the *Mollusca*, &c., collected by the U. S. Fish Commission, by VERRILL, P. U. S. Nat. Mus. iii. pp. 356–464 [1880–81].

S. Carolina. See MELVILL, J. of Conch. iii. pp. 155–173.

5. *Tropical Atlantic.*

Florida. 12 marine species added by CALKINS to his former list, Valley Nat., Nov. 1880.—Shells from Florida, chiefly from Key West; Melvill, J. of Conch. iii. pp. 155–173.

Gulf of Mexico, Florida, and Caribbean Sea. W. DALL enumerates and describes a large number of shells, including many new, dredged by the U. S. Survey Steamer 'Blake' in 1877–79, from various depths to 1568 fath.; the general views on the bathymetrical distributions, given by the author previously, 1878 (Zool. Rec. xv. *Moll.* p. 25), are confirmed by the detailed study of the specimens. Bull. Mus. C. Z. ix. pp. 33–144.

Senegal. A few observations on its marine *Mollusca* by H. v. MALTZAN, Ber. senck. Ges. 1881, pp. 125 & 126.

Ascension Island. *Purpura ascensionis* (Q. G.), *hæmastoma* (L.), *Nerita ascensionis* (Gm.), *Cypræa lurida* (L.), *spurca* (L.), *Hipponyx antiquata* (L.), *Malleus regula* (Forsk.), the first peculiar to this island, of the others 3 Mediterranean and West African, and 3 also in the West Indies. E. A. SMITH, Ann. N. H. (5) viii. pp. 430 & 431.

6. *Indo-Polynesian Seas.*

Several new or critical species of small size described by G. NEVILL, J. A. S. B. l. pt. 2, pp. 161–166.

Nossi-Bé, Madagascar. Some marine shells enumerated by H. Crosse, J. de Conch. xxix. pp. 208–211.

Mauritius. 138 species of marine shells belonging to the *Muricidæ*, *Buccinidæ*, *Fasciolariidæ*, and *Cassididæ*, with synonymy and indication of geographical distribution, enumerated by C. Tapparone-Canefri, Faun. mal. Maur. 99 pp. 2 pls.

Burma. 63 species of estuarine *Mollusca*, inhabiting the creeks and salt swamps, including 1 Paludinid (*Larina*), 5 *Rissoidæ*, 9 *Neritinæ* and *Navicellæ*, 3 *Onchidiidæ*, 12 *Auriculidæ*, 1 *Amphibola*, 1 *Cyrena* (the rest, 14 Gastropods and 17 Bivalves belonging to marine families), enumerated by W. T. Blanford, British Burma Gazetteer, i. pp. 713–716.

7. *Northern Pacific.*

Japan. Several new species and even genera of *Nudibranchia*, by R. Bergh, Verh. z.-b. Wien, xxxi. pp. 219–254, pls. vi.–x.

Charlotte Islands, N. W. coast of America. List of marine mollusks collected by G. M. and R. Dawson, given by J. F. Whiteaves, in Rep. Geol. Surv. Canada, 1878–79 [Montreal: 1880], pp. 190b–205b.

California. 450 species enumerated by H. Hemphill in a catalogue published at S. Diego, 1875, 8 pp. [not seen by the Recorder].

8. *Australian and Antarctic Seas.*

'Challenger' Expedition; *vide suprà.*

Australia, Port Jackson. Further note on some recent *Mollusca*, by J. Brazier, P. Linn. Soc. N. S. W. v. p. 481. [Not seen by the Recorder.]

New Zealand. Observations on living animals and a new Nudibranchiate, by F. Hutton, Tr. N. Z. Inst. xiii. pp. 198–204. New Nudibranchiates and a new genus of *Bullidæ*, by Cheeseman, *tom. cit.* pp. 222–224.

Kerguelen. Some new species of Bivalves; Martens, SB. nat. Fr. 1881, p. 79.

Magellan's Straits and West Coast of Patagonia. 3 Cephalopods, 40 marine Gastropods, and 21 marine Bivalves (several new), collected during the survey of H.M.S. 'Alert,' are enumerated by E. A. Smith, P. Z. S. 1881, pp. 22–44, pls. iii.–v. Several new species from the same Straits, and from the eastern coast of Patagonia, collected during the expedition of the Prussian ship 'Gazelle,' described by E. v. Martens, SB. nat. Fr. 1881, pp 64–66 & 76–80, with some general remarks on this fauna.

[The Recorder regrets that the interesting paper on the *Mollusca* of Fuegia and the Magellan Straits, by R. O. Cunningham, Tr. L. S. xxvii. 1871, pp. 474–488, has hitherto been overlooked; it enumerates a large number of species, one of which, *Eolis caldwelli*, was then new.]

Palæontology of Recent Mollusca.

R. P. Whitfield gives some additions to Dawson's paper on the Palæozoic land snails, concerning *Dawsonella* near *Helicina*, and a new

genus *Anthracopupa*, from Indiana and Ohio; Am. J. Sci. (3) xxi. pp. 125–127, with woodcuts.

R. Etheridge describes some peculiar bodies, which may be the opercula of Gastropods, from the Carboniferous Limestone, with notes on some Silurian opercula. Ann. N. H. (5) vii. pp. 25–31, pl. ii.

The existence of the genus *Helix*, subg. *Gonostoma* and *Patula*, in the cretaceous beds of India, proved by the late Dr. Stoliczka; Nevill, J. A. S. B. l. pt. 2, p. 128.

39 species of land shells found in the pleistocene beds near Weimar, of which the following no longer survive in that country: *Zonites verticillus*, *Helix tonnensis* (Sandb.), *austriaca*, *Cochlicopa columna*, *Pupa doliolum*, *Clausilia filograna*; *Helix ericetorum*, *candidula*, and *nemoralis* are wanting in the pleistocene beds, though chiefly common at present. O. Schmidt, JB. mal. Ges. viii. pp. 68–82.

18 terrestrial and 21 freshwater shells from limestone-tufa at Grenssen, near Sondershausen, Thuringia, all still living [also *Helix nilssoniana* (Beck), which the author says is extinct], enumerated by P. Hesse, Nachr. mal. Ges. 1881, pp. 6–8.

H. v. Ihering enumerates the diluvial land and fresh-water shells found by him in the 'Fränkische Schweiz' (Northern Bavaria); 18 are no longer found alive in the same country, and among them are some which belong to a more southern or rather more Alpine fauna, as *Zonites verticillus*, *Pupa pagodula*, and *Clausilia filograna*; on the contrary, two species of the subgenus *Xerophila*, *Buliminus detritus*, and *Unio batavus* are now found alive, and are wanting in the diluvial beds. Mal. Bl. (2) iii. pp. 73–77.

29 terrestrial and 5 fresh-water species from the Löss, in the Rheingau (middle part of the Rhine valley), of which 2 are extinct, and 5 no longer live in the same country, enumerated by C. Koch, Nachr. mal. Ges. 1881, pp. 9–11.

The quaternary beds of fresh-water clay near Lyons contain 46 species of land snails, 24 fresh-water snails and 7 bivalves, of which only 1, *Limnæa gerlandiana*, is extinct, and some terrestrial species no longer live in the same country, though existing in more northern or alpine regions. A. Locard, *Argiles lacustres* (Lyon: 1880). Abstract in J. de Conch. xxix. pp. 270–272.

Postpliocene land and fresh-water shells from peat at Polada, near Lonato, province of Brescia, by G. B. Adami, Bull. Soc. mal. Ital. vii. pp. 188–202; the majority are species still living in the same country, several others seem to indicate a somewhat cooler climate; *Anodonta* and *Unio* are entirely absent; a new variety of *Valvata alpestris* and a new *Pisidium* are not known elsewhere.

A list of species found in the pliocene beds of Tuscany, which are still living in the Mediterranean Sea, is given by Dante-Patanelli, Bull. Soc. mal. Ital. vii. pp. 63–68.

51 species of *Mollusca* from the post-tertiary alluvial tin deposits of the island Billiton, agreeing with those which live at present in the neighbouring sea, are enumerated by K. Martin, Notes Leyd. Mus. iii. pp. 17–22.

Paludestrina australis, *Mytilus* sp. indet., and *Solen scalprum*, subfossil on the bank of the brackish lagoon Marra-Co, Southern Argentine States; Döring, Informe Comis. R. Negro, i. Zool. p. 74 & 75.

Historical Remains and Changes.

6 species of land shells found among the remains of Roman buildings near Homburg, and 9 others, partly from Roman antiquities near Gonzenheim; several of them, as *Helix strigella*, *incarnata* and *fruticum*, do not at present live near those places, and appear to indicate a less cultivated character of the country. Rolle, JB. mal. Ges. viii. pp. 44–50. *Helix fruticum* found living in the Taunus at Eppstein; Heynemann, Nachr. mal. Ges. 1881, p. 62.

Buliminus detritus (Müll.), found in 1821 by C. Pfeiffer in the neighbourhood of Cassel, no longer occurs there; Diemar, Ber. Ver. Cassel, xxvii. p. 103.

[*Stenogyra*] *Bulimus goodalli* (Millet) has lived for many years past in the Orchid houses of Mr. Day, of Tottenham; Ashford, J. of Conch. iii. p. 240.

Bithynia tentaculata (L.) found at Oswego, N. Y., and in the Champlain Canal, 1879, in the Erie Canal at Syracuse, 1880, plentifully; Beauchamp & Ballon, Am. Nat. xiv. [1880], p. 523.

Pupilla badia (Ad.) found at Oak Island, Chelsea, and on Lowell Island, Salem, where it probably not existed before; E. Morse, Bull. Essex Inst. xii. [1880] p. 173.

Zonites [*Hyalina*] *cellarius* (Müll.) and an undetermined imported species of *Limax* in greenhouses at St. Louis, the latter destructive to foliage plants; L. B. Case, Valley Nat. ii. Sept. 1880.

Helix aspersa (Müll.) living near S. José, Santa Clara County, Calif., where it has been introduced by man 23 years ago; the other recorded locality, Santa Barbara, appears to be erroneous. Stearns, Ann. N. York Ac. ii. pp. 129–131.

A. Granger states that *Tritonium nodiferum*, *Turbo rugosus*, *Venus verrucosa*, *Artemis exoleta*, *Pecten opercularis*, and *Avicula tarentina* have disappeared from the Mediterranean coast of France, where they had been observed in former times, the four latter exterminated by man, the two former without known cause; Act. Soc. L. Bord. xxxiv. p. 335.

Gryphæa angulata (Lam.) accidentally introduced on the coast of the Gironde, has now so multiplied, that it is feared it may supplant the true oyster; M. Brocci, in a report published in the French Journal Officiel; abstract in Ann. Sci. Nat. (6) xii. art. 6, 1 p.

Litorina litorea (L.). Its gradually advancing distribution on the shores of New England, from Maine, 1870, to New Haven, 1880, pointed out by E. Morse, Bull. Essex Inst. xii. [1880] pp. 173–176; and Verrill, Am. J. Sci. (3) xx. p. 251. Gray's statement concerning 1879 [Zool. Rec. xvi. *Moll.* p. 49], also in J. of Conch. iii. p. 183.

Truncatella truncatula (Dr.), *Alexia myosotis* (Dr.), and *Assiminea grayana* (Leach), European brackish-water shells, found at Newport, Rhode Island, Verrill, P. U. Nat. Mus. iii. p. 376, and Am. J. Sci. (3)

xx. p. 250; dead specimens of the first also at Wood's Holl, Mass., 1871, by DALL, Am. Nat. xv. p. 716.

Mya arenaria (L.) first noticed in 1874 in San Francisco Bay, is now abundant there and the leading "clam" in the markets, superseding to a great extent the previous "clams", viz., *Macerna nasuta* and *Tapes staminea* (Conr.); it now lives also at the northern end of Monterey Bay, but is wanting on the whole west coast of America, north of San Francisco. It was probably introduced from the east coast, like *Ostrea virginica* which has been planted in Francisco Bay since the completion of the transcontinental railroad. E. STEARNS, Am. Nat. xv. pp. 362–366; abstract in Am. J. Sci. (3) xxii. p. 82.

Mya arenaria (L.) from the shell-heaps of Maine and Massachussetts is somewhat deeper in comparison with its length than recent specimens; *Lunatia* [*heros* ?] from the shell-heaps of Marblehead, Mass., has a less depressed spire than the recent forms. E. MORSE, Am. J. Sci. (3) xxii. xxii. p. 323 & 415; also Am. Nat. xv. p. 1015.

Shell-mounds at Omori, Japan, described by E. S. MORSE, Memoirs of the Science Department, University of Tokio, vol. i. pt. i. [1879], 36 pp. 18 pls. They contain 11 marine species of Gastropods and 13 of Bivalves, which all still live in the neighbourhood, most of them of relatively large size. Abstract in Ann. N. H. (5) vii. pp. 61–63.

USE BY MAN.

The French species of *Mollusca* which have some practical interest for mankind, their popular names, and some proverbs and popular songs concerning them, are enumerated by E. ROLLAND, Faune populaire de la France, iii. (Paris: 1881), terrestrial *Mollusca* (snails), pp. 193–213, marine (as Cephalopods, Oysters, &c.), pp. 185–192 & 214–221.

The use and distribution of cowries as money by J. E. HERTZ in MT. geogr. Ges. Hamburg, i. [1880–81] pp. 14–28.

Note on Indian implements made from *Fulgur carica* and *perversa* found in Florida mounds and elsewhere in North America; TRYON, Man. of Conch. iii. p. 140.

Worked shells of *Lunatia* [*heros*?] in New England shell-heaps; MORSE, Am. J. Sci. (3) xxii. p. 323.

COLLECTING.

DUPUY has published a second edition of his valuable "Recherche des Mollusques terrestres et d'eau douce."

Note on collecting small shells from the alluvial deposits of rivers by V. STERKI, Nachr. mal. Ges. 1881, pp. 39–42; it is necessary to collect and examine large masses of material floated down, for several species are very rarely found in it.

A. ISSEL gives hints for collecting shells, observing their mode of life, &c., in his "Istruzioni scientifiche pei Viaggiatori," Rome: 1881, 8vo, p. 413.

Paludestrina australis, *Mytilus* sp. indet., and *Solen scalprum*, subfossil on the bank of the brackish lagoon Marra-Co, Southern Argentine States; Döring, Informe Comis. R. Negro, i. Zool. p. 74 & 75.

Historical Remains and Changes.

6 species of land shells found among the remains of Roman buildings near Homburg, and 9 others, partly from Roman antiquities near Gonzenheim; several of them, as *Helix strigella*, *incarnata* and *fruticum*, do not at present live near those places, and appear to indicate a less cultivated character of the country. Rolle, JB. mal. Ges. viii. pp. 44–50. *Helix fruticum* found living in the Taunus at Eppstein; Heynemann, Nachr. mal. Ges. 1881, p. 62.

Buliminus detritus (Müll.), found in 1821 by C. Pfeiffer in the neighbourhood of Cassel, no longer occurs there; Diemar, Ber. Ver. Cassel, xxvii. p. 103.

[*Stenogyra*] *Bulimus goodalli* (Millet) has lived for many years past in the Orchid houses of Mr. Day, of Tottenham; Ashford, J. of Conch. iii. p. 240.

Bithynia tentaculata (L.) found at Oswego, N. Y., and in the Champlain Canal, 1879, in the Erie Canal at Syracuse, 1880, plentifully; Beauchamp & Ballon, Am. Nat. xiv. [1880], p. 523.

Pupilla badia (Ad.) found at Oak Island, Chelsea, and on Lowell Island, Salem, where it probably not existed before; E. Morse, Bull. Essex Inst. xii. [1880] p. 173.

Zonites [*Hyalina*] *cellarius* (Müll.) and an undetermined imported species of *Limax* in greenhouses at St. Louis, the latter destructive to foliage plants; L. B. Case, Valley Nat. ii. Sept. 1880.

Helix aspersa (Müll.) living near S. José, Santa Clara County, Calif., where it has been introduced by man 23 years ago; the other recorded locality, Santa Barbara, appears to be erroneous. Stearns, Ann. N. York Ac. ii. pp. 129–131.

A. Granger states that *Tritonium nodiferum*, *Turbo rugosus*, *Venus verrucosa*, *Artemis exoleta*, *Pecten opercularis*, and *Avicula tarentina* have disappeared from the Mediterranean coast of France, where they had been observed in former times, the four latter exterminated by man, the two former without known cause; Act. Soc. L. Bord. xxxiv. p. 335.

Gryphæa angulata (Lam.) accidentally introduced on the coast of the Gironde, has now so multiplied, that it is feared it may supplant the true oyster; M. Brocci, in a report published in the French Journal Officiel; abstract in Ann. Sci. Nat. (6) xii. art. 6, 1 p.

Litorina litorea (L.). Its gradually advancing distribution on the shores of New England, from Maine, 1870, to New Haven, 1880, pointed out by E. Morse, Bull. Essex Inst. xii. [1880] pp. 173–176; and Verrill, Am. J. Sci. (3) xx. p. 251. Gray's statement concerning 1879 [Zool. Rec. xvi. *Moll.* p. 49], also in J. of Conch. iii. p. 183.

Truncatella truncatula (Dr.), *Alexia myosotis* (Dr.), and *Assiminea grayana* (Leach), European brackish-water shells, found at Newport, Rhode Island, Verrill, P. U. Nat. Mus. iii. p. 376, and Am. J. Sci. (3)

xx. p. 250; dead specimens of the first also at Wood's Holl, Mass., 1871, by DALL, Am. Nat. xv. p. 716.

Mya arenaria (L.) first noticed in 1874 in San Francisco Bay, is now abundant there and the leading "clam" in the markets, superseding to a great extent the previous "clams", viz., *Macerna nasuta* and *Tapes staminea* (Conr.); it now lives also at the northern end of Monterey Bay, but is wanting on the whole west coast of America, north of San Francisco. It was probably introduced from the east coast, like *Ostrea virginica* which has been planted in Francisco Bay since the completion of the transcontinental railroad. E. STEARNS, Am. Nat. xv. pp. 362–366; abstract in Am. J. Sci. (3) xxii. p. 82.

Mya arenaria (L.) from the shell-heaps of Maine and Massachussetts is somewhat deeper in comparison with its length than recent specimens; *Lunatia* [*heros* ?] from the shell-heaps of Marblehead, Mass., has a less depressed spire than the recent forms. E. MORSE, Am. J. Sci. (3) xxii. xxii. p. 323 & 415; also Am. Nat. xv. p. 1015.

Shell-mounds at Omori, Japan, described by E. S. MORSE, Memoirs of the Science Department, University of Tokio, vol. i. pt. i. [1879], 36 pp. 18 pls. They contain 11 marine species of Gastropods and 13 of Bivalves, which all still live in the neighbourhood, most of them of relatively large size. Abstract in Ann. N. H. (5) vii. pp. 61–63.

USE BY MAN.

The French species of *Mollusca* which have some practical interest for mankind, their popular names, and some proverbs and popular songs concerning them, are enumerated by E. ROLLAND, Faune populaire de la France, iii. (Paris: 1881), terrestrial *Mollusca* (snails), pp. 193–213, marine (as Cephalopods, Oysters, &c.), pp. 185–192 & 214–221.

The use and distribution of cowries as money by J. E. HERTZ in MT. geogr. Ges. Hamburg, i. [1880–81] pp. 14–28.

Note on Indian implements made from *Fulgur carica* and *perversa* found in Florida mounds and elsewhere in North America; TRYON, Man. of Conch. iii. p. 140.

Worked shells of *Lunatia* [*heros*?] in New England shell-heaps; MORSE, Am. J. Sci. (3) xxii. p. 323.

COLLECTING.

DUPUY has published a second edition of his valuable "Recherche des Mollusques terrestres et d'eau douce."

Note on collecting small shells from the alluvial deposits of rivers by V. STERKI, Nachr. mal. Ges. 1881, pp. 39–42; it is necessary to collect and examine large masses of material floated down, for several species are very rarely found in it.

A. ISSEL gives hints for collecting shells, observing their mode of life, &c., in his "Istruzioni scientifiche pei Viaggiatori," Rome: 1881, 8vo, p. 413.

CEPHALOPODA.

The cartilages of the head of the Cephalopods are very quickly digested by tripsine, and differ therefore chemically from those of the Vertebrates; the Cephalopods are the only Evertebrates in the muscles of which inosite has been found. KRUKENBERG, Zool. Anz. iv. pp. 65 & 66.

The ink-bag, its structure and vessels examined, in *Sepia*, *Loligo*, *Sepiola*, and *Octopus*, by P. GIROD, C. R. xcii. pp. 364–367, 996–968, & 1241–1243, xciii. pp. 96–99; abstract in J. Micr. Soc. (2) i. pp. 227, 228, 586, 587, & 876.

The chemical composition of the ink of the *Cephalopoda* has been examined by P. GIROD, who found 60 per cent. water, 8 of mineral substances, and 30 of insoluble organic substances, including a homogeneous black powder with a greenish metallic lustre, which is bleached by chloride of lime and chlorinated water. C. R. xciii. pp. 96–99; abstract, J. R. Micr. Soc. (2) i. p. 877.

C. KELLER has observed that *Eledone* assumes the colour of surrounding objects, for example the yellow colour of the rock on which it was lying; Viert. Ges. Zürich, xxvi. pp. 100–102.

The only oviduct in *Rossia* and *Spirula* is on the right side; STEENSTRUP, Overs. Dan. Selsk. 1881, p. 24, footnote.

Regeneration of a part of the arm, and even of several entire arms in *Loligo pealii* (Les.) and *Ommastrephes illecebrosus* (Les.) stated by A. E. VERRILL, Tr. Conn. Ac. v. p. 318; abstract in Am. J. Sci. (3) xxi. pp. 333 & 336, also Ann. N. H. (5) vii. pp. 489 & 490. Two instances of the reproduction of arms in *Octopus vulgaris* (Lam.) by S. RICCHIARDI, Atti Soc. Tosc. 1881, pp. 248 & 249, and Zool. Anz. iv. p. 406.

Several errors of Gray, Jeffreys, Verrill, Brock, and others as to the systematic arrangement and description of Cephalopods are pointed out by STEENSTRUP, Overs. Dans. Selsk. 1881, pp. 8, 12, 19, 22 & 23. BROCK answers; Zool. Anz. iv. pp. 453–455.

DIBRANCHIATA.

OCTOPODA.

Octopus vulgaris. Observations on living specimens by F. Richters, Das Aquarium des zoologischen Gartens in Frankfurt-a-M. 1881.

Octopus bairdi (Verr.), east coast of the United States, 32–41° N. lat., 178–524 fath., and *lentus* (Verr.), 33° & 34° N. lat., 464 & 603 fath.; Verrill, Bull. Mus. C. Z. viii. pp. 107 & 108, pl. ii. fig. 4, and pl. iv. figs. 1 & 2. Hectocotylized portion of the third right arm very distinct.

Eledone verrucosa, sp. n., *id. l. c.* p. 105, pls. v. & vi., east coast of United States, 39–41° N. lat., 466 & 810 fath.

Tritaxeopus, g. n. Brachial acetabula in three recognizable series. *T. cornutus*, sp. n., Owen, Tr. Z. S. xi. p. 131, pl. xxiii., Australia.

Alloposus, g. n. Mantle united firmly to the head by a ventral and two lateral muscular commissures, the former placed at the base of the

siphon; third right arm hectocotylized. *A. mollis*, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 394; Tr. Conn. Ac. v. p. 294, pls. l. & li.; P. U. S. Nat. Mus. iii. p. 362; and Bull. Mus. C. Z. viii. p. 112, pl. iv. fig. 4, and pl. viii., south of Newport, 225–487 fath.

Argonauta bættgeri, sp. n., Maltzan, J. de Conch. xxix. p. 163, pl. vi. fig. 7, locality unknown.

ÆGOPSIDÆ.

Loligopsis ocellata, sp. n., Owen, Tr. Z. S. xi. pp. 139–143, pl. xxvi. figs. 3–8, and pl. xxvii., China Sea, with anatomical description.

Chiroteuthis bonplandi (Verany)?, detached tentacular arm, from the East coast of the United States, 41° N. lat., 306 fath., described by Verrill, Bull. Mus. C. Z. viii. p. 102, pl. iii. fig. 1.

Brachioteuthis, g. n. Near *Chiroteuthis*, but with simple connective cartilages on the siphon and mantle. *B. beanii*, sp. n., deep sea, N.E. coast of America; Verrill, Am. J. Sci. (3) xxii. p. 412.

Onychoteuthis ingens, sp. n., head only known, ventral arms 270, tentacles 450 millimètres, W. coast of Patagonia; E. A. Smith, P. Z. S. 1881, p. 25, sucker, radula, and mandibles figured, pl. iii. figs. 1 *a–d*.

Onychoteuthis raptor, sp. n., Owen, Tr. Z. S. xi. p. 148, pl. xxix., Southern hemisphere, probably found during Capt. Cook's travels.

Gonatus (Gray, 1849) = *Lestoteuthis* (Verrill, 1880). Distinct from *Enoploteuthis* by four rows of suckers on all arms, the want of hooks on the ventral arms, the presence of longitudinal rows of small suckers and corresponding adhesive cushions on the tentacular arms, a distinct cup-like hinder end of the pen with phragmoconoid septa, but without rostrum, and by five rows of teeth in the radula. *G. fabricii* (Lichtenstein, *Onychoteuthis*) = *kamtschatica* (Middend.); *O. amœna* (Möller) is its young: it is also figured by Sars, Moll. Arct. pl. xiii. figs. 4–11. It is found on the shores of Greenland, Iceland, Northern Norway, Kamtschatka, Japan, and even in the Mediterranean. *Owenia* (Prosch) also belongs partly to this genus, the author having confounded a true *Cranchia*, figs. 4–6, and young specimens of *Gonatus*, fig. 7, under the same name, *C. megalops*, and taken the subgenerical character of *Owenia* from the latter. The liver of *Gonatus* abounds in oil, and the animal is said to utter a piping or weeping sound. Steenstrup, Overs. Dan. Selsk. 1881, pp. 9–26, pl. i.

Cheloteuthis, g. n. Allied to *Enoploteuthis*; club of tentacular arms with a marginal series of larger connective suckers, alternating with rounded tubercles along one margin, and with a central row of unequal hooks. *C. rapax*, sp. n., south of Newport, 372 fath., Verrill, Tr. Conn. Ac. v. p. 292, pl. xlix.; and Bull. Mus. C. Z. viii. p. 109, pl. ii. fig. 1.

Ommastrephes illecebrosa (Les.). On its use as bait for the American Grand Bank Cod Fisheries; H. L. Osborn, Am. Nat. xv. pp. 366–372.

Xiphoteuthis, subg. n. for *Ommastrephes ensifer*, sp. n., the inner edge of third pair of arms being produced into a large wing-like process, like a scimitar; Owen, Tr. Z. S. xi. p. 144, pl. xxviii., no locality given.

Stenoteuthis (Verrill, 1880) = *Ommastrephes* (Orb., species typicæ; Steenstrup, 1880) = *Cycria* (Leach, 1849), Steenstrup, Overs. Dan. Selsk.

1881, pp. 3–8, with a woodcut representing the situation of a gland on the back of *Ommastrephes pteropus* (Steenstr.) and *gigas* (Orb.).

Architeuthis. About 25–30 specimens found on the Grand Banks of Newfoundland in 1875, most of them quite dead and mutilated by birds or fishes, without arms, 10–15 feet long and about 18 inches in diameter, one weighing about 700 lb. Verrill, Am. J. Sci. (3) xxi. pp. 251 & 255; also Ann. N. H. (5) vii. pp. 351 & 352; abstract in J. R. Micr. Soc. (2) i. p. 586.

Plectoteuthis, g. n. Transverse section of the arm quadrangular. *P. grandis*, sp. n., only one arm known, 9 feet long, 4 inches in diameter, with 292 suckers, locality unknown. Owen, Tr. Z. S. xi. pp. 156–158, pls. xxxiv. & xxxv., with critical notes on some other large Cephalopods and a woodcut representing *Mouchezia* from the island of St. Paul, p. 159.

Mastigoteuthis, g. n. Tentacular arms long, without any distinct club, with exceedingly numerous and minute suckers; pen narrow and bicostate anteriorly, posteriorly with a long tubular cone; connective cartilages well developed on each side; eye-lids simple. *M. agassizi*, sp. n., Verrill, Bull. Mus. C. Z. viii. p. 100, pl. i. & pl. ii. figs. 2 & 3, East coast of United States, 33–34° N. lat., 647 & 1632 fath.

Giant cuttle-fish thrown on shore at Cette, Southern France; Doumet, Rev. Montp. ii. pp. 293–299.

Myopsidæ.

J. Steenstrup arranges the genera as follows—

Family Sepiolini. Arm of the first pair hectocotylized; spermatophores deposited directly at the opening of the oviduct; eggs isolated. *Rossia*, *Sepiola*, and (probably) *Heteroteuthis*.

Family *Sepio-Loliginei*. Arm of the fourth pair hectocotylized; spermatophores deposited on the buccal membrane of the female, which is specially modified for this purpose.

Group of Loligo: Internal shell only horny; eggs united into a grape-like mass. *Sepioteuthis*, *Loligo*, and *Loliolus*.

Group of Sepia:—

(*a*) *Eusepii*: Fins lateral, occupying nearly the whole length of the body. Internal shell with a calcareous layer. Mantle supported by a cartilaginous, semilunar, or conical button, and a corresponding pit. *Sepia*, *Sepiella*, and *Hemisepius*.

(*b*) *Sepiadarii*: Fins narrow, occupying only a smaller part of the length. No internal shell. Mantle united to the neck or the back. *Sepiadarium* and *Sepioloidea*.

(*c*) *Idiosepii*: Fins small, terminal. Mantle supported by a cartilaginous prominence or ridge, and a corresponding pit or furrow. *Idiosepius*, no internal shell, and *Spirula*.

Dan. Selsk. Skr. (6) i. pp. 224–233, & 237 & 238.

Rossia sublevis (Verr.) East coast of United States, 32°–39° N. lat.; Verrill, Bull. Mus. C. Z. viii. p. 104, pl. iii. figs. 2–4, pl. vii. fig. 4.

Rossia patagonica, sp n., E. A. Smith, P. Z. S. 1881, p. 22, pl. iii. fig. 3, West coast of Patagonia.

Sepiola owenіana (Orb.), male organs described by R. Owen, Tr. Z. S. xi. p. 139, pl. xxvi. fig. 2.

Stoloteuthis, g. n., free eye-lids, round pupils, webbed arms, no pen, for *Sepiola leucoptera* (Verrill); Verrill, Am. J. Sci. (3) xxii. p. 412.

Inioteuthis, g. n., differs from *Sepiola* by wanting a pen; type, *Sepiola japonica* (Orb.); *id. ibid.*

Heteroteuthis tenera, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 392, East coast of United States, 32°–40° N. lat., also Bull. Mus. C. Z. viii. p. 103, pl. iii. fig. 3 & pl. vii. figs. 2 & 3, and P. U. S. Nat. Mus. iii. p. 360.

Loligo patagonica, sp. n., E. A. Smith, P. Z. S. 1881, p. 24, pl. iii. fig. 2, West coast of Patagonia.

Calliteuthis reversa, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 393; female described by the author, Tr. Conn. Ac. v. p. 296, pl. xlvi. fig. 1; P. U. S. Nat. Mus. iii. p. 362, and Bull. Mus. C. Z. viii. p. 112, pl. vii. fig. 1, South of Newport, 365 fath.

Sepioteuthis brevis, sp. n., Owen, Tr. Z. S. xi. p. 137, pl. xxvi. fig. 6, Japan.

Sepia uses its two long tentacular arms for seizing its prey at some distance by darting them out; Lloyd, in Owen's paper, Tr. Z. S. xi. p. 135, with 2 woodcuts.

Sepia palmata, sp. n., Owen, Tr. Z. S. xi. p. 134, pls. xxiv. & xxv., Norfolk Island, Australia.

Sepia brevimana (Steenstr.), calcareous layers in the hinder end of the shell, figured by Steenstrup, *l. c.* pl. i. figs. 24–26.

Monstrosity of *Sepia officinalis* by introflexion of the front part; Richiardi, P.v. Soc. Tosc. (May) 1881, and Zool. Anz. iv. p. 407.

Sepiadarium, g. n. General aspect like *Sepiola*, but upper edge of the mantle fixed on the back to the neck, and on the sides united with the funnel; no internal shell; male with the left arm of the fourth pair hectocotylized and without flap in the funnel. *S. kochi*, sp. n., Steenstrup, Dan. Selsk. Skr. (6) i. pp. 214–218, & 235, pl. i. figs. 1–10, Molluccas, China, Japan.

Idiosepius, g. n. General aspect of *Rossia*, fins small, nearly terminal, arms short, and support of the mantle as in *Sepia*; no internal shell; in the male the right and the left arms of the fourth pair hectocotylized, with only one sucker and membranaceous edges, the left very slender. *I. pygmæus*, sp. n., only 12–15 mm., Indian Sea. Steenstrup, *l. c.* pp. 219–224 & 236, pl. i. figs. 11-22.

Spirula. Several observations on the very small terminal fins, the really internal position of the shell, the structure of the funnels, the disposition of the eggs and spermatophores, and a difference in the shape of the shell (perhaps sexual) it being more involute in the female; *id. l. c.* pp. 227-230 & 237, pl. i. fig. 23.

H. v. Ihering thinks that the *Aptychus* of the Ammonites is homologous to the cartilages of the neck in the dibranchiate *Cephalopoda*, and that the Ammonites, therefore, belong to the *Dibranchiata*; JB. Mineral. 1881, pp. 44–92.

1881, pp. 3–8, with a woodcut representing the situation of a gland on the back of *Ommastrephes pteropus* (Steenstr.) and *gigas* (Orb.).

Architeuthis. About 25–30 specimens found on the Grand Banks of Newfoundland in 1875, most of them quite dead and mutilated by birds or fishes, without arms, 10–15 feet long and about 18 inches in diameter, one weighing about 700 lb. Verrill, Am. J. Sci. (3) xxi. pp. 251 & 255; also Ann. N. H. (5) vii. pp. 351 & 352; abstract in J. R. Micr. Soc. (2) i. p. 586.

Plectoteuthis, g. n. Transverse section of the arm quadrangular. *P. grandis*, sp. n., only one arm known, 9 feet long, 4 inches in diameter, with 292 suckers, locality unknown. Owen, Tr. Z. S. xi. pp. 156–158, pls. xxxiv. & xxxv., with critical notes on some other large Cephalopods and a woodcut representing *Mouchezia* from the island of St. Paul, p. 159.

Mastigoteuthis, g. n. Tentacular arms long, without any distinct club, with exceedingly numerous and minute suckers; pen narrow and bicostate anteriorly, posteriorly with a long tubular cone; connective cartilages well developed on each side; eye-lids simple. *M. agassizi*, sp. n., Verrill, Bull. Mus. C. Z. viii. p. 100, pl. i. & pl. ii. figs. 2 & 3, East coast of United States, 33–34° N. lat., 647 & 1632 fath.

Giant cuttle-fish thrown on shore at Cette, Southern France; Doumet, Rev. Montp. ii. pp. 293–299.

Myopsidæ.

J. Steenstrup arranges the genera as follows—

Family Sepiolini. Arm of the first pair hectocotylized; spermatophores deposited directly at the opening of the oviduct; eggs isolated. *Rossia*, *Sepiola*, and (probably) *Heteroteuthis*.

Family *Sepio-Loliginei*. Arm of the fourth pair hectocotylized; spermatophores deposited on the buccal membrane of the female, which is specially modified for this purpose.

Group of Loligo: Internal shell only horny; eggs united into a grape-like mass. *Sepioteuthis*, *Loligo*, and *Loliolus*.

Group of Sepia :—

(*a*) *Eusepii*: Fins lateral, occupying nearly the whole length of the body. Internal shell with a calcareous layer. Mantle supported by a cartilaginous, semilunar, or conical button, and a corresponding pit. *Sepia*, *Sepiella*, and *Hemisepius*.

(*b*) *Sepiadarii*: Fins narrow, occupying only a smaller part of the length. No internal shell. Mantle united to the neck or the back. *Sepiadarium* and *Sepioloidea*.

(*c*) *Idiosepii*: Fins small, terminal. Mantle supported by a cartilaginous prominence or ridge, and a corresponding pit or furrow. *Idiosepius*, no internal shell, and *Spirula*.

Dan. Selsk. Skr. (6) i. pp. 224–233, & 237 & 238.

Rossia sublevis (Verr.) East coast of United States, 32°–39° N. lat.; Verrill, Bull. Mus. C. Z. viii. p. 104, pl. iii. figs. 2–4, pl. vii. fig. 4.

Rossia patagonica, sp. n., E. A. Smith, P. Z. S. 1881, p. 22, pl. iii. fig. 3, West coast of Patagonia.

Sepiola owenianа (Orb.), male organs described by R. Owen, Tr. Z. S. xi. p. 139, pl. xxvi. fig. 2.

Stoloteuthis, g. n., free eye-lids, round pupils, webbed arms, no pen, for *Sepiola leucoptera* (Verrill); Verrill, Am. J. Sci. (3) xxii. p. 412.

Inioteuthis, g. n., differs from *Sepiola* by wanting a pen; type, *Sepiola japonica* (Orb.); *id. ibid.*

Heteroteuthis tenera, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 392, East coast of United States, 32°–40° N. lat., also Bull. Mus. C. Z. viii. p. 103, pl. iii. fig. 3 & pl. vii. figs. 2 & 3, and P. U. S. Nat. Mus. iii. p. 360.

Loligo patagonica, sp. n., E. A. Smith, P. Z. S. 1881, p. 24, pl. iii. fig. 2, West coast of Patagonia.

Calliteuthis reversa, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 393; female described by the author, Tr. Conn. Ac. v. p. 296, pl. xlvi. fig. 1; P. U. S. Nat. Mus. iii. p. 362, and Bull. Mus. C. Z. viii. p. 112, pl. vii. fig. 1, South of Newport, 365 fath.

Sepioteuthis brevis, sp. n., Owen, Tr. Z. S. xi. p. 137, pl. xxvi. fig. 6, Japan.

Sepia uses its two long tentacular arms for seizing its prey at some distance by darting them out; Lloyd, in Owen's paper, Tr. Z. S. xi. p. 135, with 2 woodcuts.

Sepia palmata, sp. n., Owen, Tr. Z. S. xi. p. 134, pls. xxiv. & xxv., Norfolk Island, Australia.

Sepia brevimana (Steenstr.), calcareous layers in the hinder end of the shell, figured by Steenstrup, *l. c.* pl. i. figs. 24–26.

Monstrosity of *Sepia officinalis* by introflexion of the front part; Richiardi, P.v. Soc. Tosc. (May) 1881, and Zool. Anz. iv. p. 407.

Sepiadarium, g. n. General aspect like *Sepiola*, but upper edge of the mantle fixed on the back to the neck, and on the sides united with the funnel; no internal shell; male with the left arm of the fourth pair hectocotylized and without flap in the funnel. *S. kochi*, sp. n., Steenstrup, Dan. Selsk. Skr. (6) i. pp. 214–218, & 235, pl. i. figs. 1–10, Molluccas, China, Japan.

Idiosepius, g. n. General aspect of *Rossia*, fins small, nearly terminal, arms short, and support of the mantle as in *Sepia*; no internal shell; in the male the right and the left arms of the fourth pair hectocotylized, with only one sucker and membranaceous edges, the left very slender. *I. pygmæus*, sp. n., only 12–15 mm., Indian Sea. Steenstrup, *l. c.* pp. 219–224 & 236, pl. i. figs. 11-22.

Spirula. Several observations on the very small terminal fins, the really internal position of the shell, the structure of the funnels, the disposition of the eggs and spermatophores, and a difference in the shape of the shell (perhaps sexual) it being more involute in the female; *id. l. c.* pp. 227-230 & 237, pl. i. fig. 23.

H. v. Ihering thinks that the *Aptychus* of the Ammonites is homologous to the cartilages of the neck in the dibranchiate *Cephalopoda*, and that the Ammonites, therefore, belong to the *Dibranchiata*; JB. Mineral. 1881, pp. 44–92.

PTEROPODA.

Cymbulia calceola, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 394, and (*calceolus*) P. U. S. Nat. Mus. iii. p. 393, N.E. Coast of America, surface.

Halopsyche, g. n., for *Psyche*, Rang (1825), *nec* Linn. (1735), *nec* Schrank (1801); *id.* P. U. S. Nat. Mus. *l. c.*

HETEROPODA.

A. Rattray's paper on the anatomy, physiology and distribution of the *Firolidæ*, Tr. L. S. xxvii. [1871] pp. 255–275, pls. xliii. & xliv., has hitherto been omitted from Zool. Rec.

GASTROPODA.

Macdonald, J. L. S. xv. pp. 241–244, continues his classification of the Gastropods [see preceding Record, *Moll.* p. 37] as follows:—

Division II. DIŒCIA.

Subdivision I. Lingual membrane unarmed, or with pleural teeth only.

Order 1 (without name).

(*a*) Rhachis and pleuræ unarmed: *Pyramidellidæ*, *Cancellariidæ*.
(*b*) Pleural teeth simple: *Pleurotomidæ*, *Acusidæ*, *Conidæ*.
(*c*) Dentition pavimental: *Solariidæ*, *Scalariidæ*, *Ianthinidæ*.

Subdivision II.—Lingual membrane strap or ribbon-like.

Order 1.—Proboscidifera.

Suborder 1. *Orthodonta*. Dental processes pointing directly backwards.

(*a*) Lingual dentition uniserial: *Volutidæ*. [Cf. *infrâ*.—Rec.]
(*b*) Lingual dentition triserial.
Rhachis and pleuræ comb-like.
Dental processes numerous, small.
Strap short: *Mitridæ*.
Strap long.
Teeth short: *Fasciolariidæ*.
Teeth long: *Fusidæ*.
Dental processes few and large: *Turbinellidæ*.
Pleuræ uncinate.
Uncinus with an additional internal cusp: *Buccinidæ*.
Uncinus simple, rhachis armed.
Cusps large, few: *Muricidæ*, *Olividæ*, *Harpidæ*.
Cusps small, numerous: *Turritidæ*.—[? Rec.]
Uncinus foliated, rhachis unarmed: *Columbellidæ*.

Suborder 2.—Anaclodonta. Cusps received from the fore part of the plates: *Velutinidæ*, *Naticidæ*, *Tritonidæ*, *Ranellidæ*, *Doliidæ*, *Cassididæ*, *Strombidæ*.

Order 2.—Rostrifera.

Suborder 1.—Orthodonta: *Heteropoda* and *Phoridæ*.

Suborder 2.—Anaclodonta.

(*a*) Marine or littoral: *Cypræidæ*, *Vermetidæ*, *Calyptræidæ*, *Planaxidæ*, *Litorinidæ*, *Cerithiidæ*, *Rissoidæ*, *Truncatellidæ*.
(*b*) Aquatic: *Melaniidæ*, *Paludinidæ*, *Valvatidæ*.
(*c*) Terrestrial: *Cyclophoridæ*, *Cyclostomidæ*, *Diplommatinidæ*.

[The *Orthodonta* are Troschel's *Rhachiglossa*, the *Anaclodonta* his *Taenioglossa*, the group (*b*) of the nameless order is his *Toxoglossa*, and (*c*) his *Ptenoglossa*. The *Cancellariidæ* have an armature of the radula, as has been ascertained also by Troschel.—REC.]

PECTINIBRANCHIA.

MURICIDÆ.

28 species of *Murex* from Mauritius, with synonyms enumerated by Tapparone-Canefri, Faun. mal. Maur. pp. 8–21.

Murex fenestratus (Chemnitz), varieties, and *dichrous*, sp. n., Mauritius, *id. l. c.* pp. 12 & 19, pl. ii. figs. 5 & 6, & pl. iii. figs. 11–14.

Chicoreus poirieri, sp. n., Jousseaux, Le Nat., Jan. 1881, p. 349, New Caledonia.

Trophon clathratus (L.) varr. nn., *maximus* and *intermedius*, Verkrüzen, JB. mal. Ges. viii. pp. 84 & 85, Great Bank of Newfoundland.

Muricidea caledonica, sp. n., Jousseaux, *l. c.* p. 349, New Caledonia.

Trophon fimbriatus (Hupé, as *Fusus*), E. A. Smith, P. Z. S. 1881, p. 28, pl. iv. fig. 4, Straits of Magellan.

Trophon [?] *fossuliferus*, sp. n., Tapparone-Canefri, *l. c.* p. 58, pl. iii. figs. 5 & 6, Mauritius.

PURPURIDÆ.

Monoceros (Lam.), list of known species by Kobelt, JB. mal. Ges. viii. pp. 323–325.

BUCCINIDÆ.

TRYON, Manual of Conchology, iii. pp. 99–106, arranges this family as follows.

Subfam. *Melongeninæ*: Gen. *Melongena* (Schum.), *Hemifusus* (Swains.).
Neptuniinæ: Gen. *Neptunea* (Bolten), *Volutopsis* (Mörch), *Sipho* (Klein), *Siphonalia* (A. Ad.), *Fulgur* (Montf.), *Streptosiphon* (Gill), *Tudicla* (Bolten).
Pisaniinæ: Gen. *Pisania* (Bivona), *Euthria* (Gray), *Metula* (H. & A. Ad.), *Cantharus* (Bolten).
Buccininæ: Gen. *Buccinum* (Lam.), *Neobuccinum* (A. Smith), *Buccinopsis* (Jeffr.), *Volutharpa* (Fischer), *Chlanidota* (Martens), *Cominella* (Gray), *Clea* (A. Ad.).
Eburninæ: Gen. *Eburna* (Lam.), *Macron* (H. & Ad.).
Photinæ: Gen. *Phos* (Montf.), *Nassaria* (H. & A. Ad.), *Cyllene* (Gray).

This family is limited by the characters of the radula, the subfamilies are characterized by characters of the shell.

Melongena (Schum.), 17 species described and figured; Tryon, *l. c.* pp. 107–111 & 229, pls. xli.–xliii. & lxxxvii.

Hemifusus (Swains.), 6 known species; *id. l. c.* pp. 111 & 112, pl. xliv.

Thatcheria mirabilis (Angas), doubtless a scalariform monstrosity; *id. l. c.* p. 112, pl. xliv. figs. 238 & 239.

Neptunea (Bolten), 19 known species, including *Volutopsis* (Mörch) and *Heliotropis* (Dall), the last sinistral; *id. l. c.* pp. 113–123 & 230, pls. xlv.–l. & lxxxvii. Alphabetical list of known species, with quotations and localities, by Kobelt, JB. mal. Ges. viii. pp. 313–322, including as subgenera *Sipho* (Klein), *Mohnia* (Friele), *Siphonalia* (A. Ad.), and *Austrofusus*, n.

[*Neptunea*] *Fusus cretaceus* (Reeve), *striatus* (Reeve), and several varieties of *tornatus* (Gould), Great Bank of Newfoundland; Verkrüzen, JB. mal. Ges. viii. pp. 86–88, the second pl. iii. figs. 1 & 2.

Sipho (Klein), 36 species; Tryon, *l. c.* pp. 123–133, pls. li.–liii. & lxxxvii.

Neptunea (*Sipho*) *calata*, p. 369, and *arata*, p. 370, spp. nn., Verrill, P. U. S. Nat. Mus. iii. [1880], Southern New England, to 500 fath.

Austrofusus, subg. n. of *Neptunea*, type *N. nodosa* (Martyn) = *raphanus* (Lam.), Kobelt, JB. mal. Ges. viii. p. 321; 6 species, as subg. of *Siphonalia*; Tryon, *l. c.* pp. 137 & 138, pl. lvi.

Siphonalia (A. Adams), 16 sp.; Tryon, *l. c.* pp. 133–137, pls. liv. & lv.

Siphonalia corrugata (Reeve, *Fusus*), var. or sp. n. *solenophora*, Tapparone-Canefri, Faun. mal. Maur. p. 58.

Fulgur (Montf.), 5 species; Tryon, *l. c.* pp. 139–143, pl. lviii.

Streptosiphon (Gill) *porphyrostoma* (Ad. & Rv.), *id. l. c.* p. 143, pl. lviii. figs. 405 & 406.

Tudicla (Bolten), 4 species; *id. l. c.* pp. 144 & 145, pl. lviii.

Pisania (Bivona), 19 species; *id. l. c.* pp. 145–149, pl. lxxi.

Pisania luctuosa (Tapp.-Can., 1876), Mauritius, Tapparone-Canefri, *l. c.* p. 60, pl. ii. figs. 7–9.

Euthria (Gray), 10 species; Tryon, *l. c.* pp. 149–152, pl. lxxii.

Euthria atrata and *meridionalis*, spp. nn., E. A. Smith, P. Z. S. 1881, p. 29, pl. iv. figs. 5 & 6, West Coast of Patagonia and Straits of Magellan.

Euthria chlorotica (Martens, 1878), Kerguelen; E. v. Martens, Conchol. MT. ii. p. 115, pl. xxii. figs. 19–22.

Metula (H. & A. Ad.), 4 species; Tryon, *l. c.* pp. 152 & 153, pl. lxxii.

Cantharus (Bolten), 39 species; *id. l. c.* pp. 153–167, pls. lxxiii. & lxxiv.

Tritonidea proxima, *lefevereiana*, and *polychloros*, spp. nn., Tapparone-Canefri, *l. c.* pp. 64–66, pl. iii. figs. 3 & 4 & 7–10, Mauritius; the first = *Pisania amphodon* (Martens); *id. l. c.* p. 84.

Buccinum (L., s. str.), type *B. undatum* (L.). Kobelt begins a monograph of this difficult genus in Küster's Conch.-Cab., parts 301 and 310, pp. 12–40, pls. lxxiii.–lxxxii., describing and figuring 15 known species, with critical notes concerning varieties and synonymy. Tryon admits only 14 species; Man. of Conch. iii. pp. 167–195, pls. lxxv.–lxxvii. & lxxxvii. Verkrüzen also gives a list of the known northern species, with table for their determination, and critical notes on most of them, from specimens in the British Museum, and others; Nachr. mal. Ges. 1881, pp. 42–44, augmented in JB. mal. Ges. viii. pp. 279–301. He brings the number of distinct species up to 50, whereas Kobelt, Nachr. mal. Ges. 1881, pp. 18–22, follows Jeffreys [Zool. Rec. xvii. *Moll.* p. 46] in admitting only 8 species and 38 varieties.

Buccinum conspicuum, *elongatum*, and *elegans* (Verkr.), *donovani* (Gray), and *totteni* (Stimps.), Great Bank of Newfoundland, with notes on their

synonymy, Verkrüzen, JB. mal. Ges. viii. pp. 89–95, the first four pl. iii. figs. 3–5, and pl. iv. figs. 1–4. *B. mirificum*, *pictum*, and *variabile*, spp. nn., Bank of Newfoundland, *id. l. c.* pp. 299–301.

Buccinum lischkeanum, sp. n., Lœbbeke, Nachr. mal. Ges. 1881, p. 49, Northern Japan.

Neobuccinum (E. A. Smith), 1 species; Tryon, *l. c.* p. 197, pl. lxxvii. figs. 357 & 358.

Buccinopsis (Jeffr.), 3 species, one figured; *id. l. c.* pp. 194–197, pls. lxxvii. & lxxix.

Volutharpa (Fischer), 5 species, 3 figured; *id. l. c.* pp. 197–201, pls. lxxvii. & lxxix.

Chlanidota (Martens), 1 species; *id. l. c.* p. 201, pl. lxxix. fig. 391.

Cominella (Gray), 17 species; *id. l. c.* pp. 201–207, pls. lxxx. & lxxxi.

Clea (A. Ad.), 9 species, including *Canidia* (A. Ad.); *id. l. c.* pp. 207 & 209, pl. lxxxi.

Clea nigricans var. n. *maxima*, Borneo, and *C. bocki*, sp. n., Sumatra, Brot, J. de Conch. xxix. pp. 159 & 160, pl. vi. figs. 4 & 5.

Eburna (Lam.). Monograph by Kobelt in Küster's Conch. Cab., part 301, pp. 3–12, pls. lxxi. & lxxii., describing and figuring 14 known species. Also 14 species, Tryon, *l. c.* pp. 209–213, pl. lxxxii.

Macron (H. & A. Adams), 2 species; Tryon, *l. c.* p. 214, pl. lxxxii. figs. 477 & 478.

Phos (Montf.), 18 species; *id. l. c.* pp. 215–220, pl. lxxxiii.

Nassaria (H. & A. Adams), 8 species; *id. l. c.* pp. 220–223, pl. lxxxiv.

Nassaria amboynensis, sp. n., Watson, J. L. S. xv. p. 273, Amboina.

Cyllene (Gray), 6 species; Tryon, *l. c.* pp. 223–225, pl. lxxxiv.

Nassidæ.

Nassa clathrata (Born), recent specimen from the Atlantic, 4° N. lat., 59 fath., *limata* (Chemn.) var. *conferta* (Martens, 1876), near the Cape Verde Islands, 47 fath., and *frigens* (Martens, 1878), Coast of W. Africa, 10° N. lat., 360 fath.; E. v. Martens, Conchol. MT. ii. pp. 112–115, pl. xxii. figs. 8–18.

Nassa limata (Chemn.) and *denticulata* (A. Ad.), both living in the coral zone of the Mediterranean; Monterosato, Bull. Soc. mal. Ital. vi. pp. 258 & 259.

Nassa costulata and *semistriata* (Brocchi), notes by F. Coppi, Ann. Soc. Mod. (2) xv. pp. 101–107.

Nassa (?) *nigro-labra*, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 371, [1880] Southern New England, 155 fath.

Nassa (*Tritia*) *coppingeri*, sp. n., and *taeniolata* (Philippi), both W. coast of Patagonia; E. A. Smith, P. Z. S. 1881, p. 30, pl. iv. figs. 7 & 8.

Venassa, subg. n. of *Nassa*, base of the shell flattened, umbilicated, with a strong spiral swelling, *N.* (*V.*) *pulcinaris*, sp. n., Timor, E. v. Martens, Conchol. MT. ii. p. 109, pl. xxii. figs. 1–4. *N. distorta* (A. Ad.), also from Timor, forms the connecting link with the normal forms of the genus; *id. l. c.* p. 111, pl. xxii. figs. 5–7.

Olividæ.

Olivella (Swains., 1835) = *Olivina* (Orb., 1839). No tentacles, foot short, rounded; operculum present; the internal walls between the whorls are constantly destroyed by reabsorption, as stated in *O. biplicata* (Sow.), *jaspidea* (Gmel.), *leucozonias* (Gray), and *columellaris* (Sow.), by P. Fischer, J. de Conch. xxix. pp. 31–35.

Fusidæ.

Tryon, Manual of Conchology, iii. pp. 46–48, arranges the family as follows :—

Subfam. *Fusinæ*, columella not plicate nor tortuous. Gen.: *Fusus* (Lam.), *Afer* (Conrad), type *Fusus afer* (Lam.), *Clavella* (Swains.), *Buccinofusus* (Conrad), including the recent *F. berniciensis* (King).

Fasciolariinæ, columella tortuous with oblique plaits. Only one genus, *Fasciolaria* (Lam.).

Ptychatractinæ. Differs from the preceding in lingual dentition. Gen.: *Ptychatractus* (Stimps.) and *Meyeria* (Dunker & Metzger).

Peristerniinæ, columella with transverse plications. *Peristernia* (Mörch), *Latirus* (Montf.), *Leucozonia* (Gray).

Fusus. 80 species, most of them typical, described and figured; Tryon, *l. c.* pp. 51–64 & 227–229, pls. xxxii.–xl. & lxxxv., lxxxvi.

Fusus [?] *xanthochrous*, sp. n., Tapparone-Canefri, Faun. mal. Maur. p. 57, pl. iii. figs. 1 & 2, Mauritius [? = *Buccinum crocatum* (Reeve)].

Afer (Conrad) *afer* (Gmel.), *bloxvillii* (Desh.) with var. *heptagonalis* (Reeve); Tryon, *l. c.* pp. 69 & 70, pl. xl. figs. 177–181.

Clavella serotina (Hinds), *id. l. c.* p. 70, pl. xl. fig. 182; the other species referred to by H. & A. Adams belong to other genera.

Buccinofusus (Conrad), *berniciensis* (King), and *terebralis* (Gould); Tryon, *l. c.* pp. 70 & 71, pl. xl. figs. 183, 184, & 189.

Fasciolaria. 14 known species described and figured; *id. l. c.* pp. 73–78, pls. lix.–lxiii.

Ptychatractus ligatus (Mighels) and *coreanicus* (E. A. Smith), *id. l. c.* p. 72, pl. xl. figs. 185 & 186. *P. occidentalis* (Stearns) is a doubtful species.

Meyeria alba (Jeffr.), *id. l. c.* p. 73, pl. xxxix. figs. 190–193.

Peristernia (Mörch). 29 known species described and figured; *id. l. c.* pp. 79–87, pls. lxiv.–lxvi.

Peristernia pauluccia and *kobeltiana* (Tapp.-Can., 1879), Mauritius, Tapparone-Canefri, Faun. mal. Maur. pp. 71 & 72, pl. ii. figs. 14 & 15, and pl. iii. figs. 17 & 18.

Latirus (Montf.). 35 known species described and figured; Tryon, *l. c.* pp. 87–94 & 225, pls. lxvi.–lxix. & lxxxv.

Latirus robillardi (Tapp.-Can., 1879), *carolianus*, new name = *Turbinella ustulata* (Kobelt, *nec* Reeve) and *concinnus*, sp. n., all from Mauritius, Tapparone-Canefri, Faun. mal. Maur. pp. 77 & 79, pl. ii. figs. 10–13, and pl. iii. figs. 15 & 16.

Leucozonia (Gray), 8 known species; Tryon, *l. c.* p. 94–96, pl. lxx.

VOLUTIDÆ.

This natural family exhibits a gradual reduction of the radula from the normal Rhachioglossan type, one median and on each side one lateral plate, *Voluta concinna*, to a median plate with only one cuspid and no laterals, *Amoria* [see also *Cymbium olla*]; E. v. Martens, Conchol. MT. ii. pp. 127 & 128.

Voluta (*Psephœa*) *concinna* (Brod.), median plate of the radula tricuspidate, lateral plates unicuspidate; Schacko, Conchol. MT. ii. pp. 126 & 127, pl. xxiv. fig. 5.

Voluta roadnightæ, sp. n., M'Coy, Ann. N. H. (5) viii. p. 89, pl. vii., Southern coast of Victoria.

Cymbium olla (L.). G. Schacko has examined the radula of an embryonal specimen, and states that the first three plates have no cuspids at all, the 4th—7th only one median, the lateral cuspids begin in the 8th, are first very small, become equal to the median in the 12th plate, and longer in the following; Conchol. MT. ii. pp. 123–126, pl. xxiv. figs. 3 & 4.

COLUMBELLIDÆ.

Columbella buchholzi, sp. n., Victoria, near Cameroons, W. Africa, and *fasciata* (Sow.), Java, varieties; E. v. Martens, Conchol. MT. ii. pp. 118–121, pl. xxiii. figs. 8–17.

Columbella (*Astyris*) *amphissella* and *verrilli*, spp. nn., Dall, Bull. Mus. C. Z. ix. p. 91, Gulf of Mexico, 310–805 fath.

Columbella (*Anachis*) *ostreicola*, sp. n., Melvill, J. of Conch. iii. p. 160, on oyster shells at Appalachicola, Gulf of Mexico. [Not duly described; REC.]

Columbella ? rubra, sp. n., Martens, SB. nat. Fr. 1881, p. 77, East Coast of Patagonia.

MARGINELLIDÆ.

Marginella watsoni, *fusina*, *seminula*, *yucatecana*, *torticula*, and (*avena* var. ?) *avenella*, spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 71–73, Havana and Yucatan Strait, 152–800 fath.

Marginella rubens and *patagonica*, sp. n., E. v. Martens, SB. nat. Fr. 1881, pp. 63 & 64, and Conchol. MT. ii. pp. 116 & 117, pl. xxiii. figs. 1–7, Patagonia.

CONIDÆ.

Conus thomasi, Red Sea, *prevosti*, New Caledonia, *bocki*, Amboyna, *gloynii*, locality unknown, and *lombei*, Mauritius, spp. nn., Sowerby, P. Z. S. 1881, pp. 635–637, pl. lvi. figs. 3–7.

Conus clarus, sp. n., E. A. Smith, Ann. N. H. (5) viii. p. 442, West Australia.

Conus brazieri, sp. n., G. B. Sowerby, Jun., J. of Conch. iii. p. 234, pl. i. fig. 9, Solomon Islands.

PLEUROTOMIDÆ.

Pleurotoma patagonica (Orb.) var. n. *magellanica*, Martens, SB. nat. Fr. 1881, p. 77, Magellan Straits.

Pleurotoma cærulea (Weinkauff), Lagos and Gaboon, and *inflexa*, sp. n., Atlantic, 10° N. lat., 360 fath., E. v. Martens, Conch. MT. ii. pp. 108–110, pl. xxi. figs. 5–9 & 10–12.

Ancistrosyrinx, subg. n. of *Pleurotoma*, = *Candelabrum* (Dall, 1878, pre-occupied). Posterior surface of the whorls concave, with a broad deep sinus, bordered externally by a pectinated elevated frill, directed backwards. *A. elegans*, sp. n., Florida reefs and Havana, 805 fath. Dall, Bull. Mus. C. Z. ix. pp. 53 & 54; and Am. Nat. xv. p. 718.

Columbarium, subg. n. of *Pleurotoma*. Notch of the outer lip very faint, canal very distinct, as long as or longer than the rest of the shell, whorls spinously keeled, nucleus globular. *P.* (*C.*) *spinicincta*, sp. n., East Coast of Australia, 76 fath., and *pagodus* (Lesson, *Fusus*), E. v. Martens, Conchol. MT. ii. pp. 105–107, pl. xxi. figs. 1–4. The radula exhibits two blunt dagger-shaped teeth, not unlike those of *Defrancia*; Schacko, *tom. cit.* pp. 122 & 123, pl. xxiv. figs. 1 & 2.

Pleurotoma (*Surcula*) *staminea*, Prince Edward and Kerguelen Islands, 1375 & 105 fath., *trilix*, between Kerguelen and Heard Islands, 150 fath., *lepta*, S.E. of Australia, 1950 fath., *rotundata*, E. of Japan, 2050 fath., *goniodes*, S.E. of La Plata, 600 fath., *plebeia* and *rhysa*, off Pernambuco, 350 fath., *syngenes*, off St. Thomas, W. Indies, 450 & 390 fath., *hemimeres* and *bolbodes*, Pernambuco, 675 fath., *anteridion*, off the Cape of Good Hope, 150 fath., *ischna*, N.E. from New Zealand, 700 fath., spp. nn., R. B. Watson, J. L. S. xv. pp. 388–404.

Pleurotoma (*Genota*) *didyma*, St. Thomas, W. Indies, 450 fath., *engonia*, off Inosima, Japan, 345 fath., and *atractoides*, Philippines, 375 fath., spp. nn., *id. l. c.* pp. 404–407.

Pleurotoma (*Genota*) *mitrella*, sp. n., Dall, Bull. Mus. C. Z. ix. p. 56, Yucatan Strait, 640 fath.

Pleurotoma (*Drillia*) *pyrrha*, Kobi, Japan, 8–50 fath., *paupera* and *brachytoma*, Aru Island, 800 fath., *gypsata*, *bulbacea*, and *ula*, N.E. of New Zealand, 700 fath., *fluctuosa*, Kerguelen and Heard Islands, 38 & 75 fath., *spicea*, *stirophora*, *phæacra*, and *tmeta*, off Pernambuco, 350 fath., *incilis*, St. Thomas, 390 fath., and *sterrha*, Flinders Passage, Torres Straits, 7 fath., spp. nn., Watson, *l. c.* pp. 409–427.

Pleurotoma (*Drillia*) *polytorta*, *subsida*, *nucleata*, *exasperata*, *leucomata*, *gratula*, *detecta*, *serga*, *smirna*, *oleacea*, *havanensis*, *verrilli*, *peripla*, *elusiva*, and *morra*, spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 61–69, Gulf of Mexico and Caribbean Sea, 287–1002 (*exasperata*) fath.

Pleurotoma (*Crassispira*) *climacota*, sp. n., Watson, J. L. S. xv. p. 428, Tongatabu, 18 fath.

Pleurotoma (*Clavus*) *marmarina*, sp. n., *id. l. c.* p. 429, off Pernambuco, 350 fath.

Pleurotoma (*Pleurotomella*) *agassizi*, sp. n., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 394, and P. U. S. Nat. Mus. iii. p. 367, N.E. Coast

of America, 65–500 fath.; *P.* (*P.*) *pandionis*, sp. n., Verrill, P. U. S. Nat. Mus iii. p. 368, Southern New England, 238 fath.

Pleurotoma (*Pleurotomella*) *verrilli* and (?) *sigsbei*, spp. nn., Dall, Bull. Mus. C. Z. ix. p. 57, Gulf of Mexico, 860 & 640 fath.

Pleurotoma (*Thesbia*) *eritima*, Tristan d'Acunha, 100–150 fath., *translucida*, Prince Edward and Kerguelen Islands, 28–150 fath., *corpulenta* and *platamodes*, Kerguelen, 28 fath., *dyscrita*, St. Thomas, W. Indies, 450 fath., *monoceros*, S.W. of Sierra Leone, 2500 fath., *papyracea*, between Prince Edward's Island and Kerguelen, 1600 fath., *brychia*, Mid Atlantic, 1° 47′ N., 1850 fath., and *pruina*, Azores, 1000 fath., the 3 latter in *Globigerina*-ooze, spp. nn., Watson, *l. c.* pp. 443–455.

Pleurotoma (*Mangelia*) *subtilis* and *hypsela*, off Pernambuco, 350 fath., *levukensis*, Levuka, Fiji, 12 fath., *eritmeta*, off Fayal, Azores, 450 fath., *acanthodes*, Bermuda, 1075 fath., *corallina* and *tiara*, St. Thomas, 390 fath., *macra* and *incincta*, Azores, 1000 fath., *Globigerina*-ooze, spp. nn., *id. l. c.* pp. 430–441.

Pleurotoma (*Mangelia*) *ipara*, *comatotropis*, *lissotropis*, *bandella*, *antonia*, *pourtalesi*, *columbella*, and *pelagia*, spp. nn., Gulf of Mexico, Dall, Bull. Mus. C. Z. ix. pp. 57–61.

Pleurotoma (*Mangelia* ?) *coppingeri*, spp. nn., E. A. Smith, P. Z. S. 1881, p. 27, pl. iv. fig. 2, West Coast of Patagonia

Pleurotoma (*M.* ?) *carpenteri*, sp. n., Verrill & Smith, *l. c.* p. 395, and P. U. S. Nat. Mus. iii. p. 368, N.E. Coast of America.

Defrancia philberti (Payr.), Mediterranean, distinct from *purpurea* (Mont.), Northern Europe; Monterosato, Nat. Sicil. i.

Pleurotoma (*Defrancia*) *hormophora*, *chariessa*, *pachia*, *pudens*, *araneosa*, *circumcoluta*, and *perpauxilla*, St. Thomas, 390 fath., *streptophora*, North Atlantic, over 1000 fath., *chyta*, W. of Azores, 1000 fath., *Globigerina*-ooze, and ? *perparva*, Pernambuco, 350 fath., spp. nn., Watson, J. L. S. xv. pp. 457–469.

Defrancia luteo-fasciata (Hutt.), animal described; Hutton, Tr. N. Z. Inst. xiii. p. 201. No operculum.

Pleurotoma (*Raphitoma*) *lithocolleta* and *lincta*, spp. nn., St. Thomas, 450 & 390 fath., Watson, *l. c.* pp. 441 & 442.

Pleurotoma (*Borsonia*) *ceroplasta*, St. Thomas, 390 fath., and *silicea*, off Pernambuco, 350 fath., spp. nn., *id. l. c.* pp. 473–475.

Pleurotoma (*Daphnella*) *compsa*, Fiji, 210 fath., and *aulacoessa*, W. of Cape York, 28 fath., spp. nn., *id. l. c.* pp. 472 & 473.

Pleurotoma (*Daphnella* ?) *leucophlegma*, sp. n., Dall, Bull. Mus. C. Z. ix. p. 70, Gulf of Mexico, 805 fath.

Bela sarsi, new name for *cancellata* (Sars, *nec* Couthouy), p. 364, and *hebes*, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 367, Southern New England, the latter 500 fath.

Pleurotoma (*Bela*) *blakeana* with var. *extensa*, *P.* (*B.*) *limacina* and *filifera*, spp. nn., Gulf of Mexico and Caribbean Sea, 331–804 fath., Dall, Bull. Mus. C. Z. ix. pp. 54–56. *P. limacina* also obtained in deep water off Newport, Rhode Island, has no operculum; *id. l. c.* p. 102.

Pleurotoma (*Bela*) *cunninghami*, sp. n, E. A. Smith, P. Z. S. 1881, p. 27, pl. iv. fig. 1, West Coast of Patagonia.

Lachesis meridionalis, sp. n., E. A. Smith, *l. c.* p. 28, pl. iv. fig. 3, Straits of Magellan, 20 fath.

Taranis bella (Verrill) perhaps a variety of *moerchi* (Malm); Dall, Bull. Mus. C. Z. ix. p. 70, Caribbean Sea.

Taranis pulchella, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 368 [1880], N.E. Coast of America, 487 fath.

Cancellariidæ.

Cancellaria (Lam.). Kobelt begins a monograph of this genus in Küster's Conchylien Cabinet, pt. 309, 16 pp. 5 pls., describing 11 and figuring 19 species. He rejects Adam's subgenera, and subdivides the genus simply as *Trigonostomes* [sic !], *Purpuriformes*, and *Mitriformes*.

Cancellaria wilmeri, sp. n., Sowerby, P. Z. S. 1881, p. 637, pl. lv. fig. 2, Port Blair, Andaman Islands.

Cerithiopsidæ.

Cerithiopsis sigsbeana and ? *crystallina*, spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 87–89, Caribbean Sea, 100–805 fath.

Isseliella, new name for *Isselia* (Semper, pre-occupied), embryonal shell sinistral, and may, therefore, be placed near *Cerithiopsis*; *I. mirabilis* (Dunker), Upolu, *abnormis* (Nevill, *Rissoina*), Indian Seas, and *concinna* (Sow., *Rissoina*) = *pseudo-concinna* (Nevill); Weinkauff, gen. *Rissoina* in Küster's Conch. Cab. pt. 312, pp. 60 & 67, pl. xv. fig. 9, & pl. xv.*a*, fig. 5.

Lepetella, g. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 396, and P. U. S. Nat. Mus. iii. p. 375; for *L. tubicola*, sp. n., Verrill & Smith, *ll. cc.*, inside old tubes of *Hyalinœcia*, N.E. Coast of America, to 365 fath.

Cerithiopsis costulatus, Whiteaves, *nec* Möller, renamed *Lovenella whiteavesi*; Verrill, *ll. cc.*

Cassididæ.

Dentition; Tryon, Manual of Conchology, iii. pl. ii.

27 species of *Tritonium*, 15 *Epidromus*, 2 *Distorsio*, 19 *Ranella*, from Mauritius, with synonymy, enumerated by Tapparone-Canefri, Faun. mal. Maur., pp. 21–56.

Triton (Montf.). 5 subgenera, 105 species described and most of them figured; Tryon, *l. c.*, pp. 6–34 & 225, pls. i.–xvi. & lxxxv.

Triton philomela, sp. n., Watson, J. L. S. xv. p. 268, Nightingale Island, Tristan d'Acunha.

Tritonium pachycheylos [*-chilus*], (Tapp.-Can., 1876), Mauritius; Tapparone-Canefri, *l. c.* p. 30, pl. ii. figs. iii. & iv. Near *T. clavator* (Chemn..)

Distorsio (Bolten), 3 species; Tryon, *l. c.* p. 35, pl. xvii.

Priene magellanica (Chemn.) = *Triton cancellatum* (Lam.), W. coast of Patagonia, the same species said to be also in the Arctic part of the Pacific; E. A. Smith, P. Z. S. 1881, p. 31. Operculum described.

Ranella. 3 subgenera, 31 species described and part of them figured; Tryon, *l. c.* pp. 36–45, pl. xviii.–xx. Jousseaume, Bull. Soc. Z. Fr. 1881, pp. 172–176, proposes to split this Lamarckian genus into several, as follows: *Ranella*, type *R. crumena* (Lam.); *Bufonaria* (Schumacher),

type *R. spinosa* (Lam.); *Bursa* (Bolten), type *R. bufonia* (Gm.); *Colubraria* (Schumacher), type *R. candisata* (Chemn.); *Aspa* (Ad.), type *R. lævigata* (Gmelin), and the three following :—

Crossata, g. n., for *R. ventricosa* (Brod.), and *californica* (Hinds).

Tutufa, g. n., for *R. lampas* (L.), *caledoniensis*, sp. n., *ranelloides* (Reeve, *Triton*), and *scrobiculator* (L.)

Lampasopsis [sic!], g. n., for *R. rhodostoma* (Brod.), and *cruenta* (Sow.).

Ranella bergeri (Sow., inedit.), sp. n., distinct from *grayana* (Dkr.) and *paulucciana* (Tapp.-Can., 1876), both from Mauritius; Tapparone-Canefri, *l. c.* pp. 50, 51, & 22, pl. ii. figs. 1, 2, & 6, 17.

Ranella fijiensis, sp. n., Watson, J. L. S. xv. p. 270, Fiji Islands, 315 fath.

Ranella vexillum (Sow.), W. coast of Patagonia, = *tumida* (Dkr.), from New Zealand; E. A. Smith, P. Z. S. 1881, p. 31.

Cassidaria provincialis (Martin), probably a distinct species, Provence, very rare; Monterosato, Bull. Soc. mal. Ital. vi. p. 257.

Oniscia cithara, sp. n., Watson, *l. c.* p. 266, Ké Islands, W. of Papua, 130 fath.

Dolium bairdi, sp. n., Verrill & Smith, Am. J. Sci. (3) xxii. p. 299, off Martha's Vineyard, 202 fath., South Coast of New England.

Cypræidæ.

Cypræa. H. C. Weinkauff continues and concludes his monograph in Küster's Conch. Cab. pts. 300, 303, 306 & 308, pp. 81–166, pls. xxv.–xliii.; 185 species are described and figured, including *C. rota*, sp. n., p. 135, pl. xxxviii. figs. 13 & 16, locality unknown, and several varieties and monstrosities of *C. pantherina* (Sol.), p. 87, pl. xxvi. figs. 5 & 6, pl. xxvii. figs. 1–6. He also gives a list of the known species with synonymy and localities in JB. mal. Ges. viii. pp. 133–157.

Cypræa decipiens (E. A. Smith, 1880), two more specimens confirm the distinctness from *C. thersites*; E. A. Smith, P. Z. S. 1880, p. 558.

Cypræa smithi, sp. n., Sowerby, P. Z. S. 1881, p. 638, pl. lvi. fig. 8. North-west coast of Australia.

Cypræa fallax, sp. n., near *cribraria* (L.), E. A. Smith, Ann. N. H. (5) viii. p. 441, West Australia.

Cypræa amabilis, sp. n., Jousseaux, Le Nat., Jan. 1881, p. 349, locality unknown.

Ovulidæ.

Ovula (Brug., Lam.). Monograph describing and figuring 72 species by Weinkauff, in Küster's Conch. Cab. pts. 308 & 313, pp. 167–215, pls. xliv.–liii. He defends the priority of the generic name *Ovulum* (Brug., emend. *Ovula*, Lam.), against *Amphiperas* (Gronov.), and maintains that the genus belongs to the family of the *Cypræidæ*, on account of the resemblance in the soft parts. [He overlooks the difference in the muzzle and radula, as stated by Gray & Troschel.]

Ovula lebbeckeana, sp. n., Weinkauff, *l. c.* p. 197, pl. l. figs. 6 & 7, Vancouver Island. *O. sempieri* [erroneously for *semperi*], new name for

hordacea (Sow., Reeve, *nec* Lam.), and *sowerbyana*, new name for *spelta* (Sow., Reeve, *nec* Lin.), *id. l. c.* pp. 190 & 202.

Ovulum vidleri, sp. n., Sowerby, P. Z. S. 1881, p. 638, pl. lvi. fig. 1, Monterey.

Pediculariidæ.

Pedicularia albida, sp. n., Dall, Bull. Mus. C. Z. ix. p. 39, Caribbean Sea and Strait of Yucatan, 100–640 fath.

Naticidæ.

Natica. Faint revolving markings, visible only by reflected light, in all species; Dall, Bull. Mus. C. Z. ix. p. 93.

Natica philippinensis, Philippines, *atypha*, Cape York, *pseustes*, Fiji, *suturalis*, Kerguelen's Land, *radiata*, N. Atlantic, over 1000 fath., *amphiala*, N. E. of New Zealand, 700 fath., *leptalea*, St. Thomas, W. Indies, *xantha*, between Kerguelen and Heard Islands, 150 fath., *prasina*, Kerguelen, *fartilis*, Marion and Kerguelen Island, 50–150 fath., *apora*, off Arra Island, 800 fath., spp. nn., Watson, J. L. S. xv. pp. 252–265.

Natica fringilla, sp. n., Dall, *l. c.* p. 93, Yucatan, 640 fath.

Lunatia levicula, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 371 [1880], Southern New England, 26 fath.

Marseniidæ.

Lamellaria patagonica, sp. n., E. A. Smith, P. Z. S. 1881, p. 32, pl. iv. fig. 9, W. coast of Patagonia. *L. pellucida*, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 395, and *l. c.* p. 372, N.E. coast of America.

Marsenina micromphala, Bergh, and *Lamellaria perspicua*, Gould, pt., = *M. glabra* (Couthouy, as *Oxinoe*); Verrill, *l. c.* p. 373. *M. ampla*, sp. n., *id.* Tr. Conn. Ac. v. pl. xlii. fig. 3, and *l. c.* p. 374, Maine Coast.

Trichotropidæ.

Trichotropis migrans, sp. n., Dall, *l. c.* p. 71 (Sigsbee) near Havana, 80 fath.

Strombidæ.

Rostellaria delicatula, sp. n., Nevill, J. A. S. B. l. pt. 2, p. 262, Coast of Arakan.

Cerithiidæ.

Cerithium latreillii (Payraudeau), distinct from *lima* (Brug.), which is West Indian, and from *scabrum* (Olivi), which = *afrum* (Danieli & Sandri); Monterosato, Nat. Sicil. i.

Cerithium pullum (Philippi, 1845) = *cœlatum* (Gould, 1849) = *ferrugineum* (Orb.), Magellan Straits; Martens, SB. nat. Fr. 1881, p. 77.

Bittium? yucatecanum, sp. n., Dall, Bull. Mus. C. Z. ix. p. 90, Yucatan, 640 fath.

Triforis torticulus, *hircus*, *cylindrellus* (*bigemma*, Watson var. ?), *abruptus*, *triserialis*, *intermedius*, *colon* and *ibex*, spp. nn., Yucatan Strait and Havana, 450–1002 fath., *id. l. c.* pp. 82–86.

Triforis (*Ino*) *longissimus*, sp. n. (26 mm.), *id. l. c.* p. 81, locality not indicated, probably Gulf of Mexico.

Melaniidæ.

Melania holandri (Fér.), and *parvula* (Schmidt), varieties and occurrence in a part of Styria; Tschapeck, JB. mal. Ges. viii. pp. 101–107, pl. v. figs. *a–k*.

Melania boeana, *provisoria* and *bocki*, spp. nn., Boea, Sumatra, Brot, J. de Conch. xxix. pp. 154–157, pl. vi. figs. 1–3.

Melania (*Sermyla*) *admirabilis* and *tanganyicensis* (E. A. Smith, 1880), *M.* (*Melanella*) *nassa* (Woodw.) and *M.* (— ?) *horei* (E. A. Smith, 1880), all from Lake Tanganyika; E. A. Smith, P. Z. S. 1881, pp. 291 & 292, pl. xxxiv. figs. 24–27.

Paramelania, subg. n. of *Melania*; shell solid, ovate-conical, longitudinally ribbed and transversely lyrate, epidermis thin, aperture ovate, indistinctly effuse, peristome thick. *P. nassa* (Woodw.), with varr. nn. *grandis* and *paucicostata*, *P. damoni* and *crassigranulata*, spp. nn., all from Lake Tanganyika, *id. l. c.* pp. 558–561, with 2 woodcuts. *M. nassa* also figured by Crosse, J. de Conch. xxix. p. 113, pl. iv. figs. 3, 3*a*.

Oncomelania, g. n. Shell near *Melania*, perpendicularly ribbed, but aperture entire, outer lip strengthened by a strong varix; operculum as in *Melania*. *O. hupensis*, sp. n., Uchang-fu, China; Gredler, JB. mal. Ges. viii. p. 120, pl. vi. fig. 2.

Melanopsis acicularis and *esperi* (Fér.), in Styria; Tschapeck, JB. mal. Ges. viii. p. 107, pl. v. figs. *l–n*.

Melanopsis tunetana, sp. n., Morlet, in Roudaire's 'Rapport sur l'Expédition des Schotts' 1881, p. 170, pl. vi. figs. 3 & 4, and J. de Conch. xxix. p. 346, pl. xii. fig. 3, Touzeur, Kris, N. Africa.

Tiphobia horii (E. A. Smith, 1880). Operculum paucispiral in the centre, surrounded by apparently concentric layers; E. A. Smith, P. Z. S. 1881, p. 293, pl. i. fig. 28; the shell also figured by Crosse, J. de Conch. xxix. p. 117, pl. iv. fig. 2.

Syrnolopsis lacustris (E. A. Smith, 1881); Smith, *l. c.* p. 288, pl. xxxiii. fig. 21; pillar with a single plait through all whorls, fig. 21*b*, Lake Tanganyika. Also J. de Conch. xxix. p. 119, pl. iv. fig. 6.

Paludomus blanfordiana (Nevill) = *labiosa* of Conchol. Indica, *P. petrosa* (Gould) = *labiosa* (Benson), *andersoniana* (Nevill), with varr. nn. *myadoungensis* and *nana*, and *P. burmanica* (Nevill), discussed and figured by Nevill, J. A. S. B. l. pt. 2, pp. 159 & 160, pl. v. figs. 2–5.

Larina cincta (Nevill), *id. l. c.* p. 161, pl. v. fig. 6.

Robinsonia (Hugh Nevill, 1869) is congeneric with *Larina*; id. *ibid.*

Turritellidæ.

Turritella yucatecanum [-*a*], sp. n., Dall, Bull. Mus. C. Z. ix. p. 93, Yucatan Straits, 640 fath.

Europe. Brusina defends their generic distinctness from *Lartetia* (Bourg.) and from *Iravadia* (Blanf.); Bull. Soc. mal. Ital. vii. pp. 266–270. [He is right in stating that Sandberger's name *Goniochilus* dates from 1874, not 1870, as indicated in Zool. Rec. xv. *Moll.* p. 47].

Isselia: vide *Cerithiopsidæ*.

Rissoellidæ.

Fairbankia? *feddeniana*, sp. n., Nevill, J. A. S. B. l. pt. 2, p. 158, Kathiawar.

Paludinidæ.

Paludina crassa (Hutt.) and *bengalensis* (Lam.). Male distinguishable by the hooked right tentacle and the smaller narrower shell, Wood-Mason, Ann. N. H. (5) viii. pp. 85–88, with woodcuts. E. A. Smith, *tom. cit.* pp. 220 & 221, remarks that the same sexual difference has been known in the European species since Lister, 1695. Hazay also mentions the sexual differences in the shells of the European *Paludinæ*; Mal. Bl. (2) iii. p. 21.

Paludina hungarica, sp. n., male and female shells rather different, Buda-Pest; Hazay, *l. c.* pp. 20 & 21, & 173–176; iv. pl. v. fig. 1, male, & fig. 2, female; *P. mammillata* (Küst.), fig. 3.

Vivipara contecta (Millet), var. n. *russiensis* [!], Milachevich, Moll. Mosc. p. 22, Moscow.

Vivipara caucasica, sp. n., Clessin, Mal. Bl. (2) iii. p. 134, Poti, Mingrelia.

Paludina fasciata (Müll.), var. *costæ* (Mouss.), Armenia; Böttger, JB. mal. Ges. viii. p. 245.

Paludina hungerfordiana, Canton, and *martensiana*, Khasing district, spp. nn., Nevill, J. A. S. B. l. pt. 2, pp. 155 & 156.

Margarya melanioides (Nevill), *id. l. c.* p. 155, pl. v. fig. 1, Lake Tali, Yunnan.

Limnotrochus thomsoni and *kirki* (E. A. Smith, 1880), described and figured by Smith, P. Z. S. 1881, pp. 285–287, pl. xxxiii. figs. 17 & 18, Lake Tanganyika.

Neothauma tanganyicense (E. A. Smith), Crosse, J. de Conch. xxix. p. 112, pl. iv. figs. 1 & 1*a*, Lake Tanganyika. Operculum described by E. A. Smith, P. Z. S. 1881, p. 293.

Cleopatra pirothi, sp. n., Jickeli, JB. mal. Ges. viii. p. 338, Anseba, Abyssinia.

[*Cleopatra*] *Paludomus ferrugineus* (Lea, *Melania*), E. A. Smith, P. Z. S. 1881 p. 294, pl. xxxiv. fig. 29, between Lake Nyassa and the East Coast.

Bythinia balatonica, sp. n., Servain, Hist. mal. lac Balaton, p. 91, Lake Balaton, Hungary.

Bythinia philippinensis, sp. n., Santa Cruz, Luzon, *subpulchella*, sp. n., Kutch, *moreletiana* (Nevill), Yunnan, *evezardi* (Blanf.), Lanowlee, and *B.* ? *turrita* (Blanf.), Kyonkpong, Nevill, J. A. S. B. l. pt. 2, pp. 156 & 177, all except the first, pl. vi. figs 12–15.

VALVATIDÆ.

Valvata glacialis, sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 67, Sweden, subfossil.

Valvata alpestris (Blauner), found also in Lapland and subfossil on the island Öland; *id. l. c.* p. 48.

Valvata alpestris var. n. *platti*, peat-ground at Lonato, prov. Brescia; Adami, Bull. Soc. mal. Ital. vii. p. 198.

Valvata borealis, sp. n., and *fluviatilis* (Colbeau), var. n. *kliniensis*, Milachevich, Moll. Mosc. p. 22, Government of Moscow.

Valvata neglecta, new name for *V. minuta* (Mörch & Küster, probably not Draparnaud), from Denmark and Germany; Westerlund, JB. mal. Ges. viii. p. 6.

Valvata fagoti (Bourguignat, MS.), sp. n., Fagot, Bull. Soc. Z. Fr. 1881, p. 141, St. Pardoult, Dép. Charente Inférieure.

Valvata balatonica, sp. n., Servain, Hist. mal. lac Balaton, p. 95, Hungary.

AMPULLARIIDÆ.

Ampullaria. An alphabetical list of the known species; Gaudion, in Bulletin de la Société d'Étude des Sciences naturelles de Beziers, iv. (1879). [Not seen by the Recorder].

Ampullaria stoliczkana (Nevill), Penang, figured; Nevill, J. A. S. B. l. pt. 2, p. 155, pl. vi. fig. 11.

Ampullaria gradata, sp. n., E. A. Smith, P. Z. S. 1881, p. 289, pl. xxxiii. fig. 22, Lake Nyassa.

Lanistes purpureus (Jonas) and *affinis* (E. A. Smith, 1877), Lake Nyassa; *id. l. c.* p. 290, the latter pl. xxxiv. fig. 23.

CALYPTRÆIDÆ.

Crepidula (Lam.), generic name preferred to *Crypta* (Humphrey, which was not characterized); Dall, Bull. Mus. C. Z. ix. pp. 79 & 80.

VERMETIDÆ.

Bivonia exserta, sp. n., Dall, *l. c.* p. 39, Gulf of Mexico.

Siliquaria modesta, sp. n., *id. l. c.* p. 39, Gulf of Mexico, in all depths from 80–800 fath.

SCALARIIDÆ.

Scalaria pourtalesi and *dalliana*, spp. nn., Verrill, Am. J. Sci. (3) xx. [1880] p. 395, N. E. Coast of America, 115 fath.

Acirsa gracilis, sp. n., *id.* P. U. S. Nat. Mus. iii. p. 377 [1880], Southern New England, 100–365 fath.

Aclis striata, sp. n., *id. ibid.*, Southern New England.

Aclis mizon, sp. n., Teneriffe, 78 fath., *hyalina* and *sarissa*, spp. nn., Pernambuco, 350 fath., Watson, J. L. S. xv. pp. 245–247.

Rissoidæ.

Rissoina (Orb.). H. C. Weinkauff continues his monograph in Küster's Conch. Cab., parts 302, 303, & 312, pp. 41–80, with 6 pls., describing and figuring 60 species, among which are the following new: *japonica*, *subulina* and *adamsiana*, Japan, *nevilliana*, S. China, *andamanica*, Andaman Islands, *jickelii*, Massowa, pp. 65–68, 75 & 79, pl. xv.*a*, figs. 1, 3, 4, & 7, pl. xv.*b*, fig. 6 & pl. xv.*c*, fig. 4; also *peaseana*, Tahiti, *hungerfordiana*, Hongkong, *subfuniculata*, Indian Seas, *subdebilis*, Mauritius (Nevill, MS.), pp. 68, 70, 76 & 77, pl. xv.*a*, figs. 6 & 9, pl. xv.*b*, figs. 8 & 9.

Rissoina barteriana, sp. n., Red Sea, *orientalis*, sp. n., Ceylon, Mauritius, &c., *blanfordiana*, sp. n., Annesley Bay, Red Sea, *weinkauffiana*, sp. n., Andamans, *nevilliana* (Weinkauff), Hongkong, *sublævigata*, sp. n., Andamans, and *pseudo-bryerea*, sp. n., Red Sea; Nevill, J. A. S. B. l. pt. 2, pp. 161–165, the third pl. vi. fig. 16.

Rissoa (*Cingula*) *harpa*, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 374 [1880], Southern New England, to 365 fath.

Amphithalamus pellyæ, sp. n., Adelaide, Nevill, J. A. S. B. l. pt. 2, p. 165. *Barleeia ? microthyra* (Martens) belongs also to this genus.

Stenothyra woodmasoniana, *hungerfordiana*, and *blanfordiana* (Nevill) figured; *id. l. c.* pl. vii. figs. 8–10. *Lithoglyphus renouſi*, sp. n., Servain, Hist. mal. lac Balaton, p. 92, Lake Balaton, Hungary.

Lithoglyphus lilliputanus, sp. n., Gredler, JB. mal. Ges. viii. p. 131, Prov. Kwangtung, China.

Lithoglyphus neritinoides and *rufo-filosus* (E. A. Smith, 1880), Smith, P. Z. S. 1881, pp. 287 & 288, pl. xxxiii. figs. 19 & 20; operculum of the latter described, resembling that of *Tiphobia*. [*Cf.* the following.]

Tanganyicia, g. n. Shell resembling a young *Ampullaria*, aperture piriform, peristome straight, produced into a small lobe near the umbilical chink; operculum horny, first spiral, afterwards concentric. *T. rufofilosa* and ? *neritinoides* (E. A. Smith, both as *Lithoglyphus*), Lake Tanganyika; Crosse, J. de Conch. xxix. pp. 123–126, the former pl. iv. fig. 5.

Lacunopsis (Desh.). No denticles in the cuspid of the median tooth of the radula, but some on the surface of its basal plate; cuspid of the intermediate (first lateral) tooth denticulated on its internal half. First group; columellar lip with a tooth, and operculum notched for its reception. *L. globosa* and *ventricosa*, spp. nn., Cambodia. Second group: columellar lip straight, operculum not notched. *L. harmandi*, sp. n., Cambodia. *L. tricostata* (Desh.) is a young *Jullienia*. Poirier, J. de Conch. xxix. pp. 6–9, pl. i. figs. 1–3, new species, and pl. iii. fig. 5, radula.

Lacunopsis (*Spekia*, Bgt.) *zonata* (Woodw., as *Lithoglyphus*), Crosse, J. de Conch. xxix. pp. 120–122, pl. iv. fig. 4.

Jullienia (Crosse & Fischer). Cuspid of the median tooth of the radula laterally denticulated in most species, entire in *J. costulata*; denticles on the surface of its basal plate; cuspid of the intermediate (first lateral) tooth denticulated on both sides. *J. harmandi*, *costata*, *nodulosa*,

and *acuta*, spp. nn., Cambodia. Poirier, *l. c.* pp. 9–12, pl. i. figs. 4–8, new species, and pl. iii. figs. 3 & 4, radula.

Pachydrobia, animal described. Cuspid of the median tooth of the radula blunt, quadrate; other characters of the radula as in *Jullienia*; verge simple; operculum horny. *P. spinosa*, *bertini*, *fischeriana*, *harmandi*, *variabilis*, *scalaroides*, and *dubiosa*, spp. nn., Cambodia, *id. l. c.* pp. 12–18, pl. ii. figs. 1–7, new species, and pl. iii. figs. 1 & 2, radula.

Amnicola callosa, sp. n., Abruzzo citeriore, and *minima*, sp. n., Terra di Lavoro, Paulucci, Bull. Soc. mal. Ital. vii. pp. 148 & 149, pl. v. figs. 7 & 8.

Amnicola marginata and *filiola*, spp. nn., Westerlund, Œfv. Ak. Forh. 1881, p. 68, Greece.

Amnicola pesmii, sp. n., Morlet, J. de Conch. xxix. pp. 46 & 315, pl. xii. fig. 2, Algerian Sahara, subfossil [1882].

Amnicola ferruginea, sp. n., Calkins, Valley Nat. ii. [Sept., 1880] p. 6, with woodcut, Calumet River, Illinois.

Hydrobia minuscula, sp. n., Paulucci, Bull. Soc. mal. Ital. vii. p. 151, pl. v. fig. 9, S. Agata, Matese Mountains.

Hydrobia hæsitans, sp. n., Westerlund, Œfv. Ak. Forh. 1881, p. 68, Greece.

Hydrobia sieversi, sp. n., Böttger, JB. mal. Ges. viii. p. 246, pl. ix. fig. 23, and Nachr. mal. Ges. 1881, p. 129, Armenia.

Hydrobia miliacea (Nevill), Port Canning, figured; Nevill, J. A. S. B. l. pt. 2, pl. vii. fig. 7.

Bythinella ginolensis, sp. n., Fagot, Bull. Soc. Z. Fr. 1881, p. 140, Ginoles, Dép. Aude.

Bythinella hungarica, sp. n. with var. n. *parva*, Hazay, Mal. Bl. (2) iii. p. 177, iv. pl. vi. figs. 1 & 2, Buda Pest.

Bythinella heynemanniana and *tornensis*, spp. nn., Hazay, JB. mal. Ges. viii. p. 271, with woodcuts, Nadaska, Upper Hungary.

Bythinella isseli (Gentiluomo) = *opaca* (Ziegl.), var.; Paulucci, Bull. Soc. mal. Ital. vii. p. 150.

Hydrobia (*Vitrella*) *fontinalis*, sp. n. (not described), Sterki, Nachr. mal. Ges. v. 1881, p. 38, Schleitheim, near Schaffhausen.

Vitrella tschapecki (Clessin) is from Styria, near Graz, not Carinthia, in a cave; Tschapeck, Nachr. mal. Ges. 1881, p. 12.

Belgrandia thermalis (L., *Turbo*) = *saviana* (Issel), baths of S. Giuliano, near Pisa, and list of Italian species of *Belgrandia*; De Stefani, J. de Conch. xxix. pp. 164–167.

Lhotelleria, sp. n., Bourguignat, Monogr. gen. *Pechaudia*. [Not seen by the Recorder.]

Pyrgula (De Cristoforis & Jan, 1832). Lengthy history of the genus and enumeration of the known species, 1 living, *annulata* (L., *Turbo*), with full synonymy, found also in the Zrmanja, in Dalmatia, hitherto only the shell known, and 19 fossil species; Brusina, Bull. Soc. mal. Ital. vii. pp. 229–266. Animal not yet known.

Diana thiesseana (Godet, *Pyrgula*), Greece, and 7 fossil species, in Dalmatia and Macedonia; *id. l. c.* pp. 285–292. The animal of this genus also is not yet known.

Micromelania (Brusina). Fossil shells in brackish deposits of Eastern

Europe. Brusina defends their generic distinctness from *Lartetia* (Bourg.) and from *Iravadia* (Blanf.); Bull. Soc. mal. Ital. vii. pp. 266–270. [He is right in stating that Sandberger's name *Goniochilus* dates from 1874, not 1870, as indicated in Zool. Rec. xv. *Moll.* p. 47].

Isselia: vide *Cerithiopsidæ*.

Rissoellidæ.

Fairbankia? *feddeniana*, sp. n., Nevill, J. A. S. B. l. pt. 2, p. 158, Kathiawar.

Paludinidæ.

Paludina crassa (Hutt.) and *bengalensis* (Lam.). Male distinguishable by the hooked right tentacle and the smaller narrower shell, Wood-Mason, Ann. N. H. (5) viii. pp. 85–88, with woodcuts. E. A. Smith, *tom. cit.* pp. 220 & 221, remarks that the same sexual difference has been known in the European species since Lister, 1695. Hazay also mentions the sexual differences in the shells of the European *Paludinæ*; Mal. Bl. (2) iii. p. 21.

Paludina hungarica, sp. n., male and female shells rather different, Buda-Pest; Hazay, *l. c.* pp. 20 & 21, & 173–176; iv. pl. v. fig. 1, male, & fig. 2, female; *P. mammillata* (Küst.), fig. 3.

Vivipara contecta (Millet), var. n. *russiensis* [!], Milachevich, Moll. Mosc. p. 22, Moscow.

Vivipara caucasica, sp. n., Clessin, Mal. Bl. (2) iii. p. 134, Poti, Mingrelia.

Paludina fasciata (Müll.), var. *costæ* (Mouss.), Armenia; Böttger, JB. mal. Ges. viii. p. 245.

Paludina hungerfordiana, Canton, and *martensiana*, Khasing district, spp. nn., Nevill, J. A. S. B. l. pt. 2, pp. 155 & 156.

Margarya melanioides (Nevill), *id. l. c.* p. 155, pl. v. fig. 1, Lake Tali, Yunnan.

Limnotrochus thomsoni and *kirki* (E. A. Smith, 1880), described and figured by Smith, P. Z. S. 1881, pp. 285–287, pl. xxxiii. figs. 17 & 18, Lake Tanganyika.

Neothauma tanganyicense (E. A. Smith), Crosse, J. de Conch. xxix. p. 112, pl. iv. figs. 1 & 1*a*, Lake Tanganyika. Operculum described by E. A. Smith, P. Z. S. 1881, p. 293.

Cleopatra pirothi, sp. n., Jickeli, JB. mal. Ges. viii. p. 338, Anseba, Abyssinia.

[*Cleopatra*] *Paludomus ferrugineus* (Lea, *Melania*), E. A. Smith, P. Z. S. 1881 p. 294, pl. xxxiv. fig. 29, between Lake Nyassa and the East Coast.

Bythinia balatonica, sp. n., Servain, Hist. mal. lac Balaton, p. 91, Lake Balaton, Hungary.

Bythinia philippinensis, sp. n., Santa Cruz, Luzon, *subpulchella*, sp. n., Kutch, *moreletiana* (Nevill), Yunnan, *evezardi* (Blanf.), Lanowlee, and *B.* ? *turrita* (Blanf.), Kyonkpong, Nevill, J. A. S. B. l. pt. 2, pp. 156 & 177, all except the first, pl. vi. figs 12–15.

VALVATIDÆ.

Valvata glacialis, sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 67, Sweden, subfossil.

Valvata alpestris (Blauner), found also in Lapland and subfossil on the island Öland; *id. l. c.* p. 48.

Valvata alpestris var. n. *platti*, peat-ground at Lonato, prov. Brescia; Adami, Bull. Soc. mal. Ital. vii. p. 198.

Valvata borealis, sp. n., and *fluviatilis* (Colbeau), var. n. *kliniensis*, Milachevich, Moll. Mosc. p. 22, Government of Moscow.

Valvata neglecta, new name for *V. minuta* (Mörch & Küster, probably not Draparnaud), from Denmark and Germany; Westerlund, JB. mal. Ges. viii. p. 6.

Valvata fagoti (Bourguignat, MS.), sp. n., Fagot, Bull. Soc. Z. Fr. 1881, p. 141, St. Pardoult, Dép. Charente Inférieure.

Valvata balatonica, sp. n., Servain, Hist. mal. lac Balaton, p. 95, Hungary.

AMPULLARIIDÆ.

Ampullaria. An alphabetical list of the known species; Gaudion, in Bulletin de la Société d'Étude des Sciences naturelles de Beziers, iv. (1879). [Not seen by the Recorder].

Ampullaria stoliczkana (Nevill), Penang, figured; Nevill, J. A. S. B. l. pt. 2, p. 155, pl. vi. fig. 11.

Ampullaria gradata, sp. n., E. A. Smith, P. Z. S. 1881, p. 289, pl. xxxiii. fig. 22, Lake Nyassa.

Lanistes purpureus (Jonas) and *affinis* (E. A. Smith, 1877), Lake Nyassa; *id. l. c.* p. 290, the latter pl. xxxiv. fig. 23.

CALYPTRÆIDÆ.

Crepidula (Lam.), generic name preferred to *Crypta* (Humphrey, which was not characterized); Dall, Bull. Mus. C. Z. ix. pp. 79 & 80.

VERMETIDÆ.

Bivonia exserta, sp. n., Dall, *l. c.* p. 39, Gulf of Mexico.

Siliquaria modesta, sp. n., *id. l. c.* p. 39, Gulf of Mexico, in all depths from 80–800 fath.

SCALARIIDÆ.

Scalaria pourtalesi and *dalliana*, spp. nn., Verrill, Am. J. Sci. (3) xx. [1880] p. 395, N. E. Coast of America, 115 fath.

Acirsa gracilis, sp. n., *id.* P. U. S. Nat. Mus. iii. p. 377 [1880], Southern New England, 100–365 fath.

Aclis striata, sp. n., *id. ibid.*, Southern New England.

Aclis mizon, sp. n., Teneriffe, 78 fath., *hyalina* and *sarissa*, spp. nn., Pernambuco, 350 fath., Watson, J. L. S. xv. pp. 245–247.

Solariidæ.

A few critical notes on the Mediterranean species; Monterosato, Bull. Soc. mal. Ital. vi. p. 255 & 256.

Solarium boreale, sp. n., Verrill & Smith, P. U. S. Nat. Mus. iii. p. 376, [1880], Southern New England, 115 fath.

Fluxina, g. n., shell porcellanous, depressed conical, with a stout umbilical rib, above which the pillar is thin and emarginate; margin of the aperture emarginate above and below the carina. *F. brunnea*, sp. n., Gulf of Mexico, 805 fath., Dall, Bull. Mus. C. Z. ix. pp. 51 & 52.

Eulimidæ.

Eulima caledonica, sp. n., Morlet, J. de Conch. xxix. p. 342, pl. xii. fig. 1, New Caledonia [1882].

Pyramidellidæ.

Odostomia studeri, sp. n., Martens, SB. nat. Fr. 1881, p. 65, Leton Bank, Atlantic, 16° N. lat., 47 fath.

Turbonilla rathbuni and *formosa*, spp. nn., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 398, N. E. Coast of America; *T. smithi*, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 380 [1880], Southern New England, 100-120 fath.

Odostomia (*Menestho*) *sulcata*, sp. n., *id. ibid.* Southern New England, 365 fath.

Menestho bulinea (Lowe), distinct from *humboldti* (Risso), synonyms and localities in the Mediterranean and Atlantic; Monterosato, Bull. Soc. mal. Ital. vi. p. 254.

Fenella elongata, sp. n., Azores, 1000 fath., *Globigerina*-ooze, R. B. Watson, J. L. S. xv. p. 249.

Dunkeria falcifera, sp. n., *id. l. c.* p. 250, Bermudas, 1000 fath.

RHIPIDOGLOSSA.

Neritidæ.

Neritina danubialis (Pfr.) var. *stragulata* (Mhlf.) in Styria; Tschapeck, JB. mal. Ges. viii. p. 107, pl. v. fig. 6.

Neritina souverbiana var. n. *hellvillensis*, Nossi-Bé, Madagascar, in the sea, perhaps not distinct from *rangiana* (Recl.); Crosse, J. de Conch. xxix. p. 208.

Navicella. Monograph by E. v. Martens in Küster's Conch. Cab. pt. 311, 40 pp. 6 pls., not quite finished. The author discusses the affinities with *Neritina* in shell and operculum, pp. 2–5, and the differences of age and other individual variations, pp. 8–10; he describes and figures 11 species with rather numerous varieties, which have been treated as species by former authors; and distinguishes in many species a var. *compressa*, which differs from the types only by its narrower shape and more prominent apex.

Navicella sculpta, sp. n., p. 15, pl. ii. fig. 5–8, Sumatra, *N. junghuhni* (Herklots, MS.), sp. n. p. 23, pl. iv. figs. 13–15, Java, *id. l. c.*

TROCHIDÆ.

Descriptions of the living animals of several New Zealand species; Hutton, Tr. N. Z. Inst. xiii. p. 202.

Turbo (*Liotia* ?) *briarius*, sp. n., Dall, Bull. Mus. C. Z. ix. p. 53, off Havana, 480 fath.

Collonia cunninghami, sp. n., E. A. Smith, P. Z. S. 1881, p. 33, pl. iv. fig. 10, West Coast of Patagonia; Martens, SB. nat. Fr. 1881, p. 78, Magellan Straits.

Leptothyra albida, sp. n. (*induta* var. ?), Dall, Bull. Mus. C. Z. ix. p. 48, Caribbean Sea and Yucatan Strait, 125–1002 fath.

Trochus wiseri (Calcara, 1841) = *gemmulatus* (Phil.) and *clathratus* (Aradas, 1847), hitherto only known as fossil, found also as recent shells near the Æolian Islands and in the Strait of Messina; Monterosato, Bull. Soc. mal. Ital. vi. pp. 251 & 252.

Trochus lævissimus, sp. n., Martens, SB. nat. Fr. 1881, p. 65, Southern Africa, 50 fath.

Trochus (*Ziziphinus*) *consimilis*, sp. n., E. A. Smith, P. Z. S. 1881, p. 34, pl. iv. fig. 11, West Coast of Patagonia.

Calliostoma circumcinctum, *roseolum*, *apicinum*, *sapidum*, *yucatecanum*, and *echinatum*, spp. nn., Yucatan Strait and Caribbean Sea, 37–805 fath., Dall, Bull. Mus. C. Z. ix. pp. 44–47.

Calliostoma bairdi, sp. n., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 396, N. E. Coast of America: = *psyche* (Dall); Dall, Am. Nat. xv. p. 712.

Cantharidus pusillus (Hutton). Varieties of shell and description of living animal; Hutton, Tr. N. Z. Inst. xiii. pp. 208 & 209.

Danilia tinei (Calcara) = *Monodonta limbata* (Philippi), many synonyms enumerated; Monterosato, Bull. Soc. mal. Ital. vi. p. 252.

[*Gibbula*] *Trochus vaillanti*, sp. n., A. Milne Edwards, C. R. xciii. p. 934, near the fossil *ottoi* (Phil.), Atlantic coast of Spain.

Solariella turritellina, sp. n., Ancey, Le Nat. No. 49, p. 389, Sumatra.

Trochus (*Margarita*) *nudiusculus*, sp. n., Martens, SB. nat. Fr. 1881, p. 77, East coast of Patagonia, 60 fath.

Margarita regalis and *lamellosa*, spp. nn., Verrill & Smith, *l. c.* p. 397, N. E. Coast of America (the latter = *æqleis*, Watson, 1879; Dall, Bull. Mus. C. Z. ix. p. 40). *M. asperrima*, *scabriuscula*, *lissocoma*, *filogyra*, *iris*, *maculata*, and *lubrica*, spp. nn., Gulf of Mexico and Caribbean Sea, 119–539 fath., Dall, *l. c.* pp. 40–44. *M. lacunella*, new name for *maculata*, pre-occupied; *id. l. c.* p. 102.

Turcicula, subg. n. of *Margarita*, near *Turcica* (A. Ad.) in general resemblance, but with peculiar sculpture and without tooth on the pillar. *M.* (*T.*) *imperialis*, sp. n., off Cuba, 200 fath.; *id. l. c.* p. 42.

Bathymophila, subg. n. of *Margarita*. Pillar broad, flattened and granulated minutely, with a polished small tubercle at its end, which later becomes enlarged and forms a blunt granulated tooth. *M. euspira*, sp. n.,

Gulf of Mexico, 805 fath., and var. n. *nitens* (Jeffreys, MS.); Dall, *l. c.* pp. 102 & 44.

Seguenzia delicatula, sp. n., *id. l. c.* p. 48, Gulf of Mexico, 805 fath.

Callogaza, g. n. Resembling *Gaza* (Watson), but the umbilical pad reflected only partly over the umbilicus, pillar straight, passing without notch or mucro into the basal margin. *C. superba* and *watsoni*, spp. nn., Caribbean Sea, 303 & 177 fath.; *id. l. c.* pp. 50 & 51.

Microgaza, subg. n. of the preceding. Shell flattened, rotelliform, without reflected lip or umbilical callus, umbilicus distinctly scalariform; brilliantly nacreous when fresh. *M. rotella*, sp. n., Barbados, 100 fath., *id. ibid.*

Adeorbis fimbriatus, sp. n., Martens, SB. nat. Fr. 1881, p. 65, New Guinea, 400 fath.

Haliotididæ.

Pleurotomaria (Sow.). A distinct family, *Pleurotomari[i]dæ*, proposed for it; operculum horny, subspiral or multispiral; two gills nearly symmetrical; edge of the mantle papillose; lateral fringes present, but no elongated cirri like those of *Trochus*; no frontal veil, muzzle simple; eyes on pedicels exterior to the base of the simple tentacles; rhachidian tooth lanceolate or bayonet-shaped, laterals rather simple, numerous, similar, diminishing in size outwardly, followed by a large number of long slender uncini, many of which are denticulate near their tips, and also furnished with a little tuft of bristles. *P. quoyana* (Fischer), 73 & 84 fath., *P. adansoniana* (Crosse), 94 & 200 fath., all near Barbados. Dall, Bull. Mus. C. Z. ix. pp. 77 & 78.

Haliotis (*Padollus*) *pourtalesi*, sp. n., *id. l. c.* p. 79, near the Florida reefs, 200 faths.

Fissurellidæ.

Puncturella (Lowe, 1827). Historical note on the generic name, *Cemoria* (Leach), which was duly published only in 1852. *P. circularis* and *trifolium*, spp. nn., Yucatan Strait, 529 & 640 fath., Dall, *l. c.* p. 74–76.

Subemarginula gigas, sp. n., E. v. Martens, Conchol. MT. ii. p. 103, pl. xix., Northern Japan.

Parmophorus unguis (L.). Description of living animal, habits nocturnal; Hutton, Tr. N. Z. Inst. xiii. p. 203.

CYCLOBRANCHIA.

Acmæidæ.

Acmæa pelta (Esch.). H. Hemphill, having examined about 400 specimens, comes to the conclusion that if this species fixes itself on weed (*Phyllospora menziesi*) it assumes the aspect of *Nacella*, and if it remains there becomes, when adult, indistinguishable from *N. instabilis* (Gould), whereas it assumes its normal form and gay coloration if fixed on rocks; P. Ac. Philad. 1881, pp. 87 & 78. [A somewhat similar instance

is known as to a British shell, *Patella* (*Nacella*) *pellucida* (L.) and its variety *lævis* (Pennant).—Rec.]

Tectura (*Pilidium*) *coppingeri*, sp. n., E. A. Smith, P. Z. S. 1881, p. 35, pl. iv. fig. 12, Straits of Magellan.

Patellidæ.

Patella vulgata (L.). A pale and thin form found in the Firth of Forth, where a spring of fresh-water rises above low-water mark; M. Murtrie, P. Phys. Soc. Edinb. vi.; J. R. Micr. Soc. (2) i. p. 583.

Chitonidæ.

Lophyrus senegalensis, sp. n., and *siculus* (Gray) var. n. *africana*, Cape Verde Islands, Rochebrune, J. de Conch. xxix. p. 42.

Chiton (*Ischnochiton*) *imitator*, sp. n., E. A. Smith, P. Z. S. 1881, p. 35, pl. iv. fig. 13, West coast of Patagonia; near *C. albus* (L.).

Leptochiton sererorum, bank of Arguin, N.W. Africa, and *cessaci*, same locality and Cape Verde, spp. nn., Rochebrune, J. de Conch. xxix. p. 43.

Hanleyia tropicalis, sp. n., Dall, Bull. Mus. C. Z. ix. p. 53, Sand Key, Florida, 128 fath.

Tonicia gambiensis, sp. n., Rochebrune, J. de Conch. xxix. p. 43, Cape Ste. Marie, W. Africa.

Acanthochites dakariensis, *adansoni*, *bouvieri*, and *joallesi*, spp. nn., coast of Senegal, Rochebrune, J. de Conch. xxv. pp. 44 & 45.

TELOBRANCHIA.

Tornatellidæ.

Actæon incisus, *melampoides*, *danaida*, and *perforatus*, spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 95 & 96, Gulf of Mexico, 310–805 fath.

Ringicula nitida (Verrill), Bed of the Gulf Stream, 447 fath., and Yucatan Strait, 640 fath.; *id. l. c.* p. 97.

Bullidæ.

Bulla gouldi, Couth., is a *Cylichna*; Verrill, P. U. S. Nat. Mus. iii. p. 383, Cape Cod. *B. abyssicola*, Yucatan Strait, 640 fath., and ? *eburnea*, Gulf of Mexico, 339 fath., spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 97 & 98.

Atys ? *bathymophila*, sp. n., 1568 fath., and ? *sandersoni*, sp. n., 805 fath., Gulf of Mexico, *id. l. c.* pp. 98 & 99.

Diaphana, Brown, restr., adopted for *Utriculus*, Br. (pt. *nec* Schum., 1817) and Sars; Verrill, Am. J. Sci. (3) xx. [1880] p. 399, note, and *l. c.* p. 381. *D. gemma*, sp. n., *id. ll. cc.* pp. 399 & 382, N. E. Coast of America, to 115 fath.

Utriculus ? *vortex* and *frielii*, spp. nn., Gulf of Mexico, 339–640 fath., Dall, *l. c.* pp. 100 & 101.

Scaphander ? *watsoni*, sp. n., *id. l. c.* p. 99, off Sombrero Island, 72 fath.

Philine amabilis, sp. n., Verrill, *ll. cc.* pp. 398 & 383, N. E. Coast of America, 120 fath.

Melanochlamys, g. n. Near *Philine*, shell internal, no odontophore (radula) or calcareous plates in the gizzard; much more elongate than *Aglaia*, gills concealed by the mantle, side-lobes of the foot oppressed. *M. cylindrica*, sp. n., Auckland Harbour, New Zealand, in tide-pools; Cheeseman, Tr. N. Z. Inst. xiii. p. 224.

Pleurobranchidæ.

Umbrella plicatula, sp. n., Cuba, and monstrosity of *U. indica* (Lam.); E. v. Martens, Conchol. MT. ii. p. 104, pl. xx.

Pleurobranchæa tarda, sp. n., Verrill, Am. J. Sci. (3) xx. [1880] p. 398, and P. U. S. Nat. Mus. iii. p. 384, N. E. Coast of America, 192 fath.

NUDIBRANCHIA.

Phyllidiidæ.

Phyllidia varicosa (Lam.). Variety from Dampier's Archipelago, N. W. Australia; R. Bergh, Mal. Untersuch. Suppl. 1, p. 8.

Doridiдæ.

Hexabranchus pulchellus (Pease), Sandwich Islands; Bergh, *l. c.* p. 32, whole animal pl. B, figs. 14–17.

Asteronotus bertrana (Bergh), Pelew Islands, and *mabilla* (Abraham), Seychelle and Samoa Islands, anatomically described; *id. l. c.* Suppl. 2, pp. 67–74, anatomical figure of the latter pl. C, fig. 10.

Platydoris (Bergh, 1877). Seven more species enumerated and *arrogans* (Bergh) var., *eurychlamys* (Bergh) var., *vicina*, sp. n., all three from Tonga Island, ? *variegata*, sp. n., from Tahiti, described; *id. l. c.* Suppl 2, pp. 57–66, whole animal of the last species pl. A, figs. 7–10, anatomical figures pl. E, figs. 3–22 and pl. F, figs. 19–21.

Doris longula (Abraham) ?. Description of living animal; Hutton, Tr. N. Z. Inst. xiii. p. 203.

Doris rubicunda and (?) *glabellifera*, spp. nn., Cheeseman, Tr. N. Z. Inst. xiii. pp. 222 & 223, New Zealand.

Doris complanata, sp. n., Verrill, Am. J. Sci. (3) xx. [1880], p. 399, and P. U. S. Nat. Mus. iii. p. 386, N. E. Coast of America, 85 fath.

Archidoris (Bergh). 3 species enumerated, *tuberculata* (Cuv.), anatomically described; Bergh, *l. c.* Suppl. 1, pp. 33–35. *A. marmorata*, sp. n., = *tuberculata* (Philippi, *nec* Cuvier), Trieste, Palermo, and Naples, anatomically described, and two new species announced, but not described; *id. l. c.* Suppl. 2, pp. 86–94, anatomical figures pl. II. figs. 1–10.

Homoiodoris, g. n., externally very like *Archidoris*; a large prostata; vagina armed with rows of keeled plates. *H. japonica*, sp. n., Japan, Bergh, Verh. z.-b. Wien, vol. xxxi. [for 1881, not published till 1882], pp. 222–227, pl. vi. figs. 11–19, pl. vii. figs. 1–3.

Discodoris (Bergh, 1877). 13 more species enumerated, and *schmeltziana*

(Garrett), Society Islands, anatomically described; *id.* Mal. Untersuch. Suppl. 1, pp. 47–50, whole animal pl. A, figs. 15–19. *D. indecora*, sp. n., Trieste, *id. l. c.* Suppl. 2, pp. 108–112, anatomical figures pl. J, figs. 26–33, and pl. K, figs. 11–19.

Staurodauris (Bergh, 1878), *januarii*, sp. n., Rio Janeiro, *id. l. c.* Suppl. 1, pp. 38–40, anatomical figures, pl. C, figs. 13–23, and pl. D, fig. 22. *S. ocelligera*, sp. n., Trieste, *id. l. c.* Suppl. 2, pp. 95–98, anatomical figures, pl. H, figs. 11–21.

Peltodoris crucis (Örsted, *Doris*), West Indies, and *atro-maculata* (Bergh), Naples, anatomically described; *id. l. c.* Suppl. 1, pp. 41–46, whole animal of the former, pl. A, figs. 1 & 2.

Hoplodoris, g. n. Armature of the lips consisting of very small rods; penis armed with several series of conical prominences; a horn-shaped dart and a dart-gland present; in other respects like *Discodoris*. *H. desmoparypha*, sp. n., Pelew Islands; *id. l. c.* Suppl. 1, pp. 51–56, anatomical figures, pl. C, figs. 5–9, and pl. F, figs. 1–18.

Dictyodoris, g. n. Body depressed, coriaceous, smooth above; branchial aperture rounded, with few compound gill-leaves; tentacles finger-shaped; foot in front scarcely bilabiate. Radula without median plate, and with many-toothed lateral plates (pleuræ), the teeth hook-like, the external pectinate at the tip. No peculiar armature in the lips nor in the penis. *D. tessellata*, sp. n., Pelew Islands. *Doris incii* (Gray) also belongs to this genus. *Id. l. c.* Suppl. 1, pp. 75–78, anatomical figures, pl. C, figs. 11 & 12, pl. F, figs. 22 & 23.

Jorunna (Bergh), generic definition improved, *J. johnstoni* (Ald. & Hanc., *Doris*), British, with var. *alba*, and *J. atypha*, sp. n., Trieste, *id. l. c.* Suppl. 2, pp. 114–128, anatomical figures of both, pl. J, figs. 17–25, and pl. K, figs. 20–36.

Rostanga (Bergh, 1879), generic definition improved, *R. coccinea* (Forbes, *Doris*), British, and *perspicillata*, sp. n., Trieste, anatomically described; *id. l. c.* Suppl. 2, pp. 99–107, anatomical figures of both, pl. H, figs. 22–32, and pl. J, figs. 1–16.

Artachæa, g. n. "Corpus depressum, suprà verruculosum; tentacula digitiformia; folia branchialia tripinnata (8). Podarium antice rotundatum. Armatura labialis nulla; lingua rhachide nuda, pleuris multidentatis; dentes dimidiæ internæ partis pleurarum hamo lævi, externæ partis hamo denticulato. Penis glande hamis seriatis armatus." *A. rubida*, sp. n., Philippines, Bergh, Verh. z.-b. Wien, xxxi. pp. 231–235, pl. vii. figs. 16–21, pl. viii. figs. 1–6.

Petalodoris, g. n. "Corpus subdepressum, dorso tuberculis minute hirsutis. Apertura branchialis valvis defensa; folia branchialia tripinnata pauca (3). Tentacula brevia, triangularia. Discus labialis non armatus; lingua rhachide nuda, pleuris sat angustis, sat paucidentatis; dentes hamati. Penis inermis." *P. triphylla*, sp. n., Enosima, Japan *Id. l. c.* pp. 227–230, pl. vii. figs. 4–15.

Acanthodoris pilosa (Müll.), anatomical figures; *id.* Mal. Untersuch. Suppl. 2, pl. I. figs. 1–5.

Chromodoris villafranca and *gracilis* (Risso), Mediterranean, *luteorosea* (Rapp), Naples and Trieste, *rudolphi*, sp. n., Tahiti, *inornata*

(Pease), and *cardinalis*, sp. n., both from Huaheine, Society Islands, and *decora* (Pease), Sandwich Islands; Bergh, *l. c.* Suppl. 1, pp. 14–27. *C. rudolphi*, whole animal, pl. A. figs. 11–14, *imperialis*, *decora*, *vitrata*, and *marginata* (all Pease), pl. B, figs. 1–8 & 18–23, anatomical figures pl. C, figs. 1–4 and pl. D, figs. 1–21. *C. cærulea* (Risso), *id. l. c.* Suppl. 2, pp. 83–85, anatomical figures, pl. K, figs. 1–8. Some of Pease's species figured from original drawings made by himself, pl. G.

Chromodoris marenzelleri, sp. n., *id.* Verh. z.-b. Wien, xxxi. p. 219, pl. vi. figs. 1–10, Japan.

Chromodoris aureo-marginata, sp. n., Cheeseman, Tr. N. Z. Inst. xiii. p. 223, New Zealand.

Goniodoris castanea (Ald. & Hanc.), anatomical figures; Bergh, Mal. Untersuch. Suppl. 1, pl. E, figs. 1 & 2.

Doridopseidæ.

Doridopsis debilis (Pease) and *grisea*, sp. n., both from Huaheine, described, and some more species mentioned; Bergh, *l. c.* Suppl. 1, pp. 9–13, whole animal of the second, pl. A, figs. 3–6, anatomical figures of the first, pl. D, figs. 27–29.

Doridopsis citrina, sp. n., Cheeseman, Tr. N. Z. Inst. xiii. p. 223, Auckland Harbour, New Zealand, common.

Polyceridæ.

Polycerella emertoni, g. & sp. nn., Verrill, P. U. S. Nat. Mus. iii. pp. 386 & 387 [1880], Southern New England, on the surface, in harbours, &c.

Idalia (Leuckart). History of the genus and list of 7—8 known species, with full anatomical description of *I. elegans* (Leuck.) = *laciniosa* (Philippi); R. Bergh, Arch. f. Nat. xlvii. pp. 140–181, pls. vi.–viii.

Idaliella, subg. n. of *Idalia*. Distinct by the absence of cirri in the middle of the back, and by lateral lamellæ of hooklets on the lips. *I. aspersa*, *pulchella*, and *inequalis* (Forb. & Hanl.); *id. l. c.* p. 145.

Issa ramosa, sp. n., Verrill & Emerson, Am. J. Sci. (3) xxii. p. 301, South coast of New England, 130 and 100 fath.

Ceratosoma, 7 species enumerated, and *polyomma*, sp. n., Pelew Islands, anatomically described; Bergh, Mal. Untersuch. Suppl. 1, pp. 28–31, whole animal, pl. B, fig. 9, anatomical figures, pl. D, figs. 23–26.

Nembrotha kubariana (Bergh) figured; *id. l. c.* Suppl. 2, pl. G, fig. 16.

Tritoniidæ.

A general description of the family in the restricted sense, and list of known genera and species: *Tritonia* (Cuv.), including *Candiella* (Gray), 19 species, *Marionia* (Vayssiere, 1879), 1 species, *Hancockia* (Gosse, 1877), 1 species; Bergh, Verh. z.-b. Wien, xxxi. pp. 235–239.

Tritonia hombergi (Cuv.) and *plebeia* (Johnst.), anatomical figures; *id.* Mal. Untersuch. Suppl. 2, pl. K, figs. 6–24.

Tritonia reticulata, sp. n., anatomical description; *id.* Verh. z.-b. Wien, xxxi. pp. 239–250, pl. viii. figs. 7–20, pl. ix. figs. 1–12, pl. x. figs. 1–10, Japan.

Tethys. A somewhat enigmatical parasite, not named, apparently belonging to the *Rhabdocœla* and near *Graffilla* (Ihering), found within the foot; A. Lang, MT. z. Stat. Neap. ii. [1880] pp. 107–112, pl. vii.

Dendronotidæ.

Dendronotus elegans, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 385 [1880], Southern New England.

Æolididæ.

The Mediterranean species enumerated by N. Tiberi, Bull. Soc. mal. Ital. vi. pp. 225–237.

Coryphella nobilis, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 388 [1880], off Cape Cod, 75 fath.

Coryphella parvula (Pease), figured; Bergh, Mal. Untersuch. Suppl. 2, pl. G, fig. 17.

Montagua corfii, sp. n., Hutton, Tr. N. Z. Inst. xiii. p. 203, Port Cooper, New Zealand.

Costæa, g. n. "Branchiarum fasciculi seorsim conglobati, communi petiolo insidentes." Type, *Doris affinis* (Gmelin), second species *Æolis digitata* (Costa), both in the Mediterranean. Tiberi, Bull. Soc. mal. Ital. vi. pp. 231 & 232.

Cratena veronicæ, sp. n., Verrill, *l. c.* p. 389 [1880], off Cape Cod, 23 fath.

Elysiidæ.

Placobranchus variegatus (Pease), anatomical description; R. Bergh, Mal. Untersuch. Suppl. 1, pp. 5–7, anatomical figures, pl. D, figs. 30 & 33.

Elysia viridis (Mont.), anatomical description; *id. l. c.* Suppl. 1, pp. 1–4. *Pterogastron bellum* and *ornatum* (Pease), are referred to the same genus and figured from drawings by Pease; *id. l. c.* Suppl. 2, pp. 79 & 80, pl. G, figs. 18 & 19.

[SOLENOGASTRA.]

Proneomenia sluiteri (Hubr., 1880), full anatomical description, in English, by the author in Nierderl. Arch. Zool. Suppl. i. 2, 75 pp. 4 pls. To the particulars already mentioned in Zool. Rec. xvii. *Moll.* p. 71, the following may be added: The longitudinal lateral nerves are connected by a regular series of commissures to the pedal nerves, and these latter are also inter-connected by similar commissures. Lumen of the intestine obstructed by deep transversal folds. Generative system perfectly symmetrical, the germ-gland lying along the whole length of the body. Circulatory system completely lacunar; no gills. This genus differs from *Neomenia* by the presence of a radula, by the multiple layer of spicula in the integument, by the absence of branchiæ at the posterior extremity, and by the absence of special male generative ducts, as vas deferens, receptaculum seminis and penis. The author proposes to place the genera *Neomenia*, *Proneomenia*, and *Chætoderma*, into a distinct Order, *Solenogastra*, characterized by the ventral groove; this Order and that of the *Polyplacophora* (*Chitonidæ*), will form the class *Amphineura*, which is

to be placed among the *Mollusca*. Besides the general type of the nervous system, the bilateral symmetry, both externally and internally, and the presence of calcareous spicula in the integuments, are common to the *Solenogastra* and the *Chitonidæ*. The plexiform arrangement of the nervous system, and the meeting of the efferent ducts of the genital and renal glands in the pericardium may be archaic characters of the *Mollusca*. Previous Note in Arch. Z. expér. ix. pp. xv. & xvi. Abstracts in J. R. Micr. Soc. (2) ii. pp. 31 & 32, and in Rep. Brit. Ass. 1881, pp. 673–675.

PULMONATA.

The late Dr. L. Pfeiffer's posthumous Essay of a natural arrangement of the *Helicidæ*, edited by S. Clessin, under the title "Nomenclator Heliceorum viventium," is useful as an index to nearly all the species known up to 1877 (some are omitted), with indications of descriptions, figures, and localities; but the natural arrangement is not reliable, and full of mistakes, as neither author nor editor had the greater part of the species before him while occupied in the work, Pfeiffer having sold his collection several years before his death.

Agnatha.

Daudebardia. Young animals can withdraw completely into the shell. Hazay, Mal. Bl. (2) iv. p. 114. Electrical? power: *vide suprà*, in generalities, Biology.

Daudebardia haliciensis and *D.* (*Libania*) *calophana*, spp. nn., both from Galicia, Westerlund, Œfv. Ak. Förh. 1881, pp. 50 & 51, and Nachr. mal. Ges. 1881, pp. 67 & 68.

Daudebardia (*Siversia*) *heydeni* (Böttg.) = *pawlenkoi* (Böttg.), and *D.* (*Rufina*) *lederi*, sp. n., Transcaucasia, Böttger, JB. mal. Ges. viii. pp. 171 & 172, fig. 2, the latter figured pl. vii. fig. 2, and its description also in Nachr. mal. Ges. 1881, p. 118.

Glandina algira (Brug.) var. *mingrelica* (Böttg.), Böttger, JB. mal. Ges. viii. p. 170, pl. vii. fig. 1, and Nachr. mal. Ges. 1881, p. 117, Kutais, Mingrelia.

Streptaxis gigas, *craveni* and *mozambicensis* (E. A. Smith, 1880), figured by the author, P. Z. S. 1881, pp. 279 & 280, pl. xxxii. figs. 4–6, East Africa.

Streptaxis regius, sp. n., and *dunkeri* var. n. *clausa*, Lœbbeke, Nachr. mal. Ges. 1881, p. 50, Brazil?

Streptaxis fuchsianus and *S.* (?) *cavicola*, spp. nn., Gredler, JB. mal. Ges. viii. p. 16, Prov. Hunan, China, the former pl. i. fig. 2.

Streptaxis erythroceros, sp. n., Dinghushan, and *costulatus*, sp. n., Shiuhengfu, Möllendorff, JB. mal. Ges. viii. pp. 311 & 312, both in the Province of Canton.

Ennea metula, sp. n., Crosse, J. de Conch. xxix. p. 193, pl. viii. fig. 3, Nossi-Comba, Madagascar.

Ennea crosseana, *incisi*, *martensiana*, *auriculata*, *pusilla*, *trigona*, *callosa*, *cryptophora*, *marici*, *lubrica* and *vermis*, spp. nn., *dupuyana* (Crosse) = *quadridentata* (Martens), a new variety, and *fischeriana* (Morelet, 1877,

Pupa), all from Mayotte Island, Comores, Morelet, J. de Conch. xxix. pp. 221–231, the new, except *vermis*, pl. ix. figs. 8–16, & pl. x. figs. 1–3.

Ennea lævigata (Dohrn), E. A. Smith, P. Z. S. 1881, p. 281, pl. xxxii. fig. 6*, Nyassa.

Ennea [*Ennea*] *passamaana* (Petit, 1853), and *balfouri*, sp. n., Godwin-Austen, P. Z. S. 1881, pp. 808 & 809, pl. lxviii. figs. 11 & 12, Socotra.

Pupa (*Ennea*) *sexdentata*, sp. n., Taylor, J. de Conch. iii. p. 144, Zanzibar.

Ennea (*Huttonella*) *mærchiana*, sp. n. (Röpstorff, MS.), Nevill, J. A. S. B. l. pt. 2, p. 130, Great Nicobar.

Gibbus lyonetianus (Pall.) var. n. *sinistrosa*, id. *l. c.* p. 129.

Gibbus dupontianus (Nevill), Mauritius, *id. l. c.* p. 130, pl. vi. fig. 1.

Rhytida inæqualis (Ofv.), radula agreeing with that of the *Testacellidæ* as already stated by C. Semper; St. Simon, Bull. Soc. Toulouse (Mars) 1880; J. de Conch. xxix. p. 185.

Diplomphalus also belongs to the *Testacellidæ*; id. *ll. cc.*

[*Diplomphalus*] *Helix seberti*, sp. n., Marie, J. de Conch. xxix. pp. 241–243, New Caledonia.

OXYGNATHA.

Limax monticola, sp. n., Taparowan, High Armenia, 8000 feet above the sea, *ecarinatus*, sp. n., Mingrelia, *melanocephalus* (Kaleniczenko), and *agrestis* (L.) = *minutus* (Kaleniczenko), Transcaucasia, Böttger, JB. mal. Ges. viii. pp. 180–187, the two new pl. vii. figs. 6 & 7, also described in Nachr. mal. Ges. 1881, pp. 120 & 121.

Limax molestus (Hutt.), anatomical notes; Hutton, Tr. N. Z. Inst. xiii. p. 199, pl. vi. figs. A & B.

Amalia budapestensis, sp. n., Hazay, Mal. Bl. (2) iii. p. 37, pl. i. fig. 1, *a–f*., Buda-Pest, with anatomical description. [Apparently near *gracilis* (Leydig).]

Milax antipodum (Hutt.), anatomical description; Hutton, *l. c.* p. 200, pl. vi. figs. C & D.

Eumilax, subg. n., of *Amalia*, respiratory orifice before the middle of the shield; Böttger, JB. mal. Ges. viii. p. 180.

Amalia (*Eumilax*) *brandti* (Martens), Transcaucasia, note on it; *id. l. c.* pp. 178 & 179.

Pseudomilax, g. n., slug with shield behind the middle of the body, respiratory orifice near the hinder end of the shield; no internal shell?; jaw and radula unknown. *P. lederi* and *bicolor*, spp. nn., Transcaucasia, Böttger, JB. mal. Ges. viii. pp. 173–175, pl. viii. figs. 3 & 4, and Nachr. mal. Ges. 1881, pp. 118 & 119. The author places it with some doubt among the *Testacellidæ*.

Trigonochlamys, g. n., near *Pseudomilax*, but edges of the triangular shield adhering to the body, no genital orifice behind the right feeler, a transverse impression before the hinder end of the tail; sculpture of the body coarsely areolated. *T. imitatrix*, sp. n., Böttger, JB. mal. Ges. viii. pp. 177 & 176, pl. vii. fig. 5, also Nachr. mal. Ges. 1881, p. 120, Transcaucasia.

Viquesnelia atlantica (Morelet & Doumet). Mantle large, submedian, tail much compressed, caudal mucus-gland absent; mandible smooth, its free edge forming a re-entrant right angle; teeth of the radula spiniform, median tooth smaller; flagellum and dart sac absent, spermatotheca present; shell rudimentary, concealed within the mantle, oval, depressed, with a rudimentary spire. Azore Islands. M. F. d'Arruda Furtado, Ann. N. H. (5) vii. pp. 250–255, pl. xiii.

Parmella elongata, sp. n., Dohrn, Nachr. mal. Ges. 1881, p. 66, Singalang, Sumatra.

Vitrina angelicæ (Beck), from the Lofoten Islands; Westerlund, Œfv. Ak. Förh. 1881, p. 35.

Vitrina alpestris, sp. n., Clessin, Mal. Bl. (2) iii. p. 185, Weissenbach, Ahrenthal, Tirol, 2300 mètres above the sea.

Vitrina bicolor, sp. n., Westerlund, Œfv. Ak. Forh. 1881, p. 51, Switzerland and Pyrenees.

Vitrina (*Phenacolimax*) *costæ*, sp. n., Paulucci, Bull. Soc. mal. Ital. vii. p. 72, pl. 1 *b*, fig. 1, Monte Morrone, Abruzzi.

Vitrina (*Phenacolimax*) *sieversi* (Mouss.) = *komarowi* (Böttg.), Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 189 & 190.

Vitrina (*Oligolimax*) *rugosa*, sp. n., Paulucci, Bull. Soc. mal. Ital. vii. p. 75, pl. 1 *b*, fig. 2, Abruzzo citeriore.

Vitrina hyalea, sp. n., Bock, P. Z. S. 1881, p. 631, pl. lv. fig. 6, Highlands of Padang, Sumatra. [? an *Austenia*.—Rec.]

Trochovitrina, subg. n. of *Vitrina* (Schacko, 1880), shell keeled; *V.* (*Tr.*) *lederi* (Böttg.), Transcaucasia, shell, radula, and jaw distinct from those of *Lampadia* (Lowe); Böttger, JB. mal. Ges. viii. pp. 188 & 189.

Durgella (Blanford, 1869). Two very ample shell-lobes; mucous pore well developed; jaw thin, with very slight central projection; radula broader than long, with a central minute tricuspid tooth, lateral teeth all similar, minutely 6-cuspid or pectiniform; shell thin or membranaceous, polished, the columellar margin having no solidity; amatorial sagitta present in the Burmese form, absent in the Indian. *D. levicula* (Benson), Tenasserim, and *assamica*, sp. n., Assam, shell, living animal, and generative organs of both described; Godwin-Austen, J. L. S. xv. pp. 291–296, pls. xx. & xxi.

Durgella christianæ (Theobald, *Helicarion*), Andaman Islands, anatomically described from a spirit-specimen; *id.* Ann. N. H. (5) viii. pp. 377–379.

Helicarion (*Austenia*) *magnificus* (Godwin-Austen) and *resplendens* (Nevill) figured; Nevill, J. A. S. B. l. pt. 2, p. 129, pl. v. figs. 23 & 24. Difference between *Girasia* and *Austenia*; id. *ibid.*

Helicarion imperator (Gould, *Vitrina*). Living animal from a sketch by Gerlach and shell; Martens, Conchol. MT. i. p. 74, pl. xiii., Hongkong.

Helicarion gomezianus (Morelet, *Vitrina*); id. SB. nat. Fr. 1881, p. 122, Angola.

Microcystis subcicercula (Mousson, MS.) and *discordica* [!], spp. nn., Garrett, Terr. Moll. of Cook's Island [1880 ?].

Nanina. Historical note on this generic name, preferable to *Macro-*

chlamys, *Tanychlamys*, and *Ariophanta*; Nevill, J. A. S. B. l. pt. 2, pp. 131 & 132.

[*Nanina*] *Helix* (*Ariophanta*) *interrupta* (Bens.), *laidlayana* (Bens.), *lævipes* (Müll.) var. *trifasciata* (Chemn.), *intumescens* (Blanf.), *Hemiplecta orobia* (Bens.), *ligulata* (Fér.), (*Oxytes*) *oxytes* (Bens.), and *pollux* (Theob.) ?, drawings of the living animals, left by the late F. Stoliczka are published by Godwin-Austen, with historical notes concerning the mentioned generic divisions; J. A. S. B. xlix. [1880] pt. 2, pp. 151–158, pls. x. & xi

Nanina sarawakana, sp. n., Dohrn, Nachr. mal. Ges. 1881, p. 66, Sarawak.

Helix (*Nanina*) *granaria* and *maarseveeni*, spp. nn., sinistral, Bock, P. Z. S. 1881, pp. 628 & 629, pl. lv. figs. 1 & 2, Highlands of Padang, Sumatra. *H. mindaiensis*, sp. n., also sinistral, *id. l. c.* p. 633, pl. lv. fig. 7, Mindai, Borneo.

Helix (*Nanina* ?) *nyassana*, sp. n., E. A. Smith, P. Z. S. 1881, p. 278, pl. xxxii. fig. 2, between Lake Nyassa and the East Coast. [Sect. *Thapsia*.]

Nanina (*Macrochlamys*) *pseudo-vitrinoides*, new name for *vitrinoides* (Gray, *nec* Bens.) = *indica* (Bens., 1832, *nec* Pfr. [1846]), the common snail throughout the plains of the Gangetic Delta; Nevill, J. A. S. B. l. pt. 2, p. 132.

Macrochlamys davidi (Desh., 1874) = *sinica* (Martens, 1877), N. China; Möllendorff, JB. mal. Ges. viii. p. 34.

Trochomorpha percompressa (Blanf.), Bhamo, figured; Nevill, *l. c.* p. 133, pl. v. fig. 22.

Trochomorpha tandianensis, sp. n., Theobald, J. A. S. B. l. pt. 2, p. 46, Tandiani, Himalaya.

Helix (*Trochomorpha*) *mozambicensis* (Pfr.) var., E. A. Smith, P. Z. S. 1881, p. 279, pl. xxxii. fig. 3, between Lake Nyassa and the East Coast.

Helix dubia, sp. n., Taylor, J. of Conch. iii. p. 142, Zanzibar. [*Trochonanina*, near *mozambicensis* (Pfr.) ?.—Rec.]

Hyalina draparnaldi (Beck), *cellaria* (Müll.), *nitens* (Mich.), *pura* (Alder), *radiatula* (Alder), and *fulva* (Drap.), radula described; S. Clessin, Mal. Bl. (2) iii. pp. 189–192.

Hyalina draparnaldi (Beck) var. n. *elata*, from several localities in Northern Germany, anatomically described; Borcherding, Mal. Bl. (2) iv. pp. 1–10, pl. i.

Zonites (*Hyalinia*) *glaber* (Fér.) var. n. *striaria*, Poland and Transylvania; Westerlund, Œfv. Ak. Forh. 1881, p. 52.

Hyalinia septentrionalis, *subnitens*, *pseudohydatina*, *illauta*, and *callopistica* (Bourg.) found in the Dép. of Ain, their differences from the next allied species given by Locard, Moll. Dép. Ain, pp. 22–31. *H. lourdheuili* (Ray), *illauta*, *sedentaria*, *vitreola*, and *callopistica* (Bourg.): critical notes on them by the same in "Variations malacologiques," ii. pp. 543–546.

Hyalinia scotophila (De Stefani) and *meridionalis*, sp. n., both from Avellana in Umbria, the latter also from Monte Cassino, Paulucci, Bull. Soc. mal. Ital. vii. pp. 76 & 78, pl. i. *b*, figs. 5 & 6.

Hyalina perspectiva (Blanc, MS.), sp. n., Kobelt, Nachr. mal. Ges. 1881, p. 179, Taranto and Otranto.

Hyalinia taurica, sp. n., Clessin, Mal. Bl. (2) iii. p. 137, Crimea.

Hyalinia kutschigi (Parreyss, Walderdorff, 1864) distinct from *kutschigi* (Parreyss, Pf., 1865); Westerlund, JB. mal. Ges. viii. p. 9.

Hyalina radiatula (Alder) and *petronella* (Charp.), their differences, both found in Northern Norway; E. v. Martens, SB. nat. Fr. 1881, p. 34.

[*Hyalina*] *Zonites norvegicus* (Esmark), Norway, and *nitidus* var. *parisiacus* (Mabille), Malmö, Westerlund, Œfv. Ak. Förh. 1881, pp. 36 & 37.

Hyalina (*Polita*) *helvetica*, sp. n., Blum, Nachr. mal. Ges. 1881, p. 141, Weissenstein, near Solothurn.

[*Hyalina*] *Zonites udvaricus*, sp. n., and *oratus* (Letourneux, 1877), Lake Balaton, Hungary, Servain, Hist. mal. lac Balaton, pp. 17 & 18.

Hyalinia (*Polita*) *suturalis*, sp. n., Suram Mountains, Transcaucasia, and *komarowi*, sp. n., Mingrelia, Böttger, JB. mal. Ges. viii. pp. 190–192, pl. viii. fig. 9, and pl. vii. fig. 8; also Nachr. mal. Ges. 1881, p. 122.

Hyalinia (*Vitrea*) *cavannæ*, sp. n., Paulucci, Bull. Soc. mal. Ital. vii. p. 80, pl. i. *b*, fig. 3, top of Mount Marrone, Abruzzo. *H. etrusca* (Paulucci, 1878), fig. 4.

Hyalina (*Vitrea*) *hyblensis* (Parreyss, MS.), sp. n., Kobelt, Nachr. mal. 1881, p. 180, Sicily.

Hyalinia (*Vitrea*) *subeffusa* (Böttg.) var. n. *depressa*, Böttger, JB. mal. Ges. viii. p. 193, pl. viii. fig. 10, Tars-tschai, Transcaucasia.

Hyalinia (*Vitrea*) *angystropha*, sp. n., Clessin, Mal. Bl. (2) iii. p. 129, Poti, Mingrelia.

Hyalinia (*Mesomphix*) *pontica*, sp. n., Mingrelia, and *elegans*, sp. n., Lenkoran, with comparative table of 6 Transcaucasian species of this subgenus; Böttger, JB. mal. Ges. viii. pp. 195–199, pl. viii. figs. 12 & 13; also Nachr. mal. Ges. 1881, pp. 123 & 124.

Hyalina (*Ægopina*) *tetuanensis*, sp. n., Kobelt, Nachr. mal. Ges. 1881, p. 134, mountains near Tetuan, Morocco.

[*Hyalina*] *Zonites andrewsi* and *rugeli*, spp. nn., Binney, Ann. Ac. Philad. i. No. 11 [1880], p. 355, Roan Mountain, North Carolina.

[*Hyalina*?] *Helix comorensis* and *ceromatica*, spp. nn., Morelet, J. de Conch. xxix. pp. 214 & 215, pl. ix. figs. 1 & 2, Mayotte Island, Comores.

Hyalina (*Conulus*), sp. near *fulva*, Möllendorff, JB. mal. Ges. viii. p. 35, N. China.

Hyalina (*Conulus*) *franciscana*, sp. n., Gredler, JB. mal. Ges. viii. p. 13, Prov. Hunan, China.

[*Conulus*?] *Zonites upsoni*, sp. n., Calkins, Valley Nat. ii. [Dec. 1880] p. 6, with woodcut, Illinois.

Helix (*Zonites*?) *ordinaria*, sp. n., E. A. Smith, P. Z. S. 1881, p. 36, pl. iv. fig. 16, Tom Bay, W. coast of Patagonia.

Macrocyclis hemphilli, sp. n., Binney, Ann. N. York Ac. i. [No. 11, 1880] p. 355, Olympia, Oregon.

Leucochroa debeauxi, sp. n., Kobelt, Nachr. mal. Ges. 1881, p. 133, Nemours, Prov. Oran.

AULACOGNATHA.

Arion ater (L.)? var., Ashford, J. of Conch. iii. p. 135, Isle of Wight.

Arion verrucosus, sp. n., and notes on *A. hibernus* (Mabille), *aggericola* (Mabille), *rubiginosus* (Baudon), &c, Dép. Nièvre; Brevière, J. de Conch. xxix. p. 310, pl. xiii. and pp. 307 & 308 [1882].

Arion incommodus (Hutt.), anatomical description; Hutton, Tr. N. Z. Inst. xiii. p. 200, pl. vi. figs. E, F.

Ariunculus, subg. n. of *Arion*, on account of the different situation of the genital orifice, for *A. speziæ*, *mortilletti*, and *camerani*, spp. nn., Piedmont, with critical notes on other species of *Arion*; Lessona, Atti Acc. Tor. xvi. pp. 185–197.

Patula goetschana (Mouss.), distinct from *ruderata* (Stud.), Armenia, Böttger, JB. mal. Ges. viii. p. 200.

(*Patula*). *Helix abietana* (Bourg.), Umbria and Abruzzi; Paulucci, Bull. Soc. mal. Ital. vii. p. 83.

Patula striatella (Anthony), N. America, Kamtschatka, and Northern China, distinct from *pauper* (Gould), Japan; Möllendorff, JB. mal. Ges. viii. p. 35.

Helix (*Patula*) *coppingeri* and *magellanica*, spp. nn., E. A. Smith, P. Z. S. 1881, p. 36, pl. iv. figs. 14 & 15, Tom Bay, W. coast of Patagonia.

Patula plano-spira, sp. n., Garrett, Terr. Moll. of Cook's Island [1880]?

[*Patula*] *Helix balatonica*, sp. n., Lake Balaton, Hungary, with list of 14 other species allied to *H. pygmæa*; Servain, Hist. mal. lac Balaton, pp. 33–36.

Libera, g. n. for *Pitys tumuloides* (Garrett), Garrett, *l. c.*

Helix.—H. Dohrn continues to describe and figure new or little known species in Küster's Conchylien-Cabinet, part 304, pp. 595–610, pls. clxxiii.–clxxvii. The new species or those not figured before will be mentioned *infrà*.

Helix. Palæarctic species:—

Helix pulchella and *costata* (Mll.). G. Watterbled thinks them specifically distinct, the former living in the plain and on rather dry spots, the latter in heights and on rocks. J. de Conch. xxix. p. 321.

Helix adela (Westerl.), note on it, and *costata* var. n. *cyclostema*, Westerlund, Œfv. Ak. Förh. 1881, pp. 37–39.

[*Fruticicola*] *Helix hispida* (L.), English examples have invariably two dart-sacs; *H. cantiana* (Mont.) has two vesiculæ multifidæ, each with three to five branches. Ashford, J. of Conch. iii. p. 239.

Helix (*Trichia*) *tumescens*, sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 52, and Nachr. mal. Ges. 1881, p. 68, Stockholm and Upsala; near *hispida* (L.).

Helix latiniacensis, sp. n., *matronica* (Mabille), *badiella* (Ziegler), and *urbana*, sp. n. (Coutagne, MS.), all near *hispida* (L.), from Dép. Seine-et-Marne, described and figured in woodcut by A. Locard, Contrib. Faune Mal. Franc. ii. pp. 15–17.

Fruticicola sericea var. *gerstfeltiana* (Clessin) and *plana*, n., Milachevich, Moll. Mosc. pp. 18 & 19, Government of Moscow.

Helix clandestina (Born), note on it by Locard, Moll. Dép. Ain, p. 40.

Helix mathildæ (Kleciach), Dalmatia = ? *zapatori* (Hidalgo), Spain; Westerlund, JB. mal. Ges. viii. p. 9.

Helix (*Trichia*) *septem-gyrata* (Mouss.), *globula* (Kryn.), *pisiformis* (Pfr.), *arpatschaiana*, *pseudo-globula*, and *epirotica* (Mouss.), notes on them, all from Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 201–204.

Helix fruticum (Müll.) var. *anderssoni* (Clessin), Dalecarlia; Westerlund, Œfv. Ak. Förh. 1881, p. 39.

Helix cantiana (Mont.) var. n. *campanica*, Monte Cassino, Matese, &c.; Paulucci, Bull. Soc. mal. Ital. vii. p. 87, pl. ii.*b*, fig. 1, with notes on other Italian varieties of the same species.

Helix orsinii (Porro), *parreyssi* (Pfr.), again distinguished from it, *apennina* (Kobelt), and *martensiana* (Tiberi), critical notes on them by Paulucci, Bull. Soc. mal. Ital. vii. pp. 88–93. *H. alphabucelliana*, sp. n., allied to the same, *cad. l. c.* p. 155, pl. ii.*b*, fig. 3, Avezzano.

Helix briandi, *gueretini*, *dubreuili*, *cucyæ*, and *cuscepia*, spp. nn., Lake Balaton, Hungary, the three former near *H. strigella*; Servain, Hist. mal. lac Balaton, pp. 20–22, 31 & 32. List of 12 species nearly allied to *H. strigella* by Bourguignat, *op. cit.* pp. 24–30.

Helix (*Carthusiana*) *flaveola* (Kryn.), and *frequens* (Mouss., *Eulota*) *circassica* (Charp.), and *ravergii* (Kyrn.), with var. n. *persica*, notes on them, all from Transcaucasia, Böttger; JB. mal. Ges. viii. pp. 205–209, the last, pl. viii. fig. 14, from Astrabad.

Helix (*Eulota*) *ravergii* (Kryn.), var. n. *persica*, Böttger, JB. mal. Ges. viii. p. 209, pl. viii. fig. 14, and Nachr. mal. Ges. 1881, p. 124, Astrabad.

Xerophila. C. de Stefani distinguishes the 4 following species living in the Central Apennines: *H. ammonis* (Schmidt) var. *major* (Kobelt) = *discrepans* (Tiberi), *H. bathyomphala* (Charpentier, Tiberi, 1878, *nec* 1869), *H.* sp. = *bathyomphala* (Kobelt, *nec* Charpentier) and *H. spadæ* (Calcara); Bull. Soc. mal. Ital. vii. pp. 56–58. Mme. Paulucci identifies the third with *H. candicans* (Ziegl.), and states that *H. ammonis* is distributed in the provinces Le Marche, Umbria, and Abruzzo citeriore, *l. c.* pp. 98–102.

(*Xerophila*) *Helix ericetilla* (Jousseaume), differences from *ericetorum* (Müll.); Locard, Moll. Dép. Ain, p. 49.

Helix (*Xerophila*) *parableta*, sp. n., Armenia, and notes on *H.* (*X.*) *derbentina* (Andr.) and *crenimargo* (Kryn.), *acutistria* (Böttg.) being a variety of the latter; Böttger, JB. mal. Ges. viii. pp. 211–214, pl. viii. fig. 15; the first also Nachr. mal. Ges. 1881, p. 124.

[*Xerophila*] *Helix cavannæ*, sp. n., Matese, with var. *scissa*, Monte Maiella, 1352–2749 mètres, and *groresiana*, sp. n., Monte Morrone, Abruzzi; Paulucci, *l. c.* pp. 104–106, pl. ii.*b*, figs. 4 & 5, and pl. iii. fig. 6, the last near *spratti* (Pfr.).

[*Xerophila*] *Helix idanica*, sp. n., allied to *fasciolata* (Poiret), and *H. lieuranensis*, *gesocribatensis* (Bourg.), *heripensis* (Mabille), and *diniensis* (Rambur), their differences from *fasciolata* and *intersecta*, all observed in the Dép. of Ain; Locard, Moll. Dép. Ain, pp. 51–55, and Variat. malac. ii. pp. 547–549.

Helix etnea (Benoit) = *H. conspurcata* (Drap.), juv.; Westerlund, JB. mal. Ges. viii. p. 9.

[*Xerophila*] *Helix renouji*, *fueredensis*, *balconyca*, and *plattenica*, spp. nn., Servain, Hist. mal. Balaton, pp. 36–39, environs of Lake Balaton, Hungary.

Helix (*Xerophila*) *theodosiæ*, and *substriata*, spp. nn., Clessin, Mal. Bl. (2) iii. pp. 137 & 138, Crimea.

[*Xerophila*] *Helix pouzouensis*, sp. n., Département Charente inférieure, and *nephœca*, sp. n., Dép. Aude, 1000 mètres above the sea, the latter allied to *nubigena* (Charp.), Fagot, Bull. Soc. Z. Fr. 1881, pp. 137 & 138.

Helix cantabrica (Hidalgo), jaw and radula described, resembling those of *H. apicina*, it belongs therefore to *Xerophila*; St. Simon, Bull. Soc. Toulouse, 1880, abstract J. de Conch. xxix. p. 260. So also *H. carascalensis* (Fér.), on account of the genital organs; Hesse, JB. mal. Ges. viii. p. 348.

Helix thiesseæ (Mousson, Kobelt) = *chalcidica* var. *didyma* (Westerl.); Westerlund, JB. mal. Ges. viii. p. 7.

Helix lacosteana, sp. n., Morlet in Roudaire's "Rapport sur l'Expédition des Schotts," 1881, p. 168, pl. vi. figs. 1 & 2, and J. de Conch. xxix. p. 343, pl. xii. fig. 5, Shott-Jerid, Jebel-Aidudi, N. Africa.

Helix eremia (Westerl.), comes from Minorca, not the Pyrenees, and *H. anonyma* (Westerl.), = *pisana* (Müll.), var.; Westerlund, JB. mal. Ges. viii. p. 1.

Helix mentonensis, sp. n., perhaps originally a hybrid between *H. pisana* (Müll.) and *virgata* (Mont.), resembling the former in the aperture and the latter in the coloration, Mentone, near Nice; J. E. Sidebotham, P. Manch. Soc. xix. [1880] p. 155.

Helix pisana (Müll.), its anatomical differences from the subgenus *Xerophila*; Hesse, JB. mal. Ges. viii. p. 349.

Helix (*Fruticocampylæa*) *narzanensis* (Kryn.), and *pratensis* (Pfr.) var. *joannis* (Mortillet) = *delabris* (Mouss.), Armenia; Böttger, JB. mal. Ges. viii. pp. 210 & 211.

Campylæa. Mme. Paulucci arranges and describes the varieties of *Helix cingulata* (Stud.), and the nearly allied Italian species as follows:—

Helix cingulata (Stud.), type = *H. luganensis* (Schinz.), Lugano; var. *anauniensis* (Betta), Val di Non; var. n. *athesina*, Valley of the Adige; var. *baldensis* (Villa), Monte Baldo; var. *bizona* (Rossm.) Nice.

Helix carrarensis (Porro), Carrara; varr nn. *montana* and *kobeltiana*, Apuan Mountains.

Helix presli (Schmidt), Trient, Görz and Julian Alps; var. *nisoria* (Rossm.), Bergamo and Como; var. *nicatis* (Costa), Mount Majella; var. *affinis* (Paulucci), Lucchio; var. *lucensis* (Paulucci), banks of the Serchio, near Lucca; var. *appeli* (Kobelt), banks of Lucca; var. *anconæ* (Gentiluomo), Monte della Verna, Tuscany; var. n. *agnata*, Apuan Mountains.

Helix colubrina (Jan), environs of the Lake of Garda; var. *nubila* (Kobelt), Trient and Brescia; var. *gobanzi* (Frauenfeld), Val Vestino and Val Sabbia.

Helix tigrina (Jan), Como and Bergamo.

Helix frigida (Cristof. & Jan), Monte Codeno; var. *hermesiana* (Pini), Monte Presolana; var. *frigidiscens* (Del Prete), Apuan Mountains; (?) var. *frigidissima* (Adami), Monte Frerone and Passo di Belviso; var. *apuana* (Issel), Apuan Mountains; var. *ligurica* (Kobelt), Limone in Piedmont.

A table is given showing the mutual and intersecting affinities of all these forms, with figures of 12 of them; Bull. Soc. mal. Ital. vii. pp. 5–55, pls. i. & ii. P. Strobel makes some critical observations on this paper, repeating his description of *H. cingulata* var. *cingulina* (Strobel, 1844), from the Klamm, near Innsbrück, and distinguishing *H. insubrica* (Jan) from *H. frigida*, both of which present one-coloured and one-banded specimens; *tom. cit.* pp. 213-220.

Helix cingulata (Stud.), variability of specimens from the same locality (Bozen); Martens, SB. nat. Fr. 1881, pp. 122–125.

Helix planospira (Lam.) var. n. *alifensis*, Piedimonte d'Alife, Terra di Lavoro; Paulucci, Bull. Soc. mal. Ital. vii. p. 95, pl. ii. fig. 2, with notes on other varieties of the same in Southern Italy, pp. 94–97.

Helix crinita (Sandri), rectification of its first description; Brusina, Bull. Soc. mal. Ital. vii. p. 226.

Helix arbustorum (L.). Description of jaw, radula, and dart varieties, observations on development, habits, food, a parasitical white mite, and large list of British localities, by J. W. Taylor, J. of Conch. iii. pp. 241–256, pl. i. figs. 1–4 variations of the jaw, fig. 5 teeth of the radula, figs. 6–8 dart and dart-sac.

Helix arbustorum (L.). P. Hesse proposes to place this species in the subgenus *Campylæa*, and to reserve the name *Arionta* for the Californian species, the genital organs of which differ essentially from it; JB. mal. Ges. viii. pp. 346 & 347. [*H. arbustorum* is the type of *Arionta*, and the only species of it which was known to Leach, the author of this name.]

[*Tachea*] *Helix nemoralis*. Table on the frequence of the different combinations of bands in this species, observed in 1714 specimens; C. Riemenschneider, Nachr. mal. Ges. 1881, pp. 25 & 26.

Helix (*Tachea*) *atro-labiata* (Kryn.) varr. nn. *tricolor*, *maculato-fasciata*, and *decussata*, Kutais in Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 215 & 216.

Helix carsoliana (Fér.) = *marrucina* (Tiberi), var. n. *milettiana*, top of Monte Miletto, 2050 mètres, Matese, and var. n. *uni-armata*, Carsoli, Paulucci, Bull. Soc. mal. Ital. vii. pp. 110, 111 & 159, pl. iii. figs. 2 & 3.

Helix scherzeri (Zelebor), Kobelt, JB. mal. Ges. viii. p. 335, pl. x. figs. 13–15, Gibraltar.

Helix scabriuscula (Desh.), *platychela* (Menke), and intermediate forms, their topographical distribution in Sicily; *id. l. c.* pp. 50–65, pl. ii.

Helix sicanoides, *platycheloides*, *tetuanensis* and *bœttgeri*, spp. nn., *id. l. c.* pp. 330-334, pl. x. figs. 1–12, also Nachr. mal. Ges. 1881, pp. 130 & 131, limestone mountains, near Tetuan.

[*Pomatia*] *Helix pomatia* (L.), varr. nn. *compacta*, *pulskiana*, *hajnal-*

diana, *solitaria*, and *sabulosa*, Buda-Pest, in different localities, Hazay, Mal. Bl. (2) iii. pp. 40–43, pl. i. fig. 2, and pl. ii. figs. 2, 4, 5 & 6.

Helix lucorum (L.) = *straminea* (Bourg.), Umbria and Abruzzo citeriore; *H. straminea* (Briganti, 1825) seems to be an accidental variety of the same. Paulucci, Bull. Soc. mal. Ital. vii. pp. 112 & 113.

Helix (*Helicogena*) *christophi*, sp. n., and *buchi* (Dubois), Böttger JB. mal. Ges. viii. pp. 217 & 218, Adsharia (Armenia).

Helix aspersa (Müll.), love-dart; Ashford, J. of Conch. iii. p. 134.

Helix. Species from Tropical Africa :—

Helix nyassana, E. A. Smith, *v. supra*, *Nanina*.

Helix mechowi, sp. n., Dohrn, in Küster's Conch. Cab. pt. 304, p. 610 pl. clxxvii. figs. 15 & 16, Chinchoxo, coast of Loango.

Helix omphaloides (Pfr.) var. n. *loucoubensis*, Crosse, J. de Conch. xxix. p. 195, Nossi-Bé, Madagascar.

Helix farafanganensis, corrected for *farafanga* (A. Ad.) from S.E. not S.W. Madagascar, belongs to section *Helicophanta*; Crosse & Fischer, J. de Conch. xxix. pp. 160–162.

Helix. Chinese species :—

Helix (*Vallonia*) sp. n. ? Möllendorff, JB. mal. Ges. viii. p. 36, N. China.

Helix (*Perforatella*) *yantaiensis* (Debeaux), var. *tetrodon* (Möllendorff); *id. ibid.* pl. i. fig. 8, N. China.

Helix similaris (Fér.) var. n. *infantilis*, Gredler, JB. mal. Ges. viii. p. 111, China.

Helix (*Fruticicola*) *buvigneri* (Desh., 1873) = *richthofeni* (Martens, 1873), and its var. *kalganensis* (Möllend.), North China; Möllendorff, JB. mal. Ges. viii. p. 37.

Helix miliaria, sp. n., and notes on *fimbriosa* (Martens) and *emoriens* (Gredler), Prov. Hunan, China; Gredler, JB. mal. Ges. viii. pp. 14 & 15, the second in adult state pl. i. fig. 1, the last re-described, p. 111.

Helix kuangtunensis, sp. n., Gredler, JB. mal. Ges. viii. p. 124, Prov. Canton, China.

Helix (*Ægista*) *gerlachi* (Möllendorff, MS.), sp. n., & var. *granulosostriata* and var. *abrupta*, Canton, *conella* (A. Ad.), West coast of Japan, *trichotropis* (Pfr.), Shanghai, with a comparative table for the determination of the known Chinese and Japanese species of *Ægista*; E. v. Martens, Conchol. MT. i. pp. 96–101, pl. xviii.

Helix (*Acusta*) *ravida* (Bens.) var. *lineolata* (Möllend.); Möllendorff, JB. mal. Ges. viii. p. 38, Northern China.

Helix pekinensis (Desh., 1873) = *tchiliensis* (Möllend., 1875), and *H. mongolica*, sp. n., Möllendorff, JB. mal. Ges. viii. p. 39, pl. i. figs. 9 & 10, both from North China, and both allied to *pyrrhozona* (Phil.).

Helix prshewalskii, sp. n., Martens, SB. nat. Fr. 1881, p. 63, Tetunga, Prov. Kansu, China.

Helix. Species from India and the Malayan Archipelago :—

Helix (*Ægista*) *perplanata* (Nevill), Upper Burma; Nevill, J. A. S. B. I. pt. 2, p. 133, pl. v. fig. 21.

Helix (*Acavus*) *superba* (Pfr.) var. n. *roseo-labiata*, Nevill, J. A. S. B. l. pt. 2, p. 134, Ceylon.

Helix smithi and *H.* (*Geotrochus*) *rufo-filosa*, spp. nn., Bock, P. Z. S. 1881, pp. 629 & 630, pl. lv. figs. 3 & 4, Highlands of Padang, Sumatra. [The latter, near *conulus* (Martens), belongs to *Trochomorphoides* (Nevill). —Rec.]

Helix doriæ, sp. n., Dohrn, Nachr. mal. Ges. 1881, p. 67, N. Borneo.

Helix (*Obba*) *heroica* (Pfr.), N. Celebes, and ? *anacardium* (Dohrn), locality unknown; Dohrn, in Küster's Conch. Cab. pt. 304, pp. 590 & 600, pl. clxxv. figs. 5–10.

Helix (*Chloritis*) *lansbergeana* (Dohrn, 1879); *id. l. c.* pt. 311, p. 598, pl. clxxv. figs. 1–3, locality unknown.

Helix. Australian and Polynesian species:—

Helix edwardsi (Cox, 1868, preoccupied) = *meadii* (Brazier, 1870) = *nigrilabris* (Martens, 1869), Liverpool River, Northern Territory of South Australia; Crosse, J. de Conch. xxvii. pp. 20–22.

Helix chelonitis (Crosse). Jaw ribbed, lateral teeth notched, similar to the median tooth, marginal teeth chisel-shaped; phytophagous. St. Simon, Bull. Soc. Toulouse, March, 1880; J. de Conch. xxix. p. 185.

Helix alveolus, sp. n., Gassies, J. de Conch. xxix. p. 336, New Caledonia.

Helix caledonica, 2 new varr.; Marie, J. de Conch. xxix. p. 244.

Helix. North American species:—

Helix (*Anguispira*) *brunneri*, sp. n., Ancey, Le Nat. iii. p. 468, Montana.

Triodopsis levetti, sp. n., Bland, Ann. N. York Ac. ii. p. 115, woodcut, Santa Fé, New Mexico. [Approaches *Polygyra*.]

Mesodon andrewsi, sp. n., Binney, Ann. N. York Ac. i. [1880] p. 355, Roan Mountain, North Carolina.

Incidental valuable critical remarks on the wrong statements of localities and on the mutual relations of the Californian species of *Helix*, chiefly *H. pandoræ* (Forbes), *kelletti* (Forb.), *levis* (Pfr.), and *ayresiana* (Newc.); by R. Stearns, Ann. N. York Ac. ii. pp. 132–139.

Bulimus interruptus (Müll.), white var.; Bock, P. Z. S. 1881, p. 633, Borneo.

Borus dorbignii (Döring) = *nucleus* (Orb., *nec* Sow.) [= *B. lutescens* var. *australis*, Martens, 1876], fresh specimens at the Rio Sauce Chico, Southern Argentinia; Döring, Informe Comis. R. Negro, i. Zool. p. 64, pl. i. fig. 4.

Plagiodontes roca, sp. n., Sierra de Currumalan, Southern Argentinia, and *patagonicus* (Orb.), distinguished from *dentatus* (Wood), Sierra de la Ventana, Southern Argentinia; *id. l. c.* pp. 63–70, pl. i. figs. 5–7.

Achatina marioni, sp. n., Ancey, Le Nat. iii. p. 414, Eastern Africa. It very probably = *kirki* (E. A. Smith); Crosse, J. de Conch. xxix. p. 139.

Achatina antourtourensis (Crosse, 1879) figured; Crosse, J. de Conch. xxix. p. 197, pl. viii. fig. 1, Nossi-Bé, Madagascar.

Achatina hamilli (Petit), Usambara, *craveni*, new name for *kirki* (E. A. Smith [*nec* Craven], between Zanzibar and Tanganyika, and *thomsoni* (E. A. Smith, 1880), between Nyassa and the East Coast; E. A. Smith, P. Z. S. 1881, p. 283, pl. xxxii. fig. 10, pl. xxxiii. figs. 11 & 12.

Achatina (*Limicolaria*) *caillaudi* (Pfr.) and *rectistrigata* (E. A. Smith, 1880), both near Lake Tanganyika, the latter variable in shape; *id. l. c.* p. 284, pl. xxxiii. figs. 13 & 14.

[*Buliminus.*] A. Locard gives a monograph of the French species, adding 3 new ones, and arranging them in three groups. *B. locardi* and *sabaudinus*, spp. nn. (Bourguignat, 1881), both separated from *B. detritus* (Müll.), the former as widely distributed as *detritus* itself, the latter from Savoy. *B. carthusianus*, sp. n., separated from *montanus* (Drap.), Grenoble and Grande Chartreuse. *B. astierianus* (Dupuy), the smallest of all, has hitherto only been found on the carriages of cannons in the island Ste. Marguerite. Contrib. faun. mal. francaise, i. pp. 1–23, pl. i. figs. 1–16.

Buliminus montanus (Drap.), var. n. *mosquensis*, Milachevich, Moll. Mosc. p. 20, near Moscow.

Buliminus (*Napæus*) *tener* (Rossm.) distinct from *merdaenianus* (Kryn.); Böttger, JB. mal. Ges. viii. p. 221.

Buliminus (*Zebrina*) *retowskianus*, sp. n., Crimea, and on the variability of *B. cylindricus* (Menke) and *bidens* (Kryn.); Clessin, Mal. Bl. (2) iii. pp. 139 & 140.

Buliminus rufistrigatus, var. from Middle China, Gredler, JB. mal. Ges. viii. p. 20.

Retowskia, subg. n. for *Buliminus schlæfli* (Mouss.), Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 220 & 221, and Nachr. mal. Ges. 1881, p. 125.

Buliminus jickelianus (Nevill), Wadela Plateau, Abyssinia; Nevill, J. A. S. B. l. pt. 2, p. 135, pl. vi. fig. 2.

[*Buliminus*] *Peronæus nevillianus*, sp. n., Theobald, *tom. cit.* pt. 3, p. 48, Tandiani, Himalaya, 8500′ above the sea.

Bulimus notabilis (E. A. Smith, 1880) and *kirki* (Dohrn), E. A. Smith, P. Z. S. 1881, pp. 281 & 282, pl. xxxii. figs. 8 & 9, between Lake Nyassa and the East Coast, the former peculiar by its basal canaliculation. [Both probably belonging to sect. *Petræus.*]

Buliminus istlimodon, *exodon*, and *riebecki*, spp. nn., Martens, Nachr. mal. Ges. 1881, pp. 136 & 137, Socotra. The former near *Pupa passamaiana* (Petit), subg. *Passamaiella* (Pfr.), but rather allied to *Petræus*, than to *Ennea*.

Bulimus comorensis, *badiolus*, *inconspicuus*, and *exiguus*, spp. nn., Mayotte Island, Comores; Morelet, J. de Conch. xxix. pp. 216–219, pl. ix. figs. 4–7. [The first belonging to *Rhachis*, the others to *Ena.*]

Bulimus (*Rhachis*) *braunsi* (Martens), adult; E. A. Smith, P. Z. S. 1881, p. 281, pl. xxxii. figs. 7–7*c*, between Lake Nyassa and the East Coast.

Helix (*Acavus*) *superba* (Pfr.) var. n. *roseo-labiata*, Nevill, J. A. S. B. l. pt. 2, p. 134, Ceylon.

Helix smithi and *H.* (*Geotrochus*) *rufo-filosa*, spp. nn., Bock, P. Z. S. 1881, pp. 629 & 630, pl. lv. figs. 3 & 4, Highlands of Padang, Sumatra. [The latter, near *conulus* (Martens), belongs to *Trochomorphoides* (Nevill). —Rec.]

Helix doriæ, sp. n., Dohrn, Nachr. mal. Ges. 1881, p. 67, N. Borneo.

Helix (*Obba*) *heroica* (Pfr.), N. Celebes, and ? *anacardium* (Dohrn), locality unknown; Dohrn, in Küster's Conch. Cab. pt. 304, pp. 590 & 600, pl. clxxv. figs. 5–10.

Helix (*Chloritis*) *lansbergeana* (Dohrn, 1879); *id. l. c.* pt. 311, p. 598, pl. clxxv. figs. 1–3, locality unknown.

Helix. Australian and Polynesian species:—

Helix edwardsi (Cox, 1868, preoccupied) = *meadii* (Brazier, 1870) = *nigrilabris* (Martens, 1869), Liverpool River, Northern Territory of South Australia; Crosse, J. de Conch. xxvii. pp. 20–22.

Helix chelonitis (Crosse). Jaw ribbed, lateral teeth notched, similar to the median tooth, marginal teeth chisel-shaped; phytophagous. St. Simon, Bull. Soc. Toulouse, March, 1880; J. de Conch. xxix. p. 185.

Helix alveolus, sp. n., Gassies, J. de Conch. xxix. p. 336, New Caledonia.

Helix caledonica, 2 new varr.; Marie, J. de Conch. xxix. p. 244.

Helix. North American species:—

Helix (*Anguispira*) *brunneri*, sp. n., Ancey, Le Nat. iii. p. 468, Montana.

Triodopsis levetti, sp. n., Bland, Ann. N. York Ac. ii. p. 115, woodcut, Santa Fé, New Mexico. [Approaches *Polygyra*.]

Mesodon andrewsi, sp. n., Binney, Ann. N. York Ac. i. [1880] p. 355, Roan Mountain, North Carolina.

Incidental valuable critical remarks on the wrong statements of localities and on the mutual relations of the Californian species of *Helix*, chiefly *H. pandoræ* (Forbes), *kelletti* (Forb.), *levis* (Pfr.), and *ayresiana* (Newc.); by R. Stearns, Ann. N. York Ac. ii. pp. 132–139.

Bulimus interruptus (Müll.), white var.; Bock, P. Z. S. 1881, p. 633, Borneo.

Borus dorbignii (Döring) = *nucleus* (Orb., *nec* Sow.) [= *B. lutescens* var. *australis*, Martens, 1876], fresh specimens at the Rio Sauce Chico, Southern Argentinia; Döring, Informe Comis. R. Negro, i. Zool. p. 64, pl. i. fig. 4.

Plagiodontes rocæ, sp. n., Sierra de Currumalan, Southern Argentinia, and *patagonicus* (Orb.), distinguished from *dentatus* (Wood), Sierra de la Ventana, Southern Argentinia; *id. l. c.* pp. 63–70, pl. i. figs. 5–7.

Achatina marioni, sp. n., Ancey, Le Nat. iii. p. 414, Eastern Africa. It very probably = *kirki* (E. A. Smith); Crosse, J. de Conch. xxix. p. 139.

Achatina antourtourensis (Crosse, 1879) figured; Crosse, J. de Conch. xxix. p. 197, pl. viii. fig. 1, Nossi-Bé, Madagascar.

Achatina hamilli (Petit), Usambara, *craveni*, new name for *kirki* (E. A. Smith [*nec* Craven], between Zanzibar and Tanganyika, and *thomsoni* (E. A. Smith, 1880), between Nyassa and the East Coast; E. A. Smith, P. Z. S. 1881, p. 283, pl. xxxii. fig. 10, pl. xxxiii. figs. 11 & 12.

Achatina (*Limicolaria*) *caillaudi* (Pfr.) and *rectistrigata* (E. A. Smith, 1880), both near Lake Tanganyika, the latter variable in shape; *id. l. c.* p. 284, pl. xxxiii. figs. 13 & 14.

[*Buliminus.*] A. Locard gives a monograph of the French species, adding 3 new ones, and arranging them in three groups. *B. locardi* and *subaudinus*, spp. nn. (Bourguignat, 1881), both separated from *B. detritus* (Müll.), the former as widely distributed as *detritus* itself, the latter from Savoy. *B. carthusianus*, sp. n., separated from *montanus* (Drap.), Grenoble and Grande Chartreuse. *B. astierianus* (Dupuy), the smallest of all, has hitherto only been found on the carriages of cannons in the island Ste. Marguerite. Contrib. faun. mal. francaise, i. pp. 1–23, pl. i. figs. 1–16.

Buliminus montanus (Drap.), var. n. *mosquensis*, Milachevich, Moll. Mosc. p. 20, near Moscow.

Buliminus (*Napæus*) *tener* (Rossm.) distinct from *merdvenianus* (Kryn.); Böttger, JB. mal. Ges. viii. p. 221.

Buliminus (*Zebrina*) *retowskianus*, sp. n., Crimea, and on the variability of *B. cylindricus* (Menke) and *bidens* (Kryn.); Clessin, Mal. Bl. (2) iii. pp. 139 & 140.

Buliminus rufistrigatus, var. from Middle China, Gredler, JB. mal. Ges. viii. p. 20.

Retowskia, subg. n. for *Buliminus schlæfli* (Mouss.), Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 220 & 221, and Nachr. mal. Ges. 1881, p. 125.

Buliminus jickelianus (Nevill), Wadela Plateau, Abyssinia; Nevill, J. A. S. B. l. pt. 2, p. 135, pl. vi. fig. 2.

[*Buliminus*] *Peronæus nevillianus*, sp. n., Theobald, *tom. cit.* pt. 3, p. 48, Tandiani, Himalaya, 8500′ above the sea.

Bulimus notabilis (E. A. Smith, 1880) and *kirki* (Dohrn), E. A. Smith, P. Z. S. 1881, pp. 281 & 282, pl. xxxii. figs. 8 & 9, between Lake Nyassa and the East Coast, the former peculiar by its basal canaliculation. [Both probably belonging to sect. *Petræus.*]

Buliminus isthmodon, *exodon*, and *riebecki*, spp. nn., Martens, Nachr. mal. Ges. 1881, pp. 136 & 137, Socotra. The former near *Pupa passamaiana* (Petit), subg. *Passamaiella* (Pfr.), but rather allied to *Petræus*, than to *Ennea*.

Bulimus comorensis, *badiolus*, *inconspicuus*, and *exiguus*, spp. nn., Mayotte Island, Comores; Morelet, J. de Conch. xxix. pp. 216–219, pl. ix. figs. 4–7. [The first belonging to *Rhachis*, the others to *Ena*.]

Bulimus (*Rhachis*) *braunsi* (Martens), adult; E. A. Smith, P. Z. S. 1881, p. 281, pl. xxxii. figs. 7–7*c*, between Lake Nyassa and the East Coast.

Bulimus bawriensis and *zanguebaricus*, spp. nn., Taylor, J. of Conch. iii. pp. 142 & 143, Zanzibar. [*Leucochila*, ? near *fallax* (Say).—Rec.]

Buliminus (*Pachnodus*) *heliciformis*, *fragilis*, and *adonensis*, spp. nn., H. H. Godwin-Austen, P. Z. S. 1881, pp. 807 & 808 [1882], pl. lxix. figs. 7–9, Socotra.

Buliminus, subg. *Achatinelloides* (Nevill, 1878) = *Ovella* (Pfr., Clessin, 1879), *socotrensis* (Pfr.), with var. n. *elongatus*, *B. hadibuensis*, *balfouri*, *gollonsirensis*, *tigris*, *zebrinus*, *longiformis*, and *semicastaneus*, all spp. nn., the second and last with a var. *alba*, all from Socotra; *id. l. c.* pp. 801–807, pl. lxviii. figs. 1–17, and pl. lxix. fig. 10.

[*Chondrula*] *Chondrus*, 5 French species: *tridens* (Müll.), *rayianus* (Bourg.), Canonville, near Vincennes, Paris, extinct, *quadridens* (Müll.), *niso* (Risso) = *seductilis* (Ziegl.), Mediterranean Shores, and *lunaticus*, (Cristof. & Jan), Nice, described and figured by Locard, Contrib. faun. mal. franc. i. pp. 23–29, pl. i. figs. 17–22.

Chondrula tridens var. n. *migrata*, Milachevich, Moll. Mosc. p. 91, Government of Moscow.

Buliminus (*Chondrula*) *dalmaticus* (Kleciak, in sched.), sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 53, Dalmatia.

Buliminus (*Chondrula*) *lamelliferus* (Rossm.) = *pupoides* (Kryn.), and notes on some other species from Transcaucasia; Böttger, JB. mal. Ges. viii. pp. 224 & 225.

Partula (Fér.). W. Hartman gives general notes on this genus, its geographical distribution, arboreal and terrestrial species, hybrids, sinistral examples, and other variations, hybrids [see the General Part], anatomy, &c., with an alphabetical list of all the known species and critical remarks; the local distribution of the single species on the islands Moorea, Tahaa, Huahine, Raiatea, and Tahiti is represented on two maps by A. Garrett. Most species exhibit spiral rows of pits at the apex of the shell, both embryo and adult; those which want them, as *P. guamensis* (Pfr.), perhaps do not belong to this genus. Bull. Mus. C. Z. ix. pp. 171–196.

Partula: *Nenia*, *Astræa*, *Clytia*, *Ilia*, *Œnone*, *Helena*, *Pasithea*, *Ægа*, *Echo*, *Latia*, *Evadne*, *Harmonia*, *Matuta*, and *Sterope*, subgg. nn. of *Partula*; types respectively *P. faba* (Martyn), *auriculata* (Brod.), *dentifera* (Pfr.), *umbilicata* (Pease), *lutea* (Less.), *hebe* (Pfr.), *otaheitana* (Brug.), *spadicea* (Reeve), *decussatula* (Pfr.), *arguta* (Pfr.), *ganymedes* (Pfr.), *bulimoides* (Less.), *gibba* (Fér.), *rosea* (Brod.), and *carteriensis* (Q. & G.). All known species enumerated and arranged into these 15 subgenera: *Partula*, s. str., and *Œnone* are partly arboreal. Hartman, Catalogue of the genus *Partula*, 1881, 14 pp., the 15 typical species figured in woodcut. [Nearly all those 14 names are preoccupied in Zoology, *Nenia* and *Latia* even in Conchology.—Rec.]

Partula rufa (Lesson) = *guamensis* (Pfr.) = *brumalis* (Reeve), 2 varieties differing in the shape of the pillar lip, Carolines; E. v. Martens, Conchol. MT. i. pp. 95 & 96, pl. xvii. figs. 12–16.

Tornatellina gigas (Martens, 1880); *id. l. c.* p. 91, pl. xvii. figs. 1–5, Ruck Island, Carolines.

Cochlicopa lubrica (Müll.) var. *minima* (Siemaschko), Transcaucasia; Böttger, JB. mal. Ges. viii. p. 225.

Geostilbia mariei (Crosse, 1880); Crosse, J. de Conch. xxix. p. 200, pl. viii. fig. 5, Nossi-Bé, Madagascar.

[*Stenogyra*?] *Achatina sokotorana*, sp. n., Martens, Nachr. mal. Ges. [Oct.] 1881, p. 135, = *Stenogyra fumificata*, H. H. Godwin-Austen, P. Z. S. 1881 [Apr., 1882], p. 810, pl. lxix. fig. 2, Socotra.

Stenogyra carolina (Martens, 1880), Ruck Island, Carolines, and *terebraster* (Lam.), Portorico; Martens, Conchol. MT. i. p. 94, pl. xvii. figs. 6–8 & 9–11.

Stenogyra socotorana and *arguta*, spp. nn., Martens, Nachr. mal. Ges. 1881, p. 138, Socotra.

Stenogyra gollonsirensis, *fumificata*, *jessica*, *adonensis*, *S.* (*Subulina*) *enodis* and (*Opeas*?) *hirsutus* [-*a*], spp. nn., H. H. Godwin-Austen, P. Z. S. 1881, pp. 809–811 [1882], pl. lxix. figs. 1–6, Socotra.

Subulina lenta and *solidiuscula* (E. A. Smith), near Lake Tanganyika; E. A. Smith, P. Z. S. 1881, pp. 284 & 285, pl. xxxii. figs. 15 & 16.

Stenogyra avenacea and *pusilla*, spp. nn., Mayotte Island, Comores, Morelet, J. de Conch. xxix. pp. 219 & 220, pl. ix. fig. 3, & pl. x. fig. 4.

Stenogyra turgida, sp. n., and another n. sp.? not named, Gredler, JB. mal. Ges. viii. pp. 21 & 22, pl. i. figs. 3 & 4, and *S. gracilior*, sp. n., *id. l. c.* p. 117, pl. vi. fig. 3, Prov. Hunan, China.

Stenogyra (*Glessula*) *pseudoreas*, new name for *oreas* (Pfr., *nec* Reeve), Nilgiris, and var. n. *subdeshayesiana*, Anamullays and Pulney Hills, *nilagirica* (Bens.) var. n. *kurnoolensis*; *subfusiformis* (Blanf.), *blanfordiana* (Nevill), both Ponsee in Yunnan, both figured; *bollampattiana* (Beddome), emendation for *bottampotana*; Nevill, J. A. S. B. l. pt. 2, pp. 136–139, pl. v. figs. 11–20 (several figures copied from European works).

Bulimus (*Stenogyra*) *paioensis*, sp. n., Bock, P. Z. S. 1881, p. 630, pl. lv. fig. 5, Highlands of Padang, Sumatra.

Balea dohrniana, sp. n., Peru, and *pyrenaica* (Bourg.) var. n. *luchonensis*, Bagnères de Luchon; Nevill, J. A. S. B. l. pt. 2, pp. 139 & 140.

Balea heydeni, sp. n., Von Maltzan, J. de Conch. xxix. p. 162, pl. vi. fig. 6, Cintra.

Cœliaxis layardi (Angas). Colour of living shell pale horny grey; it is viviparous; Layard, P. Z. S. 1881, p. 839.

Clausilia cruciata (Stud.). Found near Uleaborg, N. Sweden; Westerlund, JB. mal. Ges. viii. p. 3.

Clausilia (*Iphigenia*) *dubia* (Drap.) var. n. *suttoni*; *id.* Œfv. Ak. Förh. 1881, p. 58, Northumberland.

Clausilia micropleuros, *carina*, *carthusiana*, *gallica*, *nantuacina* (all Bourg.), their differences from better known species; Locard, Moll. Dép. Ain, pp. 69–73, all in France.

Clausilia lunensis, sp. n., Stefani, Bull. Soc. mal. Ital. vii. p. 59, Apuan Mountains; allied to *C. pecchiolii*, Stef. Observations on some allied species; *id. l. c.* pp. 61 & 62.

Clausilia leucostigma (Ziegl.) var. n. *megachilus*, top of Mount Cairo,

1069 mètres, in Terra di Lavoro, *C. bættgeriana* (Paulucci, 1878), mountains of the Abruzzi, and *C. punctulata* (Küst.) var. *platycephala* (Scacchi), Piedimonte d'Alife, Terra di Lavoro ; Paulucci, Bull. Soc. mal. Ital. vii. pp. 129–134, the first two pl. iii. figs. 4 & 5.

Clausilia ornata (Ziegl.) var. n. *humensis* ; Tschapeck, Nachr. mal. Ges. 1881, p. 23, Hum, near Tüffer, Lower Styria.

Clausilia (*Medora*) *leucantha* (Küster, MS.), sp. n., *lesinensis* var. *dimorpha* ; *C.* (*Herilla*) *kleciaki*, *alschingeri* var. *westerlundi*, *gastrolepta*, var *tringa* ; *C.* (*Delima*) *semirugata* var. *pristis* and *fuscilabris*, varr. nn., all Küster or Kleciak MS. ; Westerlund, Œfv. Ak. Förh. 1881, pp. 55–57, Dalmatia.

Clausilia (*Euxina*) *litotes* (A. Schm.) var. n. *litoderma*, *pleuroptychia*, (Böttg.) var. n. *polygyra*, *pumiliformis*, sp. n., *dipolauchen* [*diplauchen* ?], sp. n., *lederi* (Böttg.) var. *gradata* (Böttg.), and var. n. *triadis*, and *C. derasa* (Mouss.) var. *ossetica* (A. Schm.), = *sandbergeri* (Mouss.), all from Transcaucasia, Böttger, JB. mal. Ges. viii. pp. 231–240, pl. viii. fig. 16, pl. ix. figs. 17–20 : also Nachr. mal. Ges. 1881, pp. 125–128.

Acrotoma, subg. n., of *Clausilia*, near *Euxina*, apex decollated, lunella distinct. *C.* (*A.*) *komarowi*, *laccata*, and *semicincta*, spp. nn., Caucasus ; *id.* JB. mal. Ges. viii. pp. 341–344.

Micropontica, subg. n., of *Clausilia*, near *Graciliaria* (Bielz.), lunella and palatal plaits resembling those of *C. plicata* (Dv.) ; shell small, with whitish lamellæ. *C.* (*M.*) *closta*, sp. n., *id. l. c.* pp. 344 & 345, Transcaucasia.

Clausilia principalis and *gemina*, spp. nn., and *tau* (Böttg.) var. n. *hunana*, Gredler, JB. mal. Ges. viii. pp. 24–27, Prov. Hunan, China, the first pl. i. fig. 6.

Clausilia gerlachi, Lofushan mountains, and *elisabethæ*, Shiuhingfu, spp. nn., Möllendorff, JB. mal. Ges. viii. pp. 310 & 311, both in the province of Canton.

Pupa amicta (Parr.). Lives ordinarily on limestone-rocks near the level of the sea, but it has been found in two instances at considerably greater distance and elevation from it (10–17 kilomètres and 400–450 mètres), in Liguria, which may be accounted for by secular rising of the coast [?] ; Issel, Bull. Soc. mal. Ital. vii. pp. 208–212.

Puma frumentum (Drap.) var. *apennina* (Charp.), and var. *illyrica* (Rossm.), *P. avenacea* forma *elatior*, all from Umbria ; Paulucci, Bull. Soc. mal. Ital. vii. pp. 117–119.

Pupa avenacea (Brug.), placed in the subgenus *Modicella* (Ad.), and found in Transcaucasia ; Böttger, JB. mal. Ges. viii. p. 227.

Torquilla avenacea (Brug.) var. n. *arcadica*, Mount Cyllene ; Reinhardt, SB. nat. Fr. 1881, pp. 136 & 137.

Pupa anceyi, sp. n., Fagot, Bull. Soc. Z. Fr. 1881, p. 139, Val de Crède, near Marseilles [subg. *Torquilla*].

Pupa cylindracea (Da Costa) = *umbilicata* (Drap.) : there is no constant difference between British and South European specimens, as supposed by Bourguignat ; Paulucci, Bull. Soc. mal. Ital. vii. pp. 120–123.

Pupa (*Charadrobia*) *semproni* (Charp), near *caspia* (Pfr.), Transcaucasia ; Böttger, JB. mal. Ges. viii. p. 228.

Pupa (*Orcula*) *raymondi* (Bourg., 1863) = *trifilaris* (Mouss., 1863), Transcaucasia; Böttger, JB. mal. Ges. viii. p. 229.

Pupa doliolum (Brug.). Found near Buda-Pest only on Dachstein-limestone; Hazay, Mal. Bl. (2) iii. p. 8.

Pupa hebes and *sublubrica*, spp. nn., Ancey, Le Nat. iii. p. 389, Nevada.

Pupa socotrana, sp. n., H. H. Godwin-Austen, P. Z. S. 1881, p. 809, pl. lxviii. fig. 13, Socotra.

Pupa turricula, sp. n., Taylor, J. de Conch. iii. p. 143, Zanzibar.

Pupa minutalis, sp. n., Morelet, J. de Conch. xxix. p. 231, pl. x. fig. 5, Mayotte Island, Comores.

Pupa seignaciana (Crosse & Fischer), Crosse, J. de Conch. xxix. p. 199, pl. viii. fig. 4, Nossi-Bè, Madagascar.

Pupa hunana, sp. n., Gredler, JB. mal. Ges. viii. p. 23, pl. i. fig. 5, Prov. Hunan, China.

Pupa strophiodes, sp. n., *id. l. c.* p. 118, pl. vi. fig. 4, Prov. Hunan, China.

Pupa, sp. n. ?, Möllendorff, JB. mal. Ges. viii. p. 42, North China.

Pupa microstoma, sp. n., *id. l. c.* p. 311, Lofushan Mountains, Province of Canton.

Vertigo praslinensis, sp. n., Nevill, J. A. S. B. l. pt. 2, p. 140, Praslin Island, Seychelles Group.

Anthracopupa, g. n., from carboniferous beds, Ohio, Whitfield, Am. J. Sci. (3) xxi. p. 126, with woodcut, may be here mentioned exceptionally.

GONIOGNATHA.

[*Placostylus*] *Bulimus debeauxi* (Gassies), Pine Island, New Caledonia; Gassies, J. de Conch. xxix. p. 337, pl. xi. fig. 4.

Bulimus (*Placostylus*) *rossiteri* (Brazier) ?, and *fibratus* var. *sinistrorsa*, and a keeled deformity of the same species, New Caledonia; Crosse, J. de Conch. xxix. pp. 338–341, pl. xii. fig. 6, and pl. xi. figs. 2 & 3.

[*Otostomus*] *Bulimus knorri* (Pfr.), seven varieties in colour; Schaufuss, Nachr. mal. Ges. 1881, p. 178. [Correspond partly to those figured by the Recorder in his 'Mollusca of Venezuela,' 1873, pl. i. figs. 10–13].

Eudioptus avellanedæ, sp. n, Sierra de Currumelan, and *mendozanus* (Strebel), Cerros de Sotoya, both at Rio Negro, Southern Argentinia; Döring, Informe Comis. R. Negro, i. Zool. pp. 62–64, pl. i. figs. 1–3. Jaws of the first composed of twelve grass ribs.

Macroceramus kieneri (Pfr.), from Honduras, distinct from *pontificus* (Gould), from Orizaba and Florida; Bland, An. N. York Ac. ii. pp. 117 & 118, with woodcut.

Macroceramus lineatus, var. n. *glabrata*, Port au Prince, Hayti; Weinland, JB. mal. Ges. viii. p. 158.

Cylindrella paradoxa and *incerta*, spp. nn., Arango, P. Ac. Philad. 1881, p. 15, woodcuts, Cuba.

Cylindrella sericea (Pfr.) var. n. *kisslingiana*, Weinland, JB. mal. Ges. viii. p. 159, Hayti.

Amphibulina patula (Fér.) contracts itself completely within the shell; A. D. Brown, Am. Nat. xv. p. 56.

Elasmognatha.

Hyalimax, sp. indet., from the Andamans, Nevill, J. A. S. B. l. pt. 2, p. 142.

Succinea putris var. n. *fitzgeraldiana*, Hazay, JB. mal. Ges. viii. p. 164, woodcut, England.

Succinea putris (L.) var. n. *hians*, *S. baudoni* (Drouet, 1834) = *acrambleia* (Mabille, 1870), *S. pfeifferi* (Rossm.) var. n. *punctatissima*, *S. oblonga* (Drap.) var. *acuta* (Drouet), and *S. debilis* (Morelet, L. Pfr.), all from France, with a list of all French species and varieties, and description of a new ? species of *Leucochloridium*; Baudon, J. de Conch. xxix. pp. 139–153, pl. v. figs. 1–4.

Succinea lenta, sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 59, Sweden. Some notes on other critical species and varieties in Sweden; *id. l. c.* pp. 41–45.

Succinea hungarica, sp. n., with 3 varieties, *kobelti*, sp. n., with 2 varieties, and *putris* varr. nn. *clessiniana*, *grandis*, *fontana*, and *angusta*, *S. elegans* (Risso) varr. nn. *piniana*, *baudoniana*, with description and figures of shells and jaws, all from Buda-Pest; Hazay, Mal. Bl. (2) iii. pp. 11–15 & 43-69, pls. iii.–ix. *S. subcuneola* and *balatonica*, spp. nn., Servain, Hist. mal. Balaton, pp. 13 & 15, Lake Balaton.

Succinea benoiti, sp. n., Spadafora, near Messina, and *inconcinna*, sp. n., Novoli, near Livorno; Paulucci, Bull. Soc. mal. Ital. vii. pp. 172–176, pl. v. figs. 10 & 11.

Succinea yarkandensis, sp. n., Yarkand and Sasak Taka, Nevill, J. A. S. B. l. pt. 2, p. 141, pl. v. fig. 10. *S. longiscata* (Morelet), Mount Hermon, in Palestine; *id. l. c.* p. 140.

Succinea campestris (Say) and *aurea* (Lea); localities by R. Ellsworth Call, Am. Nat. xv. p. 391.

Succinea patagonica, sp. n., E. A. Smith, P. Z. S. 1881, p. 37, pl. iv. fig. 17, W. coast of Patagonia.

Vaginulidæ.

Vaginulus chinensis, sp. n., Möllendorff, JB. mal. Ges. viii. p. 310, Hongkong.

Onchidiidæ.

J. Joyeux-Laffuie continues his previous notes on the anatomy of an *Onchidium* from the French coasts, describing the digestive, nervous, and generative organs, and the spawn: C. R. xcii. pp. 144–146.

Auriculidæ.

Plecotrema rapax (Dohrn) var. n. *producta*, Nevill, J. A. S. B. l. pt. 2, p. 155, pl. v. fig. 7, Annesley Bay.

Limnæidæ.

Special observations on the eggs, their development, and the growth of the shell, in several species of *Limnæa*, *Physa*, and *Planorbis* ; J. Hazay, Mal. Bl. (2) iv. pp. 43–74.

Chilina. E. A. Smith gives a critical list of 19 known species and their synonymy, from personal examination of the specimens described by Orbigny, Frauenfeld, and Sowerby in the 'Conchologia Iconica ;' P. Z. S. 1881 [pt. 4, 1882], pp. 840–846.

Chilina amœna, sp. n., *id. l. c.* p. 37, pl. iv. fig. 18, W. coast of Patagonia.

Limnæa stagnalis (L.), jaw covered with filaments, which act, perhaps, as a strainer ; Butterell, J. of Conch. iii. p. 151.

Limnæa. List of 162 [!] European species, as maintained by Bourguignat, arranged in the following 21 groups : *Stagnaliana*, *Cyphidæana*, *Biformiana*, *Psiliana*, *Effuiana*, *Auriculariana*, *Rochiana*, *Limosiana*, *Bouchardiana*, *Ampullaceana*, *Nivalisiana*, *Walhiana* [from *L. vahli* (Möller)], *Cenisiana*, *Peregriana*, *Ligericiana*, *Corvusiana*, *Palustrisiana*, *Fenziana*, *Glabriana*, *Truncatuliana*, and *Tanousia*, the last for *L. zrmanjæ* (Brusina), and 3 allied Dalmatian species, the rest named after the typical species ; *L. anglica* (Mabille, 1880), group *Stagnaliana*, and *L. britannica* (Bourguignat, 1878), group *Auriculariana*, only indicated from England ; *L. potsdami* (Servain, 1881), without description, group *Fenziana*, from Prussia. Servain, Hist. mal. Balaton, pp. 44–65.

Limnæa stagnalis var. n. *variegata*, Buda-Pest, Hazay, Mal. Bl. (2) iii. p. 161, iv. pl. ii. figs. 1–10 ; varr. nn. *fossarina* and *fucinensis*, Lago di Fucino ; Paulucci, Bull. Soc. mal. Ital. vii. pp. 163 & 164, pl. iv. figs. 1–3.

Limnæa (*Limnophysa*) *palustris* (Müll.) var. n. *gracilis*, Hazay, JB. mal. Ges. viii. p. 274, with woodcut, Upper Hungary ; varr. nn. *clessiniana* and *baudoniana*, *id.* Mal. Bl. (2) iii. pp. 163–165, iv. pl. iv. figs. 1 & 2, Buda-Pest; var. n. *contorta*, Paulucci, *l. c.* p. 139, pl. iv. fig. 5, Lago d. Campo di Giove in Abruzzo ulteriore.

[*Limnæa*] *Limnophysa parvula*, sp. n., Hazay, Mal. Bl. (2) iii. p. 166, and iv. pl. iv. fig. 4, Buda-Pest.

Limnæa truncatula (L.) [Müll.], its varieties and geographical distribution, and some allied foreign species discussed by S. Clessin, a part of the latter only known to the author from Reeve's figures ; Mal. Bl. (2) iii. pp. 77–85.

Limnæa auricularia (L.), specimen from the Lago Fucino ; Paulucci, Bull. Soc. mal. Ital. vii. p. 165, pl. iv. fig. 4. *Limnæus auricularius* var. *tenera* (Parr.) and var. *confinis* (Mouss.), Transcaucasia ; Böttger, JB. mal. Ges. viii. p. 249.

Limnæa lagotis var. *margaritacea* (Westerl.). The nacreous aspect of the inside is peculiar to the shell, and not caused by a dark coat of mud outside ; Westerlund, JB. mal. Ges. viii. p. 3.

Limnæa ovata (Drap.) var. n. *subrotunda*, Northern Germany, Borcherding, Mal. Bl. (2) iii. p. 146. *Gulnaria ovata* var. n. *piniana*, Buda-Pest,

Hazay, *tom. cit.* p. 167, vol. iv. pl. iv. figs. 7–9, some other varieties, pp. 168 & 169, figs. 10–13.

Limnæa peregra (Müll.) is a variety of *ovata* (Drap.), produced by living in water containing much carbonic acid, as can be proved by transplanting the spawn to other waters; Hazay, JB. mal. Ges. viii. p. 265.

Limnæa peregra var. *picta*, in Derbyshire; Milnes, J. of Conch. iii. p. 153.

Limnæa peregra var. n. *ambigua*, Sweden, var. n. *styriaca*, Styria, var. n. *oblita*, Southern Bavaria, *lagotis* var. n. *prisca*, Sweden, subfossil in turf beds, *palustris* var. n. *stenostoma*, same locality, and var. n. *decollata*, Tornea; Westerlund, Œfv. Ak. Förh. 1881, pp. 60 & 61.

Limnæa allainiana, *vitrinella*, *diaphanella*, *callista*, *incomparabilis*, *bouchardiana*, *physella*, *cumiera*, *balatonica*, *renouji*, *tualiana*, *gueretiana*, *udvarica*, *colombiana*, and *callomphala*, spp. nn.; Servain, Hist. mal. Balaton, pp. 67–78, Lake Balaton, Hungary.

Limnæa acuminata (Lam.) var. *patula* (Troschel, 1837), *sulcatula* (Trosch.), *amygdalum* (Trosch.), *chlamys* (Bens.), *rufescens* (Gray), *mauritiana* (Morelet), and *gracilior*, var. n., all from Bengal except *mauritiana* from Mauritius, and *L. ovalis* (Gray) = *bulla* (Bens.), var. *prunum*, *cerasum* and *nucleus* (Trosch.), also Bengal, *L. tigrina* (Dohrn), Ceilon, *L. succinea* (Desh.) var. *impura* (Trosch.), Bengal, *L. javanica* (Hasselt) varr. nn. *obesa*, *intumescens*, *ventrosa*, all 3 from Java, var. n. *subteres*, Sumatra and Banka, var. n. *angustior*, Java and Celebes, and var. n. *porrecta*, Timor, with notes on the distribution of this genus in India and the Malayan Archipelago; E. v. Martens, Conchol. MT. i. pp. 75–91, pls. xiv. & xv., Troschel's type specimens figured, and pl. xvi.

Limnæa philippinensis, sp. n., Nevill, J. A. S. B. l. pt. 2, p. 142, Lucban, Luzon; *L. andersoniana* and *yunnanensis* (Nevill), Yunnan, figured; *id. l. c.* pl. v. figs. 8 & 9.

Aplecta bullula, Vera Cruz, and *tapanensis*, Isthmus of Tehuantepec, spp. nn., Crosse & Fischer, J. de Conch xxix. p. 334.

Physa achaia, sp. n., Westerlund, Œfv. Ak. Förh. 1881, p. 61, Patras.

Physa boucardi, Lake of Mexico, *strebeli*, Vera Cruz, and *tehuantepecensis*, Isthmus of Tehuantepec, spp. nn., Crosse & Fischer, *l. c.* pp. 334 & 335.

Physa hungerfordiana, sp. n., Nevill, *l. c.* p. 143, Lucban, Luzon.

Pechaudia, g. n., very near *Physa*, but dextral, found in the alluvial deposits of Cheliff (Algeria?); Bourguignat, Monogr. Pechaudia, 1881.

Planorbis. R. Stearns insists on the shape of the first whorls in the large-sized North American species, which resemble more or less distinctly those of the genus *Physa*, and concludes therefrom that the shell of *Planorbis* is sinistral, which is also proved by the sinistral situation of the respiratory and genital orifices [and has been admitted long ago by European anatomical conchologists, as for example Moquin-Tandon, 1855; Rec.]. He discusses further the affinities and variations of the large-sized species, dividing them into two groups: (1) Whorls rounded, *P. corneus* (L.), *guadelupensis* (Sow.) &c., and (2) Whorls planulate, angulated or carinated, *P. corpulentus* (Say); *bicarinatus* (Say), &c.

These two groups are connected by *P. trivolvis* (Say). Periodical swellings of the whorls are seen conspicuously in *P. glabratus* (Say), and *tumens* (Carp.), eccentric coiling in *P. plexatus* (Ingersoll), both occur also more or less distinctly in all of the larger American species, and are probably caused by the influence of recurring seasons of hibernation and activity. West of the Rocky Mountains, the average size of the shells of this genus is larger, and the variations referred to are more conspicuous. P. Ac. Philad. 1881, pp. 92–108, with 24 woodcuts.

Planorbis metatarsius, sp. n., *præclarus* (Letourneux, MS.), both belonging to the group of *P. corneus*, from Lake Balaton, with a list of 16 pretended European species of the same group, and note on *P. almissanus* (Letourneux, 1878); Servain, Hist. mal. Balaton, pp. 79–84.

Planorbis marginatus (Dr.) var. n. *fontinalis*, and *P. spirorbis* (Müll.) var. n. *hazayanus* (Clessin), Buda-Pest, Hazay, Mal. Bl. (2) iii. pp. 169–173, —var. *subangulata* (Phil.) and var. *sieversi* (Mouss.), Armenia, Böttger, JB. mal. Ges. viii. pp. 252–354; *P. umbilicatus* (Müll.) [= *marginatus*] var. n. *armeniacus*, Armenia, Westerlund, Œfv. Ak. Förh. 1881, p. 62.

Planorbis rotundatus (Poiret) var. n. *angulatus*; Milachevich, Moll. Mosc. p. 25, Government of Moscow.

Planorbis vorticulus (Troschel). Note on it by Westerlund, JB. mal. Ges. viii. pp. 1 & 2.

Planorbis (*Gyraulus*) *socius* and *concinnus*, Sweden, *stremi*, Norway, Finland and Siberia, and *tetragyrus*, Dalmatia, spp. nn., and list of 26 [!] European species of this subgenus; Westerlund, Œfv. Ak. Förh. 1881, pp. 62–65.

Planorbis complanatus (L.) var. n. *kobelti*, Hazay, Mal. Bl. (2) iii. p. 180, and Westerlund, *l. c.* p. 65, Buda-Pest, also Troyes, in France.

Planorbis rollandi, sp. n., Morlet, J. de Conch. xxix. pp. 46 & 344 [1882] pl. xii. fig. 4, Algerian Sahara, subfossil.

Segmentina servaini (Bourguignat, MS.), Hungary and Croatia, *clessini* (Westerlund), Northern Europe, *microcephala* (Charp., MS.), France, and *montgazoniana* (Bourguignat, sp. n.), Départ. Aube; Servain, Hist. mal. Balaton, pp. 86–90.

Segmentina (*Planorbula*) *alexandrina* (Ehrenb.) var. n. *tanganyicensis*, E. A. Smith, P. Z. S. 1881, p. 294, pl. xxxiv. fig. 30, Lake Tanganyika.

Segmentina (*Planorbula*) *newcombi*, sp. n., Ancey, Le Nat. iii. p. 468, Bahamas.

Carinifex. Variability in shape of the shell and list of known localities; Stearns, P. Ac. Philad. 1881, pp. 108–110.

Ancylus lacustris (L.), floating; Pearce, Sci. Goss. 1879, p. 207; J. of Conch. iii. p. 185.

Ancylus fluviatilis (Müll.) var. n. *armenia*; Böttger, JB. mal. Ges. viii. 255, pl. ix. fig. 21, and Nachr. mal. Ges. 1881, p. 128, Erivan.

Ancylus expansilabris, Middle Europe, and *subcircularis*, Bohemia, spp. nn., Clessin, Mal. Bl. (2) iii. p. 159.

Ancylus tinei (Bourg.) distinct from *benoitianus* (Bourg.), Paulucci, Bull. Soc. mal. Ital. vii. p. 144.

Ancylus striatulus, sp. n., Phthiotis, *ellipticus*, sp. n., Thebes and Eubœa,

and 3 other known species from Greece, described by Clessin, Mal. Bl. (2) iii. pp. 150–158.

Ancylus oregonensis, sp. n., *id. l. c.* p. 159, Oregon.

Ancylus modestus (Crosse, 1880), Crosse, J. de Conch. xxix. p. 203, pl. viii. fig. 6, Nossi-Bé, Madagascar.

Thalassophila.

Siphonaria obliquata, and *sipho* (Sow.), radula; Hutton, Tr. N. Z. Inst. xiii. p. 201.

Gadinia nivea (Hutt.), radula; *id. ibid.*

PULMONATA OPERCULATA.

Cyclophoridæ.

Cyclophorus pealianus, sp. n., Naga Hills; *C.* (*Theobaldius*) *orites*, sp. n., Chola Range, Sikkim, 11,000 feet; *C. speciosus* (Phil.) var. n. *aureo-labris*, Lushai Haut; *C. formosaensis*, sp. n., = *exaltatus* var. (Pfr.), Formosa. Nevill, J. A. S. B. l. pt. 2, pp. 146-148, the two former pl. vi. figs. 3 & 4.

Cyclophorus punctatus (Gratel.), differences from *martensianus* (Möll.); Gredler, JB. mal. Ges. viii. p. 129.

Cyclophorus elegans, Shiuhingfu, and *clouthianus*, Dinghushan, spp. nn., Möllendorff, JB. mal. Ges. viii. pp. 307 & 308, Province of Canton.

Cyclophorus raripilis, *microscopicus* and *granum*, spp. nn., Mayotte Island, Comores, Morelet, J. de Conch. xxix. pp. 234–236, pl. x. figs. 9–11.

Cyclophorus (*Craspedotropis*) *hungerfordianus*, sp. n., Canton, and *trichophorus*, sp. n., Lofushan and Dinghushan Mountains; Möllendorff, *l. c.* pp. 301 & 302.

Cyclotus amethystinus (Guppy), probably = *Cyclophorus schrammi* (Shuttl.); Brown, Am. Nat. xv. p. 56.

Cyclotus pusillus (Sow.) var. n. *nana*; Nevill, J. A. S. B. l. pt. 2, p. 143, Cebu and Guimaras, Philippines.

Cyclotus hunanus, sp. n., Gredler, JB. mal. Ges. viii. pp. 113 & 31 (as "*pusillus*, Sow.?"), Prov. Hunan, China.

Cyclotus campanulatus (Martens). Operculum described, Central China; Gredler, JB. mal. Ges. viii. p. 31.

Cyathopoma: *Jerdonia*, and *Mychopoma* (Blanf.), and *Diadema* (Pease) are only subgenera of *Cyathopoma*; *C.* (*Jerdonia*) *imperforatum*, sp. n., Anamullays; *D. shevaroyanum* (Beddome), figured: Nevill, J. A. S. B. l. pt. 2, p. 145, pl. vi. fig. 7.

Pterocyclos cyclophoroideus, sp. n., Anamullays, and *nanus* (Blanf.) var. n. *reflexilabris*, Khoondah Mountains and Nilgiris, *id. l. c.* pp. 145 & 146.

Pterocyclos planorbulus (Sow.); Gredler, JB. mal. Ges. viii. p. 128, Quantung.

Pterocyclos mindaiensis, sp. n., Bock, P. Z. S. 1881, p. 634, pl. lv. fig. 8, Mindai, Amontai district, Borneo.

Cyclosuras, g. n. Shell only spiral at the top, simply arcuated, somewhat like *Lituites* or an exaggerated *Rhiostoma*; aperture circular, operculum multispiral, externally flat, internally deeply concave. *C. mariei*, sp. n., Mayotte Island, Comores. Morelet, J. de Conch. xxix. pp. 237–239, pl. x. fig. 8.

Alycæus montanus, sp. n., Sikkim, and *hungerfordianus*, sp. n., Formosa; Nevill, *l. c.* p. 149, the first pl. vi. fig. 6.

Alycæus pilula (Gould), Southern China, its sculpture; Gredler, JB. mal. Ges. viii. p. 129.

Pupinidæ.

Coptochilus sumatranus, sp. n., Dohrn, Nachr. mal. Ges. 1881, p. 65, Singalang, Sumatra.

Cataulus tortuosus (Chemnitz) from the hills N.E. of Trevandrum, 2000 feet, South India; Nevill, *l. c.* p. 149.

Pupina ephippium, sp. n., Gredler, JB. mal. Ges. viii. pp. 28 & 112, pl. vi. fig. 1, Prov. Hunan, China.

Pupina pulchella, sp. n., Möllendorff, JB. mal. Ges. viii. p. 309, Lofu-shan Mountains, Canton.

Pupina guimarasensis, sp. n., Guimaras, and *hungerfordiana* (Nevill), Hsaddan Koo, Salween Valley; Nevill, *l. c.* p. 148, the latter pl. vi. fig. 6.

Pupina rufilabris and *turgidula*, spp. nn., Dohrn, Nachr. mal. Ges. 1881, p. 66, Singalang, Sumatra.

Diplommatinidæ.

Diplommatina hungerfordiana, sp. n., Formosa, and *japvoensis*, sp. n., India: Nevill, *l. c.* p. 150 (the latter figured as *sherfaiensis*, J. A. S. B. 1875, pl. iv. fig. 5).

Moussonia paxillus, sp. n., Gredler, JB. mal. Ges. viii. pp. 29 & 112, pl. i. fig. 7, Prov. Hunan, China.

Hagenmulleria, ? g. n., very small, found in the alluvial deposits of the coast of Oran; Bourguignat, Monogr. *Pechaudia*, &c.

Cyclostomatidæ.

Cyclotopsis ornatus[*-a*], sp. n., H. H. Godwin-Austen, P. Z. S. 1881, p. 257, pl. xxviii. fig. 5, Socotra.

Cyclotopsis dubia, sp. n., Morelet, J. de Conch. xxix. p. 236, pl. x. fig. 6, Mayotte Island, Comores.

Otopoma naticoides (Recl.), *balfouri*, *complanatum*, *conicum*, and *turbinatum*, spp. nn., and *clathratulum* (Recl.) varr. nn. *socotrana* and *minor*, all from Socotra; Godwin-Austen, *l. c.* pp. 252–255, pl. xxvii. figs. 1–4, and pl. xxviii. figs. 1 & 2.

Lithidion marmorosum, sp. n., *id. l. c.* p. 256, pl. xxviii. fig. 6, Socotra.

Tropidophora [rather *Lithidion*] *socotrana* and *balfouri*, spp. nn., *id. l. c.* pp. 255 & 256, pl. xxviii. figs. 3 & 4, Socotra.

Cyclostoma (*Tropidophora*) *caldwellianum* (Nevill), with varr. nn. *sublævis* and *sexcarinata*, and *C.* (*T.*) *erroneum*, sp. n., = *unicolor* (Pfr., pt.), with varr. *subunicolor*, *subocclusa*, and *subligatum* [sic !], both Mauritius, only subfossil; Nevill, J. A. S. B. l. pt. 2, pp. 150–153, the first pl. vi. figs. 10 & 10 A.

Cyclostoma radiolatum, sp. n., Martens, Nachr. mal. Ges. 1881, p. 135, Socotra.

Cyclostoma insulare (Pfr.), var., = *C. kraussianum* (Reeve, *nec* Pfr.), from the continent of East Africa between Lake Nyassa and the coast; E. A. Smith, P. Z. S. 1881, p. 277, pl. xxxii. fig. 1.

Cyclostoma semiliratum and *moniliatum*, spp. nn., Mayotte Island, Comores, Morelet, J. de Conch. xxix. pp. 233 & 234, pl. ix. fig. 15, and pl. x. fig. 7.

Cyclostoma elegans: on its locomotion; see Simroth, *anteà* in the General Part.

Cyclostoma costulatum var. *hyrcanum* (Martens, 1874) = *C. caspicum* (Mouss.), Böttger, JB. mal. Ges. viii. p. 243.

Choanopoma acervatum, sp. n., Arango, P. Ac. Philad. 1881, p. 15, woodcut, Cuba.

Ctenopoma nodiferum and *wrightianum*, spp. nn., *id. l. c.* p. 16, Cuba.

Pomatias apistus, sp. n., Syria ?, and *henricæ* (Strobel) var. n. *lissogyrus*, Val Seigena, Trentino; Westerlund, Œfv. Ak. Förh. 1881, pp. 65 & 66.

Pomatias elongatus and *adamii* var. *carseolanus* (Paulucci), *macrochilus* with var. *limbatus*, *sospes*, and *agriotes* (Westerlund), Paulucci, Bull. Soc. mal. Ital. vii. pp. 145–147, pl. v. figs. 1–6, Terra di Lavoro and Abruzzi.

Pomatias lederi, sp. n., Böttger, JB. mal. Ges. viii. p. 244, pl. ix. fig. 22, and Nachr. mal. Ges. 1881, p. 128, Kutais, Transcaucasia.

Omphalotropis dupontiana (Nevill) and *caldwelliana*, sp. n., both Mauritius, Nevill, J. A. S. B. l. pt. 2, pp. 153 & 154, pl. vi. figs. 8 & 9.

Truncatelliidæ.

Truncatella obscura, sp. n., Morelet, J. de Conch. xxix. p. 239, pl. x. fig. 12, Mayotte Island, Comores.

Acme delpretii, sp. nn., Viareggio, near Lucca, and list of 8 Italian species of *Acme*; Paulucci, Bull. Soc. mal. Ital. vii. pp. 221–225.

Assimineidæ.

Assiminea woodmasoniana, *hungerfordiana*, *beddomeana*, *theobaldiana*, *micro-sculpta*, and *brevicula* (Pfr.), figured by Nevill, J. A. S. B. l. pt. 2, pp. 158 & 159, pl. vii. figs. 1–6.

Acmella hungerfordiana, sp. n., *id. l. c.* p. 143, pl. vii. fig. 11, Guimaras, Philippines.

Helicinidæ.

Hydrocena bachmanni, sp. n., Gredler, JB. mal. Ges. viii. p. 114, pl. vi.

fig. 2 [shell, operculum, and radula, the last very incomplete], Prov. Hunan, China.

Revoilia and *Rochbrunnia*, ? gg. nn., incertæ sedis, Bourguignat, Moll. terr. et fluv. de Çomalis Medjourtins. [Not seen by the Recorder.]

SOLENOCONCHÆ.

Dentalium occidentale, Stimps. Jeffreys and others apply this name wrongly to *D. striolatum*: the differences (? specific) are pointed out. Verrill, P. U. S. Nat. Mus. p. 394.

Dentalium clathratum, sp. n., Martens, SB. nat. Fr. 1881, p. 66, Moreton Bay, 550 fath. *D. perlongum*, *sericatum*, *ceratum*, *sigsbeanum*, and *ophiodon*, spp. nn., Yucatan Strait and West Florida; Dall, Bull. Mus. C. Z. ix. pp. 36–38.

Siphonodentalium quadridentatum, sp. n., *id. l. c.* p. 36, Atlantic, 7–30 fath.

Cadulus pandionis, sp. n., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 397, and P. U. S. Nat. Mus. iii. p. 395, N.E. Coast of America. *C. æqualis*, *watsoni*, *agassizi*, *lunulus* [!], *cucurbitus* [!], spp. nn., Dall, *l. c.* pp. 34–36, Gulf of Mexico and Caribbean Sea, 229–805 fath.

BIVALVIA.

Pholadidæ.

Teredo. On the preservation of timber against its attacks; J. W. Putman in the 'Scientific American,' July 10th, 1880.

Myidæ.

Mya arenaria (L.) = *hemphilli* (Newc.), in San Francisco Bay; Stearns, Am. Nat. xv. p. 362 [*suprâ*, Acclimatation].

Corbulidæ.

Corbula cymella, sp. n., Dall, Mus. Bull. C. Z. ix. pp. 114 & 115, Gordon Key, 68 fath., with notes on some well known Caribbean species.

Neæra. Jeffreys, P. Z. S. 1881 [1882], pp. 936, 940, 943, arranges the species as follows:—

A. Smooth, typical.

B. *Aulacophora*, subg. n., striated concentrically. *N. lamellosa* (Sars), &c.

C. *Tropidophora*, subg. n. [pre-occupied in *Cyclostomatidæ*] keeled. *N. abbreviata* (Forbes).

D. *Spathophora*, subg. n., ribbed lengthwise. *N. costellata* (Desh.), &c.

Neæra truncata, *sulcifera*, *gracilis*, *bicarinata*, *teres*, *depressa*, spp. nn., *N.* (*Aulacophora*) *contracta*, *semistrigosa*, *ruginosa*, *inflata*, spp. nn., and *circinata* (Jeffr., 1876), *N.* (*Tropidophora*) *angularis* (Jeffr., 1876), *N.* (*Spathophora*) *curta* and *striata* (Jeffr., 1876), Atlantic; *id. l. c.* pp. 936–946, pl. lxx. figs. 9–11, pl. lxxi. figs. 1–11.

Neæra crassa, sp. n., = *cuspidata* (Tiberi, *nec* Olivi) = *cuspidata* var. *crassa* (Monter., 1879), Mediterranean; Monterosato, Bull. Soc. mal. Ital. vi. p. 250.

Neæra multicostata, sp. n., Verrill & Smith, P. U. S. Nat. Mus. iii. p. 398, [1880], Coast of Southern New England.

Neæra granulata, *jeffreysi*, *claviculata*, *limatula*, *arcuata*, and *lamellifera*, spp. nn., Dall, Bull. Mus. C. Z. ix. pp. 110–113, Caribbean Sea and Yucatan Strait, 46–640 fath., with notes on several known species from the same localities.

Poromya neæroides (Seguenza), Jeffreys, *l. c.* p. 936, pl. lxx. fig. 8, Atlantic.

Poromya granulata (Nyst), Caribbean Sea, 15–111 fath., and *P.? granatina*, sp. n., Yucatan Strait, 640 fath., Dall. *l. c.* pp. 108 & 109.

Eucharis (Recl.). Note on this genus; *id. l. c.* pp. 108 & 109.

Saxicavidæ.

Saxicava azaria, sp. n., Dall, *l. c.* p. 116, Florida, 13 fath.

Panopæa aldrovandi (Menard), found on the shore of the Gironde, near Huga, and also at Faro, Portugal; Fischer, J. de Conch. xxix. pp. 255 & 256.

Anatinidæ.

Pandora oblonga (Sow.), Florida and Yucatan Strait, 13 & 640 fath., Dall. *l. c.* p. 109.

Pandora (*Kennerlia*) *braziliensis* (Gould), E. A. Smith, P. Z. S. 1881, p. 40, pl. v. fig. 4, West Coast of Patagonia.

Myodora (Gray). List of known species, from Smith's monograph (P. Z. S. 1880) in JB. mal. Ges. viii. pp. 325–327.

Lyonsia formosa and *argentea*, spp. nn., Jeffreys, P. Z. S. 1881 [1882], p. 940, pl. lxx. figs. 1 & 2, Atlantic and Mediterranean.

Lyonsia bulla, sp. n., Dall, *l. c.* p. 107, Florida, 1920 fath.

Lyonsiella gemma, sp. n., Verrill, P. U. S. Nat. Mus. iii. p. 396 [1880], Southern New England, 487 fath.

Mytilimeria flexuosa, sp. n., Verrill & Smith, Am. J. Sci. (3) xxii. p. 302, South coast of New England, 312 fath.

Pholadomya arata, sp. n., *iid. l. c.* p. 301, South coast of New England, 69–130 fath., 36 mm. long.

Pholadomya loveni, sp. n., Jeffreys, *l. c.*, p. 934, pl. lxx. fig. 7, Atlantic and Mediterranean, 320–600 fath.

Hippagus (Lea, 1833), *Verticordia* (Wood, 1846), and *Pecchiolia* (Meneghini, 1851). A. Heilprin gives the history of these three groups, the original types of which are fossil shells, and comes to the conclusion that they are generically distinct. *H. acuticostatus* (Phil.) is also recent, and belongs to *Verticordia*; and *Lyonsiella abyssicola* (Sars, 1868) is generically distinct from all three. P. Ac. Philad. 1881, pp. 423–428.

Pecchiolia (Meneghini, 1851), preferred to *Verticordia* (S. Wood, 1844, pre-occupied in botany), *P. abyssicola* (Sars), animal described, *subquadrata*, *insculpta*, *sinuosa*, and *angulata*, spp. nn., Atlantic and Mediter-

ranean; Jeffreys, P. Z. S. 1881 [1882], pp. 931–933, the four latter pl. lxx. figs. 3–6.

Verticordia fischeriana and *elegantissima*, spp. nn., *ornata* (Orb.) and *acuticostata* (Phil.), Barbados and Cuba, 84–756 fath.; Dall, Bull. Mus. C. Z. ix. pp. 105–107.

Solenidæ.

Solen ensis (L.). Living specimens encumbered with common mussels; Jeffreys, P. Z. S. 1881, p. 929.

Solecurtus scopula (Turt., *Psammobia*) = *S. candidus* (Renier?), description of the animal; *id. l. c.* p. 927.

Tellinidæ.

Psammobia vespertina (Chemn.), perhaps = *Tellina albida* (L.); *P. intermedia* (Desh.) = *costata* (Hanl.), var. monstr.; Jeffreys, P. Z. S. 1881, p. 723.

Tellina tenella, sp. n., *id. l. c.* p. 721, pl. lxi. fig. 11, Cape Sagres, Atlantic. Some critical notes on other European species; *id. l. c.* pp. 718–720.

Tellina sybaritica, sp. n., Dall, *l. c.* p. 134, Yucatan Strait, 640 fath.

Macoma carlottensis, sp. n., Whiteaves, Rep. Geol. Survey of Canada, 1878–79 [1880], p. 190B, Charlotte Islands, N. W. America.

Donax. V. Bertin reviews this genus, and enumerates the species now in the Paris Museum, with full synonymy, critical notes, and indication of many precise localities; N. Arch. Mus. (2) iv. pp. 57–121.

Donax dussumieri, coast of Malabar, *erythræensis*, Red Sea, *proximus*, Japan, *incertus*, loc. unknown, *seychellarum*, Seychelle Islands, and *crassus*, loc. unknown, Bertin, *l. c.* pp. 95, 98, 99, 100, 106, & 118, pl. iii. figs. 2–7, and pl. iv. fig. 3. *D. radiatus* (Val.) *id. l. c.* p. 95, pl. iii. fig. 1. *D. veneriformis* (Lam.), Red Sea, Madagascar, Seychelle Islands, and Zanzibar, *id. l. c.* p. 113.

Donax trunculus (L.), the right valve overlaps the other; young shell, which is *D. bellardi* (Canefri), described; Jeffreys, P. Z. S. 1881, p. 724.

Iphigenia ambigua, West Coast of Central America, and *fragilis*, locality unknown; Bertin, N. Arch. Mus. (2) iv. pp. 120 & 121, pl. iv. figs. 4 & 1.

Paphiidæ.

Syndosmya renieri (Payr.), Mediterranean, distinct from *alba* (Boys), Northern Europe; Monterosato, Nat. Sicil. i.

Syndosmya lioica [*liæca*], sp. n., Florida, 30–805 fath., and *longicallis* (Scacchi), 860 fath., Dall, Bull. Mus. C. Z. ix. p. 133.

Mactridæ.

Mactra. H. C. Weinkauff continues his monograph in Küster's 'Conchylien-Cabinet,' Parts 302 & 305, pp. 37–68, pls. xiii.–xxiv., describing and figuring 34 species, including *M. jickelii*, sp. n., p. 54, pl. xix. figs.

1 & 2, Massowa, and *læbbeckiana*, sp. n., p. 60, pl. xxi. figs. 1 & 2, locality unknown.

Mactra (*Mulinia*) *lævicardo*, sp. n., E. A. Smith, P. Z. S. 1881, p. 39, pl. v. fig. 2, Cockle Cove, S. Patagonia.

Lutraria elliptica (L. [Lam.]). Account of the animal; Jeffreys, P. Z. S. 1881, p. 923.

Veneridæ.

Gouldia (C. B. Ad.). Dall defends the distinctness of the genus from *Circe*, type *cerina* (C. B. Ad.), Florida, 13 fath., Barbados, 100 fath.; *G. cubaniana* (Orb., *Venus*), Caribbean Sea, 54–539 fath.; Dall, Bull. Mus. C. Z. ix. pp. 128–130. [See also Astartidæ.]

Venus (*Dione*) *aquilatera*, sp. n., Martens, SB. nat. Fr. 1881, p. 66, Patagonia, 25 fath.

Venus. Critical notes on the European species and their synonymy; Jeffreys, *l. c.* pp. 714–718.

Venus casina (L.) var. *globosa* (Monterosato), *V. rusteruccii* (Payr.) = *casinula* (Desh.) = *ioenia* (Benoit), *V. multilamella* (Lam.) and *effossa* (Bivona), Mediterranean. Critical notes by Monterosato, Bull. Soc. mal. Ital. vi. pp. 247–250.

Chione gayi (Hupé), West Coast of Patagonia, E. A. Smith, P. Z. S. 1881, p. 38.

Tapes geographicus (Chemnitz) = *pullastra* (Mont.); Jeffreys, *l. c.* p. 717.

Cyrenidæ.

Velorita. E. A. Smith criticises Sowerby's monograph in Reeves' Conch. Ic. xii.; J. de Conch. xxix. pp. 38–42.

Corbicula fluminalis (Müll.) var. *crassula* (Mouss.), and var. *compressa* (Mouss.); Böttger, JB. mal. Ges. viii. p. 259, Agdschakabul, Transcaucasia.

Cyrena (*Corbicula*) *radiata* (Parr.)? from Lake Tanganyika; E. A. Smith, P. Z. S. 1881, p. 295.

Pisidium rambottianum, sp. n., Adami, Bull. Soc. mal. Ital. vii. p. 200, peaty ground at Lonato, prov. Brescia.

Pisidium pirothi, sp. n., Jickeli, JB. mal. Ges. viii. p. 340, Anseba, Abyssinia.

Cardiidæ.

Cardium aculeatum (L.), Bergen is probably an erroneous locality; *C. echinatum* (L.), note on its life; *C. edule* (L.), popular opinions and uses concerning it: Jeffreys, P. Z. S. 1881, pp. 706 & 709.

Cardium fragile, sp. n., Haren-Noman, Niederl. Arch. Zool. Suppl. 1, Barents Sea.

Cardium (*Fulvia*) *peramabilis*, sp. n., Dall, Bull. Mus. C. Z. ix. p. 132, Florida and Barbados, 54–111 fath.

Chamidæ.

Chama circinata (Monterosato, 1878), Mediterranean, description; Monterosato, Bull. Soc. mal. Ital. vi. p. 247.

Lucinidæ.

Loripes lena, sp. n., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 400, and Verrill, P. U. S. Nat. Mus. iii. p. 400, Cape Cod, &c., to 192 fath.

Loripes compressa, sp. n., Dall, *l. c.* p. 135, Yucatan Strait, 413–424 fath.

Loripes pertenuis, sp. n., E. A. Smith, P. Z. S. 1881, p. 41, pl. v. fig. 5, Straits of Magellan.

Axinus flexuosus (Mont.), varieties and synonymy; *A. orbiculatus* (Seguenza, *Verticordia*), *incrassatus* (Jeffr., 1876), *tortuosus* and *subovatus*, spp. nn., Bay of Biscay and Mediterranean; Jeffreys, P. Z. S. 1881, pp. 701 & 704, the four latter pl. lxi. figs. 5–8.

Diplodonta turgida, sp. n., Verrill & Smith, Am. J. Sci. (3) xxii. p. 303, South Coast of New England, 69 fath.

Diplodonta pilula, sp. n., Dall, Bull. Mus. C. Z. ix. p. 136, Gulf of Mexico, 339 fath.

Diplodonta lamellata, sp. n., E. A. Smith, P. Z. S. 1881, p. 38, pl. v. fig. 1, West Coast of Patagonia.

Kelliidæ.

Kellia nuculina, sp. n., Kerguelen, 50 fath., and *K. miliaris* (Philippi, 1845) = *consanguinea* (E. A. Smith), Magellan Straits; Martens, SB. nat. Fr. 1881, pp. 79 & 80.

Kellia magellanica, sp. n., E. A. Smith, P. Z. S. 1881, p. 41, pl. v. fig. 6, Magellan Straits.

Lasæa, Brown: generic name defended by Jeffreys, *l. c.* p. 699.

Montacuta pellucida, Mediterranean, and *ovata*, Bay of Biscay and Algiers, spp. nn., *id. l. c.* pp. 697 & 698, pl. lxi. figs. 3 & 4.

Scacchia tenera, sp. n., *id. l. c.* p. 696, pl. lxi. fig. 2, 'Porcupine' Expedition.

Decipula, g. n. Shell oval, thin, glossy, completely closed; cartilage triangular, clasping and supporting the hinge; in one valve a minute cardinal tooth, below the beak, and with a slight lateral on each side; in the other valve none, except a small angular projection of the hinge-plate. *D. ovata*, correction of *Tellimya ovalis* (Sars); *id. l. c.* p. 696, Norway and Bay of Biscay.

Lepton lacerum (Jeffr.), Bay of Biscay and Mediterranean, 35–70 fath.; *id. l. c.* p. 695.

Lepton rude (Dall, MS.), sp. n., Whiteaves, Rep. Geol. Surv. of Canada, 1878–79 [1880] p. 190 B, Queen Charlotte Islands, N. W. America.

Pythina setosa (Dkr., *Coralliophaga*) = *Scintilla recondita* (Fischer), and *P. geoffroyi* (Payr., *Erycina*,), Bay of Biscay and Mediterranean: notes on internal sculpture, &c.; Jeffreys, *l. c.* pp. 693 & 694. The first named *caillati* (Conti), Dunker's species being the young of *Cypricardia lithophagella*; id. *l. c.* p. 952.

Galeommatidæ.

Scintilla rotunda, spp. nn., Jeffreys, P. Z. S. 1881, p. 695, pl. lxi. fig. 1, Palermo, 48–70 fath.

Astartidæ.

Astarte (J. Sow., 1816). E. A. Smith gives a history of the genus, type *scotica* (Mat. & Rack.) = *sulcata* (Da Costa), and a critical list of the 26 recent species, with full synonymy; as to the question whether a crenulated or smooth margin of the valves may be a specific difference, the author comes to the result that crenulation is a mark of maturity in those species in which it is found; J. of Conch. iii. pp. 196–232. Jeffreys, *tom. cit.* pp. 233 & 234, contests the latter statement, and unites some forms into one species, which are distinguished by Smith. He also gives further critical notes on the European species, their synonymy and varieties; P. Z. S. 1881, pp. 711–713. *A. acuticostata* (Jeffr., 1877), and *pusilla* (Forbes), figured, pl. lxi. figs. 9 & 10.

Astarte magellanica, sp. n., Smith, *l. c.* p. 41, pl. v. fig. 7, Straits of Magellan, 20 fath.

Woodia (Desh.) is not to be separated from *Astarte*; Jeffreys, P. Z. S. 1881, p. 713.

Crassatella (Lam.). H. C. Weinkauff begins a monograph of this genus in Küster's 'Conchylien-Cabinet,' Part 307, 16 pp. 6 plates, describing and figuring 20 known species.

Crassatina, subg. n. of *Crassatella*, for the smaller species with crenated margin of the valves; *id. l. c.* p. 1.

Crassatella knockeri, sp. n., Smith, *l. c.* p. 491, Wydah, W. Africa.

Gouldia (C. B. Ad.) E. A. Smith discusses the original description of this genus and enumerates the species referred to it by various authors. He comes to the conclusion, that most of them, including one of C. B. Adams's original species, are small forms of the genus *Crassatella*, while *G. cerina* (C. B. Ad.), *minima* (Mont.), *australis* (Angas), and perhaps *dilecta* (Gould), belong to *Circe*. P. Z. S. 1881, pp. 489–491.

Crassatella (*Eriphyla*) *parva* (C. B. Ad., as *Gouldia*), Gulf of Mexico, 287–1568 fath.; Dall, Bull. Mus. C. Z. ix. pp. 131 & 129.

Cardita (*Actinobolus*) *velutinus*, sp. n., E. A. Smith, *l. c.* p. 42, pl. v. fig. 8, West Coast of Patagonia.

Carditella, g. n. Two cardinal teeth in the left valve, one in the right; two lateral teeth in each valve; external ligament small; internal cartilage minute, placed immediately beneath the apex of the valves. *C. pallida*, sp. n., West Coast of Patagonia. *Cardita tegulata* and *semen* (Rv.) belong also to this genus. E. A. Smith, *l. c.* pp. 43 & 44, pl. v. fig. 9.

Carditopsis, g. n., exteriorly like *Carditella*, but no external ligament; internal ligament considerably larger. For *Cardita flabellum* (Reeve). *Id. l. c.* p. 43.

Milneria, new name for *Ceropsis* (Dall, preoccupied); Dall, Am. Nat. xv. p. 718.

Isocardia cor (L.). Jeffreys maintains that *Kelliella abyssicola* (Sars) and *Venus miliaris* (Phil.) are its fry; P. Z. S. 1881, p. 710.

Pectinidæ.

Pecten lucidus, sp. n. [? Jeffr.], Haren-Noman, Niederl. Arch. Zool. Suppl. 1, Barents Sea.

Pecten pycnolepis, sp. n., East coast of Patagonia, 67 fath., and *clathratus*, sp. n., near Kerguelen; Martens, SB. nat. Fr. 1881, pp. 78 & 79.

Pecten sp., near *opercularis*; Verrill, P. U. S. Nat. Mus. iii. p. 403, N.E. Coast of America.

Amussium. Critical note on some European species by Jeffreys, *l. c.* pp. 949 & 950.

Amussium lucidum (Jeffr.), Florida, Havana, and Yucatan Strait, 13–804 fath.; Dall, Bull. Mus. C. Z. ix. p. 117.

Lima elliptica (Jeffr.). Anatomical notes on its tentacles by Haren-Noman, Niederl. Arch. Zool. Suppl. 1; abstract, J. R. Micr. Soc. (2) i. p. 432.

Unionidæ.

Adult specimens of *Unio tumidus* and *crassus* (Retz) with well preserved tubercles on the summits; Martens, SB. nat. Fr. 1881, p. 94.

Unio bardus (Bourg., MS.), *dubreuili*, and *balatonicus*, spp. nn., Servain, Hist. mal. Balaton, pp. 98–103, Lake Balaton, Hungary.

Unio tumidus var. n. *falcatulus*, Kharkov, *U. stevenianus* (Kryn., name only), Crimea and Transcaucasia, *stepanoffi*, Crimea, *mingrelicus*, *sieversi*, *raddii*, *colchicus*, all four from Mingrelia, and *araxenus*, river Araxes, spp. nn.; Drouet, Unionid. Russ. pp. 9–18.

Unio batavus (Lam.) var. *mingrelica* (Drouet), Böttger, JB. mal. Ges. viii. p. 256, pl. ix. fig. 24, Transcaucasia.

Unio desectus, sp. n., Peneus River, Thessalia, *decipiens*, sp. n., Lake of Scutari, *stevenianus* (Krynicki, ined.), Crimea and Transcaucasia, *gargottæ* and *aradæ* (Phil.), Sicily, *heldii* (Küster), Bavaria, Podolia, and river Saone, in France, *squamosus* (Charp.), Switzerland, Bavaria, and Albania, described by Drouet, J. de Conch. xxix. pp. 22–27.

Unio gaudroni, Bellegrade, near Constantinople, *succineus*, Dalmatia, *croaticus*, Korana River, Croatia, *brachyrrhynchus*, Mincio River and Lake of Garda, *neocomensis*, Lake of Neuchatel, spp. nn., and *prainosus* (Schmidt, 1840), France and Carniolia, *id. l. c.* pp. 244–248.

Unio luteolus (Lam.), several forms, found near Muscatine, in the Mississippi, are distinguished; *U. siliquoideus* and *ventricosus* (Barnes) belong to them: Witter, J. of Conch. iii. pp. 173–175.

Unio buckleyi and *buddianus* (Lea) united into one species, *U. blandingianus* (Lea) nearly allied, their distribution in Florida; Calkins, Valley Nat. ii. Sept. 1880.

Unio bolli, sp. n., R. E. Call, Am. Nat. xv. p. 290, Colorado River, Texas. Near *U. quadrans* (Lea).

Unio leai (Gray) var. n. *cinnamomeus*, Gredler, JB. mal. Ges. viii. p. 122, Hu-chen-fu, China.

Unio sculptus (Desh., 1873) = *douglasiæ* (Gray), N. China; Möllendorff, JB. mal. Ges. viii. p. 43.

Unio gladiator, sp. n., Ancey, Le Nat. iii. p. 468, Tongkin.

Unio burtoni (Woodw.), *nyassaensis* (Lea) with var. n. *tanganyicensis*, *U. tanganyicensis*, *thomsoni*, and *horii* (E. A. Smith, 1880), Smith, P. Z. S. 1881, pp. 297–299, pl. xxxiv. figs. 33–37, Lakes Nyassa and Tanganyika.

Anodonta. Notes on the difference of age, sex, and localities; Hazay, Mal. Bl. (2) iii. pp. 24–27. Variability of the American forms; R. E. Call, Am. Nat. xiv. [1880] p. 529.

Anodonta kleciaki, Dalmatia, *savensis*, Servia, *mœsica*, Servia, and *dorsuosa*, Saone River, Dep. Côte d'Or, spp. nn., Drouet, *l. c.* pp. 22–31.

Anodonta plattenica, *balatonica*, *tihanyca*, *tissoti*, *hydatina*, *aquatica*, *briandiana*, *renoufi*, *hazayana*, and *dubreuili*, spp. nn., Servain, Hist. mal. Balaton, pp. 104–125, Lake Balaton, Hungary.

Anodonta byzantina and *gaudroni*, Constantinople, *wimmeri* and *dokici*, Servia, *nymphigena* and *dealbata*, Carinthia, spp. nn., *id. l. c.* pp. 249–254.

Anodonta ostiaria, mouth of the Dnieper, *parmata*, Southern Russia, *sieversi*, Mingrelia, *georgiana*, Caucasus, *cyrea*, Kur River, *lenkoranensis*, Transcaucasia, spp. nn., *id.* Unionid. Russ. pp. 26–30.

Anodonta grandis (Say). On its local and sexual variations, among which are *A. plana* and *decora* (Lea), *hockingensis* and *somersi* (Moores, MS.): R. E. Call, Am. Nat. xiv. [1880] p. 529; J. of Conch. iii. p. 186.

Pliodon spekii (Woodw.), Lake Tanganyika; E. A. Smith, P. Z. S. 1881, p. 296, pl. xxxiv. fig. 31.

Spatha tanganyicensis (E. A. Smith, 1880), *id. ibid.* pl. xxxiv. fig. 32, Lake Tanganyika.

Spatha (*Mutela*) *hirundo*, sp. n., Martens, SB. nat. Fr. 1881, p. 122, Quango, Angola.

Mytilidæ.

Mytilus fischerianus (Tapp.-Canefri), Tom Bay, W. Coast of Patagonia; E. A. Smith, P. Z. S. 1881, p. 43.

Modiola polita, sp. n., Verrill & Smith, Am. J. Sci. (3) xx. [1880] p. 400, N.E. Coast of America, 238 fath.; ? = *Mytilus luteus* (Jeffr., 1880), Gulf of Mexico, 339 fath.; Dall, Bull. Mus. C. Z. ix. p. 116.

Modiolaria discors (L.). Anatomical notes by Haren-Noman, Niederl. Arch. Zool. Suppl. 1; abstract in J. R. Micr. Soc. (2) i. p. 432.

Aviculidæ.

Avicula hirundo (?) L. var. n. *nitida*. Verrill, P. U. S. Nat. Mus. iii. p. 402, Coast of Southern New England, 192 fath.

Arcidæ.

Arca polii (Mayer, 1868) = *antiquata* (Poli, *nec* L.) = *diluvii* (Philippi, *nec* Lam.), Mediterranean; Monterosato, Bull. Soc. mal. Ital. vi. p. 245.

Arca corbuloides (Monterosato, 1878), Mediterranean, new description ; *id. l. c.* p. 246.

Arca glomerula and *polycyma*, spp. nn., and *pectunculoides* (Scacchi) var. n. *orbiculata*, Dall, Bull. Mus. C. Z. ix. pp. 121 & 122, Havana and Barbados, 100–1568 fath.

Macrodon (Lycett, 1845). Type fossil in the lower oolite, a recent species, *M. asperula*, sp. n., Yucatan Strait, 310–1568 fath. ; *id. l. c.* p. 120.

Limopsis minuta (Phil.), Gulf of Mexico, 30–805 fath., teeth variable in number, and *L. antillensis*, sp. n., Havana, 80 fath. ; *id. l. c.* p. 119.

Limopsis cancellata, sp. n., Martens, *l. c.* p. 66, Eastern Australia.

Nuculidæ.

Nucula cancellata, new name for *reticulata* (Jeffreys, 1876, preoccupied) ; Jeffreys, P. Z. S. 1881 [1882], p. 951.

Nucula cytherea, sp. n., *crenulata* (A. Ad.), and *tenuis* (Mont.), Dall, *l. c.* p. 123, Yucatan Strait and Havana, 30–800 fath.

Leda carpenteri and *solida*, sp. n., *L. vitrea* (Orb.) var. n. *cerata*, Barbados and Havana, 100–450 fath., and notes on some known Caribbean species ; *id. l. c.* pp. 124–126.

Neilonella, subg. n. of *Leda*, shell not gaping, epidermis polished, ligament central. *Leda* (*N.*) *corpulenta*, sp. n., Havana, 190–450 fath. ; *id. l. c.* pp. 125 & 126.

Yoldia solenoides and *liorhina*, spp. nn., *id. l. c.* pp. 127, Gulf of Mexico, 118–1568 fath.

Yoldia isonota, sp. n., Martens, *l. c.* p. 79, Kerguelen, 10–15 fath.

Malletia magellanica (Smith), E. A. Smith, P. Z. S. 1881, p. 39, pl. v. fig. 3, W. Coast of Patagonia.

Ostreidæ.

Ostrea edulis (L.). Numerical statements concerning the multiplication and breeding of the oyster at Arcachon by M. Brocchi in the 'Journal Officiel' of France, 1881 ; abstract in Ann. Sci. Nat. (6) xii. Art. 6, 1 p.

Polyzoa are not noxious to oysters, but the perforating Sponge, *Cliona celata*, is very detrimental, and a small Annelid, *Leucodora sanguinea*, is also partly injurious ; Giard, Bull. Sci. Nord. (2) iv. pp. 70–73.

Observations on the excavations of oyster-shells by the young of *Cliona* ; N. Nassonow, Zool. Anz. iv. p. 459.

Abstract of Brooks's paper on the development of the American Oyster, 1880, in Arch. Z. expér. ix. p. xxviii.

Ostrea cochlear (Poli). Note on its occurrence in the Mediterranean by Monterosato, Bull. Soc. mal. Ital. vi. p. 244.

Account of artificial fertilization of the Cadiz Oyster by F. Winslow, Am. Nat. xv. pp. 57 & 58. W. Dall suggests that this may be the 'Portuguese Oyster' of the French, which appears to be identical with *Ostrea virginiana* ; tom. cit. p. 707. [Perhaps *Gryphæa angulata* (Lam.).—Rec.]

Acclimatation and multiplication of *Gryphæa angulata* in the Gironde ; *suprà*, Generalities, Historical Changes.

MOLLUSCOIDEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

BARROIS, J. Métamorphose des Pedicellines. C. R. xcii. pp. 1524 & 1525.

——. Membranes embryonales des Salpes. J. de l'Anat. Phys. xvii. pp. 455–498, 2 pls.

BENEDEN, E. VAN. Cœlome chez les Ascidiens. Zool. Anz. iv. pp. 375–378, and C. R. xciii. pp. 1238–1241.

BUSK, G. Descriptive Catalogue of the species of *Cellepora* collected on the 'Challenger' Expedition. J. L. S. xv. pp. 341–356, with 4 woodcuts.

——. On the use of the chitinous elements or appendages of the Cheilostomatous *Polyzoa* in the Diagnosis of Species. Rep. Brit. Assoc. 1881, pp. 662 & 663.

——. Supplementary Note respecting the use to be made of the chitinous organs in the *Cheilostomata* in the diagnosis of species, and more particularly in the genus *Cellepora*. J. L. S. xv. pp. 357-362, pls. xxvi. & xxvii.

——. Notes on a peculiar form of *Polyzoa* closely allied to *Bugula* (*Kinetoskias*, Kor. & Dan.); Q. J. Micr. Sci. xxi. pp. 1–14, 2 pls.

DELLA VALLE, A. Nuove Contribuzioni alla Storia naturale delle Ascidie composte del golfo di Napoli. Atti Acc. Rom. (3) Trans. vi. p 14.

GIARD, A. Sur l'embryogénie des Ascidies du genre *Lithonephria*. C. R. xcii. pp. 1350–1352.

GOLDSTEIN, J. R. Y. 'Challenger' *Bryozoa* from Marion Island. Tr. R. Soc. Vict. xvii. (June, 1881), 8 pp. 2 pls.

HAMM, H. Die Bryozoen des Mastrichter Ober-Senon. I. *Cylostomata*. Dissert. inaug. Berlin: 1881, 8vo, 47 pp.

HERDMAN, W. A. Notes on British *Tunicata*. J. L. S. xv. pp. 274–289, pls. xiv.–xix.

[HERDMAN, W. A.]. Preliminary Report on the *Tunicata* of the 'Challenger' Expedition. Part iii. P. R. Soc. Edinb. xi. pp. 52–88 ; pt. iv. pp. 233–240.

——. Olfactory Tubercle of Simple Ascidians. P. Phys. Soc. Edinb. 1881, 14 pp. ; abstract in J. R. Micr. Soc. (2) i. p. 726.

——. On individual Variation in the branchial sac of Simple Ascidians. J. L. S. xv. pp. 329–332.

HINCKS, T. Contributions towards a general history of the marine *Polyzoa*. Ann. N. H. (5) vii. pp. 147–161, pls. viii.–x., & viii. pp. 1–14, & 122–136, pls. i.–v.

JOLIET, L. Sur le bourgeonnement du Pyrosome. C. R. xcii. pp. 473–475.

——. Remarques sur l'anatomie du Pyrosome. *L. c.* pp. 1013–1015.

JULIN, C. Recherches sur l'organisation des Ascidies simples. Arch. Biol. ii. pp. 59–126, & pp. 211–232, 4 pls.

——. Étude sur l'hypophyse des Ascidies et sur les organes qui l'avoisinent. Bull. Ac. Belg. (3) i. pp. 151–170 & 895–900.

JULLIEN, J. Remarques sur quelques espèces de Bryozoaires Cheilostomiens. Bull. Soc. Z. Fr. 1881, pp. 163–168.

MACGILLIVRAY, P. H. On two new genera of *Polyzoa*. Tr. R. Soc. Vict. xvii. pp. 15–18, pl.

——. On some new species of *Catecinella* and *Dictyopora* ; and on *Urceolipora*, a new genus of *Polyzoa*. L. c. pp. 81–87, pl.

REINHARD, W. Zur Kenntniss der Süsswasser-Bryozoen. Zool. Anz. iv. p. 345.

RIDLEY, S. O. *Polyzoa* in : Account of the zoological collections of H.M.S. 'Alert,' in the Straits of Magellan and on the Coast of Patagonia. P. Z. S. 1881, pp. 44–61, pl. vi.

——. *Polyzoa* of Franz-Josef Land. Ann. N. H. (5) vii. pp. 442–457, pl. xxi.

SALENSKY, W. Neue Untersuchungen über die embryonale Entwickelung der Salpen. Zool. Anz. iv. pp. 597–603 & 613–619.

ULIANIN, B. Über die embryonale Entwicklung des *Doliolum*. Zool. Anz. iv. pp. 473–476 & 575.

WATERS, A. W. The Use of the Opercula in the Determination of the Cheilostomatous *Bryozoa*. P. Manch. Soc. xviii. pp. 8–11.

BRACHIOPODA.

P. OEHLERT recapitulates very ably the statements concerning the geographical and bathymetrical distribution of the Brachiopods contained in Davidson's Report of the 'Challenger' *Brachiopoda*. J. de Conch. xxix. pp. 61–67.

9 species of Brachiopods, dredged in the Gulf of Mexico and the Caribbean sea, 80–640 fath., by the U. S. Coast Survey Steamer 'Blake,' enumerated by W. DALL, Bull. Mus. C. Z. ix. pp. 103 & 104.

Terebratula sphenoidea, sp. n. [Philippi, 1844, foss.?], recent specimen dredged on the Atlantic Coast of Spain; A. Milne Edwards, C. R. xciii. p. 934.

Waldheimia, *Argiope* and *Rhynchonella*. Median septum not constant in all species. JEFFREYS, P. Z. S. 1881, pp. 948 & 949.

TUNICATA.

The late F. M. BALFOUR in his "Treatise on Comparative Embryology," vol. ii. (London: 1881), places the *Tunicata* under the name of "*Urochorda*" between the *Cephalochorda* (*Branchiostoma* or *Amphioxus*), and the *Elasmobranchia* (sharks and rays), and subdivides them as follows:—

I. CADUCICHORDATA.
- (*a*) *Simplicia*: *Solitaria* (*Ascidia*).
  Socialia (*Clavellina*).
- (*b*) *Composita*: *Sedentaria* (*Botryllus*).
  Natantia (*Pyrosoma*).
- (*c*) *Conserta*: *Salpidæ*.
  Doliolum.

II. PERENNICHORDATA (*Appendicularia*).

He describes the chief features of generation and development in these animals in his usual concise and clear manner, chiefly from the observations of Kowalewsky, Huxley, and Krohn, with several woodcuts.

E. PERRIER, in "Les colonies animales" (Paris: 1881, 798 pp.), discusses the *Tunicata* in pp. 378–401 (more particularly *Pyrosoma*), pp. 378 & 388, the *Salpæ*, pp. 389–391, and the compound Ascidians (pp. 391–396). He gives a general account of the morphology and development of these animals, and comes to the same general conclusion as Häckel, viz., that in the compound lower animals no absolute difference between organs and individuals is to be traced. The eggs in *Pyrosoma* belong, according to him, properly to the cyathozoid, but they are, as it were, handed over by it to the following really male individuals, and grow at their expense, somewhat like parasites; in *Salpa* and some Ascidians also, the egg is contemporary with the individual which bears it, and rather its younger brother than its child. The tailed larva is, according to him, typical for the *Tunicata*, the exceptions are abbreviations of development. With regard to general form, the fixed colonies (e.g., *Botryllus*) more resemble a Radiate animal, and their individuals are rather more independent; swimming colonies, on the contrary, as *Pyrosoma* (and the *Siphonophora*) exhibit a higher degree of partition of work, and the whole more resembles the complex organism of a higher animal.

The literature of the *Tunicata* for 1880 is recorded by H. FOL in Zool. JB. Neap. ii. pt. 3, pp. 1–3.

Firth of Forth. *Tunicata* enumerated by HERDMAN. P. Phys. Soc. Edinb. vi.

Naples. New compound Ascidians, A. DELLA VALLE. Atti Acc. Rom. (3) Trans. vi. p. 14 ; abstract in Ann. N. H. (5) viii. p. 455.

The *Cynthiidæ* and *Molgulidæ* collected during the 'Challenger' expedition, are described by HERDMAN, P. R. Soc. Edinb. xi. pp. 52–88, & 233–240. Several new abyssal species have an exceedingly wide distribution. *Culeolus*, *Styela*, and *Abyssascidia* are the only genera found in depths exceeding 500 fath.

R. O. CUNNINGHAM'S paper on the *Tunicata* of Magellan Straits, in Tr. L. S. xxvii. [1871], has been omitted from the former Records; it contains descriptions of several then new species of Ascidians and 1 new genus, the latter will be mentioned hereafter.

ASCIDIÆ.

E. VAN BENEDEN, having examined the development of the mesoderm, heart, and sexual organs in *Phallusia*, *Ciona*, *Perophora*, and *Clavellina*, comes to the conclusion that a cœlom, or true abdominal cavity, exists only in the larval stage in the Ascidians; the epithelial cells, which line it, expand afterwards, and closing together form a continuous mass or secondary mesenchym, which is, by its origin, distinct from the primitive mesenchym of the *Cœlenterata* and *Vertebrata*. The pericardial cavity of the Ascidians is, according to him, homologous to that of the *Vertebrata*. Zool. Anz. iv. pp. 375–378, & C. R. xciii. pp. 1238–1241 ; abstract in J. R. Micr. Soc. (2) i. p. 727, & ii. p. 180.

C. JULIN describes the organization of the simple Ascidians, and particularly some of their finer histological structure ; he terms the side of the endostyle 'ventral,' and the space between the oral and cloacal orifice 'dorsal,' regarding the oral orifice as the homologue of the mouth of the *Vertebrata* ; and he finds that the body wall of an Ascidian is formed of the same parts as that of *Amphioxus*. The epibranchial and peritoneal grooves are invested by a vibratile epithelium, and they probably drive the nutrient matters towards the œsophagus. The ganglion consists of an external layer of grey matter, solely formed of unipolar ganglionic cells, and of an inner white substance, formed of nerve fibrils and smaller nerve-cells. In all Ascidians there is a glandular organ, which, in situation, relations, texture, and probable origin, may be regarded as the homologue of the hypophysis cerebri of the *Vertebrata*. It is situated immediately below the brain, and contains an excretory canal, which opens by a ciliated infundibulum into the buccal region ; its orifice is situated on a special tubercle, which has not, as supposed, any olfactory function. In *Phallusia mammillata* the efferent duct of this organ has several branches, which open into the peribranchial cavity.—Further studies lead the author to suggest that this 'hypophysis' may be an excretory organ, and functionally comparable to a kidney. Unlike most glands, there is more than one excretory orifice ; 128 ciliated infundibula were found completely developed in one not adult individual. Arch. Biol. ii. pp. 59–127 & 211–232, with 5 plates. Abstracts in J. R. Micr. Soc. (2) i. pp. 590–592 & 726; also in Bull. Ac. Belg. (3) i. pp. 151–170 & 895–900, in Arch. Z. expér. ix. p. 30, and in Kosmos, ix. p. 387.

The same so-called 'olfactory' tubercle has been the object of new researches by W. A. Herdman, who records a remarkable variability in it, not only as to genus and species, but even in the same species; he also has "grave doubts on the sensory function of this organ." P. Phys. Soc. Edinb. 1881, 16 pp.; abstract in J. R. Micr. Soc. (2) i. p. 726.

A. della Valle gives preliminary anatomical notes on the larvæ and adult stages of several compound Ascidians; he states that the axial cord in the tail of the larvæ is a cylindrical canal full of a transparent and colourless liquid, that the amœboid cells move about in the common mantle, that the endostyle is a gland, and that the circulation of the blood takes place exclusively by lacunæ; he has found a special oviduct in the *Botryllidæ*, analogous to that of the *Salpæ*; he also states the continuity of the ganglion with the vibratile groove. Particular attention is given to the relations of the peritoneal sac, which is, according to him, bilobed and interposed between the two primary sacs; his observations on the development of the buds and of the embryo in the egg lead him to the conclusion that the Ascidians belong to the entrocœlous type. Atti Acc. Rom. (3) Trans. vi. pp. 14 & 15; abstract in Ann. N. H. (5) viii. p. 455.

The segmentation of the egg of *Lithonephria* is described, with critical remarks, by A. Giard, C. R. xcii. pp. 1350–1352; abstract in J. R. Micr. Soc. (2) i. pp. 592 & 593 and Ann. N. H. (5) viii. pp. 64-66. The so-called cellulæ of the green layer or of the granulosa do not belong originally to the yelk, but originate from the follicle.

W. A. Herdman notes several remarkable variations in the structure of the branchial sac observed in specimens of one species, viz., one fold only on the right and none on the left side, instead of four folds on either side, in *Styela grossularia* (Beneden); the unequal or equal size of the transverse vessels in *Ascidia plebeia* (Alder); five to ten stigmata within the single meshes in *Ciona intestinalis* (L.); the presence or absence of delicate horizontal vessels, placed irregularly between the transverse vessels, and dividing the meshes into two parts, in *Ascidia aspersa* (Müll.). J. L. S. xv. pp. 329-332.

Ascidiæ simplices.

Corella parallelogramma, *Ascidia scabra* and *compressa*, *Phallusia mentula*, *mammillata*, and *venosa*, are minutely described anatomically by C. Julin, Arch. Biol. ii. pp. 56–127, and Bull. Ac. Belg. (3) i. pp. 151-170 & 895–900.

The family of *Cynthiidæ* is re-defined with *Boltenia*, *Culeolus*, g. n., and probably *Cystingia*, Macl., in a third sub-family *Bolteni[i]næ*; Herdman, P. R. Soc. Edinb. xi. pp. 52 & 53.

Microcosmus helleri, Australia, and *propinquus*, Bass's Straits, spp. nn., *id. l. c.* pp. 54 & 55.

Cynthia cerebriformis, Port Jackson, *fissa*, Bass's Straits, *formosa*, and *arenosa*, Torres Straits, *irregularis*, Port Jackson, *hispida*, Bass's Straits, and *complanata*, Port Jackson, spp. nn.; *id. l. c.* pp. 57–62.

Polycarpa pedata and *irregularis*, Philippines, *sulcata*, Banda, *pilella*, Bahia, *viridis* and *radicatus*[-*ta*], Port Jackson, *molguloides* and *rigida*, Bass's Straits, *longisiphonica*, Port Jackson, *quadrata*, Ki Island, 129 fath., and *minuta*, South of Kerguelen Island, 150 fath., spp. nn.; *id. l. c.* pp. 71–62.

Styela bythia and *squamosa*, South of Australia, 2600 fath., *flava* and *glans*, off Buenos Aires, 600 fath., *grandis* and *convexa*, South of Kerguelen Island, 150 fath., *lactea*, Kerguelen, 10–100 fath., *exigua*, Port Jackson, and *clava*, Kobe, Japan, 8–50 fath., spp. nn.; *id. l. c.* pp. 63–70.

Ascidia lata, *fusiformis*, *truncata*, *triangularis*, *patoni*, and *exigua*, spp. nn., *aspersa* (Müll.) = *pustulosa* (Alder) = *cristata* (Heller), *scabra* (Müll.), *muricata* (Hell.), *obliqua* (Ald.), *depressa* (Ald.), and *plebeia* (Ald.), all British, described and characteristic parts of them figured; *id.* J. L. S. xv. pp. 377–388, pls. xiv.–xix.

Ciona is, in the arrangement of its intestine, intermediate between *Corella* and *Ascidia*, and probably a more primitive form; *id. l. c.* pp. 274–276, woodcuts.

Boltenia elegans, south of Halifax, 51 fath., and *pachydermatica*, New Zealand, spp. nn.; *id.* P. R. Soc. Edinb. xi. pp. 80 & 81.

Culeolus, g. n.; stalked as the preceding, branchial aperture trilobed, branchial sac longitudinally folded, consisting of longitudinal and transverse bars, without stigmata, the fine longitudinal vessels being absent. *C. murrayi*, east of Japan, 2300 fath., *wyville-thomsoni*, north of the Kermadec Islands, 500 fath., *recumbens* and *perlucidum* [sic], between Cape of Good Hope and Kerguelen Island, 1375 & 1600 fath., *suhmi*, East coast of North America, 1700 fath., and *moseleyi*, centre of the Pacific, 2425 fath., spp. nn.; *id. l. c.* pp. 82–88.

Molgula pedunculata, South of Kerguelen Island, 150 fath., *horrida* Falkland Islands, *forbesi*, Port Jackson, and *pyriformis*, off Buenos Aires, 600 fath., spp. nn., and several known species from the 'Challenger' Expedition mentioned; *id. l. c.* pp. 233–236.

Eugyra kerguelenensis, sp. n., *id. l. c.* p. 237, Kerguelen Island, 10–110 fath.

Lithonephria eugyranda (Lac. Duth., *Ctenicella*), its affinities and first development; Giard, C. R. xcii. p. 1350.

Ascopera, g. n.; body pyriform, more or less pedunculated, attached, test thin; seven folds on either side of the branchial sac; stigmata straight or curved, but not arranged in spirals. *A. gigantea* and *pedunculata*, spp. nn., South of Kerguelen Island, 150 fath.; Herdman, P. R. Soc. Edinb. 1881, pp. 238 & 239.

Ascidiæ Compositæ.

Distaplia, g. n. Colony pedunculate or sessile, individuals arranged into a ramified cœnobium; they have the form of the *Didemnidæ*, but are provided with an ectodermic process; branchial sac with four rows of fissures, walls of the stomach smooth, &c. Della Valle, Atti Acc. Rom. (3), Trans. vi., p. 14, from Naples; abstract in Ann. N. H. (5) viii. p. 455.

Goodsiria coccinea, g. & sp. nn., Cunningham, Tr. L. S. xxvii. [1871] p. 489, pl. lviii. fig. 3, Straits of Magellan.

Luciæ.

L. Joliet remarks upon the nervous and colonial nervous system of *Pyrosoma giganteum*; with regard to the development, he states that the four ascidiozooids near the closed extremity of the colony cannot be the four primitive individuals, these being pushed forwards by the whole of their progeny; he comes to the conclusion that the cæoblast acts as a reserve for the young animal at the time when nutrition has not commenced or is insufficient, and he compares the agamic *Salpa* with the Cyathozoid, the sexual *Salpa* with the sexual *Pyrosoma*; the whole difference is, that the sexual *Pyrosoma* produces by gemmation other individuals, which are similar to itself. As to the gemmation, he comes to the conclusion that the bud originally consists of three layers, originating from the parent individual, that the sexual elements are contained in the middle layer, and that the participation of the sexual organs in the gemmation is reduced to the extension of this middle layer into the bud. C. R. xcii. pp. 473–475 & 1013–1015, also Ann. N. H. (5) vii. pp. 492 & 493.

The peribranchial spaces or lateral atria of *Pyrosoma* are produced by the mesoderm, according to observations in sufficiently young buds; *id. l. c.* pp. 473–475, abstract in J. R. Micr. Soc. (2) i. p. 438.

SALPÆ.

J. Barrois has observed the development of *Salpa maxima*, and states that three parts are concerned in the formation of the embryo and its appendages, of which two (the follicle and an expansion of the wall of the branchial sac) are developed from the mother, and the third is formed from the egg; he compares the two former parts with two incubatory pouches and the maternal placenta, the third with the allantois of the *Mammalia*. He also comes to the conclusion that the different species of *Salpa* exhibit remarkable differences in their embryogeny, which will account for the different statements given by Salensky and Todaro. J. de l'Anat. Phys. xvii. pp. 455–498, 2 pls.; abstract in J. R. Micr. Soc. (2) ii. pp. 182 & 183.

W. Salensky gives a preliminary account of his new researches into the embryonal development of *Salpa*. Having observed it in several species, he comes to the result that it exhibits very remarkable differences in different species, and that the discrepancies between his own former observations and those of Todaro may be caused by the circumstance that each has observed different species. He considers the development of *Salpa* as a peculiar sort of gemmation, which he terms follicular. Zool. Anz. iv. pp. 597–603 & 613–618; abstract in J. R. Micr. Soc. (2) ii. pp. 32 & 33.

Cyclomyaria.

B. Ulianin gives preliminary notes on the development of *Doliolum*,

sp. n. ?, from the egg into a tailed larva, and its metamorphosis into the definitive form, the annular muscles of which begin to act when the tail of the larva has disappeared. Zool. Anz. iv. pp. 473–476 & 575 ; abstract in J. R. Micr. Soc. (2) i. pp. 879 & 880.

Appendiculariæ.

E. Moss's paper on the anatomy of *Appendicularia*, Tr. L. S. xxvii. [1871] pp. 299–304, pl. xlvii., has hitherto been omitted from Zool. Rec.

POLYZOA.

E. Perrier, in 'Les Colonies Animales" (Paris : 1881), discusses the *Polyzoa* in pp. 326–377. He gives a general outline of their organization, considering the cystid and polypid as two distinct individuals morphologically, though functionally they act as one individual ; in the polypid, however, the actions of life are more energetic, and its force is therefore sooner exhausted, so that it dies before the cystid, which produces a new polypid individual by gemmation.

The literature of the *Polyzoa* for 1880 is recorded by J. W. Spengel in Zool. JB. Neap. ii. pt. 1, pp. 336–347.

A large colonial Bryozoon found in the Lake of Ritom, Piora Valley, Switzerland, 1829 mètres above the sea, by Asper, Arch. Sci. Nat. iv. p. 406.

Arctic Sea, Franz-Josef Land. 19 species of *Polyzoa*, including *Anarthropora monodon* (Smitt), *Mucronella ventricosa* (Hassall), *Crisia denticulata* (Lam.), and *Heteropora pelliculata* (Waters), not before known from the Arctic Seas, the last not even from European seas or the Atlantic, collected by B. Leigh Smith, described by Stuart O. Ridley, Ann. N. H. (5) vii. pp. 442–457, pl. xxi.

Glacial Sea of Siberia. Some *Polyzoa* mentioned by Stuxberg, Sv. Ak. Handl. Bih. v. No. 22, pp. 47, 49, 52, 53, 54, 56.

Firth of Forth. *Polyzoa* enumerated by Leslie & Herdman, P. Phys. Soc. Edinb. vi.

Mediterranean. G. Seguenza's work on the tertiary *Bryozoa* from Reggio, in Calabria, Mem. Acc. Rom. vi., 445 pp., 17 pls., may be mentioned here, as being an important subject of comparison for the recent fauna of the Mediterranean. Some critical notes about it in J. R. Micr. Soc. (2) i. pp. 594 & 595.

New foreign *Polyzoa* by T. Hincks, Ann. N. H. (5) vii. pp. 147–151, pls. viii.–x. and viii. pp. 129–135, pl. v.

Descriptions of 27 new species of *Cellepora* collected during the 'Challenger' Expedition by G. Busk, J. L. S. xv. pp. 341–356. The most remarkable as to geographical distribution is *Cellepora catanensis*, sp. n., found at Kerguelen Island and in Magellan Straits, in various depths from 5 to 1325 fath. ; *C. solida*, sp. n., has been found in a depth of 2600 fath. in 42° S. lat. and 134° E. long.

Straits of Magellan, S. Brazil, and S. Chili. 33 species of *Polyzoa* collected on the expedition of H.M.S. 'Alert,' among which are some identical with European recent or fossil species and several new, are enumerated by S. O. Ridley, P. Z. S. 1881, pp. 44–61, pl. vi. The genus

Chaunosia has one species in Magellan Straits and the other at the Cape of Good Hope; a species of *Pedicellina* is probably identical with one observed at Kerguelen Island. Generally, however, the facies of the fauna is Atlantic rather than Australian or Novo-Zelandian.

Australia. New *Bryozoa* by P. H. MacGillivray, Tr. R. Soc Vict. xvii. pp. 15–18, 84–87; abstract in J. R. Micr. Soc. (2) i. p. 593.

Bass's Straits. 90 species of *Polyzoa* collected by Capt. Warren, 22 of which are European and 23 apparently new (described); Hincks, Ann. N. H. (5) viii. pp. 1–14 & 122–129. The enumeration of all the species will be given in Tr. Liverp. Soc. Some new species of *Cellepora* by Busk, J. L. S. xv. p. 345.

New species of *Cellepora* from a depth of 2600 fath. in the Australian region, and another from 1325 mentioned by G. Busk, J. L. S. xv. p. 357.

Marion Islands. 5 new species described by J. R. Goldstein, P. R. Soc. Vict. xvii. (June, 1881). [Not seen by the Recorder.]

CHILOSTOMATA.

G. Busk points out the importance of the chitinous appendages, avicularia and opercula, for the diagnosis of genera and species, and describes the method of studying them by dissolving the calcareous matter, staining the rest with picrocarmine, and covering it with glycerine; Rep. Brit. Ass. 1881, pp. 602 & 603, and J. L. S. xv. pp. 357–362, pls. xxvi. & xxvii. A paper on the same subject by A. W. Waters, Pr. Manch. Soc. xviii. pp. 8–11.

Catenicellidæ.

Catenicella concinna, p. 84, fig. 1, and *wilsoni*, p. 85, fig. 2, spp. nn., MacGillivray, Tr. R. Soc. Vict. xvii., Port Phillip Heads, Australia.

Eucrateidæ.

Gemellaria loriculata (L.), specimen from Franz-Josef Land; Ridley, Ann. N. H. (5) vii. p. 445, pl. xxi. fig. 1.

Fam. —— ?

Urceolopora, g. n. Resembling *Calwellia*, but the individual cells arranged alternately. *U. nana*, sp. n. (Port Phillip Heads?), MacGillivray, *l. c.* p. 85, pl., fig. 3; J. R. Micr. Soc. (2) i. p. 594.

Cellulariidæ.

Caberea grandis, sp. n., Hincks, Ann. N. H. (5) viii. p. 2, pl. iii. fig. 4, Bass's Straits.

Menipea arctica (Busk), variety with two spines on upper margin of cells; Ridley, Ann. N. H. (5) vii. p. 444, Franz-Josef Land.

Scrupocellaria scabra (Bened.), note on specimens from Franz-Josef Land; *id. ibid.*

Bicellariidæ.

Diachoris distans, sp. n., South Africa, *intermedia*, sp. n., Tasmania, and *hirtissima* (Heller), var. n. *robusta*, Algiers, Hincks, Ann. N. H. (5) viii. pp. 132 & 133, pl. v. figs. 4–6, 8 & 9.

Diachoris bilaminata, sp. n., *id. op. cit.* vii. p. 157, pl. viii. fig. 7, New Zealand, with a list of the known species of this provisional genus.

Chaunosia fragilis, sp. n., Ridley, P. Z. S. 1881, p. 45, pl. vi. fig. 1, Straits of Magellan, 7–10 fath.

Cinetoskias (Koren & Dan.); notes on it by G. Busk, Q. J. Micr. Sci. xxi. pp. 1–14, 2 pls.

Farciminariidæ.

Malakosaria, g. n. Zoarium chitinous, flexible; cells raised, flat, rounded, or tubular, not bounded by raised lines. *M. pholaramphos*, sp. n, Marion Islands, Goldstein, Tr. R. Soc. Viet. xvii. (June, 1881), figured.

Tuliparidæ.

Epicaulidium, g. n. Zoarium calcareous, composed of a creeping base and erect stems, made up of internodes linked together at their extremities by corneous joints, on which the zoœcia are borne in companies; zoœcia erect, clavate, with a small, oblique, subterminal orifice, several united together longitudinally into a cluster, the clusters opposite, free, except at the base, attached by corneous joints to the internodes. *E. pulchrum*, sp. n., Jamaica, Hincks, Ann. N. H. (5) vii. p. 156, pl. x. fig. 5. The author proposes a new family, *Epicaulidiidæ*, for it. Afterwards he has found out that it is *Cellaria tulipifera* (Ellis & Solander), gen. *Tuliparia* (Blainv.) and *Liriozoa* (Lam.); Ann. N. H. (5) viii. p. 135.

Membraniporidæ.

Membranipora sophiæ (Busk) ? and *craticula* (Alder), specimens from Franz-Josef Land described, the former figured; Ridley, Ann. N. H. (5) vii. pp. 446 & 447, pl. xxi. fig. 2.

Membranipora coronata, Singapore or the Philippines, *terrifica*, Straits of Magellan, *rubida*, Australia, *bicolor*, West Australia, *bellula*, Ceylon, Madagascar and Cape Verde Islands, *patula*, California, *setigera*, Australia, *permunita*, Bass's Straits, spp. nn., and notes on *M. spinosa* (Quoy & Gaim.) = *ciliata* (MacG.), Kerguelen, Australia, and Arabian Sea, *denticulata* (MacG.), Victoria and Bass's Straits, *cervicornis* (Busk), same localities; Hincks, Ann. N. H. (5) vii. pp. 147–155, pls. viii.–x.

Membranipora amplectens, Australia, *velata*, *circum-clathrata*, and *variegata*, California, spp. nn., *id. op. cit.* viii. pp. 130–132, pl. iii. fig. 7, pl. v. figs. 1–3.

Membranipora lacroixi (Aud.) and *curvirostris* (Hincks), specimen from Southern Brazil; Ridley, *l. c.* p. 46.

Membranipora pyrula, sp. n., = *lineata* (MacG., *nec* L.), *inarmata*, *vitrea*, *punctigera*, *inornata*, and *radicifera*, the last remarkable by clusters

of long, slender, tubular fibres emitted from the dorsal surface of the zoœcia, and serving for attachment, all from Bass's Straits; Hincks, *l. c.* pp. 3–6, pl. i. figs. 1 & 2, pl. ii. fig. 6, pl. iii. fig. 3, pl. iv. figs. 4 & 5.

Membranipora roborata, sp. n., with Flustrine habit and marginal rib, like *Flustramorpha*; id. *l. c.* p. 128, pl. ii. fig. 3, Bass's Straits.

Membranipora echinata (Orb.) and *monostachys* (Busk) described, the former extending from Chili to Sitka, the latter found at Panama and on the coast of Portugal; Jullien, Bull. Soc. Z. Fr. 1881, pp. 165 & 168.

Chaperia australis, new name for (*Membranipora*) *spinosa* (Quoy, Busk, *nec* Orbigny), Cape of Good Hope, on the shells of Bivalves; *id. l. c.* p. 163.

Diplopora, g. n. Zoœcium divided into two parts, a narrow transverse portion of the front cell wall entirely membranous; *D. cincta* (Hutton, *Membranipora*, 1878), Australia. MacGillivray, Tr. R. Soc. Viet. xvii. p. 15, pl. figs. 1–1c. T. Hincks gives a new account of the generic characters, adding that the cells of the first transverse row of the colony are elongated, entirely closed and destitute of orifice, and that his own *Membranipora transversa* (1880) is the same species; Ann. N. H. (5) vii. pp. 154 & 155.

Microporidæ.

Vincularia abyssicola (Smitt), Hincks, Ann. N. H. (5) vii. p. 155, pl. x. fig. 4, Cuba, 450 fath., Florida and ? Singapore.

Cribrilinidæ.

Cribrilina ferox (MacG.), *monoceros* (MacG.) ?, *tubulifera*, and *speciosa*, spp. nn., Bass's Straits, the first with tubular processes for attachment; Hincks, *op. cit.* viii. pp. 7–9, the last three pl. i. figs. 7 & 8, and pl. iii. fig. 6.

Gigantopora, g. n. Growth encrusting; zoœcia salient, ventricose, minutely roughened and punctured; above the true mouth, which is terminal, not horizontal, is an enlarged tubular prolongation of the peristome directed upwards and outwards, terminated by a secondary aperture; on the front face of zoœcium proper, a large roundish special pore, at least half as broad transversely as the cell itself. *G. lyncoides*, sp. n., Victoria Bank, S. Brazil, 33 fath. *Hippothoa fenestrata* (Smitt) also belongs to this genus. Ridley, P. Z. S. 1881, p. 47, pl. vi. fig. 3.

Microporellidæ.

Microporella mucronata (MacG., *Eschara*) = *Eschara lichenoides* (Busk, *nec* M. Edw.); Hincks, Ann. N. H. (5) viii. p. 10, Bass's Straits.

Haploporella, g. n. Zoœcia destitute of a membranous area or aperture and of raised margins; orifice arched above, with the lower lip entire; no special pores. *H. nodulifera* and *lepida*, spp. nn., Bass's Straits, *id. l. c.* p. 11, pl. i. fig. 4, and pl. ii. fig. 2.

Porinidæ.

Porina gracilis (Lamx., *Eschara*), Bass's Straits; *id. l. c.* p. 12.

Anarthropora monodon (Smitt), specimen from Franz-Josef Land; Ridley, Ann. N. H. (5) vii. p 448.

Myriozoidæ.

Schizoporella cruenta (Norman), specimens from Franz-Josef Land; Ridley, *l. c.* p. 449, pl. xxi. fig. 4.

Schizoporella argentea, sp. n., Africa, on coral, and *lineris* (Hassall) var. n. *quincuncialis*, Ceylon; Hincks, *op. cit.* vii. p. 158, pl. ix. figs. 6 & 3.

Schizoporella bi-aperta (Michelin), incrusting and erect, *triangula*, *tumida*, and *acuminata*, spp. nn., Bass's Straits, *id. op. cit.* viii. pp. 12–14, pl. i. fig. 3, pl. ii. figs. 1 & 4.

Schizoporella insignis, sp. n., *id. l. c.* p. 134, pl. v. fig. 10, Africa.

Schizoporella marsupium (MacG., *Lepralia*) and *labiosa* (Busk), Straits of Magellan, *spinifera* (Johnst.), and an undetermined species from Tom Bay, S.W. Chili; Ridley, P. Z. S. 1881, pp. 48 & 49, the first, pl. vi. fig. 6.

Myriozoum subgracile and *crustaceum* (Smitt), specimens from Franz-Josef Land and their synonymy; *id.* Ann. N. H. (5) vii. pp. 448 & 449.

Hippothoa distans (MacG.) = *flagellum* (Manzoni); Hincks, *l. c.* p. 14, Bass's Straits.

Escharidæ.

Lepralia clidostoma (Smitt) var. n. *orbicularis*, and *L. poisoni* (Aud.), Bass's Straits; Hincks, *l. c.* p. 122.

Lepralia monoceros (Busk), Straits of Magellan, and *appressa* (Busk) var. n. *vinosa*, Portland Bay, S. Chili; Ridley, P. Z. S. 1880, pp. 50 & 51, the latter pl. vi. fig. 4.

Porella concinna (Busk) = *lævis* (Smitt), variations from Franz-Josef Land; *id.* Ann. N. H. (5) vii. pp. 450 & 451.

Porella marsupium (MacG.), Bass's Straits; Hincks, *l. c.* p. 123, pl. i. fig. 6.

Smittia nitida (Verrill), North America and Africa, on coral; *id. op. cit.* vii. p. 159, pl. ix. fig. 5.

Smittia landsborovii (Johnst.) var. n. *purpurea* and *S. reticulata* (MacG.) var., Bass's Straits, *id. op. cit.* viii. p. 123.

Smittia landsborovii (Johnst.), *reticulata* (MacG.)? var., and *affinis* (Hincks) var. n. *acuminata*, Straits of Magellan; *S. trispinosa* (Johnst.) var. n. *ligulata*, S. Brazil; Ridley, P. Z. S. 1881, pp. 52 & 53, the last pl. vi. fig. 9.

Mucronella ventricosa (Hassall) var. n. *connectens*, Franz-Josef Land; *id.* Ann. N. H. (5) vii. p. 451, pl. xxi. fig. 6.

Mucronella porosa, *teres*, *spinosissima*, and *tricuspis*, spp. nn., Hincks, *l. c.* viii. pp. 124 & 125, pl. i. fig. 5, pl. ii. fig. 5, and pl. iii. figs. 1 & 2, Bass's Straits.

Mucronella alvarezi (Orb.), specimens from Valparaiso described; Jullien, Bull. Soc. Z. Fr. 1881, p. 167.

Rhynchopora longirostris, sp. n., Hincks, *l. c.* p. 125, Bass's Straits.

Rhynchopora bispinosa (Johnst.)? Victoria Bank, S. Brazil; Ridley, P. Z. S. 1881, p. 50.

Aspidostoma, g. n. Zoœcia with a calcareous front wall, destitute of raised margins; orifice arched above, straight below, protected in front by a broad shield-like plate; wall of the cell elevated behind the orifice into a broad hood-like expansion, which covers it in and forms an arched secondary orifice. Zoarium erect, bilaminate, thick and solid. *A. crassum*, sp. n., between Patagonia and the Falkland Isles. *Eschara gigantea* (Busk) bears some general resemblance to it. Hincks, Ann. N. H. (5) vii. pp. 159–161, pl. x. fig. 6.

[*Adeona*] *Dictyopora wilsoni*, sp. n., p. 85, and *albida* (Kirchp.) var. n. *avicularis*, p. 86, MacGillivray, Tr. R. Soc. Vict. xvii. Port Phillip Heads, Australia.

Celleporidæ.

G. Busk divides *Cellepora* (L.) into two sections: (1) *holostomatous Celleporæ*, with the borders of the primary orifice entire, and (2) *schizostomatous*, borders of this orifice notched or sinuated in front; and again into two other sections: (1) operculum suborbicular, semicircular or arcuate, and (2) operculum more or less contracted below with an articular notch on the sides. J. L. S. xv. pp. 341–344, woodcuts. He describes the following spp. nn., pp. 344–356:—*Cellepora hastigera*, Bass's Straits, *apiculata* and *nodulosa*, off Port Jackson, *zamboangensis*, Philippines, *albirostris* (Smitt, *Discopora*), off Heard's Island, *tridenticulata*, 10° S. lat., 142° E. long., *columnaris*, Bass's Straits, *honoluluensis*, Sandwich Islands, *imbellis*, Bahia, *rudis*, 37° S. lat., 53° W. long., *solida*, 42° S. lat., 134° E. long., 2600 fath., *simonensis*, Simon's Bay, S. Africa, 400 fath., *pustulata*, Marion Island, *cylindriformis*, 35° S. lat., 18° E. long., 150 fath., *jacksoniensis*, Port Jackson, *catoniensis*, Kerguelen and Magellan Straits, 5–1325 fath., *ovalis*, 38° N. lat., 28° W. long., 450 fath., *polymorpha*, Sandwich Islands, *tuberculata*, Port Jackson, *vagans*, Sandwich Islands, 210–310 fath., *bicornis*, Prince Edward's Island, 80–150 fath., *bilabiata*, Port Phillip and Tristan d'Acunha, 60–1100 fath., *signata*, 46° S. lat., 75° W. long., *conica*, Simon's Bay, *ansata*, 38° N. lat., 28° long., *canaliculata*, 43° N. lat., 64° W. long., and *bidenticulata*, Port Jackson, all except the fifth collected on the 'Challenger' Expedition, and all for which the depth is not mentioned, above a depth of 100 fath.

Cellepora granum, sp. n., Hincks, Ann. N. H. (5) viii. p. 127, pl. iii. fig. 8, Bass's Straits.

Cellepora tubigera (Busk), S. Chili, *bilabiata* (Busk), Straits of Magellan, *mammillata* (Busk), *turrita* (Smitt) and *dichotoma* (Hincks), S. Brazil; Ridley, P. Z. S. 1881, pp. 54 & 55.

Reteporidæ.

Retepora altisulcata, sp. n., S. Chili, and *cellulosa* (Oken)? Straits of Magellan, Ridley, *l. c.* p. 53, the former pl. vi. fig. 5.

Selenariidæ.

Lunulites incisa, sp. n., Hincks, Ann. N. H. (5) viii. p. 127, pl. iv. figs. 1–3, Bass's Straits.

CYCLOSTOMATA.

H. Hamm (*suprà*, p. 94) proposes to arrange the inarticulate *Cyclostomata* as follows:—

1. *Tubuliporina*. All cells (zoœcia) originate from the median longitudinal axis of the colony (polyzoarium); 5 families: *Diastoporidea* and *Tubuliporidea* as understood by Reuss and Smith. *Spiroclausidea* (n.), *Idmoneidea* as understood by Reuss, *Osculiporidea* (n.).
2. *Cerioporina*. The cells originate one from the other irregularly, presenting the aspect of a sheaf; 2 families: *Cerioporidea*, including also *Fasciculipora*, and *Radioporidea* (n.).
3. *Stigmatoporina*. A central vertical bundle of long tubular cells (zoœcia), from which the other cells originate. This division comprises the fossil genera *Cyrtopora* (Hagen), *Stigmatopora* (n.) = *Pustulipora*, (Hagen, pt.), and *Meliceritites* (A. Römer).

The *Spiroclausidea* are distinguished by a spirally twisted polyzoarium, with quincuncial position and narrowed apertures of the cells; they contain the genera *Spiroclausa* (Orb.) = *Terebellaria* (Hagen, *nec* Lamx.), and *Spirofascigera* (n.), both only fossil.—The *Osculiporidea* are distinguished from the *Idmonidea* by the plurality of rows of zoœcia, they correspond to a part of Reuss's *Frondiporidæ*, and contain the genera *Seriefascigera* (n.) *Lopholepis* (Hagen), *Osculipora* (Orb.), *Patenaria* (n.), and *Stephanodesma* (n.), all fossil.—The *Radioporidea* are distinguished from the *Cerioporidea* by radial arrangement of the zoœcia; they contain the known genera *Multicavea* (Orb.), *Semimulticavea* (Orb.), *Domopora* (Orb.), *Radiocavea* (Orb.), *Stellocavea* (Orb.), *Polytaxia* (n.), *Radiocavaria* (n.), *Actinotaxia* (n.), all fossil except *Domopora*.

Tubuliporidæ.

Tubulipora capitata, sp. n., Hincks, Ann. N. H. (5) viii. p. 128, pl. 4, fig. 9, Bass's Straits.

Tubulipora serpens (L.), *organizans* (Orb.) and *dichotoma* (Orb.) var. n. *serialis*, all Straits of Magellan, 6 fath., on *Fucus*; Ridley, P. Z. S. 1881, pp. 58 & 59, the last pl. vi. fig. 10.

Idmonea milneana (Orb.), S. Chili, the 'dots' raised, but perforated in the centre; *id. l. c.* p. 56.

Densipora, g. n. Polyzoary forming an encrusting mass, discoid when young, composed of numerous long closely-packed tubular cells, continuous throughout the whole thickness and with the orifices not projecting. *D. corrugata*, sp. n., Australia, young specimens show Diastoporidan characters. MacGillivray, Tr. R. Soc. Vict. xvii. pp. 16 & 17, pl., figs.

2–2*b*; abstract with suggestion to its relation with *Heteropora*, in J. R. Micr. Soc. (2) i. p. 593.

Reticulipora intricaria (Smitt), plentiful and of large size near the N. E. coast of Novaya Zemlya, 50–125 fath.; Stuxberg, Sv. Ak. Handl. Bih. v. No. 22, p. 53.

Lichenoporidæ.

Lichenopora verrucaria (Fabr.), septal structure; Ridley, Ann. N. H. (5) vii. p. 453.

Lichenopora grignonensis (M. Edw.), Straits of Magellan, 9 & 10 fath.; *id.* P. Z. S. 1881, p. 57, pl. vi. fig. 2.

Cerioporidæ.

Heteropora pelliculata (Waters)? from Franz-Josef Land; *id.* Ann. N. H. (5) vii. p. 453, pl. xxi. fig. 3.

CTENOSTOMATA.

Alcyonidiidæ.

Alcyonidium gelatinosum (L.), two distinct varieties from Franz-Josef Land; Ridley, *l. c.* p. 454.

Alcyonidium mammillatum (Alder), plentiful in some parts of the Siberian glacial sea, 4–6 fath.; Stuxberg, Sv. Ak. Handl. Bih. v. No. 22, p. 56.

LOPHOPODA.

Note on the formation of the statoblast of *Cristatella* by W. Reinhard, Zool. Anz. iv. pp. 349 & 350.

ENDOPROCTA.

The metamorphosis of *Pedicellina* is described by J. Barrois; he states that it becomes fixed by the oral and not the ab-oral pole of its body, and that the digestive tube undergoes a rotation from the front backwards. C. R. xcii. pp. 1524 & 1525; abstract in J. R. Micr. Soc. (2) i. p. 727, and Ann. N. H. (5) viii. pp. 163 & 164.

Pedicellina australis, sp. n., Ridley, P. Z. S. 1880, p. 60, pl. vi. fig. 8, Straits of Magellan, perhaps also Kerguelen Island.

CRUSTACEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

BATE, C. SPENCE. On the *Penæidea*. Ann. N. H. (5) viii. pp. 169–196, pls. xi. & xii.

——. On *Synaxes*, a new genus of *Crustacea*. Op. cit. vii. pp. 220–228, pl. xiv.

BELLONCI, G. Ricerche istologiche sull' apparecchio digerente dello *Sphæroma serratum*. Rend. Acc. Bologn. 1880–81, pp. 92 & 93.

——. Sistema nervoso ed organi dei sensi dello *Sphæroma serratum*. Atti Acc. Rom. (3) Trans. v. p. 228.

BOVALLIUS, C. *Ianthe*, a new genus of *Isopoda*. Sv. Ak. Handl. Bih. vi. No. 4, 14 pp. 3 pls.

——. Anmärkningar om 'Portunid-slägtet *Thranites*. Œfv. Ak. Förh. 1881, No. 2, pp. 9–12, pl. ii.

BROOKS, W. K., & WILSON, E. B. The first Zoëa of *Porcellana*. Studies Biol. Labor. Hopkins Univ. iii. pp. 58–64.

CARRINGTON, J. T., & LOVETT, E. Notes and observations on British Stalk-eyed *Crustacea*. Zool. (n.s.) v. pp. 97–101, 137–142, 198–205, 301–307, 358–364, 413–418, & 455–461.

CHAMBERS, V. T. New species of *Entomostraca*. J. Cincinn. Soc. iv. pp. 47 & 48, 2 pls.

CLAUS, C. Neue Beiträge zur Kenntniss der Copepoden unter besonderer Berücksichtigung der Triester Fauna. Arb. z. Inst. Wien, iii. pt. 3, 20 pp., with 3 pls.

——. Über die Gattungen *Temora* and *Temorella* nebst den zugehörigen Arten. SB. Ak. Wien, lxxxiii. pp. 482–493, with 2 pls.

DELAGE, YVES. Contributions à l'étude de l'appareil circulatoire des Crustacés Edriophthalmes marins. Arch. Z. expér. ix. pp. 1–173, pls. i.–xii.

DELLA VALLE, A. Sui *Coriceidi* parassiti e sull' anatomia del genere *Lichomolgus*. MT. z. Stat. Neap. ii. 1, pp. 83–106, pls. v. & vi.

FAXON, W. On some Crustacean deformities. Bull. Mus. C. Z. viii. No. 13, pp. 257–274, 2 pls.

GABRINI, A. Organi di sostegno e di movimento del *Peltesaxonia varians*. Bull. Soc. Ven. Trent. ii. p. 19.

GERSTÄCKER, A., in BRONN's Klassen und Ordnungen des Thier-Reichs. v., Arthropoda, second division, pts. 1–3, pp. 1–96, pls. i.–viii.

GIESBRECHT, W. Vorläufige Mittheilung aus einer Arbeit über die freilebenden Copepoden des Kieler Hafens. Zool. Anz. iv. pp. 254–258.

GISSLER, CARL, F. Evidences of the effect of chemico-physical Influences in the Evolution of Branchiopod Crustaceans. Am. Nat. xv. pp. 280–282.

——. On a parasitic structure found in *Eubranchipus vernalis*. Am. Monthl. Micr. J. ii. p. 101, with fig.

GORDON, G. *Phronima sedentaria* and its *Beroë*. Scot. Nat. vi. pp. 56–59.

GROBBEN, CARL. Die Entwicklungsgeschichte des *Cetochilus septentrionalis*. Arb. z. Inst. Wien, iii. pt. 3, pp. 1–40, pls. i.–iv.

HARTOG, M. On some undescribed hairs in *Copepoda*. P. Manch. Soc. xix. p. 41.

HARZ, C. O. Die sogenannte Krebspest. Wien: 1881, 12mo, 103 pp. Also in the "Oesterreichisch-ungarische Fischerei-Zeitung."

HASWELL, W. A. On some new Australian marine *Isopoda*. P. Linn. Soc. N. S. W. v. pp. 470–481, and vi. pp. 1–15, 2 pls.

HESSE, M. Crustacés rares ou nouveaux des côtes de France. Ann. Sci. Nat. (6) xi. No. 8, 19 pp. pls xi. & xii.

JOURDAIN, S. Sur les stomatorhizes de la *Sacculina carcini*. C. R. xcii. pp. 1352–1354.

——. Poils des antennes anterieures des Crustacés. J. de l'Anat. Phys. xvii. p. 402–418, with 2 pls.

JOUSSET DE BELLESME, —. Observations sur les fonctions de l'appendice caudal des Limules. Ann. Sci. Nat. (6) xi. No. 7, 5 pp.

KOSSMANN, R. Studien über *Bopyriden*. I. *Gigantione moebii* und Allgemeines über die Mundwerkzeuge der Bopyriden. II. *Bopyrina virbii*. Beiträge zur Kenntniss der Anatomie und Metamorphose der Bopyriden. Z. wiss. Zool. xxxv. pp. 652–680, pls. xxxii.–xxxv.

——. III. *Ione thoracica* and *Cepon portuni*. MT. z. Stat. Neap. iii. pp. 170–183, pls. x. & xi.

——. Die *Entonisciden*. L. c. pp. 149–169, pls. viii. & ix.

LANKESTER, E. RAY. Observations and Reflections on the Appendages and on the Nervous System of *Apus cancriformis*. Q. J. Micr. Sci. xxi. pp. 343–376.

——. *Limulus* an Arachnid. *L. c.* pp. 504–548, 2 pls., and pp. 609–649.

MAN, F. G. DE. *Aracosternus wieneckei*. Tijdschr. Ent. xxv. 6 pp. 2 pls.

——. On a New Collection of Podophthalmous *Crustacea*] presented by Mr. J. A. Kruyt, collected in the Red Sea, near the town of Djeddah. Notes Leyd. Mus. iii. No. 2, pp. 93–107.

——. Remarks on the species of *Matuta* in the collection of the Leyden Museum. *L. c.* pp. 109–120.

——. Carcinological Studies in the Leyden Museum. *L. c.* No. 3, pp. 121-144, and No. 4, pp. 245–256.

MEINERT, F. [See SCHIÖDTE.]

MIERS, E. J. *Crustacea* in : Account of the Zoological Collections made during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. P. Z. S. 1881, pp. 61–79, pl. vii.

——. Revision of the *Idoteidæ*, a Family of Sessile-eyed *Crustacea*. J. L. S. xvi. pp. 1–88, pls. i.–iii.

——. On a Collection of *Crustacea* made by H. Maltzan at Goree Island, Senegambia. Ann. N. H. (5) viii. pp. 204–220, 259–281, & 364–377, pls. xiii.-xvi.

——. On a small Collection of *Crustacea* and *Pycnogonida* from Franz-Josef Land, collected by B. Leigh Smith. Ann. N. H. (5) vii. pp. 45–51.

MILNE EDWARDS, ALPHONSE. Études sur les Xiphosures et les Crustacés podophthalmaires, in Mission scientifique au Mexique, Recherches zoologiques, 5 partie, pp. 265–372, pls. xlix.–lxi. [1880 ?].

——. Description de quelques Crustacés Macroures provenant des grandes profondeur de la mer des Antilles. Ann. Sci. Nat. (6) xi. Art. 4, 14 pp.

——. Considérations générales sur la Faune Carcinologique des grandes profondeurs du Golfe de Mexique. C. R. xcii. pp. 384-388 ; translated in Ann. N. H. (5) vii. pp. 312–317.

MÜLLER, FRITZ. Descripçaõ de *Elpidium bromeliarum*. Arch. Mus. R. Jan. iv. pp. 27-34.

——. Farbenwechsel bei Krabben und Garnelen. Kosmos, viii. pp. 472 & 373.

——. *Atyoida potimirim*. Op. cit. ix. pp. 117–124, woodcuts.

NEBESKI, O. Beiträge zur Kenntniss der Amphipoden der Adria. Arb. z. Inst. Wien, iii. pt. 2, pp. 1–52, pls. i.–iv.

NEUMANN, R. Systematische Uebersicht der Gattungen der Oxyrhynchen, &c. Leipzig : 1878, 39 pp.

PACKARD, A. S. Notes on the Early Larval Stages of the Fiddler Crab, and of *Alpheus*. Am. Nat. xv. pp. 784–789.

PAVESI, P. Quarta serie di ricerche e studj sulla fauna pelagica dei laghi Italiani. Bull. Soc. Ven. Trent. ii. pp. 68–70.

PFEFFER, G. Panzerkrebse des Hamburger Museums. Verh. Ver. Hamb. v. 1880 [1881], pp. 22–55.

POPPE, S. A. Über eine neue Art der Calaniden-gattung *Temora*. Abh. Ver. Brem. vii. 1, pp. 55–60, pl. iii.

——. Ueber einen neuen Harpacticiden. *L. c.* 2, pp. 149–152.

RICHIARDI, S. Sopra due specie nuove di Crostacei parassiti. P. v. Soc. Tosc. 1881, and Zool. Anz. iv. pp. 504 & 505.

SARS, G. O. Crustacea et Pycnogonida nova in itinere secundo et tertio Expeditionis Norvegicæ anno 1877–78 collecta. Arch. Math. Naturvid. (1881 ?) pp. 427–476.

SCHIÖDTE, J. C., & MEINERT, F. Symbolæ ad monographiam *Cymothoarum*. Nat. Tids. (3) xiii. pp. 1–156, pls. i.–viii. [1882 ?].

SLUITER, C. P. Bijdrag tot de Kennis der Crustaceen Fauna van Java's Noordkust. Tijdschr. Nederl. Ind. xl. pp. 159–164, pl.

SMITH, S. I. Preliminary Notice of the *Crustacea* dredged, in 64–325 fathoms, off the South Coast of New England, by the United States Fish Commission in 1880. P. U. S. Nat. Mus. iii. pp. 413–452; abstract in Ann. N. H. (5) vii. pp. 143–146.

STUXBERG, A. Evertebratfauna i Sibiriens Ishaf. Sv. Ak. Handl. Bih. v. pp. 1–76, with a map.

THOMSON, G. M. Recent Additions to and Notes on New Zealand *Crustacea*. Tr. N. Z. Inst. xiii. pp. 204–221, pls. vii. & viii.

ULIANIN, B. Zur Entwicklungsgeschichte der Amphipoden. Z. wiss. Zool. xxxv. pp. 440–460, pl. xxiv.

WALCOTT, C. D. The Trilobites, new and old evidence to its organization. Bull. Mus. C. Z. viii. pp. 191–224, 4 pls.

WALZ, R. Ueber den Organismus der Bopyriden. Zool. Anz. iv. pp. 159–164.

WEBER, MAX. Ueber einige neue Isopoden der niederländischen Fauna. Tijdschr. Ned. Dierk. Ver. v. pp. 167–195, pl. v.

——. Anatomisches über Trichonisciden. Arch. mikr. Anat. xix. pp. 579–648, pls. xxviii. & xxix.

WIERZEJSKI, A. O Faunie jezior Tatrzsankich (Fauna of the Tatra Lakes). In the Polish periodical: Pamietnika Tow. Tatrzanskiego, (Cracow), vi. pp. 99–110, pl. iii.: also separately, Cracow, 8vo, 12 pp. 1 pl.

WRZESNIOWSKI, A. *Goplana polonica*, nowy rodzaj i gatunek skorupiaka obunogiego z okolic Warszawy. Warsaw: 27 pp. 2 pls., in Polish.

The literature of the *Crustacea* for 1880 is recorded by P. Mayer in Zool. JB. Neap. ii. pt. 2, pp. 5–66.

Record of American Carcinology by J. Kingsley in Am. Nat. xv. pp. 532–536.

A. Gerstäcker, in the continuation of Bronn's "Klassen und Ordnungen des Thierreichs," v. *Arthropoda*, ii., first treats the *Malacostraca* generally, pp. 1–7, pl. i., and proceeds then to describe the external and internal organization of the *Isopoda*, pp. 8–96, pls. ii.–viii.

E. Perrier, in "Les Colonies Animales" (Paris: 1881), discusses incidentally the organism of several *Crustacea*, pp. 525–532, chiefly in order to prove the original homology of the antennæ and feet in the *Arthropoda*.

Anatomy and Physiology.

1. *Nervous System.*

The anatomical configuration and histological structure of the brain and nervous elements of the eyes in *Spharoma* is described by G. Bellonci, Atti Acc. Rom. (3) Trans. v. p. 228; abstract in J. R. Micr. Soc. (2) i. pp. 886 & 887.

2. *Organs of Sense.*

Sir John Lubbock concludes from experiment that the limits of vision for *Daphnia* are, at the red end of the spectrum, approximately the same as in man, but that at the violet end they extend somewhat farther. Rep. Brit. Assoc. 1881, p. 676.

C. de Merejkowsky, C. R. xciii. pp. 1160 & 1161, comes to the conclusion that the larvæ of *Balanus* and some marine *Copepoda*, e.g., *Dias longiremis*, can well distinguish quantity of light, but not colour.

S. Jourdain describes the peculiar hairs on the first pair of antennæ in *Crustacea*, regarded by Leydig as "olfactory," and calls them "poils à bâtonnet;" their free end bears a hyaline body, which appears to be comparable to the rods found at the sensory ends of sensory organs; he dares not, however, decide whether their function may be olfactory. They are confined to the *Podophthalma*, and are found in less number in the young than the adult. J. de l'Anat. Phys. xvii. pp. 402–418, 2 pls.; abstract in J. R. Micr. Soc. (2) i. p. 886.

Olfactory organs at the last joint of the inner antennæ and tactorial hairs and cones in different parts of the skin of *Trichoniscus* and other *Oniscidæ* described by M. Weber, Arch. mikr. Anat. xix. pp. 599–601.

Tactorial hairs on the dorsal surface of the cephalothorax, and the dorsal and ventral surface of the abdomen in the Copepods, described by M. Hartog, P. Manch. Soc. xix. p. 41.

3. *Circulation and Respiration.*

Differentiations and transformations in the protoplasm of the blood-corpuscles of the common crayfish, either spontaneous or caused by in-

duction of electric currents, discussed by C. Fromman, Jen. Z. Nat. xiv. Suppl. i. pp. 113–124.

The circulatory apparatus of the *Isopoda* and *Amphipoda* is the subject of a paper by Y. Delage, who describes the heart, pericardium, chief arteries, and interstitial sinuses in the thorax and abdomen, from which the blood passes to the gills. In the *Amphipoda*, the heart is thoracic, in the *Isopoda* abdominal in position; and the chief blood-current goes from it in opposite direction in these two groups; but the author points to the existence of a series of intermediate forms, and thinks that the heart ought to be considered as a portion of a long dorsal vessel, which has become contractile in one point; the opposite directions of the currents are the result of the difference in the situation of the heart. Arch. Z. expér. ix. pp. 1–173, with 12 plates: Isopoda, especially *Anilocra*, *Conilera*, *Paranthura*, *Sphæroma*, *Ligia*, *Praniza*, and *Bopyrus*, pp. 1–87, pls. i.–vii.; Amphipoda, *Talitrus* and *Corophium*, pp. 87–120, pls. viii. & ix.; *Caprella* and *Proto*, pp. 120–134, pl. x.; *Tanais*, pp. 134–147, pl. xi.; systematic comparison of *Isopoda* and *Amphipoda*, pl. xii. Previous notes by the author in C. R. xciii. pp. 63–66 & 216–218; abstract in J. R. Micr. Soc. (2) i. pp. 242, 453, & 732.

Notes on the heart and vessels of the *Copepoda* by C. Claus, Arb. z. Inst. Wien, iii. pt. 3, pp. 2–6, pl. i.

The structure of the gills of *Orchestia* in comparison with *Gammarus*, is described by O. Nebeski, Arb. z. Inst. Wien, iii. pt. 2, pp. 20–24, pl. iii. figs. 26–31; the structure is essentially the same in both, but is much more solid and strong in the former, which lives mostly above the level of the water.

4. *Digestion.*

The very greatly developed rectum of *Orchestia* and its anal glands, as well as those of *Gammarus*, *Mœra*, *Melita*, and *Nicea*, are described by O. Nebeski, Arb. z. Inst. Wien, iii. pt. 2, pp. 12–20, pl. ii. figs. 14–20 and pl. iii. figs. 21–25.

The intestinal tract of the *Oniscidæ*, especially *Trichoniscus*, described by M. Weber, Arch. mikr. Anat. xix. pp. 618–622.

5. *Secretion and Excretion.*

The genera *Microdeutopus*, *Microprotopus*, *Amphithoe*, *Podocerus*, *Cerapus*, and *Corophium*, and probably all *Corophiidæ*, are provided with peculiar dark unicellular glands in the second, third, fourth, and fifth (rarely also in the sixth) joints of the third and fourth pairs of thoracic feet; the secretion of these glands is used for cementing the free tubes in which *Cerapus*, *Unicola*, *Amphithoe*, and *Podocerus* live, or for solidifying the walls of the mud-holes inhabited by *Corophium*; *Amphithoe penicillata* (Costa), *longicornis*, and *longimana* (Hllr.), fold the edge of the leaves of *Ulva* longitudinally, and glue it by the same secretion, in order to form a hiding-place. Other unicellular glands are more generally distributed through the whole body in *Orchestia*, but their function is not known. O. Nebeski, Arb. z. Inst. Wien, iii. pt. 2, pp. 2–12, pl. i., and pl. ii. figs. 10–13.

The histological elements of the skin of the *Oniscidæ* and *Trichoniscus*, with special regard to the cutaneous glands and ramified pigment cells, are described by M. Weber, Arch. mikr. Anat. xix. pp. 583–599, pl. xxviii.

Unicellular glands in the skin of many *Copepoda* described by C. Claus, Arb. z. Inst. Wien, iii. pt. 3, pp. 6–9, pl. ii. figs. 1–9.

6. *Generation.*

M. Weber has examined the sexual organs of *Trichoniscus* and other *Oniscidæ*; the appendages of the second segment of the pleon are really the intromittent organ, and their external shape is different in species of the same genus; the large cells in the vesicula seminalis, which have the appearance of eggs, are probably rudimentary eggs, and it appears from them that the vesicula seminalis of the *Oniscidæ* and other Isopods is a rudimentary ovary, the separation of the sexes in them being rather actual than strictly morphological. Arch. mikr. Anat. xix. pp. 623–648, pls. xxviii. & xxix.

O. Nebeski states that in *Orchestia* the hinder part of the testicle produces eggs, though in every other respect both sexes are quite distinct. Arb. z. Inst. Wien, iii. pt. 2, pp. 24–31, pl. iii. figs. 32 & 33, pl. iv. figs. 34–38.

7. *Development.*

Imperfect metamorphosis in *Alpheus heterochelis* (Say), the larva on hatching closely approximating to the form of the adult, observed by A. S. Packard, Am. Nat. xv. pp. 788 & 789, and Ann. N. H. (5) viii. pp. 447 & 448.

B. Ulianin has examined the first stages of development in the eggs of several species of *Orchestia* and *Gammarus pœcilurus*; he describes the progress of cleavage, and dwells chiefly on the origin of the "globiform organ," rejecting the opinions of previous authors concerning it, and suggesting that it may be an inherited part without physiological function, homologous to the shell-gland of the *Mollusca*, and proving a nearer phylogenetic connection between the *Arthropoda* and *Mollusca*. Z. wiss. Zool. xxv. pp. 440–460, pl. xxiv.; abstract in J. R. Micr. Soc. (2) i. pp. 599 & 600.

The development of *Cetochilus* is the subject of a paper by C. Grobben. The cleavage is, according to him, bilaterally symmetrical; after the 32-cell stage there is a considerable pause, the blastomeres absorbing yelk-material. The endodermal invagination, the closing of the blastopore, and the moultings of the Nauplius are described. The genital organs make their first appearance very early, and are then paired and ventral in position, in the adult unpaired and dorsal. Arb. z. Inst. Wien, iii. 40 pp. with 4 pls.; abstract in J. R. Micr. Soc. (2) i. pp. 734–736.

8. *Biology.*

M. Weber discusses the known instances of change of colour in living *Crustacea*: *Gelasimus*, *Squilla*, *Mysis*, *Palæmon*, *Nika*, *Idotea*, and *Pro-*

tella. He suggests that the loss of the faculty of change after the extirpation of the eyes may simply result from the violent attack on the nervous system, and not directly from blindness; and he thinks that the dilatation of the pigment-cells may have some relation to a sensation of cold in the animal. Arch. mikr. Anat. xix. pp. 591–597.

Change of colour in *Atyoida*, *Palæmon*, *Gelasimus*, and *Nautilograpsus*, the animals being ordinarily darker in their native haunts, and becoming by degrees pale in captivity, observed by F. Müller, Kosmos, viii. pp. 472 & 473; abstract in J. R. Micr. Soc. (2) i. p. 452.

General notes on some species of *Crustacea* which live in darkness by M. Weber, Tijdschr. Nederl. Dierk. Ver. v. pp. 167–173. A new species of *Trichoniscus* (*leydigi*), found under stones on the shores of the Zuyder See, exhibits all the properties of cavernicolous animals, and the author thinks it might have originated from *T. pusillus*, its light-shunning habits being accompanied by a decrease of pigment and subsequent modification in the genital organs.

A. Cortes states that the eggs of *Artemia salina* (L.) survive dessication for three years, and subsequent heating in boiling water; C. R. xciii. pp. 750–752, and Ann. N. H. (5) viii. pp. 456–458.

Daphnia, *Gammarus*, and *Asellus* do not revive when frozen; *Cyclops* perishes when exposed to — 6° Cels. for two hours. Rödel, "Über das vitale Temperatur-minimum wirbelloser Thiere" (Diss. Inaug.), Halle: 1881, pp. 25, 26, & 34.

9. *Deformities.*

W. Faxon describes and figures a number of deformities in the large claws of the lobster, taken from a collection of nearly two-hundred deformed lobster-claws in the Museum of Comparative Zoology, and others of several other *Crustacea*; he also mentions and classifies other known deformities and monstrosities of *Crustacea*, described by various authors, including dimorphism and hermaphroditism. Bull. Mus. C. Z. viii. pp. 257–274, with 2 pls.; abstract in J. R. Micr. Soc. (2) i. p. 599.

Geographical Distribution.

1. *Fresh-water and Terrestrial Crustacea.*

Grasmere Lake, Westmoreland. *Leptodora hyalina* (Lillj.), *Hyalodaphnia kahlbergensis* (Schödler), *Holopedium gibberum* (Zaddach), *Latona setifera* (Strauss), and *Bythotrephes*, sp. n.? not before known as British, and some other rare *Entomostraca*; E. Ray Lankester, Ann. N. H. (5) ix. p. 53, and J. R. Micr. Soc. (2) ii. p. 187.

Netherlands. New or little-known terrestrial *Isopoda* enumerated by M. Weber; Tijdschr. Nederl. dierk. Ver. v. pp. 173 & 174.

Berlin. *Branchipus grubii* (Dybowski) and *Limnetis brachyura* (Mlb.); Martens, SB. nat. Fr. 1881, p. 75.

Lakes of the Tatra, Carpathian Mountains. *Holopedium gibberum* (Zadd.), *Daphnia pulex* and *longispina* (Müll.), *Bosmina longirostris* (Müll.)?, *Eurycercus lamellatus* (Müll.), *Acroperus leucocephalus* (Koch),

Alona quadrangularis and *oblonga* (P. E. Müll.), *Chydorus sphæricus* (Müll.), *Polyphemus oculus* (Leydig), *Cyclops serrulatus* (Fisch.), *C. brevicaudatus*?, *Canthocamptus staphylinus* (Jurine), and *Diaptomus castor* (Jurine); Wierzejski, Pamietnik Tow. Tatrz. vi. pp. 109 & 110 (in Polish) most of them figured, pl. vi.

Some *Copepoda* and *Daphniidæ* in the small lake of St. Gothard at 2154 mètres above the sea, and in the Lake of Ritom, Piora Valley, 1829 mètres; Asper, Arch. Sci. Nat. iv. p. 406.

P. Pavesi continues his researches on the animals in the depths of the lakes of Italy [*cf.* Zool. Rec. xvii. *Crust.* p. 11]; Bull. Soc. Ven.-Trent. 1881, pp. 68–70. [Not seen by the Recorder.]

G. Rolland states that *Telphusa fluviatilis* has been found in artesian wells at Wady Rir, in the Algerian Sahara, probably by communication with surface waters, not from considerable depths, as supposed; C. R. xciii. pp. 1090–1093.

A second species of *Temora* (*affinis*, sp. n.) living in brackish and fresh-water, in Northern Germany, found by S. A. Poppe, Abh. Ver. Brem. vii. pp. 55–61, pl. iii.

Two new species of *Copepoda* from the interior of the United States, one, *Tachidius fonticola*, in a salt-water spring; Chambers, J. Cincinn. Soc. iv. pp. 47 & 48, 2 pls.; abstract in J. R. Micr. Soc. (2) i. p. 455.

A terrestrial Amphipod, *Orchestia cavimana* (Heller), in gardens at Triest; Nebeski, Arb. z. Inst. Wien, iii. pt. 2, p. 32.

New Zealand. Observations on terrestrial species of *Orchestia* living in the bush; G. M. Thomson, Tr. N. Z. Inst. xiii. pp. 209–212.

2. *Arctic Seas.*

Franz Josef Land. 3 species of marine *Decapoda* and 7 *Amphipoda* (two new), collected by B. Leigh Smith, enumerated and described by E. J. Miers, Ann. N. H. (5) vii. pp. 45–49, pl. vii.

Siberian Glacial Sea. *Idothea sabinii*, *I. entomon*, *Diastylis rathkii*, *Atylus carinatus*, and *Acanthostephis malmgreni* are the most common and characteristic *Crustacea* in the glacial sea, N. of Siberia, the first and third occur in certain regions in very great numbers. Of 115 arctic species of *Amphipoda* enumerated, 35 are circumpolar, 44 merely arctic, 17 peculiar to the Siberian glacial sea, and 55 wanting in it, Novaya Zemlya forming a distinct eastern limit for the distribution of many Arctic animals. Of Decapods are mentioned: *Hippolyte turgida*, *polaris* and *gaimardi*, *Sabinea septem-carinata*, *Pagurus pubescens* and *Hyas araneus*. Stuxberg, Sv. Ak. Handl. Bih. v. No. 22, pp. 30–42, 47, 51, 52, 55, 56, & 62–69.

G. O. Sars describes a number of new species taken in the Arctic Sea and the northernmost parts of the North Sea from 62°–80° N. lat., some in considerable depths, by the second and third Norwegian Expedition, 1877 and 1878, and states the numbers of species procured in all three expeditions to be 342 (including 16 *Pycnogonidæ*), 76 of which were new, and 150 of which live in the abyssal region; Arch. Math. Naturvid. 1881, pp. 427–476.

3. *Seas of Northern Europe.*

Throndjems Fjord. 19 species of *Crustacea* enumerated by V. Storm, Nor. Selsk. Skr. 1880, p. 73.

Firth of Forth. Crustacea enumerated by Leslie and Herdman; P. Phys. Soc. Edinb. vi.

Skagerrack, Bohuslän. Hyperia medusarum (Müll.), 10 species of Copepods and several larvæ of Copepods and Balanids caught in comparatively large numbers during December, 1880, and January, 1881, in herring-nets, and 13 species of Decapods and Amphipods dredged in the same months from the bottom at 12–130 fath.; F. Trybom, Œfv. Ak. Förh. 1881, No. 3, pp. 36, 37, & 40.

Kiel. 23 species of Copepods, including several new, enumerated; W. Giesbrecht, Zool. Anz. iv. pp. 254–258.

Southern Coast of Devon and Cornwall. Some notes on its *Crustacea*, by C. Spence Bate and J. Brooking Rowe, Rep. Brit. Assoc. 1881, p. 199.

Roscoff. 50 species of *Podophthalma*, 35 *Isopoda*, 8 *Læmodipoda*, and 24 *Amphipoda*, enumerated by Y. Delage, Arch. Z. expér. ix. pp. 152–157.

4. *Mediterranean.*

R. Neumann gives several special localities, *e.g.*, Palma in Mallorca, Palermo, and Spezzia, for a number of brachyurous and macrurous Decapods from the Heidelberg Museum, in the pamphlet cited above.

Trieste. 35 species of *Amphipoda* enumerated by O. Nebeski, Arb. z. Inst. Wien, iii. pt. 2, pp. 31–46; 4 species of *Bopyridæ* by R. Walz, Zool. Anz. iv. p. 159.

5. *Atlantic.*

The *Penæidæ* and *Sergestidæ* of the 'Challenger' Expedition, enumerated by C. Spence Bate, Ann. N. H. (5) viii. pp. 172–196.

South Coast of New England. 50 very interesting species of *Crustacea*, of which 14–17 are new, and others hitherto only known from the Straits of Florida, or from other still more remote localities, *e.g.*, the genera *Lyreidus* and *Nephropsis* have been dredged off the South Coast of New England in 64–325 fath.; S. I. Smith, P. U. S. Nat. Mus. iii. pp. 413–452; abstract in Ann. N. H. (5) vii. pp. 143–146.

A. Milne Edwards continues to review, describe, and figure the species of crabs from both coasts of America [*cf.* Zool. Rec. xvi. *Crust.* p. 11], having examined the materials in the Paris Museum, and those obtained by the American 'Hassler' and 'Blake' Expeditions. The present part discusses the second half of the *Cancridæ*, and give some additions to the *Oxyrrhyncha*. It is very remarkable that most genera have analogous species on both coasts; two species of *Trapezia*, which are very common in the Red Sea and Indian Ocean, have been also found on the West Coast of Mexico and Central America. Mission

scientifique au Mexique, Recherches Zoologiques, 5 partie, pp. 265-372, pls. xlix.-lxi. & xxxi.*a*.

The same author describes several new genera of macrurous *Crustacea* from great depths in the West Indies; Ann. Sci. Nat. (6) xi. No. 4, 16 pp.

He also gives several general considerations upon the *Crustacea* of great depths in the Caribbean Sea and the Gulf of Mexico, collected by the Expeditions of the U. S. navy in 1877, 1878, and 1879; dwelling on the great number of species (representing about 40 new genera), the abundance of *Galateidæ* and scarcity of true *Brachyura*, the forms without eyes, or with rudimentary eyes, as *Bathyplax*, *Willemoesia* and some new genera of *Galateidæ* [see Zool. Rec. xvii. *Crust.* p. 31], and finally the connecting forms between families heretofore quite distinct, as *Pylocheles* between the *Paguridæ* and *Thalassinidæ*, *Homolodromia* between the *Dromiidæ* and *Homolidæ*, and *Cymopolia* between the latter and the *Dorippidæ*. C. R. xcii. pp. 384–388, translated in Ann. N. H. (5) vii. pp. 312-317; abstracts in J. R. Micr. Soc. (2) i. p. 449, in Kosmos, viii. pp. 314–316, and in Naturforscher, xiv. pp. 132–134.

Gorée Island, W. Africa. 52 species or well-marked varieties, collected by Baron H. Maltzan, determined and the new ones described by E. J. Miers; 17 of them are known from the European seas, and only 5 from the West Indies or the East Coast of North America, but several have near allies in America. Ann. N. H. (5) viii. pp. 373–376, pls. xiii.–xvi.

Ascension Island. 4 species of *Brachyura* and 1 of *Anomura* (*Petrolisthes*) collected by T. Coury, 1 new, 1 both Caribbean and Madeiran, 1 only African, 2 only American; *id. l. c.* pp. 432–434.

6. *Indian Seas.*

Red Sea, near Jedda. 37 species of *Decapoda*, 1 *Gonodactylus*, and 1 *Bopyrus*, collected by J. A. Kruyt, enumerated by J. G. de Man, Notes Leyd. Mus. iii. pp. 93–107.

Malayan Archipelago. 15 Brachyurous Decapods and 1 *Remipes* from the North Coast of Java enumerated by C. P. Sluiter, Tijdschr. Nederl. Ind. xl. pp. 159–164. Notes on the *Leucosiidæ* of the Archipelago by De Man, Notes Leyd. Mus. iii. pp. 123–129, *Matuta*, pp. 109–120, *Ocypode*, pp. 245–252, *Leander*, pp. 137–142, *Arœosternus*, g. n., p. 131.

7. *Pacific.*

Penæidæ and *Sergestidæ* of the 'Challenger' Expedition; see *suprà*, 5. Atlantic.

Brachyura from the West Coast of America by A. Milne Edwards in Missión scientifique au Mexique; see *suprà*, 5. Atlantic.

8. *Australian and Antarctic Seas.*

Australia. New marine *Isopoda* by W. A. Haswell, P. Linn. Soc. N. S. W. v. pp. 470–481, vi. pp. 1–15, 2 pls. [Not seen by the Recorder.]

New Zealand. Several Amphipods and Isopods, 1 *Mysis*, and 1 *Nebalia*

described, and some of them figured by G. M. Thomson, Tr. N. Z. Inst. xiii. pp. 204–221, pls. vii. & viii. Most of them already described in Ann. N. H. (5) iv. 1879, and vi. 1880.

Straits of Magellan and both Coasts of Patagonia. 30 species of Decapods, 2 Stomatopods, 9 Isopods (some new), and 1 *Balanus*, collected during the survey of H.M.S. 'Alert,' are enumerated by E. J. Miers, P. Z. S. 1881, pp. 61–79, pl. vii. "The *Crustacea* of the Magellan Straits are essentially Antarctic in character; many of the species are known to occur at New Zealand, the Auckland and Kerguelen Islands; many are congeneric to those of the Arctic Seas, but with a few somewhat doubtful exceptions the same species do not occur in the Northern and Southern Seas."

R. O. Cunningham's paper on the *Crustacea* of Magellan's Straits, Tr. L. S. xxvii. [1871] pp. 496–501, has not hitherto been mentioned in Zool. Rec.; 11 then new species from nearly all orders of *Crustacea* are therein described.

DECAPODA.

An abstract of J. Boas's paper on the natural affinities of the *Decapoda* [Zool. Rec. xvii. *Crust.* p. 10] in J. R. Micr. Soc. (2) i. pp. 450–452.

BRACHYURA.

A systematic synopsis of the known genera of the *Brachyura Oxyrrhyncha* has been given by R. Neumann in 1878 (title *supra*).

Inachidæ.

Stenorrhynchus rostratus (L.). Note on specimens from Gorée Island; Miers, Ann. N. H. (5) viii. p. 206.

Collodes depressus (A. M.-Edw.), New England, 65–142 fath.; S. I. Smith, P. U. S. Nat. Mus. iii. p. 414.

Euprognatha rastellifera (Stimps.), differences of age; *id. l. c.* p. 415.

Euprognatha acuta (1880), A. Milne-Edwards, Crust. Mexico, p. 348, pl. xxxi. A, fig. 3, West Indies.

Lispognathus forcillatus (A. M.-Edw., 1880), Grenada Island, West Indies, *id. l. c.* p. 349, pl. xxxi. A, fig. 4.

Eurypodius latreillii (Guérin), *E. tuberculatus* (Eyd.), *audouini* (M.-Edw.), *septentrionalis* and *brevipes* (Dana), all not specifically distinct from the first, Straits of Magellan and West Coast of Patagonia; Miers, P. Z. S. 1881, pp. 64 & 65.

Halimus rubiginosus (Hutton, MS.), sp. n., Kirk, Tr. N. Z. Inst. xiii. p. 236, New Zealand.

Chorinus algatectus, sp. n., Sluiter, Tijdschr. Nederl. Ind. xl. p. 160, figs. 3 & 4, Java.

Pugettia, sp., Miers, P. Z. S. 1881, p. 66, mouth of the Rio de la Plata.

Trachymaia cornuta (A. M.-Edw., 1880), Barbados, 82–114 fath., A. Milne-Edwards, *l. c.* p. 351, pl. xxxi. A, fig. 2.

Anasimus fugax (A. M.-Edw., 1880), Santa Cruz, West Indies, *id. l. c.* p. 350, pl. xxxi. A, fig. 1.

Maiidæ.

Egeria arachnoides (Rumph.). Note on it by Neumann, *l. c.* p. 19.

Herbstia ovata (Stimps., *Micropisa*), Cape Verde Islands, Miers, P. Z. S. 1881, p. 62.

Pisoides edwardsi (Bell), W. Patagonia and Straits of Magellan; *id. l. c.* p. 66.

Nibilia armata (1880), A. Milne-Edwards, *l. c.* p. 348, pl. xxxi. A, fig. 3, West Indies.

Periceridæ.

Tylocarcinus styx (Hbst.), Jedda, De Man, Notes Leyd. Mus. iii. p. 94.

Parthenopidæ.

Lambrus verrilli, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 415, New England, 65 & 86 fath.

Lambrus (*Parthenopoides*) *bicarinatus*, sp. n., Gorée Island, and notes on *L. massena* (Roux), from the same locality; Miers, Ann. N. H. (5) viii. pp. 207 & 208.

Heterocrypta maltzami[*-ani*], sp. n., *id. l. c.* p. 209, pl. xiii. fig. 1, Gorée Island.

Mesorrhœa cristatipes (1880), A. Milne-Edwards, *l. c.* p. 352, pl. xxxi. A, fig. 6, St. Vincent, West Indies, 124 fath.

Cancridæ.

Cancer edwardsi (Bell), var. n. *annulipes*, West Coast of Patagonia, Miers, P. Z. S. 1881, p. 67.

Lophactæa cristata (A. M.-Edw.) and *granulosa* (Rüpp.), notes on specimens from Jedda; De Man, Notes Leyd. Mus. iii. p. 95.

Actæa hirsutissima (Rüpp.), *rufo-punctata* (M.-Edw.), and *helleri* (A. M. Edw.), notes on specimens from the Red Sea; *id. l. c.* p. 96 & 97. *A. rufo-punctata* also from the South Atlantic; Miers, P. Z. S. 1881, p. 68.

Xantho pilipes (A. M.-Edw.)?, specimens from Gorée Island; Miers, Ann. N. H. (5) viii. p. 213.

Xanthodes melanodactylus (A. M.-Edw.), specimens from Gorée Island; Miers, Ann. N. H. (5) viii. p. 212. *X. bidentatus*, sp. n., A. Milne-Edwards, Crust. Mex. p. 353, pl. liii. fig. 5, Grenada Island, West Indies.

Lophozozymus (*Lophoxanthus*) *sex-dentatus*, sp. n., Gorée Island, and note on *L. lamelliger* and *lateralis* (White); Miers, Ann. N. H. (5) viii. pp. 211 & 212, pl. xiii. fig. 2.

Etisus lævimanus (Rand.), variations; De Man, Notes Leyd. Mus. iii. p. 99.

Chlorodius (M.-Edw.), generic characters, and *C. longimanus* (M.-Edw.), West Indies, described; A. Milne-Edwards, *l. c.* p. 265, pl. xlix. fig. 5.

Chlorodius niger (Forsk.), variations, and *sculptus* (A. M.-Edw.), description ; De Man, *l. c.* p. 98.

Leptodius punctatus, Gorée Island, and *macandreæ*, Canaries, spp. nn., Miers, Ann. N. H. (5) viii. pp. 214 & 15, pl. xiii. figs. 3 & 4.

Leptodius floridus (Gibbes), West Indies, *agassizi*, sp. n., Florida *lobatus*, sp. n., Chili, and *sternberghi* (Stimps.), Panama, A. Milne-Edwards, *l. c.* pp. 267–273, pl. xlix. figs. 2–4, and pl. xlv. fig. 4.

Melybia (Stimps.) *forceps*, sp. n., *id. l. c.* p. 273, pl. xlix. fig. 1, Abrolhos, Brazil, 30 fath.

Phymodius maculatus (Stimps.), Tortugas, West Indies; *id. l. c.* pp. 266 & 267.

Menippe pagenstecheri, sp. n., Neumann, Syst. Übers. p. 22, 1869, West Indies.

Panopeus herbsti (M.-Edw.) with varr. *granulosus* and *obesus*, Carolina, Florida, Aspinwall, *harrisi* (A. Gould), Massachusetts, *texanus* (Stimps.), Texas, *crassus*, sp. n., Bahia and Destero, Brazil, *rugosus*, sp. n., Bahia, *convexus*, sp. n., Chili, *purpureus* (Lockington), Lower California, described and figured, and in all 13 American species mentioned, several of them living at the mouth of rivers ; A. Milne-Edwards, *l. c.* pp. 306–317, pl. lvii. figs. 1–4, and pl. lviii. figs. 3–5. *P. xanthiformis*, sp. n., Grenada Island, 92 fath., *id. l. c.* p. 353, pl. liii. fig. 5.

Eurypanopeus, g. n., distinguished from *Panopeus* by the broad little-vaulted cephalothorax with indistinct areolæ. *E. crenatus* (M.-Edw., *Panopeus*), Chili, *peruvianus*, sp. n., Peru, *transversus* (Stimps.), West Coast of Central America and Mexico, *depressus* (S. Smith), Florida, *abbreviatus* (Stimps.), Barbados, *planus* (S. Smith), Panama, *planissimus* (Stimps.), West Indies, *parvulus* (Fabr., M.-Edw.), Brazil and West Indies, and *politus* (S. Smith), Abrolhos, Brazil ; A. Milne-Edwards, *l. c.* pp. 318–323, all except *crenatus*, *parvulus* and *politus* figured, pl. lix. figs. 1–4, and pl. lx. fig. 3.

Micropanope sculptipes (Stimps.), Florida, 101 fath., *spinipes*, sp. n., Abrolhos, *pugilator*, sp. n., Florida, 101 fath., *pusilla*, sp. n., Florida, and *lobifrons*, sp. n., Montserrat, 88 fath.; *id. l. c.* pp. 324–329, pl. liii. fig. 3, pl. liv. figs. 1–4.

Neopanope, g. n., distinguished from *Panopeus* by the convex front and the hexagonal cephalothorax with four latero-anterior teeth. *N. pourtalesi*, and *lobipes*, spp. nn., Florida, 37 fath. *Id. l. c.* pp. 329–331, pl. lxi. figs. 2 & 3.

Eurytium limosum (Say, Stimps.), Florida, West Indies, and Brazil, and *affine* (Streets), Lower California; *id. l. c.* pp. 332–334, pl. lx. figs. 1 & 2.

Glyptoplax pugnax (S. Smith), Panama, and *smithi*, sp. n., Florida ; *id. l. c.* pp. 334–336, pl. lxi. figs. 4 & 5.

Eriphiidæ.

Ozius verreauxi (Saussure), Mazatlan and Galapagos, *perlatus* (Stimps.), Panama, *reticulatus* (Desbonne), West Indies, and *agassizi*, sp. n., Panama, Milne-Edwards, *l. c.* pp. 276–279, pl. lv. figs. 1–4.

Pseudozius mellissi, sp. n., Miers, Ann. N. H. (5) viii. p. 432, Ascension and St. Helena Islands.

Pilumnus, 17 species from the Eastern and 5 corresponding from the Western Coasts of America enumerated; *P. aculeatus* (Say), Florida and Guadeloupe, *vinaceus*, sp. n., Florida and Martinique, *xantusi* (Stimps.), Cape St. Lucas, California, *gracilipes*, sp. n., Barbados, 100 fath., *quoyi* (M.-Edw.), Rio Janeiro and Guiana, *urinator*, sp. n., Sta. Cruz, West Indies, 245 fath., *gemmatus* (Stimps.), Florida and St. Thomas, *limosus* (S. Smith), Panama and Peru, *lacteus* (Stimps.), Cuba and Key West, *miersi*, sp. n., West Indies, *nudifrons* (Stimps.), Sombrero Key and Barbadoes, *tessellatus*, sp. n., Destero, Brazil, and *fragosus*, sp. n., St. Thomas, described and figured; A. Milne Edwards, *l. c.* pp. 287–297, pl. l. figs. 1–5, pl. li. figs. 1–5, pl. lii. fig. 1, pl. liii. figs. 1 & 2.

Pilumnus verrucosipes (Stimps.) from Gorée Island; Miers, Ann. N. H. (5) viii. p. 216, pl. xiii. fig. 5.

Lophopilumnus, g. n., distinguished from *Pilumnus* by the very vaulted cephalothorax with deep lobulations in front, like that of *Actumnus*. *L. agassizi* (Stimps., *Pilumnus*) and *pulchellus*, sp. n., both from Florida. *Id. l. c.* pp. 297–299, pl. lii. figs. 4 & 5.

Heteractæa (Lockington, 1876), distinguished from *Pilumnus* by the straight thick front of the cephalothorax, like that of *Xantho*, and by the keeled feet. *H. ceratopus* (Stimps., *Pilumnus*), Florida and Guadeloupe, *H. lunata* (M.-Edw., *Pilumnus*) = *pilosa* (Lockington), Chili and California; *id. l. c.* pp. 299–301, pl. lii. figs. 2 & 3.

Acidops (Stimps.), distinguished from *Pilumnus* by the very large eyestalks and orbits. *A. fimbriatus* (Stimps.), California; *id. l. c.* pp. 301–303.

Pilumnoides (Lucas) *perlatus* (Pöppig), Chili and Peru, and *hassleri*, sp. n., coast of La Plata, 40° S. lat.; *id. l. c.* pp. 303–305, pl. liv. figs. 5 & 6.

Eriphia gonagra (Fabr.), from Florida to Rio Janeiro, *squamata* (Stimps.), from Chili to Cape St. Lucas, California, and *granulosa*, sp. n., Chili; *id. l. c.* pp. 337–339, pl. lvi. figs. 2–4.

Pseuderiphia, g. n., distinct from *Eriphia* by the broad, scarcely lobulated cephalothorax with broad, straight front, and by an external suborbital hiatus like that of *Panopeus*. *Ps. hispida* (Stimps., *Eriphia*), Panama; *id. l. c.* p. 340, pl. lvi. fig. 1.

Trapezia rufo-punctata (Hbst.), also at the Island of Socoro, W. Mexico, and *cymodoce* (Hbst.), also in the Bay of Panama, both species of the Indian Seas, and *formosa*, sp. n., Panama; *id. l. c.* pp. 341–343, the last pl. lviii. fig. 1.

Quadrella nitida (S. Smith), Panama; *id. l. c.* p. 344.

Domæcia hispida (Souleyet), West Indies; *id. l. c.* p. 345, pl. lviii. fig. 2.

Eucratodes, g. n., near *Galene* and *Eucrate*, cephalothorax nearly quadrilateral, with long entire front and two blunt latero-anterior teeth, resembling that of *Cyrtonotus*; hands equal also in the male; abdomen of the male 5-jointed, the third, fourth, and fifth joints being united. *E. agassizi*, sp. n., Florida, 100 fath. *Id. l. c.* pp. 346 & 347, pl. lxi. fig. 1.

Thaumastoplax, g. n., closely allied to *Hexapus* and *Amorphopus*; orbits well formed, merus of the outer maxillipeds elongated and narrowed at its summit, where it is articulated with the next joint; second pair of ambulatory legs much developed, fifth pair entirely wanting. *T. anomalipes*, sp. n., Gorée Island. Miers, Ann. N. H. (5) viii. p. 261, pl. xiv. fig. 2.

Portunidæ.

Portunus corrugatus (Penn.) and *pusillus* (Leach). On their geographical distribution; Miers, *l. c.* pp. 219 & 220.

Thranites (Bovallius, 1876). Additions and corrections to the former description from three more specimens dredged off Bergen, Norway, at 100–200 fath.; three frontal lobes, the middle more or less deeply notched, &c. Bovallius, Œfv. Ak. Förh. 1881, pp. 9–12, pl. ii.

Thalamita integra var. n. *africana*, Gorée Island; Miers, *l. c.* p. 218.

Goniosoma milleri (A. M.-Edw.), specimens from Gorée; *id. ibid.*

Neptunus pelagicus (L.), variability; Neumann, Syst. Übers. 1878, p. 24.

Neptunus (*Amphitrite*) *inæqualis*, sp. n., Miers, *l. c.* p. 217, pl. xiii. fig. 6, Gorée Island.

Callinectes hastatus (L.), deformities of claws, and cephalothorax; Faxon, Bull. Mus. C. Z. viii. pp. 262 & 263, pl. ii. figs. 5 & 8.

Telphusidæ.

Telphusa africana (A. M.-Edw.), specimens from Liberia described; De Man, Notes Leyd. Mus. iii. pp. 121–123.

Ocypodidæ.

Ocypode ceratophthalma (Pall.), Madagascar, Moluccas, Amoy, *ægyptiaca* (Gerst.), Red Sea, *cursor* (Belon), Congo, *arenaria* (Catesby), Curaçao, *cordimana* (Latr.), Amoy, Moluccas, and Java, *kuhli* (De Haan), Java, and *africana*, sp. n., Liberia and Congo; De Man, *l. c.* p. 253.

Gelasimus, spotted when captured, becomes uniformly grey in captivity; Fr. Müller, Kosmos, viii. p. 472.

Zoea of *Gelasimus pugnax* described and figured; Packard, Am. Nat. xv. pp. 784–787.

Gelasimus tangieri (Eydoux) = *perlatus* (Herkl.), specimens from Gorée; Miers, Ann. N. H. (5) viii. p. 262.

Gelasimus thomsoni, sp. n., Kirk, Tr. N. Z. Inst. xiii. p. 236, with woodcut, New Zealand.

Gonoplacidæ.

Macrophthalmus depressus (Rüpp.), specimens from Jedda; De Man, Notes Leyd. Mus. iii. p. 255.

Pilumnoplax sulcatifrons (Stimps.) var. n. *atlantica*, Gorée ; Miers, Ann. N. H. (5) viii. p. 259.

Xenophthalmus duplo-ciliatus, sp. n., Sluiter, Tijdschr. Nederl. Ind. xl. p. 163, Java.

PINNOTERIDÆ.

Pinnoteres pisum (L.) and *mytilorum* (Hbst.). Note on them by Lucas; Ann. Soc. Ent. Fr. (5) x. p. cxvi.

Pinnixa transversalis (M.-Edw.), Coquimbo and Straits of Magellan ; Miers, P. Z. S. 1881, p. 71.

RHIZOPIDÆ.

Typhlocarcinus integrifrons, sp. n., Miers, Ann. N. H. (5) viii. p. 260, Gorée.

GRAPSIDÆ.

Leptograpsus variegatus (F.) = *planifrons* (Dana) = *gayi* (M.-Edw.), Island of S. Ambrose, South Pacific; Miers, P. Z. S. 1881, p. 69.

Nautilograpsus changing colour according to circumstances ; Fr. Müller, Kosmos, viii. p. 472.

Sesarma angustipes (Dana)? from Montevideo; Miers, *l. c.* p. 70.

CALAPPIDÆ.

Matuta victrix (Fabr., Miers), Madagascar, Java, Celebes, Moluccas, *lunaris* (Hbst.) = *lineifera* and *circulifera* (Miers), Java and Banka, *granulosa* (Miers), Amboina, *banksi* (Leach ?, Miers), Amboina, Timor, Sanghir, *maculata* (Miers), probably from Japan, *picta* (Hess) = *distinguenda* (Hoffm.) = *obtusifrons* (Miers), Madagascar and Moluccas, in all 270 specimens in the Leyden Museum ; De Man, Notes Leyd. Mus. iii. pp. 109–120.

Hepatus kossmanni, sp. n., Neumann, Syst. Übers. 1878, p. 28, West Coast of America.

LEUCOSIIDÆ.

Leucosia margaritacea (Bell), female and colours in life; Sluiter, Tijdschr. Nederl. Ind. xl. p. 160, fig. 2, Java.

Leucosia neocaledonica (A. M.-Edw.) = *longifrons* (De Haan), and = *urania* (Hbst.), *pulcherrima* (Miers), a variety of the same, and *L. perlata* (Haan), specimens from Banda-neira and Ceram described ; De Man, *l. c.* pp. 123, 124, & 256.

Ilia spinosa, sp. n., Miers, Ann. N. H. (5) viii. p. 265, pl. xv. fig. 3, Gorée.

Ebalia tuberculata and *affinis*, spp. nn., Miers, Ann. N. H. (5) viii. pp. 266 & 268, pl. xiv. figs. 3 & 4, Gorée.

Philyra scabriuscula (F.), specimens from Sumatra and Amboina described ; De Man, *l. c.* pp. 126–128.

Philyra cristata and *lævidorsalis*, spp. nn., Miers, Ann. N. H. (5) viii. pp. 263 & 264, pl. xv. figs. 1 & 2, Gorée.

Pseudophilyra hædti, sp. n., De Man, *l. c.* p. 125, Amboina.

Nursia plicata (Hbst.), from China; *id. l. c.* p. 129.

Iphis septem-spinosa (Leach) Sluiter, Tijdschr. Nederl. Ind. xl. p. 159, fig. 1, Java.

Corystidæ.

Peltarion spinulosum (White) = *magellanicum* (Jacquinot & Lucas), Straits of Magellan; Miers, P. Z. S. 1881, p. 68.

Dorippidæ.

Dorippe armata (White, not described), sp. n., Miers, Ann. N. H. (5) viii. p. 269, pl. xv. fig. 4, Gorée.

Ethusa microphthalma, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 418, New England, 142 fath.

ANOMURA.

Dromiidæ.

Dromia fulvo-hispida and *spinirostris*, spp. nn., Miers, Ann. N. H. (5) viii. pp. 270 & 271, pl. xvi. figs. 1 & 2, Gorée.

Latreillia elegans (Roux), and *Homola barbata* (White) = *spinifrons* (Lam.), both New England, 85 & 86 fath.; S. I. Smith, P. U. S. Nat. Mus. iii. pp. 419 & 420.

Lithodidæ.

Paralomis verrucosus (Dana, *Lithodes*), W. Patagonia and Magellan Straits; Miers, P. Z. S. 1881, p. 71.

Raninidæ.

Lyreidus bairdi, sp. n., S. I. Smith, *l. c.*, p. 420, New England, 100 fath.

Paguridæ.

Eupagurus excavatus (Hbst.) = *angulatus* (Risso), specimens from Gorée; Miers, Ann. N. H. (5) viii. p. 280.

Eupagurus comptus (White), Straits of Magellan; *id.* P. Z. S. 1881, p. 72.

Pagurus imperator, S. Helena, and *granulimanus*, Gorée, spp. nn., and note on *P. striatus* (Latr.); *id.* Ann. N. H. (5) viii. pp. 274–276, the second pl. xvi. fig. 3.

Pagurus scabrimanus (Dana)?, specimen from Jedda described; De Man, Notes Leyd. Mus. iii. pp. 100 & 101.

Pagurus varipes (Heller), specimens from the Moluccas; *id. l. c.* pp. 129–131.

Spiropagurus elegans, sp. n., Miers, Ann. N. H. (5) viii. p. 278, Gorée.

Hemipagurus, g. n., near *Spiropagurus* (Stimps.), but with the sexual appendage of the last thoracic segment of the male originating from the right coxa and curved in one plane round the right side of the abdomen; right testis and vas deferens much larger than the left, with much larger spermatophores. *H. socialis* and *gracilis*, spp. nn., New England, 65–252 fath., in masses built up by *Epizoanthus* or *Adamsia*, S. I. Smith, P. U. S. Nat. Mus. iii. pp. 422–427, and Ann. N. H. vii. p. 145. Probably identical with *Catapagurus* (A. M.-Edw., 1880).

Calcinus intermedius, sp. n., De Man, Notes Leyd. Mus. iii. p. 102, Jedda.

Calcinus formosus, sp. n., Neumann, Syst. Übers. 1878, p. 31, Bay of Campeche.

Isocheles? *gracilis*, sp. n., Miers, Ann. N. H. (5) viii. p. 277, Gorée.

Diogenes varians (Costa), specimens from Gorée described; *id. l. c.* p. 272.

Cœnobita subrugosa, sp. n., Java and Western America, [?] and *baltzeri*, sp. n., East Indies, Neumann, Syst. Übers. 1878, p. 32.

Glaucothoe rostrata, sp. n., Miers, P. Z. S. 1881, p. 62, pl. vii. figs. 1–5, Madeira, 15–50 fath.

Hippidæ.

Albunea symnista (Fabr.), colours and variations in size; Lucas, Bull. Soc. ent. Fr. (6) i. pp. liv. & lv.

Porcellanidæ.

Porcellana: zoea described by Brooks & Wilson, Studies Biol. Labor. Hopkins Univ. ii. pp. 58–64.

Porcellana bosci (Aud.) and *carinipes* (Heller), notes on specimens from Jedda; De Man, Notes Leyd. Mus. iii. pp. 104 & 105.

MACRURA.

Galateidæ.

Munida gregaria (F.) = *subrugosa* (Dana), W. Patagonia and Straits of Magellan; *Grimothea* (Leach) is the younger stage of it: Miers, P. Z. S. 1881, p. 73.

? *Munida caribæa* (Stimps.) from New England; S. I. Smith, P. U. S. Nat. Mus. iii. p. 428.

Palinuridæ.

G. Pfeffer gives a review of the species of *Palinuridæ* and *Scyllaridæ* in the Zoological Museum of Hamburg, with descriptive notes and critical remarks on several of them. Verh. Ver. Hamb. v. 1880 [1881] pp. 22–55.

Philyra cristata and *lævidorsalis*, spp. nn., Miers, Ann. N. H. (5) viii. pp. 263 & 264, pl. xv. figs. 1 & 2, Gorée.

Pseudophilyra hædti, sp. n., De Man, *l. c.* p. 125, Amboina.

Nursia plicata (Hbst.), from China; *id. l. c.* p. 129.

Iphis septem-spinosa (Leach) Sluiter, Tijdschr. Nederl. Ind. xl. p. 159, fig. 1, Java.

Corystidæ.

Peltarion spinulosum (White) = *magellanicum* (Jacquinot & Lucas), Straits of Magellan; Miers, P. Z. S. 1881, p. 68.

Dorippidæ.

Dorippe armata (White, not described), sp. n., Miers, Ann. N. H. (5) viii. p. 269, pl. xv. fig. 4, Gorée.

Ethusa microphthalma, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 418, New England, 142 fath.

ANOMURA.

Dromiidæ.

Dromia fulvo-hispida and *spinirostris*, spp. nn., Miers, Ann. N. H. (5) viii. pp. 270 & 271, pl. xvi. figs. 1 & 2, Gorée.

Latreillia elegans (Roux), and *Homola barbata* (White) = *spinifrons* (Lam.), both New England, 85 & 86 fath.; S. I. Smith, P. U. S. Nat. Mus. iii. pp. 419 & 420.

Lithodidæ.

Paralomis verrucosus (Dana, *Lithodes*), W. Patagonia and Magellan Straits; Miers, P. Z. S. 1881, p. 71.

Raninidæ.

Lyreidus bairdi, sp. n., S. I. Smith, *l. c.*, p. 420, New England, 100 fath.

Paguridæ.

Eupagurus excavatus (Hbst.) = *angulatus* (Risso), specimens from Gorée; Miers, Ann. N. H. (5) viii. p. 280.

Eupagurus comptus (White), Straits of Magellan; *id.* P. Z. S. 1881, p. 72.

Pagurus imperator, S. Helena, and *granulimanus*, Gorée, spp. nn., and note on *P. striatus* (Latr.); *id.* Ann. N. H. (5) viii. pp. 274–276, the second pl. xvi. fig. 3.

Pagurus scabrimanus (Dana)?, specimen from Jedda described; De Man, Notes Leyd. Mus. iii. pp. 100 & 101.

Pagurus varipes (Heller), specimens from the Moluccas; *id. l. c.* pp. 129–131.

Spiropagurus elegans, sp. n., Miers, Ann. N. H. (5) viii. p. 278, Gorée.

Hemipagurus, g. n., near *Spiropagurus* (Stimps.), but with the sexual appendage of the last thoracic segment of the male originating from the right coxa and curved in one plane round the right side of the abdomen; right testis and vas deferens much larger than the left, with much larger spermatophores. *H. socialis* and *gracilis*, spp. nn., New England, 65–252 fath., in masses built up by *Epizoanthus* or *Adamsia*, S. I. Smith, P. U. S. Nat. Mus. iii. pp. 422–427, and Ann. N. H. vii. p. 145. Probably identical with *Catapagurus* (A. M.-Edw., 1880).

Calcinus intermedius, sp. n., De Man, Notes Leyd. Mus. iii. p. 102, Jedda.

Calcinus formosus, sp. n., Neumann, Syst. Übers. 1878, p. 31, Bay of Campeche.

Isocheles? gracilis, sp. n., Miers, Ann. N. H. (5) viii. p. 277, Gorée.

Diogenes varians (Costa), specimens from Gorée described; *id. l. c.* p. 272.

Cœnobita subrugosa, sp. n., Java and Western America, [?] and *baltzeri*, sp. n., East Indies, Neumann, Syst. Übers. 1878, p. 32.

Glaucothoe rostrata, sp. n., Miers, P. Z. S. 1881, p. 62, pl. vii. figs. 1–5, Madeira, 15–50 fath.

Hippidæ.

Albunea symnista (Fabr.), colours and variations in size; Lucas, Bull. Soc. ent. Fr. (6) i. pp. liv. & lv.

Porcellanidæ.

Porcellana: zoea described by Brooks & Wilson, Studies Biol. Labor. Hopkins Univ. ii. pp. 58–64.

Porcellana bosci (Aud.) and *carinipes* (Heller), notes on specimens from Jedda; De Man, Notes Leyd. Mus. iii. pp. 104 & 105.

MACRURA.

Galateidæ.

Munida gregaria (F.) = *subrugosa* (Dana), W. Patagonia and Straits of Magellan; *Grimothea* (Leach) is the younger stage of it: Miers, P. Z. S. 1881, p. 73.

? *Munida caribæa* (Stimps.) from New England; S. I. Smith, P. U. S. Nat. Mus. iii. p. 428.

Palinuridæ.

G. Pfeffer gives a review of the species of *Palinuridæ* and *Scyllaridæ* in the Zoological Museum of Hamburg, with descriptive notes and critical remarks on several of them. Verh. Ver. Hamb. v. 1880 [1881] pp. 22–55.

Palinurus longipes, new name for *dasypus* (M.-Edw.), specimens from Monrovia and St. Thomé, W. Africa, described, *P. sulcatus* (Lam.) and *fasciatus* (Fabr.) being also referred to this species, and *brevipes*, new name for *ornatus* (Fabr.), specimens from Mazatlan, the Amur reef [?], Zanzibar, and Manila, described; Pfeffer, *l. c.* pp. 41–46.

Senex, new name for *Panulirus* (Gray), which is rejected as being a mere anagram of *Palinurus*; id. *l. c.* p. 30. [Linné himself has used an anagram for a generic name in Botany, viz., *Mahernia* of *Hermania*. Rec.]

Palinurus guttatus (M.-Edw.) = *japonicus* (Haan) = *echinatus* (Smith) = *americanus* (Lam.), specimen from the Sandwich Islands described, and *femoristriga* (Martens) = *guttatus* (Haan), specimen from New Guinea described; the furrows on the abdominal segments can be interrupted or not in the same species. *Id. l. c.* pp. 30–38.

Arœosternus, g. n., sternum rectangular, not dilatated behind, cephalothorax oblong, subcylindrical, hairy, without spines. *A. wieneckii*, sp. n., Benkoolen, Sumatra. De Man, Notes Leyd. Mus. iii. pp. 131–137, and Tijdschr. Ent. xxv. pp. 1–6, pls. i. & ii. [= *Palinurellus*, Von Martens, 1878.]

Synaxes, g. n. Carapace anteriorly produced between the eyes to a flat-pointed rostrum; breadth of the ventral surface of the perion, form of periopods and antennæ as in *Palinurus*, eyes and posterior appendages as in *Scyllarus*. *S. hybridica*, sp. n., West Indies; C. Spence Bate, Ann. N. H. (5) vii. pp. 220–228, pl. xvi. The author proposes a new family, *Synaxidæ*, for it, to be placed between the *Scyllarina* and *Palinurina*. [Very like *Palinurellus*, Von Martens, 1878, but in this the fifth pair of thoracic feet in the female is clawed, as in some *Palinurus*; in Bate's genus it is simple.]

Scyllaridæ.

Scyllarus (*Arctus*) *arctus* var. n. *paradoxus*, Gorée; Miers, Ann. N. H. (5) viii. p. 364.

Arctus depressus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 429, New England, 86 fath.

Scyllarus martensi, sp. n., Pfeffer, Verh. Ver. Hamb. v. 1880 [1881], p. 48, locality not stated.

Paribacus antarcticus var. n. *carinatus*, id. *l. c.* p. 49, South Sea.

Pseudibacus gerstæckeri, sp. n., *id. l. c.* p. 51, Atlantic.

Astacidæ.

C. O. Harz attributes the sickness of crayfish observed in several parts of Germany in recent years to the presence in large number of the Entozoan *Distoma cirrigerum* and *isostomum*; "Die Krebspest," Wien, 1881. Zaddach remarks, on the contrary, that he has often found in former years a large number of these parasites in crayfishes which appeared to be healthy; Zool. Anz. iv. pp. 398 & 426.

Monstrosity of the common crayfish ; Maggi, Rend. Ist. Lomb. (2) xiv., May, 1881.

Cambarus primævus (Packard), from the lower tertiary beds of Western Wyoming, described and figured by Packard, Bull. U. S. Geol. Surv. vi. No. 2, pp. 391–397, with general observations on tertiary *Astacidæ* ; also figured in Am. Nat. xv. p. 832.

Homarus americanus (M.-Edw.), moulting ; Hyatt, P. Bost. Soc. xxi. pp. 83–90.

Homarus americanus (M.-Edw.), deformities of claws, the most remarkable are outgrowths ; Faxon, Bull. Mus. C. Z. viii. pp. 257–263, pls. i. & ii. figs. 1–4, 6, 7, & 9.

Nephropsis aculeatus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 431, New England, 100–126 fath. The structure and arrangement of the gills agrees with those of *Nephrops*. Probably = *N. agassizi* (A. M.-Edw., Oct., 1880) ; *id.* later note.

Phoberus, g. n. Intermediate between the *Astacidæ*, *Thalassinidæ*, and *Carides*, the gills brush-shaped as in the former, but a large scale below the antennæ, and a well-developed rostrum as in the last. *P. cæcus*, sp. n., 70 centimètres long, off Grenada, West Indies, 416 fath. A. Milne-Edwards, Ann. Sci. Nat. vi. (6) xi. Art. 4, pp. 1–3.

Thalassinidæ.

Callianassa krukenbergi, sp. n., Neumann, Syst. Übers. 1878, p. 34, Central America.

Axius armatus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 431, New England, 100 & 142 fath., and note on *A. serratus* (Stimps.), distinct from *stirhynchus* (Leach), *id. l. c.* p. 435.

Crangonidæ.

Pontophilus brevirostris, sp. n., S. I. Smith, *l. c.* p 435, New England, 65–155 fath.

Paracrangon hystrix, sp. n., A. Milne-Edwards, Ann. Sci. Nat. (6) xi. Art. 4, p. 6, Guadeloupe, 734 fath.

Glyphocrangon, g. n. Feet as in *Crangon*, penultimate joint of the second pair multi-articulated, as in *Lysmata* ; sixth abdominal joint nearly wholly united to the seventh ; cephalothorax covered with large wrinkled tubercles, arranged in longitudinal rows. *G. spinicauda*, *nobile*, and *aculeatum*, spp. nn., West Indies, 250, 1131, & 593 fath. *Id. l. c.* pp. 3–5.

Tozeuma (Stimps.) *serratum* and *cornutum*, spp. nn., *id. l. c.* p. 16, Barbados, 56 & 40 fath.

Atyidæ.

Atyoida potimirim, sp. n. Fresh-water of Southern Brazil, the bristle-bearing pincers in it and in *Caridina* serve for feeding off the mud, a hairy process of the hinder maxilla and a hooked appendage of the first periopod for keeping the branchial cavity clean. F. Müller, Kosmos, ix.

Palinurus longipes, new name for *dasypus* (M.-Edw.), specimens from Monrovia and St. Thomé, W. Africa, described, *P. sulcatus* (Lam.) and *fasciatus* (Fabr.) being also referred to this species, and *brevipes*, new name for *ornatus* (Fabr.), specimens from Mazatlan, the Amur reef [?], Zanzibar, and Manila, described; Pfeffer, *l. c.* pp. 41–46.

Senex, new name for *Panulirus* (Gray), which is rejected as being a mere anagram of *Palinurus*; id. *l. c.* p. 30. [Linné himself has used an anagram for a generic name in Botany, viz., *Mahernia* of *Hermania*. Rec.]

Palinurus guttatus (M.-Edw.) = *japonicus* (Haan) = *echinatus* (Smith) = *americanus* (Lam.), specimen from the Sandwich Islands described, and *femoristriga* (Martens) = *guttatus* (Haan), specimen from New Guinea described; the furrows on the abdominal segments can be interrupted or not in the same species. *Id. l. c.* pp. 30–38.

Aræosternus, g. n., sternum rectangular, not dilatated behind, cephalothorax oblong, subcylindrical, hairy, without spines. *A. wieneckii*, sp. n., Benkoolen, Sumatra. De Man, Notes Leyd. Mus. iii. pp. 131–137, and Tijdschr. Ent. xxv. pp. 1–6, pls. i. & ii. [= *Palinurellus*, Von Martens, 1878.]

Synaxes, g. n. Carapace anteriorly produced between the eyes to a flat-pointed rostrum; breadth of the ventral surface of the perion, form of periopods and antennæ as in *Palinurus*, eyes and posterior appendages as in *Scyllarus*. *S. hybridica*, sp. n., West Indies; C. Spence Bate, Ann. N. H. (5) vii. pp. 220–228, pl. xvi. The author proposes a new family, *Synaxidæ*, for it, to be placed between the *Scyllarina* and *Palinurina*. [Very like *Palinurellus*, Von Martens, 1878, but in this the fifth pair of thoracic feet in the female is clawed, as in some *Palinurus*; in Bate's genus it is simple.]

Scyllaridæ.

Scyllarus (*Arctus*) *arctus* var. n. *paradoxus*, Gorée; Miers, Ann. N. H. (5) viii. p. 364.

Arctus depressus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 429, New England, 86 fath.

Scyllarus martensi, sp. n., Pfeffer, Verh. Ver. Hamb. v. 1880 [1881], p. 48, locality not stated.

Paribacus antarcticus var. n. *carinatus*, id. *l. c.* p. 49, South Sea.

Pseudibacus gerstæckeri, sp. n., *id. l. c.* p. 51, Atlantic.

Astacidæ.

C. O. Harz attributes the sickness of crayfish observed in several parts of Germany in recent years to the presence in large number of the Entozoan *Distoma cirrigerum* and *isostomum*; "Die Krebspest," Wien, 1881. Zaddach remarks, on the contrary, that he has often found in former years a large number of these parasites in crayfishes which appeared to be healthy; Zool. Anz. iv. pp. 398 & 426.

Monstrosity of the common crayfish ; Maggi, Rend. Ist. Lomb. (2) xiv., May, 1881.

Cambarus primævus (Packard), from the lower tertiary beds of Western Wyoming, described and figured by Packard, Bull. U. S. Geol. Surv. vi. No. 2, pp. 391–397, with general observations on tertiary *Astacidæ* ; also figured in Am. Nat. xv. p. 832.

Homarus americanus (M.-Edw.), moulting ; Hyatt, P. Bost. Soc. xxi. pp. 83–90.

Homarus americanus (M.-Edw.), deformities of claws, the most remarkable are outgrowths ; Faxon, Bull. Mus. C. Z. viii. pp. 257–263, pls. i. & ii. figs. 1–4, 6, 7, & 9.

Nephropsis aculeatus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 431, New England, 100–126 fath. The structure and arrangement of the gills agrees with those of *Nephrops*. Probably = *N. agassizi* (A. M.-Edw., Oct., 1880) ; *id.* later note.

Phoberus, g. n. Intermediate between the *Astacidæ*, *Thalassinidæ*, and *Carides*, the gills brush-shaped as in the former, but a large scale below the antennæ, and a well-developed rostrum as in the last. *P. cæcus*, sp. n., 70 centimètres long, off Grenada, West Indies, 416 fath. A. Milne-Edwards, Ann. Sci. Nat. vi. (6) xi. Art. 4, pp. 1–3.

Thalassinidæ.

Callianassa krukenbergi, sp. n., Neumann, Syst. Übers. 1878, p. 34, Central America.

Axius armatus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 431, New England, 100 & 142 fath., and note on *A. serratus* (Stimps.), distinct from *stirhynchus* (Leach), *id. l. c.* p. 435.

Crangonidæ.

Pontophilus brevirostris, sp. n., S. I. Smith, *l. c.* p 435, New England, 65–155 fath.

Paracrangon hystrix, sp. n., A. Milne-Edwards, Ann. Sci. Nat. (6) xi. Art. 4, p. 6, Guadeloupe, 734 fath.

Glyphocrangon, g. n. Feet as in *Crangon*, penultimate joint of the second pair multi-articulated, as in *Lysmata* ; sixth abdominal joint nearly wholly united to the seventh ; cephalothorax covered with large wrinkled tubercles, arranged in longitudinal rows. *G. spinicauda*, *nobile*, and *aculeatum*, spp. nn., West Indies, 250, 1131, & 593 fath. *Id. l. c.* pp. 3–5.

Tozeuma (Stimps.) *serratum* and *cornutum*, spp. nn., *id. l. c.* p. 16, Barbados, 56 & 40 fath.

Atyidæ.

Atyoida potimirim, sp. n. Fresh-water of Southern Brazil, the bristle-bearing pincers in it and in *Caridina* serve for feeding off the mud, a hairy process of the hinder maxilla and a hooked appendage of the first periopod for keeping the branchial cavity clean. F. Müller, Kosmos, ix.

pp. 117–124, with woodcuts ; abstract in J. R. Micr. Soc. (2) ii. pp. 42 & 43. Change of colour, *suprà* in the generalities, 8. Biology.

Stylodactylus, g. n. Rostrum long, compressed, with mobile articulated spines above and below ; feet of the first and second pair equal, didactyle, hairy, the palmar portion very small ; the following pairs monodactyle. *S. serratus*, sp. n., Dominica, 524 fath., A. Milne-Edwards, *l. c.* p. 11.

Palæmonidæ (incl. Alpheidæ).

Alpheus heterocheles (Say), abbreviated metamorphosis ; Packard, Am. Nat. xv. p. 784 ; abstract in Ann. N. H. (5) viii. pp. 447 & 448.

Alpheus edwardsi (Aud.), *strenuus* (Dana), perhaps only sexual difference of the first, *lævis* (Randall), and *insignis* (Heller), notes on specimens from Jedda; De Man, Notes Leyd. Mus. iii. pp. 105–107.

Alpheus paracrinitus, sp. n., Miers, Ann. N. H. (5) viii. p. 365, pl. xvi. fig. 6, Gorée.

Alpheus (*Betæus*) *scabro-digitus* (Dana), and an undetermined species, both from West Patagonia; *id.* P. Z. S. 1881, pp. 73 & 74.

Hippolyte phippsi (Kröyer) and *polaris* (Sabine), notes on specimens from Franz-Josef Land ; *id.* Ann. N. H. (5) vii. p. 46.

Heterocarpus, g. n. Cephalothorax and abdomen keeled, the keel finishing on the abdomen in several spines; feet without palpiform appendage, first pair monodactyle, second pair didactyle, unequal, with multi-articulated carpus, the following pairs monodactyle. *H. ensifer* and *oryx*, spp. nn., Barbados, 218 & 955 fath. A. Milne-Edwards, *l. c.* pp. 8–10.

Bythocaris leucopis, sp. n., G. O. Sars, Arch. Math. Naturvid. 1881, p. 427, Arctic Sea, 1110 fath.

Pandalus leptocerus, sp. n., *tenuipes*, sp. n., and *propinquus* (G. O. Sars), New England, 100–252 fath., S. I. Smith, P. U. S. Nat. Mus. iii. pp. 437–443. Branchial formula of *Pandalus* ; id. *l. c.* p. 443.

Pandalus longipes, sp. n., A. Milne-Edwards, *l. c.* p. 15, Barbados, 204 fath.

Pandalus paucidens, sp. n., Miers, P. Z. S. 1881, p. 74, pl. vii. figs. 6 & 7, West Patagonia.

Palæmonetes varians (Leach) described, it belongs rather to *Anchistia* ; Gabrini, Bull. Soc. Ven.-Trent. i. p. 187, and ii. p. 19.

Palæmon, change of colour, *vide suprà*, Biology.

Palæmon rectirostris (Zaddach) var. n. *octodentatus*, Neumann, Syst. Übers. 1878, p. 37, Palma, Mallorca.

Leander semmelinkii and *celebensis*, spp. nn., Makassar, and notes on *L. pacificus* (Stimps.), *indicus* (Heller), *serrifer* (Stimps.), *longirostris* (Say), and *natator* (M.-Edw.), from the Malayan and China Seas ; De Man, Notes Leyd. Mus. iii. pp. 137–142.

Nematocarcinus, g. n. The feet of the second, third, fourth, and fifth pair three times as long as the cephalothorax, with slender palpiform appendage. *N. cursor*, West Indies, 500 fath., A. Milne-Edwards, *l. c.* pp. 14 & 15.

Hoplophorus gracilirostris, sp. n., *id. l. c.* p. 6, Dominica, 118 fath.

Notostomus, g. n. Near *Hoplophorus*, cephalothorax much more gibbous, elevated, and compressed; rostrum broad at the base, covering the eyes partly; feet long, with distinct palpiform appendage. *N. gibbosus* and *elegans*, spp. nn., West Indies, 626 & 955 fath. *Id. l. c.* pp. 7 & 8.

Gonatonotus, g. n. Near *Hoplophorus*, rostrum very elevated, many-toothed; sub-antennal scale large and rounded; feet of the first pair short and thick, didactyle, of the second more slender and didactyle, the following monodactyle, all with a small palpiform appendage. *G. crassus*, sp. n., Grenada, West Indies, 262 fath. *Id. l. c.* pp. 10 & 11.

Penæidæ.

C. Spence Bate having examined the types in the Museum of the Jardin des Plantes, publishes notes and often figures of them, together with a general review of the family and its genera, an enumeration of the specimens taken during the 'Challenger' Expedition, and descriptions of some new species. Ann. N. H. (5) viii. pp. 169–196, pls. xi. & xii.

Sicyonia lævis, sp. n., *id. l. c.* pp. 172 & 173, New Guinea, 150 fath., with notes on some known species. Note on the synonymy of *S. sculpta*; Miers, *tom. cit.* p. 367.

Penæus. Generic description and notes on many species, *setiferus* (L.), *monoceros* (Fabr.), *indicus* (M.-Edw.), *affinis* (M.-Edw.), and *brevicornis* (M.-Edw.) figured; Bate, *l. c.* pp. 173–180, pl. xi. figs. 1–3, & pl. xii. figs. 1 & 2. *P. fissurus*, New Guinea, *rectacutus*, Philippines, 100 fath., *philippii*, Philippines, *anchorilis*, New Guinea, *telsodecacanthus*, Japan, and *serratus*, Fiji Islands, 100 fath., spp. nn. *id. l. c.* pp. 180–182.

Penæus velutinus (Dana), specimens from Gorée; Miers, *l. c.* p. 367.

Penæus politus, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 444, New England, 142 fath.

Penæopsis, (A. M.-Edw. MS.), g. n. Like *Penæus*, but with the flagella of the first pair of antennæ longer than the carapace, and cylindrical. *P. serratus* (A. M.-Edw.), sp. n., Gulf of Mexico. *Penæus styliferus* (A. M.-Edw.) and *dobsoni* (Miers) belong also to this genus. C. S. Bate, *l. c.* pp. 171, 182 & 183.

Solenocera lucasi, sp. n., *id. l. c.* pp. 183–185, New Guinea, 130 fath., with notes on the known species.

Haliporus, g. n. Body more slender than in *Penæus* and *Solenocera*; second pair of gnathopods as long as and stouter than the periopods; flagella of the first pair of antennæ long, sub-equal, cylindrical; telson long and narrow, laterally compressed. *H. curvirostris*, mid-Pacific, 2375 fath., *lævis*, mid-Atlantic, 2500 fath., *neptunus*, Celebes, 600 fath., and *obliquirostris*, off Kermadec Island, spp. nn. *Id. l. c.* pp. 171, 185, & 186.

Hemipenæus, g. n. Rostrum straight, short; five podobranchiæ present. *H. spinidorsalis*, South Atlantic, 1900 fath., *speciosus*, Atlantic, 2650 fath., *virilis* and *dubius*, Philippines, 255 & 20 fath., spp. nn. *Id. l. c.* pp. 171, 186 & 187.

Aristeus (Duvernoy, 1841), re-established; rostrum long; five podo-

branchiæ. *A. antennatus* (Risso) = *edwardsianus* (Johnson), Mediterranean at a great depth. *A. armatus*, Australasian Archipelago, North Pacific and South Atlantic, 1900–2050 fath., *semidentatus* and *tomentosus*, South of the Philippine Islands, and *rostridentatus*, Fiji Islands, 300 fath., spp. nn. C. Spence Bate, *l. c.* pp. 171 & 187–189.

Hepomadus, g. n. Four podobranchiæ. *H. glacialis*, South Atlantic, 1875 fath., and *inermis*, South Pacific, 2550 fath., spp. nn. *Id. l. c.* pp. 171, 189 & 190.

Benthesicymus, g. n. Rostrum short and crest-like; five podobranchiæ. *B. crenatus*, mid-Pacific, 2600 fath., *altus*, between Australia and Japan, 350–1400 fath., *brasiliensis*, off Brazil, 1100–2440 fath., and *iridescens*, South Atlantic, 1900 fath., spp. nn. *Id. l. c.* pp. 171, 190 & 191.

Gennadas, g. n. Like *Benthesicymus*, with less arborescent branchiæ. *G. parvus*, sp. n., off Japan, 2425 fath. Near the fossil *Penæus* (*Kolga*) *speciosus* (Salter). *Id. l. c.* p. 171, 191 & 192.

Euphema sp. from the Atlantic, probably the young state of some Penæid; *id. l. c.* p. 192.

Acanthephyra, g. n. Near *Penæus*, rostrum long as in *Hoplophorus*, abdominal keel prolonged into a spine; feet of the first and second pair didactyle. *A. armata*, *debilis*, and *ensis*, spp. nn., West Indies, 422, 500 & 237 fath. A. Milne-Edwards, Ann. Sci. Nat. (6) xi. art. 4, pp. 12–14.

Sergestidæ.

Sergestes krœyeri, off Kermadec Island, 500 fath., *prehensilis* and *japonicus*, off Japan, 500 & 350 fath., *diapontius*, Atlantic, on the surface, spp. nn., C. S. Bate, Ann. N. H. (5) viii. pp. 193 & 194.

Petalidium, g. n. Near *Sergestes*; four branchial plumes only, and four single foliaceous branchial plates. *P. foliaceum*, sp. n., South Indian Ocean, 2100 fath. *Id. l. c.* pp. 172, 194 & 195.

SCHIZOPODA.

Mysis denticulata (Thomson), female described by Thomson, Tr. N. Z. Inst. xiii. p. 205, pl. vii. fig. 1, Dunedin Harbour, New Zealand. *M. meinertshageni*, sp. n., Kirk, *tom. cit.* p. 237, with woodcut, New Zealand.

Boreomysis nobilis and *scyphops*, spp. nn., G. O. Sars, Arch. Math. Naturvid. 1881, pp. 428 & 429, Arctic Sea, 459 & 1110 fath.

Pseudomysis, g. n. Eyes rudimentary; telson very short, subquadrangular, broadly notched behind; in other respects like *Mysideis*. *P. abyssi*, sp. n., *id. l. c.* p. 431, Arctic Sea, 1110 fath.

Nebalia longicornis (Thomson), Thomson, *l. c.* p. 221, pl. viii. fig. 10, New Zealand.

STOMATOPODA.

Lysiosquilla armata, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 446, New England, 65–120 fath.

Lysiosquilla (*Coronis*) *acanthocarpus* var. n. *septem-spinosa*, Miers, Ann. N. H. (5) viii. p. 368, pl. xvi. fig. 7, Gorée.

Lysiosquilla polydactyla, sp. n., Martens, SB. nat. Fr. 1881, p. 92, locality unknown, probably Chili.

Squilla gracilipes, sp. n., Miers, P. Z. S. 1881, p. 75, pl. vii. fig. 8, West Coast of Patagonia.

Gonodactylus trachurus, sp. n., Mauritius and Pelew Islands, and observations on *chiragra* (L.) and *graphurus* (White), both common in the Malayan Archipelago, and variable in colour; Martens, *l. c.* pp. 93 & 94.

CUMACEA.

Diastylis nodosus, sp. n., Sars, *l. c.* p. 472, Arctic Sea, 125 fath.

AMPHIPODA.

Anatomical observations on the rectum, gills, genital organs, and several glands in *Orchestia* and some other *Amphipoda*, by O. Nebeski, Arb. z. Inst. Wien, iii. [1880] pp. 111–163, 4 pls. Abstract in J. R. Micr. Soc. (2) i. pp. 453–455.

Circulatory organs described by Delage, Arch. Z. expér. ix. pp. 87–134, pls. viii.–x, *vide suprà*.

Orchestia (Leach). Anatomical notes on this genus by O. Nebeski, see suprà. *O. cavimana* (Hllr.), terrestrial, in gardens at Trieste; *id.* Arb. z. Inst. Wien, iii. pt. 2, p. 32.

Orchestia mediterranea, *montagui*, and *bottæ*, common at Sebastopol, the females have eggs in the summer months; Ulianin, Z. wiss. Zool. xxxv. p. 440.

Orchestia. G. M. Thomson examines the known New Zealand species and comes to the result that there are only 3 distinct littoral species. *O. chilensis* (M.-Edw.), *aucklandiæ* and *telluris* (C. S. Bate), and one species found in the bush, *O. sylvicola* (Dana), including *novæ-zeelandiæ* (Bate), and *tenuis* (Dana), variable, the males of this species having at least two forms of gnathopods, and the females also differing considerably in the length of the antennæ and relative size of the third, fourth, and fifth periopods. Tr. N. Z. Inst. xiii. pp. 208–212.

Gammaridæ.

Anonyx typhlops, sp. n., G. O. Sars, Arch. Math. Naturvid. 1881, p. 437, Arctic Sea, 1710 fath., whitish, without eyes.

Anonyx (*Onisimus*) *turgidus*, Arctic Sea, 223 fath., and *leucopis*, North Sea, 805 fath., spp. nn., *id. l. c.* pp. 437 & 438.

Anonyx (*Tryphosa*) *pusillus*, sp. n., *id. l. c.* p. 439, Arctic Sea, 1004 fath.

Anonyx (*Hippomedon* ?) *calcaratus*, sp. n., *id. l. c.* p. 440, Arctic Sea, 600–1200 fath.

Acidostoma laticornis, sp. n., *id. ibid.*, Arctic Sea, 634 fath.

Amphilochus squamosus (Thomson), Thomson, Tr. N. Z. Inst. xiii. p. 214, pl. vii. fig. 5, New Zealand.

Phoxus oculatus, sp. n., Sars, *l. c.* p. 441, Jan Mayen Island, 10–30 fath.

Harpinia abyssi, *carinata*, *serrata*, and *mucronata*, spp. nn., *id. l. c.* pp. 443–446, Arctic Sea, the third near Jan Mayen Island.

Urothoe abbreviata, sp. n., *id. l. c.* p. 446, Arctic Sea, 620 fath.

Cressa abyssicola, sp. n., *id. l. c.* p. 453, Arctic Sea, 447 fath.

Bruzelia serrata, sp. n., *id. l. c.* p. 447, North Sea, 350 fath.

Probolium tergestinum, sp. n., Nebeski, Arb. z. Inst. Wien, iii. pt. 2, p. 33, pl. iv. fig. 39, Trieste.

Eusirus cuspidatus var. *antarcticus* (Thomson), with note on the generic characters; Thomson, Tr. N. Z. Inst. xiii. pp. 215 & 216.

Leucothoe denticulata (Costa). Some individuals live freely, others in the pallial cavity of Ascidians or in the water-channels of *Cacospongia*, the parasitical individuals are paler coloured; Nebeski, Arb. z. Inst. Wien, iii. pt. 2, p. 36.

Amphithonotus levis (Thomson), Thomson, *l. c.* p. 215, pl. vii. fig. 6, New Zealand.

Tritropis ? appendiculata, sp. n., Sars, *l. c.* 1881, p. 451, Arctic Sea, 1280 fath. "Probably a new genus."

Acanthonotozoma inflatum (Kröyer), female from Franz-Josef Land; Miers, Ann. N. H. (5) vii. p. 47.

Œdicerus macrocheir, sp. n., Sars, *l. c.* p. 449, Arctic Sea, 1004 fath.

Acanthostephia pulchra, sp. n., Miers, Ann. N. H. (5) vii. p. 47, pl. vii. figs. 1 & 2, Franz-Josef Land.

Epimeria loricata, sp. n., Sars, *l. c.* p. 450, Arctic Sea, 125–260 fath.

Dexamina dolichonyx, sp. n., Nebeski, Arb. z. Inst. Wien, iii. pt. 2, p. 35, pl. iv. fig. 40, Trieste.

Pherusa bispinosa (Bate, *Atylus*), id. *l. c.* p. 36, Trieste.

Metopa spectabilis and *aquicornis*, spp. nn., Sars, *l. c.* p. 451, Arctic Sea, 743 fath.

Gammarus marinus (Leach) common on shallow sandy places at Trieste, *G. locusta* (Fabr.) on the muddy bottom of the port, a dark-coloured variety of the latter = *G. edwardsi* (C. S. Bate); Nebeski, *l. c.* pp. 36 & 37.

Gammarus pœcilurus (Rathke) common at Sebastopol; Ulianin, Z. wiss. Zool. xxxv. p. 440.

Goplana polonica (Wrzesniowski, 1879), monographed in Polish: upper antennæ longer and thicker than the lower, with short lateral branches; lower antennæ of the male with olfactory "calceolæ"; first and second pair of thoracic feet prehensile in both sexes and nearly equal; uropods with concave joints; the three last abdominal segments united. It is nearly allied to *Crangonyx* (Bate), but distinct by the abdominal segments. Warsaw, in stagnant ditches. *Gammarus ambulans* (Fritz Müller) is a second species of the same genus. Wrzesniowski, Goplana polonica, Warszawa: 1881, with 2 plates, containing coloured figures of male and female, and several details.

Melita pallida, sp. n., Sars, *l. c.* p. 457, Arctic Sea, 1333 fath., in the holes of a piece of submerged wood.

Melita tenuicornis (Dana). The female has the same hook-like process on the coxal lamella as *M. insatiabilis* (F. Müll.); Thomson, Tr. N. Z. Inst. xiii. p. 218.

Amathillopsis affinis, sp. n., Miers, Ann. N. H. (5) vii. p. 48, pl. vii. figs. 3–4, Franz-Josef Land.

Ampelisca odontoplax and *minuticornis*, spp. nn., Sars, *l. c.* pp. 454 & 455, North and Arctic Seas.

Ampelisca tenuicornis (Lilljeb.), specimens from Gorée described; Miers, Ann. N. H. (5) viii. p. 371.

Byblis abyssi, sp. n., Sars, *l. c.* p. 456, North and Arctic Seas, 350–620 fath.

Microdeutopus gryllotalpa (Costa), sexual difference in the hands; Nebeski, Arb. z. Inst. Wien, iii. pt. 2, p. 45, pl. iv. fig. 41, Trieste.

Microdeutopus maculatus (Thomson), perhaps the other sex of *Aora typica*?; Thomson, *l. c.* p. 217, pl. viii. fig. 7, New Zealand.

Aora typica (Kröyer) = *Lalaria longitarsis* (Nicolet), New Zealand specimens described, the type is from Chili; *id. l. c.* p. 216.

Autonoe megacheir, sp. n., Sars, *l. c.* p. 458, Arctic Sea, 107 fath.

Corophiidæ.

Cement glands and habits described by Nebeski, see *suprâ*; differences in the shape of the telson, which is used to fix them on their tubes, *id.* Arb. z. Inst. Wien, iii. pt. 2, pp. 38 & 39, pl. iv. fig. 42.

Amphithoe pencillata (Costa), *longicornis* and *longimana* (Heller), habits and differences; *id.* Arb. z. Inst. Wien, iii. pt. 2, pp. 39–41.

Podocerus spectus (Mont.), including as varieties of the males *pelagicus* (Bate), *piapoïllus* (M.-Edw.), and *variegatus* (Leach), and *P. ocius*, Bate, distinct species, Trieste; *id. l. c.* pp. 41–44, pl. iv. figs. 42 & 43.

Podocerus assimilis, *brevicornis*, and *longicornis*, spp. nn., Sars, *l. c.* pp. 459–461, Arctic Sea, the last 1110 fath.

Cerapus megalops, sp. n., *id. l. c.* p. 461, Arctic Sea, 70 & 620 fath.

Chelura terebrans (Phil.), destructive to the timber of submarine structures on the coast of the United States; S. I. Smith, P. U. S. Nat. Mus. ii. [1880] pp. 232–235.

Corophium contractum (Stimps.), New Zealand specimens described, the type is from Japan; Thomson, Tr. N. Z. Inst. xiii. p. 220, pl. viii. fig. 9.

Cyrtophium, its resemblance to the *Dulichiidæ*; Nebeski, Arb. z. Inst. Wien, iii. pt. 2, pp. 45 & 46.

Cyrtophium cristatum (Thomson), both sexes; Thomson, *l. c.* p. 219, pl. viii. fig. 8. New Zealand.

Glauconome petalocera, sp. n., Sars, *l. c.* p. 462, Arctic Sea.

Neohela, new name for *Hela* (Böck), preoccupied; *N. phasma*, sp. n., S. I. Smith, P. U. S. Nat. Mus. iii. p. 448, New England, 372 fath.

Phronimatidæ.

Phronima sedentaria (Forsk); note on it by G. Gordon, Scot. Nat. vi pp. 56–59.

Dulichiidæ.

Dulichia septentrionalis, Spitsbergen, 10–20 fath., and *macera*, Arctic Sea, 400–800 fath., spp. nn., Sars, *l. c.* pp. 463 & 464.

Caprellidæ.

Caprella microtuberculata, sp. n., *id. l. c.* p. 465, Arctic Sea, 70–180 fath.

ISOPODA.

Gerstäcker, see *suprà*.

Circulatory organs described by Delage, Arch. Z. expér. ix. pp. 1–87, pls. i.–vii., and pp. 124–147, pl. xi., see *suprà*.

Tanaidæ.

Delage, *l. c.* pp. 147–150, dwells on the differences of this family from the rest of the *Isopoda*, and regards the *Tanaida* as an archaic form, from which not only the *Isopoda* and *Amphipoda*, but also the *Podophthalmata*, may be derived.

Tanais novæ-zealandiæ (Thomson), Thomson, Tr. N. Z. Inst. xiii. p. 207, pl. vii. fig. 3, Dunedin Harbour, New Zealand, 4–5 fath.

Paratanais cornutus, sp. n., Sars, *l. c.* p. 431, Arctic Sea, 191 fath.

Gnathiidæ.

Anceus robustus, sp. n., Sars, *l. c.* p. 432, Arctic Sea, 191 & 416 fath.

Arcturidæ.

Arcturus tuberculatus (Thomson), perhaps = *Leachia nodosa* (Dana), male and female described by Thomson, Tr. N. Z. Inst. xiii. p. 206, pl. vii. fig. 2, New Zealand.

Arcturus coppingeri, sp. n., Miers, P. Z. S. 1881, p. 75, pl. vii. fig. 9, West Coast of Patagonia.

Idoteidæ.

Miers gives a critical revision of this family, arranging it as follows :—

Subfam. I. *Glyptonotinæ*. Sides of the head emarginate or cleft, and laterally produced beyond the eyes; three anterior pairs of legs prehensile, pl. i. figs. 1–4.

Only genus *Glyptonotus* (Eights), 5 spp., all northern.

Subfam. II. *Idoteinæ*. Sides of the head not laterally produced, entire; eyes lateral; legs all ambulatory.

Gen. 1. *Idotea* (Fabr.). Body oblong-ovate, with the epimera distinct, and more or less evident in a dorsal view; 1–5

distinct segments in the post-abdomen; antennæ with a multi-articulated flagellum.

I. Subgen. *Zenobia* (Risso): 4–5 distinct post-abdominal segments. 4 sp.

II. Subgen. *Armida* (Risso): 3 distinct post-abdominal segments. 15 sp.

III. Subgen. No name: 2 distinct post-abdominal segments. 4 sp.

IV. Subgen. *Leptosoma* (Risso), *Crabyzos* (Bate): all post-abdominal segments consolidated into one piece. 5 sp.

Gen. 2. *Edotia* (Guérin) = *Desmarestia* (Gay) = ? *Epelys* (Dana). Body ovate, epimera not distinctly separated; basal opercular plates with an oblique line crossing their outer surface.

§ 1. *Synidotea* (Harger). Antennæ well developed. 3 sp.

§ 2. *Edotia*, s. str. Flagellum of antennæ rudimentary. Post-abdomen 1-jointed. 4 sp.

§ 3. *Desmarestia* (Gay), ? *Epelys* (Dana). Flagellum obsolete. Post-abdomen 2-jointed. 1 sp.

Gen. 3. *Cleantis* (Dana). Body oblong-ovate, slender; epimera small, but distinct; joints of the flagellum consolidated into a single piece.

§ 1. *Erichsonia* (Dana). All post-abdominal segments coalescent. 3 sp.

§ 2. *Cleantis*, s. str. Post-abdomen 2–5 jointed. 3 sp.

All the species are described and their synonymy given, some new or little known species being figured. J. L. S. xvi. 88 pp. 3 pls.

Glyptonotus japonii (Kröyer) = *Chiridotea megalura* (G. O. Sars), young specimen from Picton Rock glacier described; *id. l. c.* pp. 15 & 16, pl. i. fig. 5.

Idotea entomon (L.) and *sabinii* (Kröyer), the former 100, the latter 90 mm. long, plentiful on clay bottom in the sea north of the mouth of the river Lena; Nordenskiöld, "Umsegelung Asiens auf der Vega," vol. i. pp. 376 & 377, with figures.

Idotea (*Zenobia*) *whymperi*, sp. n., Miers, *l. c.* p. 23, pl. i. figs. 6 & 7. North mid-Atlantic, lat. 58° N., long. 19° W., among seaweed.

Idotea (*Armida*) *marina* (L.) = *pelagica* (Leach) = *irrorata* (Say) = *tricuspidata* (Desm.) = *basteri* (Aud.), variable in colour and markings in the articulations of the antennæ, and in the 3 or 1-cuspidated telson, distributed throughout the Mediterranean, Black, and Caspian Seas, German Ocean and Baltic, Eastern Coast of North America, Rio Janeiro, New Zealand, Red Sea, and ? Java; Miers, *l. c.* pp. 25–32. *I. ochotensis* (Brandt), Yedo, *lacustris* (Thomson), New Zealand, var. or sp. n. ? *rotundicauda*, Port Henry, Straits of Magellan, and *whitii* (Stimps.), California; *id. l. c.* pp. 32–42, pl. i. figs. 8–12, and pl. ii. figs. 1–3. *I. indica* (M.-Edw.), *id. l. c.* p. 50, pl. ii. figs. 4 & 5.

Idotea (III.) *peroni* (M.-Edw.) = *distincta* (Guérin), Flinders' Island, and *lobata* (White), sp. n., locality unknown; *id. l. c.* pp. 55 & 57, pl. ii. figs. 6–9.

Idotea annulata (Dana) ?, from Port Henry ; Miers, P. Z. S. 1881, p. 76.

Edotia hirtipes (M.-Edw.) var. n. *laevidorsalis*, Japan, and *tuberculata* (Guérin), Straits of Magellan and Falkland Islands; *id. l. c.* pp. 69 & 72, pl. iii. figs. 1–6.

Chiridotea megalura, sp. n., Sars, *l. c.* p. 433, Northern Sea, 1081 & 1215 fath., Arctic Sea, 1110–1710 fath. Nearly allied to *C. sabinii* (Leach).

Synidotea incisa, sp. n., *id. l. c* p. 433, Spitsbergen.

Cleantis filiformis (Say), New Jersey and Massachusetts, var. from Brazil ?, and *isopus* (Grube, MS.), sp. n., Goto Island; Miers, *l. c.* pp. 77–80, pl. iii. figs. 7–11.

Asellidæ.

Ianthe, g. n. Near *Janira* (Leach), distinguished by the great convexity of the body, the small and distant eyes, the want of an articulated scale at the peduncles of the inner antennæ, the fully developed palpiform appendage of the mandibles and the three-articulated maxillar feet. *I. speciosa*, sp. n., with two rows of spines on the back and spiniform lateral edges of the segments. Baffin's Bay, 98 fath. Bovallius, Sv. Ak. Handl. Bih. vi. No. 4, 11 pp. 3 pls.

Acanthoniscus, g. n. Near *Janira* (Leach), but first pair of feet not subcheliform, the other feet with only one claw, uropods styliform, with very short branches. *A. typhlops*, sp. n., Sars, Arch. Math. Naturvid. 1881, p. 434, Arctic Sea, 457 fath., whitish, no eyes.

Ischnosoma quadrispinosum, sp. n., *id. l. c.* p. 435, Arctic Sea, 778 fath.

Oniscidæ.

M. Weber gives an exact anatomical and histi ,ical description of several species of *Trichoniscus*, comparatively with : *Oniscidæ*, with special regard to the integuments, the ramified pigment cells, the glands, the olfactory clubs on the last joint of the inner antennæ, the feeling-hairs and cones at different parts of the body, the mandibles and maxillæ, the sexual organs, chiefly those of the males, which also yield useful specific distinctions. Arch. mikr. Anat. xix. pp. 579–648, pls. xxviii. & xxix.

Porcellio reaumuri and *olivieri* (M.-Edw.), specimens from Ramle described, the former also found at Sfax in Tunis ; Lucas, Bull. Soc. Ent. Fr. (6) i. p. lxvii.

Trichoniscus (Brandt), monographically described, *T. leydigi*, sp. n., and *pusillus* (Brandt) var. n. *batavus*, shores of Zuyder See, under stones, the former colourless, slow and groping in the manner of animals which live always in darkness. Weber, Tijdschr. Nederl. Dierk. Ver. v. pp. 174–191, pl. v. figs. 1–6.

Haplophthalmus mengii (Zaddach, as *Itea*) = *elegans*, Schöbl, described from Dutch specimens; *id. l. c.* pp. 191–194, pl. v. figs. 7–9.

Platyarthrus hoffmannseggi (Brandt) found near Amsterdam, not in society with ants; *id. l. c.* p. 195.

Sphæromidæ.

Dynamene montagui (Leach), note on its young state by Y. Delage, Arch. Z. expér. ix. p. 156.

Cirolanidæ.

Cirolana hirtipes (M.-Edw.) found on *Thalassochelys corticata* (Rond.) [*Chelonia caouana*]; Valle, Boll. Soc. Adr. iv. [1879].

Cirolana swainsoni (Leach) = ? *hirtipes* (Heller), from Gorée, described; Miers, Ann. N. H. (5) viii. p. 369.

Corallana acuticauda, sp. n., Miers, P. Z. S. 1881, p. 78, pl. vii. fig. 13, South Atlantic, 17° S. lat., 35 fath.

Ægidæ.

Ægа punctulata, sp. n., Miers, *l. c.* p. 77, pl. vii. figs. 10–12, Straits of Magellan.

Cymothoidæ.

J. C. Schiödte and F. Meinert, Nat. Tids. (3) xiii. pp. 1–156, pls. i.–viii., continue their monograph of this family, discussing the second subdivision, that of *Anilocridæ*. They describe and figure 8 genera and about 50 species, describing several stages of growth in many of them; as this must be a standard work of reference, only the following new genera and species will be mentioned: *Nerocila cebuana*, Philippines, *serra*, Banka, *japonica*, Japan, *recurvispina*, Calcutta, *breviceps*, Sandwich Islands, *australasiæ*, Hobart Town, *neapolitana*, Naples, *adriatica*, Spalato, *acuminata*, Carolina and Gulf of Mexico, *cephalotes*, Gaboon and Southern Africa, *fluviatilis*, Montevideo, *novæ-zeelandiæ*, New Zealand, *californica*, California, *laticaud.* and Port Westerman, Australia, spp. nn. (and the other known species [ou]ll 27, described and figured), pp. 4–84, pls. i.–vii. fig. 2.

Rosca, g. n. Distinct from *Nerocila* by the sides of the abdominal segments being entire, not notched; the antennæ of the first pair are cylindrical. *R. limbata*, sp. n., Amboina, p. 86, pl. vii. fig. 3.

Plotor, g. n. Antennæ of the first pair compressed. In other respects like the preceding. *P. indus*, sp. n., Indian Sea, pp. 87–91, pl. vii. figs. 4–7.

Braga, g. n. Body compact, front rounded and vaulted, sides of the abdominal segments entire. *B. nasuta*, *cichlæ* and *brasiliensis*, spp. nn., Brazil, pp. 92–97, pl. vii. figs. 8–13.

Lathrana, g. n. Sides of the abdominal segments notched, in other respects like *Braga*. *L. insidiosa*, sp. n., Brazil, on *Cetengraulis*, pp. 97–100, pl. vii. figs. 14 & 15.

Anilocra (including *Epichthys*, Herkl.), *longicauda*, Indian Sea, *amboinensis*, Amboina, *coxalis*, Zanzibar, *australis*, New Caledonia, *atlantica*, Atlantic, *plebeia*, Costa Rica, spp. nn. (and a number of known species

described and figured), pp. 100–150, pl. vii. fig. 16, pls. viii. ix. & x. figs. 1–5.

Olencira (Leach), distinct by the contracted occiput from all the preceding genera; the only species, *O. prægustator* (Say) = *lamarcki* (Leach), common in North America in the mouth of fresh-water fishes, pp. 150–154, pl. viii. figs. 6–9.

Asotana, g. n. Distinct from all the preceding genera by two deep notches in the front. *A. formosa*, sp. n., River Ica, Pera, pp. 154–156, pl. viii. figs. 10–12.

Livoneca novæ-zeelandiæ (White), Straits of Magellan; Miers, P. Z. S. 1881, p. 77.

Bopyridæ.

The oral parts of *Bopyrus*, *Gyge*, *Ione*, *Cepon*, *Phryxus* and the new genera *Gigantione* and *Pseudione* are compared and discussed by R. Kossmann, Z. wiss. Zool. xxxv. pp. 658–664, pl. xxxiii.

Anatomical notes on the intestinal tract, liver, heart, nervous system, and genital organs of the *Bopyridæ*, with critical remarks on the statements of previous authors; *id. l. c.* pp. 672–679, pl. xxxv.; also R. Walz, Zool. Anz. iv. pp. 159–164.

List of generic names of *Bopyridæ* and of the species of *Crustacea* in which they have been found; R. Kossmann, *l. c.* pp. 653 & 654.

Bopyrus virbii, sp. n., Walz, Zool. Anz. iv. pp. 159 & 164, Trieste, common, in the branchial cavity of *Virbius viridis*. [*Cf.* the following.]

Bopyrina, g. n. Inner antennæ of both sexes strong, the basal joint dilated and cutting in the female; outer antennæ in the adult rudimentary. Pleon of both sexes indistinctly segmentated, without epimeral lobes. *B. virbii* (Walz, *Bopyrus*, 1881), Naples, on *Virbius viridis*. Kossmann, *l. c.* pp. 666–672, pl. xxxiv., with previous notes on various stages of development.

Bopyrina ocellata (Czerniawsky, 1868, *Bopyrus*), Black Sea, on the gills of *Virbius*; a variety of it = *B. virbii* (Walz, *suprà*, and Kossmann, *suprà*): both shortly described by Czerniawsky, Zool. Anz. iv. p. 528.

Ione thoracica (Latr.), younger stages of the female described; the so-called branchial appendages are not respiratory, but fill up the intervals between the gill-leaves of its host; 6 pairs of "epimeroid" and 2 "pleopodoid" appendages in the pleon, the epimeroids are perhaps respiratory. Kossmann, MT. z. Stat. Neap. iii. pp. 171–180, pl. x.

Pseudione, g. n. Maxillipeds of the male quite rudimentary. An undescribed species on *Callianassa subterranea*. Kossmann, Z. wiss. Zool. xxxv. p. 663, pl. xxxiii. fig. 17.

Gigantione, g. n. Male with 6-jointed external antennæ, distinctly segmentated pleon, and six pairs of oval pleopods. Female nearly circular; inner antennæ 3-jointed, the first joint very dilated; external antennæ 5-jointed; periopods with short pointed claw; lateral edges of all segments of the perion and pleon lobiform, but not ramified; all pleopods, except the first pair, ramified. *G. mœbii*, sp. n., female 15 mm.,

Mauritius, on *Rueppellia impressa*, De Haan. *Id. l.* c. pp. 655–658, pl. xxxii.

Cepon portuni, sp. n., *id.* MT. z. Stat. Neap. iii. pp. 174, 181 & 182, pl. xi., Naples, in the branchial cavity of *Portunus arcuatus*; female with very strong muscular coxal cushions.

Leptophryæus clypeatus, sp. n., = *Daius mysidis* (G. O. Sars, 1876, *nec* Kröyer), G. O. Sars, Arch. Math. Naturvid. 1881, p. 436, North Sea, 407 fath., on *Pseudomma roseum*.

Entione, g. n. Distinguished from *Entoniscus*, the males having only six pairs of periopods and rudimentary 1-jointed antennæ. In both genera the sexes are separate, and the females are provided with pairs of lamellæ on the ventral side of the perion for sheltering the young; the contradictory statements by Fraisse and Giard are refuted by the author. *E. cancrorum* (F. Müll.), *cavolinii*, (Fraisse), and *meniezii* (Giard), described. *Entoniscus porcellanæ* (F. Müll.) alone remains in the genus *Entoniscus*. Kossmann, MT. z. Stat. Neap. iii. pp. 170–183, pls. x. & xi.

Calyptura, *Codonophilus*, *Haliophasma*, and *Stenetrium*, gg. nn. of Australian *Isopoda*; Haswell, P. Linn. Soc. N. S. W. v. [The Recorder does not know to what family they are to be referred.]

PHYLLOPODA.

Branchiopodidæ.

Eubranchipus vernalis (Verr.), parasites; Gissler, Am. Monthl. Micr. J. ii. p. 101, with figures.

Apodidæ.

Apus cancriformis (Schäff.). E. Ray Lankester, from observations on the appendages of the body and nervous system, comes to the conclusion that *Apus* is an archaic Crustacean; Q. J. Micr. Sci. xxi. pp. 343–376. The same found in Belgium; Segvelt, CR. Ent. Belg. xxiv. p. cxlix.

OSTRACODA.

Cytheridæ.

Elpidium bronneliarum (F. Müller) [Zool. Rec. xvii. *Crust.* p. 52] is also described by the author in Arch. Mus. R. Jan. iv. pp. 27–34, but the figure given there is not so good as that in Kosmos, vi. [1880] p. 387; F. Müller, Zool. Anz. iv. p. 505.

COPEPODA.

Anatomical notes, chiefly on the structure of the head and blood-lacunæ, and the unicellular tegumentary glands with their innervation, by C. Claus, Arb. z. Inst. Wien, iii. pp. 313–332, 3 pls.; abstract in J. R. Micr. Soc. (2) i. pp. 733 & 734.

R. Kossmann defends himself against objections made by Della Valle; Zool. Anz. iv. pp. 544-548.

Cyclopidæ.

Cyclops quadricornis (Mll.), shower of it; F. E. L. Beal, Am. Nat. xv. p. 736.

Harpacticidæ.

Sigmatidium, g. n. Near *Longipedia*; both pairs of maxillipeds without warts or prehensile appendages; inner branch of the first pair of feet 2-jointed. *S. difficile*, sp. n., Giesbrecht, Zool. Anz. iv. p. 255, Kiel.

Ectinosoma gothiceps, sp. n., *id. ibid.*, Kiel.

Tachidius littoralis, sp. n., Poppe, Abh. Ver. Brem. vii. pp. 149–152, pl. vi., shore of Northern Germany.

Tachidius discipes, new name for *brevicornis* (Lillj., *nec* O. Fr. Müll.); Giesbrecht, *l. c.* p. 255.

Tachidius fonticola, sp. n., Chambers, J. Cincinn. Soc. iv. p. 47, with pl., in salt-water, Big Bone Springs, N. America.

Dactylopus debilis, sp. n., Giesbrecht, *l. c.* p. 256, Kiel.

Harpacticus brevicornis (O. Fr. Müll., *Cyclops*) = *chelifer* (Lilljeb., *nec* O. Fr. Müll.); *id. l. c.* p. 255.

Calanidæ.

Diaptomus sanguineus, variations; C. F. Gissler, Am. Nat. xv. pp. 736 & 737.

Diaptomus ? kentuckyensis, sp. n., Chambers. J. Cincinn. Soc. iv. p. [illegible] rudi- with pl., Kentucky.

Cetochilus. Development observed, the eggs are laid in the water before the Nauplius-stage; Grobben, Arb. z. Inst. Wien, iii. pp. 243–282, 4 pls. (see *suprà*, p. 7).

Calanus (Leach), originally probably = *Cetochilus* (Roussel de Vauzème); Claus, Arb. z. Inst. Wien, iii. pt. 3, p. 11.

Eucalanus, g. n., for *Calanus mastigophorus* (Claus); *id. l. c.* pp. 13 & 14, pl. ii. figs. 10–16, Mediterranean.

Paracalanus (Bœck) limited to *Calanus parvus* and *pygmæus* (Claus); *id. l. c.* pp. 12, 14 & 15, pl. iii. figs. 1–10, Seas of Northern Europe and Adriatic.

Clausia (Bœck, 1864) = *Pseudocalanus* (Bœck, 1872), distinct by the want of the fifth pair of feet in the female. *C. elongata* (Bœck), seas of Northern Europe; *id. l. c.* pp. 16 & 17, pl. iii. figs. 11–15.

Lucullus, g. n. Near *Euchæta* (Phil.); antennæ of the male 19-jointed; manducatory plate of the mandible rudimentary, and outer lobe of the maxilla wanting in the male. *L. acuspes*, sp. n., Giesbrecht, Zool. Anz. iv. p. 258, Kiel.

Dias bifilosus, sp. n., *discaudatus*, sp. n., and *longiremis* (Lilljeb.); *id. l. c.* p. 257, Kiel.

Temora (Baird). Male and female very different. Male: abdomen

5-jointed, outer branch of the second, third, and fourth pairs of feet 3-jointed, fifth pair prehensile, on the left (not right) side, in the shape of a pair of tongs. Female: abdomen 3-jointed, outer branch of the second, third, and fourth pairs of feet 2-jointed, fifth pair 3-jointed. *T. finmarchica* (Baird, Claus) = *longicornis* (Brady), but not *Monoculus finmarchicus* (Gunner) or *Cyclops longicornis* (O. Fr. Müller), and *T. armata* (Claus), described. Claus, SB. Ak. Wien, lxxxiii. pp. 482–488, pl. i., figs. 1–13.

Temora. Giesbrecht, Zool. Anz. iv. pp. 257 & 258, subdivides it into the following new subgenera:—

Halitemora. First pair of antennæ equally slender in the female; second maxilliped long. Only in the sea. *H. longicornis* (A. F. Müll.) and *armata* (Claus).

Eurytemora. First pair of antennæ thickened and spinous at the base; second maxilliped short. Sea and fresh-water. *E. velox* (Lillj.), *inermis* (Bœck), *clausi* (Hoek), *affinis* (Poppe), and *hirundo*, sp. n., Kiel.

Temorella, g. n. Fourth and fifth thoracic segments imperfectly separated; antennæ shorter, with large terminal papilla; maxillæ and maxillar feet much smaller than in *Temora*; inner branch of the first pair of feet 1-jointed, of the three following 2-jointed, outer branch in both sexes 3-jointed with long and feeble claw; fifth pair 1-branched, 4-jointed in the female, unequal on both sides, with 2-jointed prehensile hook in the male. *T. clausi* (Hoek, as *Temora*) = *Temora velox*, Lilljeborg, ♀, shores of Scandinavia, Holland, and Northern Germany, and *T. affinis* (Poppe, as *Temora*), = *Temora velox*, Lilljeborg, ♂, distinct species, brackish and fresh-water in Northern Germany. Claus, *l. c.* pp. 488-492, pl. ii. figs. 1–14.

Notodelphyidæ.

Biomonaste, g. n. Near *Doropygus*, head triangular, the following 3 segments equal; 4 pairs of forked feet; abdomen bag-shaped, with a single ovi-sac on its ventral face. Male unknown. *B. bicolor*, sp. n., in an Ascidian, Coast of France. Hesse, Ann. Sci. Nat. (6) xi. Art. 8, pp. 1–4 & 11, pl. xi. figs. 1–9.

Scotophilus, g. n. [name preoccupied in *Mammalia*; Rec.]. Near *Botachus*, head oval-oblong, the last of the three following segments much longer than the rest, 4 pair of forked feet; abdomen 3-jointed, with terminal fork. Male unknown. *S. tricolor*, sp. n., in an Ascidian, Coast of France. *Id. l. c.* pp. 4–9 & 12, pl. xi. figs. 10–17.

Notopteropherus bombyx and *papilio* (Hesse, 1865). Young males and females described; *id. l. c.* pp. 13–19, pl. xii. figs. 1–8 & 9–11; abstract with woodcut in J. R. Micr. Soc. (2) ii. p. 187.

Corycæidæ and Ergasilidæ.

A. Della Valle proposes to unite these families; MT. z. Stat. Neap. ii. [1880] pp. 83 & 84. His paper, "Sui *Coricеidi* parassiti e sull' ana-

tomia del genere *Lichomolgus* [Zool. Rec. xvii. *Crust.* p. 5] is also given, *l. c.* p. 53.

Lichomolgus sarsi (Clap.), with a new variety, *branchialis*, Naples, on *Spirographis*, somewhat different from the other species of the genus, and the other species already mentioned in Zool. Rec. xvii. *Crust.* p. 58, described and figured ; *id. l. c.* pp. 87–102, pls. v. & vi. figs. 1–18.

Anthessius solecurti and *pleurobranchiæ* (Della Valle, 1880), also described and figured by the author; *l. c.* pp. 102–104, pl. vi. figs. 49–58.

Ascomyzontidæ.

Nicothoe astaci (Aud.), found also on *Palinurus vulgaris*; Ann. Soc. Ent. Fr. (6) i. p. 24.

Ascomyzon thorelli, sp. n., G. O. Sars, Arch. Math. Naturvid. 1881, p. 474, Spitsbergen.

Stellicola kossmanniana, sp. n., Della Valle, Boll. Soc. Adr. vi. [1880] with a pl., Constantinople, on the sea-feather *Pteroides griseum* var. *longispinosum* (Kölliker).

Dichelesthiidæ.

Anthosoma smithi (Leach) found on the shark *Oxyrrhina spallanzanii* (Raf.), Adriatic ; *id. l. c.* p.

Lernanthropus polynemi, sp. n., Ricchiardi, P.v. Soc. Tosc. July, 1881, and Zool. Anz. iv. p. 505, on the gills of *Polynemus tetradactylus* (Shaw), Batavia.

Nemesis mediterranea (Risso) var. n. *sinuata*, Della Valle, *l. c.*, found on the shark *Oxyrrhina spallanzanii* (Raf.).

Lernæidæ.

Peroderma petersi, sp. n., Ricchiardi, P.v. Soc. Tosc. May, 1881, and Zool. Anz. iv. p. 387, on *Gobius buccatus* (C. V.).

Chondracanthidæ.

Chondracanthus bleekeri, sp. n., Ricchiardi, *l. c.*, and Zool. Anz. iv. p. 387, gills of *Chilinus chlorurus* (Bl.) and *Pseudorrhombus russeli* (Gray).

Lernæopodidæ.

Tracheliastes gigas, sp. n., Ricchiardi, *op. cit.* July, 1881, and Zool. Anz. iv. p. 504, "Sagaurag-Songer," Malayan Archipelago.

CIRRIPEDIA.

Lepadidæ.

Scalpellum angustum = *strømi* (Heller, *nec* M. Sars), *cornutum* and *hamatum*, spp. nn., G. O. Sars, Arch. Math. Naturvid. 1881, pp. 466–468, Arctic Sea.

PELTOGASTRIDÆ.

Sacculina carcini. Its sucking appendages, "sarcorhizæ," are ramified delicate tubes with milk-white contents, which form a very complex network round the digestive tube and extend to the liver, the genital gland, and even the sternal muscles and extremities of the limbs of their hosts, but never touch the heart, gills, or central nervous system, so the crab apparently retains its general health. The *Sacculina* is itself infested by a species of *Saccharomyces*, which destroys it. S. Jourdain, C. R. xcii. pp. 1352–1354; abstract in J. R. Micr. Soc. (2) i. p. 601.

Sylon hymenodoræ, sp. n., G. O. Sars, Arch. Math. Naturvid. 1881, p. 469, North Sea, 1862 fath., under the last cephalothoracic segment of *Hymenodora glacialis*.

XIPHOSURA.

E. RAY LANKESTER, from a comparison of the nervous system, the skeleton of the abdominal region, the alimentary tract, &c., now comes to the conclusion that *Limulus* agrees more with the Scorpions than with the *Crustacea*, and he proposes a new order of *Arachnida*, to be called *Hæmobranchia*, for its reception. Q. J. Micr. Sci. xxi. pp. 504–548, 609–649, with 2 pls. ; abstract in J. R. Micr. Soc. (2) ii. pp. 40 & 41.

Limulus uses its caudal spine for turning itself round when fallen on its back ; J. de Bellesme, Ann. Sci. Nat. xi. No. 7, 5 pp. [This has long ago been observed by the Recorder and others.]

TRILOBITÆ.

C. D. WALCOTT's researches on the organisation of the Trilobites may be here mentioned; according to them, the ventral membrane was thin and delicate, strengthened in each segment by a transverse arch, to which the appendages were attached ; there was a series of 6–7-jointed ambulatory legs extending from the cephalic shield beneath the thorax and pygidium to the posterior segment of the latter. An epipodite and a branchia were attached to the basal joint. The appendages beneath the pygidium did not essentially differ from those of the thoracic segment. The eggs of the Trilobites, which are found beneath the dorsal shield, are also noticed. The author places the Trilobites in a distinct class, *Pœcilopoda*, which includes also *Limulus* and the *Eurypteridæ*, and which has its place after the *Crustacea* and before *Arachnida*. Bull. Mus. C. Z. viii. pp. 191–224 with 6 plates ; abstract in J. R. Micr. Soc. (2) i. pp. 736 & 737, and in Arch. Z. expér. ix. p. xlvi.-xlviii. Some objections by "J. D. D." in Am. J. Sci. (3) xxii. p. 79.

H. MILNE-EDWARDS gives an abstract of Walcott's paper in Ann. Sci. Nat. (6) xii. art. 3, 33 pp., coming to the conclusion that it would be very artificial to unite the *Trilobites* with *Limulus* in the same higher group ; he thinks, on the contrary, that Walcott's observations confirm the position of the Trilobites between *Isopoda* and *Phyllopoda*, which he assigned them many years ago.

J. Dewitz has observed that the shell of the Trilobites is perforated by fine pores, by which the surface is rendered punctate; B. E. Z. xxv. pp. 87 & 88.

The supposed Crustacean *Prosopistoma* (Duméril) = "*binocle à queue en plumet*" (Geoffroy) is at last proved to be an insect of the family *Ephemeridæ*, nymph and sub-imago being described by A. Vayssière, Ann. Sci. Nat. (6) xi. art. 1, 16 pp. 1 pl., translated in Ann. N. H. (5) viii. pp. 73–85, pl. x. [*Cf.* also Zool. Rec. xvii. *Ins.* p. 213.]

ARACHNIDA.

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S. &c.
(Assisted by F. M. CAMPBELL, F.L.S., &c.)

LIST OF GENERAL PUBLICATIONS.

CAMBRIDGE, O. P. The Spiders of Dorset, with an Appendix containing short descriptions of those British species not yet found in Dorsetshire. Part ii. P. Dorset. Club, 1881, pp. 237–625, pls. iv.–vi. [*Cf.* Zool. Rec. xvi. *Arachn.* pp. 27 & 28.]

The completion of the work, containing, besides those Spiders of the families *Epeiridæ*, *Uloboridæ*, *Thomisidæ*, *Lycosidæ*, *Oxyopidæ*, and *Salticidæ*, found in Dorsetshire (pp. 237–417), an Appendix A, pp. 418–457, in which are described 27 species discovered in that county since the publication of Part i. Also an Appendix B, pp. 458–569, describing 145 species found in Great Britain and Ireland, but not up to that time met with in Dorsetshire (though several were subsequently so found; see Postscript). Another Appendix, C, pp. 570–588, contains additional notes on Dorset Spiders, with rectification of synonyms, and further observations on the senses, habits, and economy of Spiders in general; and a Postscript, pp. 589–598, includes several other species either new to Britain or to Dorsetshire. The plates (iv.–vi.) illustrate the various families treated upon, and many of their genera. At pp. 599–606 is a synopsis of the families of British Spiders; pp. 607–609 contain a Table showing the different families, genera, and number of Spiders found in Great Britain and Dorsetshire respectively—518 in the former, comprised in 15 families and 85 genera; 373 in the latter, comprised in 14 families and 77 genera. A Systematic List of all known British Spiders is given, pp. 610–625, followed by a copious Index of 11 pages. The whole work brings the history of British Spiders down to the date of publication.

CLAUS, C. Grundzüge der Zoologie zum wissenschaftlichen Gebrauche. i. Marburg: 1880. *Arachnoidea*, pp. 642–675.

Treats upon the general classification, habits, structure, and development of the class *Arachnida*, under the following systematic arrangement:—i. *Linguatulidæ*; ii. *Acarina* (including *Pycnogonidea*); iii. *Tar-*

digradæ; iv. *Araneidea*; v. *Phalangiidea*; vi. *Pedipalpi*; vii. *Scorpionidea*; viii. *Pseudoscorpionidea*; ix. *Solifugæ*.

HOLMBERG, E. L. Generos y especies de Aráenidos Argentinos nuevos ó poco conocidos. An. Soc. Arg. xi. [1880] pp. 125–132, and continued pp. 169–177, & pp. 271–278.

Describes some new species of *Theraphosidæ*, *Myrmeciidæ*, and *Lycosidæ*, and characterizes two new genera of the former.

——. Aracnidos, in:—Informe oficial de la Comision cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia) ...bajo las órdenes del General D. Julio A. Roca. Entrega i. Zoologia. Buenos Aires: 1881, fo. pp. 117–168.

15 species of *Araneidea* are described, belonging to nine families (*Epeiridæ*, *Scytodidæ*, *Agelenidæ*, *Drassidæ*, *Theraphosidæ*, *Heteropodidæ*, *Thomisidæ*, *Lycosidæ*, and *Attidæ* (two species of this last not named); also 2 species (known) of *Scorpionidea* and 1 of *Acaridea* (new).

——. Descriptions et Notices d'Arachnides de la République Argentine. Period. Zool. Argent. i. p. 282, pl. vi. [Omitted from former vols. of Zool. Rec.]

Describes and records various species of *Araneidea*, *Pseudoscorpiones*, and *Acaridea*, all new.

KARSCH, F. Verzeichniss der während der Rohlfs'schen Africanischen Expedition erbeuteten Myriopoden und Arachniden. Arch. f. Nat. xlvii. i., pp. 1–14, pls. i. & ii. [A. Myriopoden; B. Arachniden.)

Of the *Arachnida* are, *Araneidea*, 32 spp. (11 new), and 1 g. n. of *Theridiidæ*; *Solpugidea* 3 spp., *Scorpionidea* 4 spp., and *Acaridea* 3 spp. These 43 spp. are also discussed, and of the new ones *Dysdera soleata* and *cornipes*, *Drassus tarrhonensis*, *nugatorius*, and *sokniensis*, *Echemus pharetratus*, *Micaria fausta*, *Sparassus beluinus* (with woodcut of ♀), *Pardosa abacata*, *Agelenia pupia*, and *Gnathonarium* (g. n.) *rohlfsianum*, briefly characterized by the author in Pt. vi. (pp. 380–385) of Gerhard Rohlfs's "Kufra. Reise von Tripolis nach der Oase Kufra" (Leipzig: 1881, 8vo).

——. Diagnoses Arachnoidarum Japoniæ. B. E. Z. xxv. pp. 35–40, with woodcuts.

Contains 21 species of *Araneidea*, *Scorpionidea*, *Phalangidea*, and *Acaridea*. 9 species of the *Araneidea* and 2 genera are new.

——. Gliederthiere von Angola. *L. c.* pp. 93 & 94.

Describes and records some species of *Myriopoda* and *Arachnida*; of the latter 1 (*Selenops*) new.

——. Arachniden und Myriopoden Mikronesiens. *L. c.* pp. 95 & 96.

13 species of *Arachnida*, *Scorpiones*, and *Araneidea* are recorded. Of the *Araneidea* 6 are new, and belong to widely-separated families.

——. Chinesische Myriopoden und Arachnoiden. *L. c.* pp. 219–220.

Records 10 species of *Araneidea* (3 new), 1 new species of *Phalangiidea*, and 1 of *Scorpiones*.

[Karsch, F.]. Reliquiæ Rutenbergianæ. Spinnen. Abh. Ver. Brem. vii. pp. 191–197, pl. xii.

Describes and records 15 species (6 new) of various families and genera of *Araneidea* from Madagascar, and characterizes a new genus of *Theraphosidæ*.

Keyserling, Eugen [Graf] von. Neue Spinnen aus Amerika. Verh. z.-b. Wien, xxx. pp. 547–582, pl. xvi.

Describes 25 species of several families and genera of *Araneidea*, 17 new; 2 new genera, 1 of *Epeiridæ*, the other of *Arcyidæ*, are also characterized.

Koch, Ludwig. Die Arachniden Australiens nach der Natur beschrieben und abgebildet. Pts. xxvii. & xxviii. pp. 1213–1324, pls. cv.–cxii.

In continuation of the work [*cf.* Zool. Rec. xvii. *Arachn.* p. 3], comprises 44 species of various genera of *Salticidæ*, 41 new; 2 new genera are also characterized.

——. Beschriebungen neuer von Herrn Dr. Zimmermann bei Niesky in der Oberlausitz entdeckter Arachniden. Abh. Ges. Görl. xvii. pp. 41–71, pl. ii.

A list is given of 100 species of *Arancidea* (13 new), 3 of *Pseudoscorpiones*, and 2 *Acaridea* (1 new), all found in the neighbourhood of Niesky.

MacLeod, J. La Structure des Trachées et la circulation péritrachéenne. Mémoire Couronnée au concours universitaire de 1878–1879. Bruxelles: 1880, pp. 1–70, pls. i.–iv. [*Cf.* Bull. Ent. Ital. xii. 1880, p. 96.]

The object of this memoir is to explain the existing state of our knowledge of the internal structure and office of the tracheæ of Insects, Myriopods, and Arachnids, including a histiological examination of the pulmonary sacs as well as of the tracheæ of the *Araneidea*. The author observes that peritracheal circulation is anatomically impossible.

Pavesi, Pietro. Considerazione sogna nuovi casi di cecità parziale negli Aracnidi. Rend. Ist. Lomb. (2) xiv.

The species referred to belong to the orders *Scorpionidea* and *Araneidea*.

——. Studi sugli Aracnidi Africani. II. Aracnidi d'Inhambane, raccolti da Carlo Fornasini, e considerazioni sull' Aracnofauna del Mozambico. Ann. Mus. Genov. xvi. pp. 536–560.

Describes and records 25 species of *Arachnida* comprised in the orders *Scorpionidea* (2 spp. *Scorpiones*), *Solpugidea* (*Solifugæ*) 1 sp., *Phalangiidea* (*Opiliones*) 1 sp., *Araneidea* 21 spp., the latter represent 14 families; 4 species are new. 1 new genus of *Drassidæ* (*Apochinomma*) is also characterized. A list is appended of the known Mozambique *Arachnida*—54 species of 43 genera, contained in 20 families belonging to 5 orders: *Scorpionidea* 10 spp., *Solpugidea* 1 sp., *Phalangiidea* 1 sp., *Araneidea* 35 spp., *Acaridea* 7 spp.

Simon, Eugène. Descriptions d'Arachnides nouveaux d'Afrique. Bull. Soc. Z. Fr. 1881, pp. 1–11.

Describes and records 18 species (15 new) of various families of *Araneidea*, and characterizes a new genus of *Thomisidæ* (*Runciniopsis*).

——. Arachnides nouveaux ou rares de la faune française. *L. c.* pp. 82–91.

Contains notices and descriptions of 5 species of *Araneidea* (2 new), 9 spp. of *Phalangiidea* (5 new), and 1 sp. n. of *Pseudoscorpiones*.

——. Arachnides nouveaux ou peu connues des Provinces Basques. An. Soc. Esp. x. pp. 127–132.

Describes and records a new genus and species of *Araneidea* and 6 species (3 new) of *Phalangiidea*.

——. Les Arachnides de France. Vol. v. Pt. 1, pp. 1–179, pl. xxv.

In continuation of the work [*cf.* Zool. Rec. xvi. *Arachn.* p. 5], containing (pp. 1–12) a supplement on the family *Epeiridæ* (cf. i. p. 17) and a portion of the family *Theridiidæ*. 21 genera are characterized, 2 being new, and 84 species, 11 new.

Thorell, T. Studi sui Ragni Malesi e Papuani. Part iii. Ragni dell' Austro-Malesia e del Capo York, conservati nel Museo Civico di Storia Naturale di Genova. Ann. Mus. Genov. xvii. pp. vii.–xxvii. & 1–720.

The introduction gives an account of the Spiders already described from these regions; the total, including those here recorded as new, being 505: *Orbitelariæ* 162, *Retitelariæ* 38, *Tubitelariæ* 31, *Territelariæ* 10, *Laterigradæ* 84, *Citigradæ* 20, *Saltigradæ* 151. These are divided, in respect to locality, as follows:—Moluccas 164, New Guinea 180, Islands of Timor 11, Aru 36, Key 3, and of Torres' Straits 12, Cape York 104. The new species described are 173, and 16 new genera are characterized. A table of species observed till now in the island of Celebes, Austro-Malaysia, and Cape York is given, pp. 683–711, showing the localities in which each was found.

Léon Becker, in "Communications Arachnologiques," C. R. Ent. Belg. xxiii. p. clxxxi., gives a list of Arachnids, chiefly *Araneidea*, and all of known species, found in Belgium by several collectors; also, p. clxxxii., a list from Italy found by M. Fœttinger; another from Germany (Friedrichroda) found by M. de Borre, p. clxiii.; and others from Eisenach and Potsdam, *ibid.*; also others from Berlin, Schneeberg (Saxony), and Inselberg, p. clxxxiv.: to these communications remarks are added on the utility of such lists as contributions towards a knowledge of the geographical distribution of Arachnids.

The same author, *l. c.* pp. clxxxviii. & clxxxix., gives a list of known species of *Araneidea* and *Phalangiidea* captured at Nuremberg, and *Linyphia cristata*, Menge, new to Belgium.

Becker also, *op. cit.* xxv., gives the following lists, &c.:—

Pp. xxvi.–xxxiv., lists of Arachnids from Mentone (known *Araneidea*,

Chernetes, *Scorpiones*, and *Opiliones*) and from Porquerolles; also of 7 species of *Araneidea* and 2 of *Phalangiidea* new to the Netherlands fauna, and 1 (*Araneidea*, *Oxyopus ramosus*, Panz.) new to Belgium. Also an additional list of Arachnids from Hungary and Moldavia, bringing the total known from those parts to 150 species. Various species of known *Araneidea*, *Phalangiidea*, and *Scorpiones* are likewise recorded from Douro, Sicily, and Val Sesia.

Pp. lxv.–lxvii., a list of known Spiders found in Galicia, Spain, belonging to various families, and a few known species of *Phalangiidea*; pp. lxvii.–lxviii., a list of known *Araneidea* of several families found at Diest, Belgium, as well as near Wavre and Namur; pp. civ.–cvii., list of Arachnids found at Heyst and Knocke: *Araneidea* 14, *Phalangiidea* 1, and *Pseudoscorpiones* 1, all of known species; also a list from Yvoir, *Araneidea*, 24, all known, and from Hastières and Aublain 2 known species from each. 3 of the species from Heyst (*Synageles venator*, Luc., *Attus saltator*, Sim., and *Clubiona subtilis*, L. Koch) are new to Belgium.

Pp. cxiv.–cxviii., a list of *Araneidea*, 79 species, *Phalangiidea* 5, all known; also notes on some other species of *Araneidea* found in Belgium, to which country the following are new :—*Leptorchestes berolinensis*, C. Koch, and *Marpessa pomatia*, Walck., from Laroche, *Dendryphantes nidicolens*, Walck., Hastières, *D. encarpatus*, Walck., Laroche, *Phlegra fasciata*, Hahn, Arendonck, *Heliophanus dubius*, C. Koch, Hastières, *Evophrys petrensis*, C. Koch, Laroche, *E. erratica*, Walck., Groenendael, *Dolomedes limbatus*, Hahn, Calmpthout, *Lycosa fabrilis*, Clerck, Boitsfort, *L. trabalis*, Clk., Hastières, *L. cursor*, Hahn, Arendonck, *L. robusta*, Sim., and *Pardosa bifasciata*, C. Koch, Groenendael, *Pirata hygrophila*, Thor., Laroche, *Xysticus luctuosus*, Bl., Forest of Soignies, *Tetragnatha montana*, Sim., Laroche, *Erigone retusa*, Westr., Laroche, *E. altifrons*, Cambr., Heyst, *E. agrestis*, Bl., and *E. herbigrada*, Bl., Laroche, *Drepanodus thoracicus*, Hahn, Heyst, *Zora nemoralis*, Bl., Laroche.

Pp. cli.–cliii., notes on various known *Araneidea* and *Phalangiidea* found in Belgium during 1881; the following being new to that country :—*Xysticus robustus*, C. Koch, *Oxyptila blackwalli*, Sim., *Drassus pubescens*, Thor., and *Eresus cinnabarinus*, Hahn.

Pp. clvii. & clviii., notes on captures of *Araneidea* and *Phalangiidea* in Belgium in 1881, *Erigone abnormis*, Bl., and *E. glaphyra*, Sim., are new to that country.

Pp. lxxv.–lxxvii., a list of *Araneidea* (all known) of various families and genera found at Hennuyères, Belgium, in April, 1881. *Linyphia variegata*, Bl., and *Erigone viaria*, Bl., are new to Belgium. A note is added on a scorpion from Antigua, *Diplocentrus purvesi*, L. Becker, on which Simon (in 1880) based a new genus, *Oiclus*.

—Elvezio Cantoni, Bull. Ent. Ital. xiii. pp. 278–289, gives a list of 72 Arachnids from Madonia, comprising *Scorpiones* 1, *Pseudoscorpiones* 2, *Araneidea* 68, *Phalangiidea* 1, all of known species, some of which show plainly the southern or semi-tropical character of the collection. The *Araneidea* belong to 15 families and 44 genera. The *Epeiridæ* (13 spp.) and *Thomisidæ* (10 spp.), being the most numerously represented.

Eugène Simon, Bull. Soc. Ent. Fr. (5) x. pp. cxxix. & cxl. gives a list of Arachnids (chiefly *Aranéidea*), all of known species, found at Athens, Patras, Missolonghi, Santorin and Corfu.

The Recorder has not seen the following publications and papers relating to *Arachnida* :—

Hagen, G. Zoologie. Vol. ii. Arthropoden. Vienna : 1881, 8vo, woodcuts.

Holmberg, E. L. Aracnidos Argentinos. Anales de Agricultura de la República Argentina, iv. (No. 42) pp. 19.

——. Géneros y Especies de Arácnidos Argentinos nuevos ó poco conocidos. Ann. Soc. Argent. xi. pp. 125–133.

Characterizes *Stenosterommata*, g. n., with 1 sp. n.

Lucanti, A. Catalogue raissonnée des Arachnides observés jusqu'à ce jour dans les Departments du Sud-ouest de la France, d'après E. Simon. Bordeaux.

ARANEIDEA.

Anthony, John. On the Threads of Spiders' Webs. J. R. Micr. Soc. (2) ii. p. 170, 1882.

An attempt to count the primary (or, as the author calls them, "ultimate") threads of silk issued by *Epeira diadema*, but with apparently no very satisfactory result. So far as arrived at the number forming an ordinary thread always came below 200.

Bertkau, P. Vorläufige Mittheilung über den Bau und die function der sogenannten Leber bei Spinnen. Zool. Anz. iv. pp. 543 & 544.

A short description of the glands in Spiders supposed to act as the liver in Vertebrates.

Cambridge, O. P. On some Spiders from Newfoundland. P. Phys. Soc. Edinb. vi. pp. 112–115, pl. iii.

Records 3 species of *Epeiridæ*, 1 new.

——. On some new Genera and Species of *Araneidea*. P. Z. S. 1881, pp. 765–775, pl. lxvi.

Describes six spp. nn. of *Araneidea* belonging to four widely-separated families—*Theridiidæ*, *Gasteracanthidæ*, *Aphantochilidæ*, and *Perissoblemm[at]idæ*, and characterizes four new genera.

Collett, R. Oversigt af Norges Araneider. II. *Laterigradæ*, *Orbitelariæ*. Forh. Selsk. Chr. 1876, No. 2, pp. 1–27 [1877]. [Omitted from former Records].

Contains a catalogue of 24 species of *Laterigradæ*, and 10 of *Orbitelariæ*, 1 species of the former (*Xysticus*) new.

J. H. Emerton, Bull. Ess. Inst. ix. p. 67, gives a short survey and description of the various Spiders' webs; referring to *Argyroneta aquatica*; also to the *Lycosidæ*, *Dictynidæ*, *Linyphia*, *Hyptiotes*, *Uloborus*, and *Epeiridæ*.

Hansen, H. J. Sur les dessins d'Aranéides Danoises données dans l'ouvrage illustré "Zoologica Danica," publié par Schiödte. Ent. Tidjs. i. pp. 169 & 170.

[Not seen by the Recorder.]

Macleod, Jules. Notice sur l'appareil venimeux des Aranéides. Arch. Biol. i. pp. 573–582, pl. xxiv.

Describes and illustrates the poison glands, with reference to various Spiders under the following heads: 1. General disposition and size; 2. Histiological structure; 3. Excretory ducts; with a summary of the conclusions arrived at. An abstract of results in Am. Nat. xv. p. 236.

McCook, H. C. How orb-weaving Spiders make the frame-work or foundations of webs. P. Ac. Philad. 1881, pp. 430–435 [1881].

The author concludes, from many carefully detailed observations, that air-currents have a large part in placing the foundation lines of webs, but that this is not the only mode of laying them; thus so far confirming the conclusions (quoted by the author), come to by the Recorder in "Spiders of Dorset," i. p. xxi. [modified, however, *l. c.* p. 586, which the author had not then seen].

——. The Snare of the Ray Spider (*Epeira radiosa*); a new form of Orb-Web. *L. c.* pp. 163–175, woodcuts.

The snare described is of an irregular geometric, or wheel-shape, drawn up in the middle so as to form a hollow cone or funnel-shaped dome. The spiral lines are studded with viscid globules, as in the webs of other Epeirids. This snare is worked both in the ordinary way, and also in the way described by Dr. Wilder as peculiar to *Hyptiotes cavata*, Hentz., that is, by the sudden loosening of the slack portion (gathered up by the spider), of a main line bearing upon the snare. This operation, in both cases, no doubt tending to confuse and to entangle the spider's prey. These modes of working (in respect both to *Epeira radiosa*, and *Hyptiotes cavata*), are fully described, and illustrated by figures.

Sabatier, A. Formation du blastoderme chez les Aranéides. C. R. xcii. pp. 200–202. [*Cf.* Ann. N. H. (5) vii. p. 277.]

The ova observed were those of *Pholcus opilionoides*, *Epeira diadema*, *E. fasciata*, *Agelena labyrinthica*, *Latrodectus malmignatha*, &c. The result of the author's observations is that the egg of the Spider presents a type intermediate between the general superficial segmentation of the *Crustacea* (e.g., *Penæus*), and the regular discoidal segmentation in certain fishes,—the "blastulation" being intermediate between "periblastulation" and "discoblastulation." It very closely approaches the eggs of Chelifers (as described by Metschnikoff), *Tetranychus* (according to Claparède), and *Insecta* (Bobretzky), and therefore proves in a marked

degree the original affinity of the *Aranceidea* with the other groups of *Arachnida*, and with the *Insecta*.

E. Bergroth, C. R. Ent. Belg. (3) p. x. mentions 21 species of known Spiders found between Tobolsk and Obdorsk, in Siberia.

Landois, H. Conservirungs-methoden der Spinnen. JB. zool. Sect. westf. Ver. 1881, pp. 42 & 43.

[Not seen by the Recorder.]

Theraphosidæ.

Homœomma stradlingi, sp. n., O. P. Cambridge, P. Z. S. 1881, p. 682, pl. lx., Brazil.

Stenoterommata, g. n. (nearly allied to *Cyrtauchenius* and *Bolostromus*), p. 125, for *S. pratensis*, sp. n., p. 126; E. Holmberg, An. Soc. Arg. xi., Argentine Republic.

Aussereria, g. n. (near *Pachyloscelis*), p. 169, for *A. insignis*, sp. n.; *id. l. c.* p. 171, Argentine Republic.

Eurypelma dæringi, sp. n., *id.* in Informe oficial, &c. (title *suprà*), p. 147, pl. iii. fig. 8, Pampa Mesopotamia, Rio Negro. *E. duponti*, Becker, figured; L. Becker, C. R. Ent. Belg. xxv. pl. ii. fig. 1.

Thelecorus, g. n. Allied to *Ischnothele*, Auss., and *Aname*, Auss., for *T. rutenbergi*; F. Karsch, Abh. Ver. Brem. vii. p. 196, pl. xii. fig. c, Madagascar.

Cyrtauchenius vittatus, p. 7, *C. luridus*, p. 8, *C. latastii*, p. 9, *C. dayensis* and *C. bedeli*, p. 10, E. Simon, Bull. Soc. Z. Fr. 1881, spp. nn., Algeria.

Atypus coriaceus, sp. n., *id. l. c.* p. 11, Algeria.

Conothele doleschalli, sp. n., T. Thorell, Ann. Mus. Genov. xvii. p. 237, New Guinea and Cape York.

Cethegus, g. n. Allied to *Ixalus*, L. Koch (specially distinguished by the tarsal claws being armed with only a single row of teeth), and somewhat like *Migas*, L. Koch, for *C. lugubris*, sp. n.; Thorell, *l. c.* p. 241, Cape York.

Idiommata fuliginea, p. 243, Cape York, *variata*, p. 246, and *annulipes*, p. 248, Yule island, New Guinea, spp. nn., *id. l. c.*

Phrictus validus, p. 250, Katau, New Guinea, and *strenuus*, p. 253, Cape York, spp. nn., *id. l. c.*

Nemesia fodiens, Th., minutely redescribed; A. Carruccio, Bull. Ent. Ital. iii. [1871] pp. 55–66, pl. i. figs. 6–9 and pl. ii. figs. 1–9.

Stromatopelma, g. n. Near *Hapalopus*, Auss., and *Phrictus*, L. Koch, for *S. alicapillatum*, sp. n., F. Karsch, B. E. Z. xxv. p. 218, Accra, Gold Coast.

N. eleanora, Cambr. A cavity was discovered in the wall of a tube of this species about an inch long, partly separated from it by a silken filament, and placed about an inch or an inch and a half below the lower door. The cavity was filled with the husks of small red ants, and supposed to be a "storehouse or larder." M. L. F. White, Sci. Goss. 1881, p. 68. [Probably it was only a receptacle for the disposal of the rejectamenta of the Spider's food.]

Scodra aussereri, Becker, figured; L. Becker, C. R. Ent. Belg. xxv. pl. i. fig. 1.

Pachylomerus pustulosus, Becker, figured; *id. l. c.* pl. i. fig. 2.

Dysderidæ.

Harpactes lehonii, Becker, figured; Becker, *l. c.* pl. i. fig. 4.

Dysdera cornipes, Wadi Mader, fig. 12, and *D. soleata*, Jebel Tarrhuna, Bir Milrha, fig. 13, spp. nn.; Karsch, Arch. f. Nat. xlvii. p. 13, pl. i.

Oonops triangulipes, sp. n., Karsch, B. E. Z. xxv. p. 95, Jaluit.

Gamasomorpha, g. n. for *G. cataphracta*, sp. n., *id. l. c.* p. 40, Japan.

Phædima, g. n., p. 232, with six eyes; near *Segestria* and *Ariadne*, Sav., but has only two spiracular openings at the base of the abdomen; for *P. granulosa*, sp. n., p. 233. Thorell, Ann. Mus. Genov. xvii., Ramoi.

Drassidæ.

Micaria fausta, sp. n., Karsch, Arch. f. Nat. xlvii. i. p. 11, Jebel Tarrhuna, Bir Milrha.

Drassus socknensis, fig. 9, and *D. nugatorius*, fig. 10, Sockna, and *D. tarrhunensis*, fig. 11, Jebel Tarrhuna, Karsch, *l. c.* p. 12, pl. i., spp. nn.

D. australis, sp. n., Holmberg, Informe, &c., p. 136, Rio Colorado.

D. montandoni, Becker, figured, Becker, C. R. Ent. Belg. xxv. pl. i. fig. 3.

D. dysderiformis, Guér, perhaps referable to one of the species of *Hirtia*, g. n., *infrà*. Thorell, Ann. Mus. Genov. xvii. p. 228.

Echemus pharetratus, sp. n., Karsch, *l. c.* p. 11, pl. i. fig. 8, Jebel Tarrhuna.

Clubiona lusatica, sp. n., Koch, Abh. Ges. Görl. p. 58, pl. ii. fig. 9, Niesky.

Hirtia, g. n. Very nearly allied to *Clubiona*, Latr., distinguished by longer maxillæ and a different armature of the legs, p. 222, for *H. ternatensis*, p. 223, Island of Ternate, *hatamensis*, p. 225, Hatam, and *ramoiensis*, p. 227, Ramoi, spp. nn., Thorell, Ann. Mus. Genov. xvii.

Apochinomma, g. n., p. 545. Allied to *Tylophora*, Pav., and apparently also, by the position of the eyes, to *Gnaphosa*, Latr., for *A. formicæformis* [*formicif-*], sp. n., p. 546, Inhambane, Africa (Mozambique). P. Pavesi, Ann. Mus. Genov. xvi.

Corinna plumosa, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 216, Island of Ternate.

Chiracanthium impressum, sp. n., Thorell, *l. c.* p. 219, Cape York. *C. abnorme*, sp. n., Holmberg, Informe, &c., p. 138, Sierra de la Ventana (Southern Argentine States).

Anyphæna argentina, p. 141, fig. 6, Sierra de la Ventana and Paso de Pacheco, and *A. pampa*, p. 145, fig. 7, Sierra de la Ventana, spp. nn., Holmberg, *l. c.* *A. insulana*, sp. n., Karsch, Abh. Ver. Brem. vii. p. 194.

Liocranum pulchrum, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 213, New Guinea. *L. palliardii*, sp. n., Koch, Abh. Ges. Görl. xvii. p. 60, pl. ii. fig. 10, Niesky.

Rhomalea? *insularis*, sp. n., Karsch, B. E. Z. xxv. p. 95, Niua-fu or Great Hope Island, between the Fijian and Samoan groups.

Œdignatha, g. n., p. 208. Remarkable for the falces being, at the base, much like those of many of the *Opiliones*; it also bears some affinity to *Enyo*, Sav. (*Zodarion*, Walck.). For *Œ. scrobiculata*, p. 209 (note), Penang, and *Œ. radiata*, p. 210, New Guinea, spp. nn.: Thorell, Ann. Mus. Genov. xvii.

Anchognatha, g. n., p. 228. Of doubtful position; much resembling, in some respects, some of the *Heteropodidæ*, but most probably a Drassid; for *A. avida*, sp. n., p. 229, Cape York, *id. l. c.*

Myrmeciidæ.

Myrmecia? *bonaerensis*, sp. n., Holmberg, An. Soc. Arg. xi. p. 277 (footnote), Island of Antequera, near River Parana.

Eresidæ.

Eresus sedilloti, sp. n., Simon, An. Soc. Esp. x. p. 133, Aranjuez.

Dictynidæ.

Dictyna albo-vittata, p. 570, fig. 17, and *D. flavo-vittata*, p. 571, fig. 18, Pathaypampa, Peru, *D. vultuosa*, p. 572, fig. 19, Monterico, Peru, *D. sedentaria*, p. 573, fig. 20, Baltimore, spp. nn., E. von Keyserling, Verh. z.-b. Wien, xxx. pl. xvi. *D. mandibularis*, Tacz., described and figured from Cayenne, *id. l. c.* p. 574, fig. 21. *D. boiorum*, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 82, Cape Ferret, near Arcachon. *D. scalaris*, Cambr., = *D. bicolor*, Sim., *id.* Bull. Soc. Ent. France (5) x. p. cxv. *D. ammophila*, Menge, described from Niesky, Koch, Abh. Ges. Görl. xvii. p. 57. *Amaurobius longipalpis*, Kron., = *Nurscia albo-signata*, Sim.; Simon, Bull. Soc. Ent. Fr. (5) x. p. cxv.

Nurscia, g. n. Near *Amaurobius*, C. L. Koch, for *N. flavipes*, Cyprus, and *N. albo-signata*, Ourmiah, spp. nn., Simon, Arachn. Fr. i. p. 235. [Omitted from Zool. Rec. xi. (1874).]

Mezentia, g. n., p. 203. Near *Amaurobius*, C. L. Koch, forming a transition from that genus to *Psechrus*, Thor., for *M. angustata*, sp. n., p. 204, Thorell, Ann. Mus. Genov. xvii., Ternate.

Dinopidæ.

Dinopis camelus, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 194, Yule Island, New Guinea.

Avella superciliosa, sp. n., *id. l. c.* p. 200, Cape York.

Agelenidæ.

Cedicus maellendorffi, sp. n., Karsch, B. E. Z. xxv. pp. 219 & 220, Peking.

Hadrotarsus, g. n., p. 190. Possibly allied to *Lachesis*, Sav., but never-

theless dubiously placed near the *Urocteidæ*, between the *Tubitelariæ* and certain *Retitelariæ*; for *H. babirussa*, sp. n., p. 191, Thorell, *l. c.*, Yule Island.

Storena zebra, p. 184, Island of Wokan, Aru, and Fly River, New Guinea, and *S. rufescens*, p. 188, Cape York, spp. nn., *id. l. c.*

Argenna pallida, sp. n., Koch, Abh. Ges. Görl. xvii. p. 56, pl. ii. fig. 8, Niesky.

Agelena pupia, sp. n., Karsch, Arch. f. Nat. xlvii. p. 10, pl. i. fig. 6, Socna.

Iberina, g. n. Allied to *Hahnia*, C. L. Koch, for *I. mazarreda*, sp. n., Simon, An. Soc. Esp. x., Basque Provinces.

Hersiliidæ.

Hersilia fossulata, sp. n., Karsch, Abh. Ver. Brem. vii. p. 195, Madagascar.

Scytodidæ.

Scytodes tardigrada, sp. n., Thorell, *l. c.* p. 181, Cape York.

Loxoscelis compactilis, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 6, Batna, Algeria.

Theridiidæ.

Ariamnes, Thor., = *Rhomphæa*, L. Koch; Simon, Arachn. France, v. p. 18.

Ariamnes attenuata, sp. n., Cambridge, P. Z. S. 1881, p. 770, pl. lxvi. fig. 3, Amazons.

Ariamnes (*Ariadne*) *lateralis*, sp. n., Karsch, B. E. Z. xxv. p. 40, Japan.

Eriauchenus, g. n. Allied to *Ariamnes*, Thor.; for *E. workmanni*, sp. n., Cambridge, *l. c.* p. 768, pl. lxvi. fig. 2, Madagascar.

Thwaitesia, g. n. Nearly allied both to *Argyrodes*, Sim., and *Theridion*, Walck., for *T. margaritifera*, sp. n., Cambridge, *l. c.* p. 766, pl. lxvi. fig. 1, Ceylon.

Conopistha, g. n., for *C. bonadea*, sp. n., Karsch, B. E. Z. xxv. p. 39, Japan.

Theridion glaucinum, p. 76, Isère, Bourg d'Oisans, *gentile*, p. 106, Corsica, and *crinigerum*, p. 72, Corsica and Morocco, spp. nn.; *T. blackwalli*, Cambr., = *T. hortense*, L. Koch, and *T. hasselti*, Thor., p. 82; *T. aulicum*, C. L. Koch, = *T. elegans*, Bl., *T. rufo-lineatum*, Luc., and *T. spirifer*, Cambr., p. 95; *T. pallens*, Bl., = *T. minimum*, Wid., and *T. persubtile*, L. Koch, p. 107; *T. lepidum*, Walck., = *T. venustum*, Walck., *T. instabile*, Cambr., and *T. bellicosum*, Sim., p. 64; *T. nigro-variegatum*, Sim., = *T. frivaldskii*, Hermann, p. 66; *T. varians*, Hahn, = *T. leuconotum*, Hahn, and *T. abelardi*, Walck., p. 70; *T. tinctum*, Walck., = *T. longimanum*, Sund., and *Steatoda punctulata*, Menge, p. 72: Simon, Arachn. France, v. *T. apicatum*, p. 165, and *bertkaui*, p. 175, Hatam, *elevatum*, p. 167, *triviale*, p. 170, and *femorale*, p. 173, Cape York, spp. nn., Thorell, Ann. Mus. Genov. xvii. *T. impressum*, sp. n., Koch, Abh. Ges. Görl. xvii. p. 45, pl. ii. fig. 1, Niesky.

Janulus, g. n. Very nearly allied to *Theridion*, Walck., but differs in

the disposition of the eyes, and in the tuberculose surfa
For *J. bicornis*, sp. n., Thorell, *l. c.* p. 163, Cape York.

Theonoe, g. n., p. 130, closely allied to *Pholcomma*, Thor.
Walck., for *T. filiola*, p. 131, Aube and Ain, *T. longiset*
and Pierrefeu, and *T. cornix*, p. 133, Seine-et-Marne and G
Simon, Arachn. France, v.

Euryopis, Menge, re-characterized, *id. l. c.* p. 121;
maculata, C. L. Koch, p. 123; *E. quinque-notatum*, sp.
Soc. Ent. Fr. (5) x. p. cviii. Palermo.

Lasceola, g. n., established for various species hitherl
Euryopis, Menge; *id.* Arachn. France, v. p. 136. *L. ery*
Basses Pyrenées, St. Jean de Luz, *L. testaceo-marginat*
Island of Porquerolles, St. Mandrier, and Corsica, *L.*
Gers, Basses Pyrenées, Faillefeu, and Var (Island of P
L. auberti, p. 147, Var, spp. nn., and *L.* (*Theridion*) *concea*
pilula, Sim., p. 148; *id. l. c.*

Crustulina, Menge, adopted for *Steatoda guttata* and
p. 155, and *C. scabripes*, sp. n., p. 159, from various loc
id. l. c.

Theridiosoma (*Theridion*) *gemmosum*, L. Koch, 1
Cambr.; *id. l. c.* p. 26.

Nesticus —— ?, an immature male of an undete
found in the Grotto of Fabbiano, near Spezzia, with t
of eyes wanting, the remaining six being very minute
with a strong lens) depressed and opaline. P. Pavesi,
(2) xiv.

Gnathonarium, g. n. Allied to *Nesticus*, Thor., but
and no spines; falces of the male armed with a long
tooth on their face. Type, *G. rohlfsianum*, sp. n., Kar
xlvii. i. p. 10, pl. i. fig. 7, Ain Schersozura.

Teutana, Sim., genus characterized, Simon, Arachn. F
The following are included in it:—*T.* (*Theridion*) *tria*
p. 163, *T.* (*Ther.*) *grossa*, C. L. Koch, p. 164, and *T.*
Clk., p. 166 (synonyms of the first two are given).

Lithyphantes corollatus, Sim.; synonyms, *id. l. c.* p. 1
lianus, Walck.; synonyms, *id. l. c.* p. 168.

Asagena phalerata, Panz.; synonyms; *id. l. c.* p. 173.

Latrodectus tredecim-guttatus, Rossi; synonyms, *id. l. c.*

Neriene demissa, sp. n., pp. 438 & 575, England; *N. dil*
N. demissa, Cambr., p. 575, *N. campbelli*, sp. n., p. 590,
decora, Cambr., in "Addendum et Corrigendum"), *N*
p. 592, England; *N. fusca*, Bl., = *N. agrestis*, Cambr
commoides, Cambr., = *Linyphia pholcommoides*,
Bl., = *N. exhilarans*, Cambr., p. 575 : Cambri
Walckenaera ingrata, p. 443, *W. jucundiss*
laudata, p. 594, and *W. melanocephala*, p. 5
vipes, Bl., = *W. implana*, Cambr., *W. cr*
affinitata, Cambr., and *W. hiemalis*, Bl
id. l. c.

xv. p. 95, Niua-fu
groups.
being, at
ridion,
a, p. 132, Var
ronde, spp. nn.,
type, *E. flavo-*
, Simon, Bull.
included in
hrysas, p. 141,
, p. 142, Var.
nigrina, p. 144,
rquerolles), and
Bl., = *Euryopis*
sticta, Cambr.,
ties in France;
133
T. argenteolum,
ied speci s was
fore-central pair
(scarcely visible
Rend. Ist. Lomb.
with shorter legs
, sharp
ch. Arch. f Nat.
rance, v. p. 161.
ngulosa, Walck.,
Ther.) *castanea*,
39. *L. paykul-*
p. 177.
uta, Cambr., =
England (= *N.*
rustica, sp. n.,
enov. xv
N. phol-
, p. 374,
da,
ar
. 375, and *N. herbigra*
lge, "Spiders of Dorset."
ima, p. 449, pl. vi. fig. 8, *W.*
96, spp. nn., England; *W. fla-*
assiceps, Westr., Cambr., = *W.*
= *W. similis*, Cambr., p. 577 :

Erigone jubata, p. 47, fig. 2, *equestris*, p. 48, fig. 3, *resina*, p. 50, fig. 4, *bi[illegible]nata*, p. 52, fig. 5, spp. nn., Koch, Abh. Ges. Görl. xvii., Niesky. *E.* [illegible], p. 233, various localities in France, *cusipotens*, p. 234, Eastern Pyrenees, &c., *discedens*, p. 235, Cantal, Le Lioran, *paupera*, p. 236, Eastern Pyrenees and Corsica, *turrigera*, p. 287, Perpignan, *decollata*, p. 237, Gironde, &c., *ericicola*, p. 238, Porquerolles, *medusa*, p. 239, Hyères, &c., *nigro-carulea*, p. 240, Corsica, *rufithorax*, p. 24, Hyères, and Corsica, *cucurbitina*, p. 242, Hyères, &c., *parumpunctata*, p. 243, Hyères, *nuncia*, [illegible]4, various localities in France, *cyclops*, p. 245, Dieppe and Corsica, [illegible] p. 245, Aube, Villeneuve, Gyé-sur-Seine, *servula*, p. 246, various localities in France, *tauricornis*, p. 447, Valais, Vassory, *verticalis*, p. 248, Corsica, *digiticeps*, p. 249, Mouths of the Rhone, Marignane, *gradata*, p. 250, Cantal, Le Lioran, and Nuremberg, *polita*, p. 251, Aube, Forêt d'Aumont, *glaphyra*, p. 252, several localities in France, *curta*, p. 253, Bouches-du-Rhone, *genistæ*, p. 254, *inclara*, p. 255, and *stativa*, p. 256, Corsica, *vestringi*, p. 256, Seine-et-Oise, Forest of Compiègne, &c., spp. nn., Simon, Bull. Soc. Z. Fr. 1881.

Linyphia incilium, p. 53, pl. ii. fig. 6, and *L. umbratica*, p. 55, fig. 7, spp nn., Koch, Abh. Ges. Görl. xvii., Niesky. *L. angulata*, sp. n., Cambridge, "Spiders of Dorset," p. 519, England. *L. abnormis*, Bl., = *L. [illegible]*, Cambr., and *L. impigra*, Cambr., = *L. circumcincta*, Cambr., *id. l.* *L. encausta*, Becker, figured, Becker, C. R. Ent. Belg. xxv. [illegible]. *L. contortipes*, sp. n., Karsch, B. E. Z. xxv. p. 39, Japan.

Pachygnatha [illegible] Sund., transferred to the *Epeiridæ*; Simon, Arachn. France, v. p. 7.

Mimetus interfector, Hentz, = *Ero lævigata*, Keys., and *Ctenophora monticola*, Bl.; *id. l. c.* p. 29.

Ero flammeola, sp. n., *id. l. c.* p. 37, Corsica.

Epeiridæ.

Meta longimana, p. 555, fig. 6, Peru, Amable Maria, *satulla*, p. 556, fig. 7, Peru, Pathaypampa, *speciosissima*, p. 557, Peru, Amable Maria, *opulenta*, p. 558, fig. 9, Pathaypampa and Amable Maria, *mariana*, p. 560, fig. 10, Amable Maria and Lima, Peru, *unicolor*, p. 566, fig. 15, New Granada, spp. nn., pl. xvi.; *M. argentea*, Tacz., described and figured, from Cayenne and Hassa, p. 562, pl. xvi. fig. 11, *M. argyra*, Walck., = *Linyphia ornata*, Tacz., p. 563, fig. 12, generally distributed in Central America, *M. pulcherrima*, Keys., = *Linyphia splendida*, Tacz., p. 565, fig. 13, *M.* (*Linyphia*) *branickii*, Tacz., described and figured from Cayenne, p. 565, fig. 14: Keyserling, Verh. z.-b. Wien, xxx.

Tetragnatha rubriventris, Dol., = *T. lupata*, L. Koch, Thorell, Ann. Mus. Genov. xvii. p. 132. *T. fallax*, p. 134, Amboina, *tenera*, p. 136, Cape York, *biseriata*, p. 139, Ramoi, New Guinea, spp. nn., *id. l. c.*

Eucta, g. n. Allied to *Eugnatha*, Sav., and *Tetragnatha*, Latr., for *E. isidis*, Sim., Egypt, and *E. gallica*, sp. n., near Biarritz; Simon, Arachn. France, v. p. 3.

Nephila labillardierii, Thor. Simon, Bull. Soc. Ent. Fr. (5) xi., corrects an account given some months ago of the snare of a large Spider from

Rhomalea? *insularis*, sp. n., Karsch, B. E. Z. xxv. p. 95, Niua-fu or Great Hope Island, between the Fijian and Samoan groups.

Œdignatha, g. n., p. 208. Remarkable for the falces being, at the base, much like those of many of the *Opiliones*; it also bears some affinity to *Enyo*, Sav. (*Zodarion*, Walck.). For *Œ. scrobiculata*, p. 209 (note), Penang, and *Œ. radiata*, p. 210, New Guinea, spp. nn.: Thorell, Ann. Mus. Genov. xvii.

Anchognatha, g. n., p. 228. Of doubtful position; much resembling, in some respects, some of the *Heteropodidæ*, but most probably a Drassid; for *A. avida*, sp. n., p. 229, Cape York, *id. l. c.*

Myrmecidæ.

Myrmecia? *bonaerensis*, sp. n., Holmberg, An. Soc. Arg. xi. p. 277 (footnote), Island of Antequera, near River Parana.

Eresidæ.

Eresus sedilloti, sp. n., Simon, An. Soc. Esp. x. p. 133, Aranjuez.

Dictynidæ.

Dictyna albo-vittata, p. 570, fig. 17, and *D. flavo-vittata*, p. 571, fig. 18, Pathaypampa, Peru, *D. vultuosa*, p. 572, fig. 19, Mo terico, Peru, *D. sedentaria*, p. 573, fig. 20, Baltimore, spp. nn., E. von Keyserling, Verh. z.-b. Wien, xxx. pl. xvi. *D. mandibularis*, Tacz., described and figured from Cayenne, *id. l. c.* p. 574, fig. 21. *D. boiorum*, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 82, Cape Ferret, near Arcachon. *D. scalaris*, Cambridge, = *D. bicolor*, Sim., *id.* Bull. Soc. Ent. France (5) x. p. cxv. *D. ammophila*, Menge, described from Niesky, Koch, Abh. Ges. Görl. xvii. p. 57. *Amaurobius longipalpis*, Kron., = *Nurscia albo-signata*, Sim.; Simon, Bull. Soc. Ent. Fr. (5) x. p. cxv.

Nurscia, g. n. Near *Amaurobius*, C. L. Koch, for *N. flavipes*, Cyprus, and *N. albo-signata*, Ourmiah, spp. nn., Simon, Arachn. Fr. i. p. 235. [Omitted from Zool. Rec. xi. (1874).]

Mezentia, g. n., p. 203. Near *Amaurobius*, C. L. Koch, forming a transition from that genus to *Psechrus*, Thor., for *M. angustata*, sp. n., p. 204, Thorell, Ann. Mus. Genov. xvii., Ternate.

Dinopidæ.

Dinopis camelus, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 194, Yule Island, New Guinea.

Avella superciliosa, sp. n., *id. l. c.* p. 200, Cape [illegible] p. 374, [illegible] p. 375, and *N. herbigra* [illegible]ge, "Spiders of Dorset."

Agelenidæ.

Cedicus mallendorffi, sp. n., Karsch, B. E. Z. xxv. p. 96, spp. nn., England; *W. fla-* [illegible] *ima*, p. 449, pl. vi. fig. 8, *W.* [illegible] *ssiceps*, Westr., Cambr., = *W.* *Hadrotarsus*, g. n., p. 190. Possibly [illegible] = *W. similis*, Cambr., p. 577;

Erigone jubc[illegible]y placed near the *Urocteidæ*, between the *Tubitelariæ* and
bi[illegible]*iæ*; for *H. babirussa*, sp. n., p. 191, Thorell, *l. c.*, Yule
c[illegible]*nata*, p.
Island. [illegible], p. [illegible]. 184, Island of Wokan, Aru, and Fly River, New
Storena zebrafescens, p. 188, Cape York, spp. nn., *id. l. c.*
Guinea, and *S.*[illegible], sp. n., Koch, Abh. Ges. Görl. xvii. p. 56, pl. ii.
Argenna pall
fig. 8, Niesky. sp. n., Karsch, Arch. f. Nat. xlvii. p. 10, pl. i. fig. 6,
Agelena pupi
Socna. Allied to *Hahnia*, C. L. Koch, for *I. mazarreda*, sp. n.,
Iberina, g. n. sp. x., Basque Provinces.
Simon, An. Soc

Hersiliidæ.

[illegible]*a*, sp. n., Karsch, Abh. Ver. Brem. vii. p. 195, Mada-
Hersilia f[illegible]
gascar.

Scytodidæ.

da, sp. n., Thorell, *l. c.* p. 181, Cape York.
Scytodes tard[illegible]*ctilis*, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 6,
Loxoscelis co[illegible]
Batna, Algeria.

Theridiidæ.

= *Rhomphæa*, L. Koch; Simon, Arachn. France, v. p. 18.
Ariamnes, Thor*a*, sp. n., Cambridge, P. Z. S. 1881, p. 770, pl. lxvi.
Ariamnes attenu
fig. 3, Amazons[illegible]*ne*) *lateralis*, sp. n., Karsch, B. E. Z. xxv. p. 40, Japan.
Ariamnes (*Ari* Allied to *Ariamnes*, Thor.; for *E. workmanni*, sp. n.,
Eriauchenus, g68, pl. lxvi. fig. 2, Madagascar.
Cambridge, *l. c.* Nearly allied both to *Argyrodes*, Sim., and *Theridion*,
Thwaitesia, g*garitifera*, sp. n., Cambridge, *l. c.* p. 766, pl. lxvi. fig. 1,
Walck., for *T.*
Ceylon. for *C. bonadea*, sp. n., Karsch, B. E. Z. xxv. p. 39,
Conopistha, g.
Japan. *num*, p. 76, Isère, Bourg d'Oisans, *gentile*, p. 106,
Theridion glerum, p. 72, Corsica and Morocco, spp. nn.; *T. black-*
Corsica, and *criT. hortense*, L. Koch, and *T. hasselti*, Thor., p. 82;
walli, Cambr., Koch, = *T. elegans*, Bl., *T. rufo-lineatum*, Luc., and
T. aulicum, C. , p. 95; *T. pallens*, Bl., = *T. minimum*, Wid., and
T. spirifer, Carh, p. 107; *T. lepidum*, Walck., = *T. venustum*, Walck.,
T. persubtile, L., and *T. bellicosum*, Sim., p. 64; *T. nigro-variegatum*,
T. instabile, C*kii*, Hermann, p. 66; *T. varians*, Hahn, = *T. leuco-*
Sim., = *ven.* *elardi*, Walck., p. 70; *T. tinctum*, Walck., =
xvii. xvii. p. 132. *l Steatoda punctulata*, Menge, p. 72: Simon,
no[illegible]*biseriata*, p. 139, Ram *catum*, p. 165, and *bertkaui*, p. 175, Hatam,
Tucta, g. n. Allied to *E.* 0, and *femorale*, p. 173, Cape York, spp. nn.,
E. isidis, Sim., Egypt, and *i.* *T. impressum*, sp. n., Koch, Abh. Ges.
Arachn. France, v. p. 3. sky.
Nephila labillardierii, Thor. Si ed to *Theridion*, Walck., but differs in
an account given some months ag

the disposition of the eyes, and in the tuberculose surfa[ce] many individuals
For *J. bicornis*, sp. n., Thorell, *l. c.* p. 163, Cape York.

Theonoe, g. n., p. 130, closely allied to *Pholcomma*, Th[orell] v. xvii. p. 142, Island
Walck., for *T. filiola*, p. 131, Aube and Ain, *T. lunoted*; *id. l. c.* pp. 146
and Pierrefeu, and *T. cornix*, p. 133, Seine-et-Marne a[nd]
Simon, Arachn. France, v.

Euryopis, Menge, re-characterized, *id. l. c.* p. 1[36], and *N. hofmanni*,
maculata, C. L. Koch, p. 123; *E. quinque-notatum*, [*chella*, spec.
Soc. Ent. Fr. (5) x. p. cviii, Palermo.

Laseola, g. n., established for various species hi[therto] Tin[kal] to p. 74,
Euryopis, Menge; *id.* Arachn. France, v. p. 136. *L.* [included] *l. c.*
Basses Pyrenées, St. Jean de Luz, *L. testacco-margin*[ata], [*hr*]*inea*.
Island of Porquerolles, St. Mandrier, and Corsica, *L.* [*t*], p.
Gers, Basses Pyrenées, Faillefeu, and Var (Island of P[orquerolles]), *nigrina*, p. 144,
L. auberti, p. 147, Var, spp. nn., and *L.* (*Theridion*) *convex*[a], [Bl.] = *Euryopis*
pilula, Sim., p. 148; *id. l. c.*

Crustulina, Menge, adopted for *Steatoda guttata* and[*sticta*, Cambr.,
p. 155, and *C. scabripes*, sp. n., p. 159, from various loc[alities in France;
id. l. c.

Theridiosoma (*Theridion*) *gemmosum*, L. Koch, [*T. argenteolum*,
Cambr.; *id. l. c.* p. 26.

Nesticus —— ?, an immature male of an undete[rmined speci]es was
found in the Grotto of Fabbiano, near Spezzia, with t[he fore-central pair
of eyes wanting, the remaining six being very minut[e (scarcely visible
with a strong lens) depressed and opaline. P. Pavesi, [Atti] Soc. Ital. Lomb.
(2) xiv.

Gnathonarium, g. n. Allied to *Nesticus*, Thor., but v[ith shorter legs
and no spines; falces of the male armed with a long[, sharp] tooth on their face. Type, *G. rohlfsianum*, sp. n., Ka[rsch, Arch. f. Nat.
xlvii. i. p. 10, pl. i. fig. 7, Ain Schersozura.

Teutana, Sim., genus characterized, Simon, Arachn. F[rance, v. p. 131.
The following are included in it:—*T.* (*Theridion*) *tria*[*gulosa*, Walck.,
p. 163, *T.* (*Ther.*) *grossa*, C. L. Koch, p. 164, and *T.* (*Ther.*) *castanea*,
Clk., p. 166 (synonyms of the first two are given).

Lithyphantes corollatus, Sim.; synonyms, *id. l. c.* p. [169. *L. paykul-*
lianus, Walck.; synonyms, *id. l. c.* p. 168.

Asagena phalerata, Panz.; synonyms; *id. l. c.* p. 173.

Latrodectus tredecim-guttatus, Rossi; synonyms, *id. l. c.* p. 177.

Neriene demissa, sp. n., pp. 438 & 575, England; *N. di*[*uta*, Cambr., =
N. demissa, Cambr., p. 575, *N. campbelli*, sp. n., p. 590, [England (= *N.*
decora, Cambr., in "Addendum et Corrigendum"), A[*rustica*, sp. n.,
p. 592, England; *N. fusca*, Bl., = *N. agrestis*, Cambr., p. [*N. phol-*
commoides, Cambr., = *Linyphia pholcommoides*, [Menge], p. 375, and *N. herbigr*[*ada*,
Bl., = *N. exhilarans*, Cambr., p. 575: Cambri[dge, "Spiders of Dorset."

Walckenaera ingrata, p. 443, *W. jucundiss*[*ima*, p. 449, pl. vi. fig. 8, *W.*
laudata, p. 594, and *W. melanocephala*, p. 5[96], spp. nn., England; *W. fla-*
vipes, Bl., = *W. implana*, Cambr., *W. cr*[*assiceps*, Westr., Cambr., = *W.*
affinitata, Cambr., and *W. hiemalis*, Bl[., = *W. similis*, Cambr., p. 577:
id. l. c.

p. 554, fig. 4, Caye[illegible]. 47, fig. 2, *equestris*, p. 48, fig. 3, *resina*, p. 50, fig. 4, pl. xvi.

Larinia longissima, [illegible]. 5, spp. nn., Koch, Abh. Ges. Görl. xvii., Niesky. various localities in France, *ensipotens*, p. 234, *discedens*, p. 235, Cantal, Le Lioran, *paupera*, p. 236, l Corsica, *turrigera*, p. 287, Perpignan, *decollata*, , *cricicola*, p. 238, Porquerolles, *medusa*, p. 239,

Gasteracantha sepul[illegible]*rulea*, p. 240, Corsica, *rufithorax*, p. 24, Hyères, and Simon, Bull. Soc. Z. p. 242, Hyères, &c., *varumpunctata*, p. 243, Hyères, New Guinea, *G. wa*[illegible]ious localities in Fr[illegible]ce, *cyclo*[illegible] p. 245, Dieppe and p. 15, New Guinea. 245, Aube, Villeneuv[illegible], Gyé-sur-Seine, *servula*, p. 246, *G. aruana*, p. 40, in France, *tauricornis*, p. 447, Valais, Vassory, *verticalis*, Genov. xvii.: spp. *digiticeps*, p. 249, Mouths of the Rhone, Marignane, *G. [illegible]stris [illegible]utenb*[illegible]ntal, Le Lioran, and Nuremberg, *polita*, p. 251, Aube, *gradata*, p. 25[illegible]ad[illegible], Forêt d'Aumon[illegible], *glaphyra*, p. [illegible] several localities in France, *curta*, p. 253, Bouches-du-Rhone, *genista*, p. 254, *inclara*, p. 255, and *stativa*, p. 256, Corsica, *westringi*, p. 256, Seine-et-Oise, Forest of Compiègne, &c., spp. nn., Simon, Bull. Soc. Z. Fr. 1881.

Lin[illegible]*phia incilium*, p. 53, pl. ii. fig. 6, and *L. umbratica*, p. 55, fig. 7, spp. nn., Koch, Abh. Ges. Görl. xvii., Niesky. *L. angulata*, sp. n., Cam[illegible]"Spid[illegible]rs of Dorset," p. 519, England. *L. abnormis*, Bl., = *L. li*[illegible]*reticul*[illegible], and *L. impigra*, Cambr., = *L. circumcincta*, Cambr., *id. l.* [illegible]*encausta*, Becker, figured, Becker, C. R. Ent. Belg. [illegible]xv.[illegible] *L. contortipes*, sp. n., Karsch, B. E. Z. xxv. p. 39, Japan.

Pachygnatha, Sund., transferred to the *Epeirida*; Simon, Arachn. France, v. p. 7.

Mimetus interfector, Hentz, = *Ero lævigata*, Keys., and *Ctenophora monticola* [illegible]sl.; *id. l. c.* p. 29.

Ero flammeola, sp. n., *id. l. c.* p. 37, Corsica.

Epeiridæ.

Meta longimana, p. 555, fig. 6, Peru, Amable Maria, *satulla*, p. 556, fig. 7, Peru, Pathaypampa, *speciosissima*, p. 557, Peru, Amable Maria, *opulenta*, p. 558, fig. 9, Pathaypampa and Amable Maria, *mariana*, p. 560, fig. 10, Amable Maria and Lima, Peru, *unicolor*, p. 566, fig. 15, New Granada, spp. nn., pl. xvi.; *M. argentea*, Tacz., described and figured, from Cayenne and Hassa, p. 562, pl. xvi. fig. 11, *M. argyra*, Walck., = *Linyphia ornata*, Tacz., p. 563, fig. 12, generally distributed in Central America, *M. pulcherrima*, Keys., = *Linyphia splendida*, Tacz., p. 565, fig. 13, *M.* (*Linyphia*) *branickii*, Tacz., described and figured from Cayenne, p. 565, fig. 14: Keyserling, Verh. z.-b. Wien, xxx.

Tetragnatha rubriventris, Dol., = *T. lupata*, L. Koch, Thorell, Ann. Mus. Genov. xvii. p. 132. *T. fallax*, p. 134, Amboina, *tenera*, p. 136, Cape York, *biseriata*, p. 139, Ramoi, New Guinea, spp. nn., *id. l. c.*

Eucta, g. n. Allied to *Eugnatha*, Sav., and *Tetragnatha*, Latr., for *E. isidis*, Sim., Egypt, and *E. gallica*, sp. n., near Biarritz; Simon, Arachn. France, v. p. 3.

Nephila labillardierii, Thor. Simon, Bull. Soc. Ent. Fr. (5) xi., corrects an account given some months ago of the snare of a large Spider from

New Caledonia, but which is now found to be that o[illegible] many individuals of this species.

Nephila laurinæ, sp. n., Thorell, Ann. Mus. Geno[illegible] v. xvii. p. 142, Island of Ternate. *N. maculata*, Fabr., 11 synonyms qu[illegible] noted; *id. l. c.* pp. 146 & 147.

Nephilengys malabarensis, Walck., = *N.* (*Ep[illegible]*ira) *anama*, Walck., and *N. hofmanni*, *N.* (*E.*) *rhodosternum*, Dol., *N.* (*E.*) *rivulata*, Cam[illegible] L. Koch; *id. l. c.* p. 156.

Argiope concinna, p. 71, Wokan Island, Aru, *A. pulv[illegible]*ella, [illegible] to p. 74, Maulmein (? = *Nephila ornata*, Bl.), *A. modesta*, p. 75, [illegible] incl[illegible] *l. c.*

Ebœa bituberculata, sp. n., *id. l. c.* p. 60, Hatam, New G[illegible]

Herennia papuana, sp. n., *id. l. c.* p. 77, Pulo Faor, N[illegible] inea.

Pronous, g. n., distinguished by the large size of th[illegible], p. d-central pair of eyes, which are widely separated, and placed consi[illegible] ably above the other three pairs, for *P. tuberculifer*, sp. n.; Keyserling, Verh. z.-b. Wien, xxx. p. 548, pl. xvi. fig. 1, Amable Maria, Peru.

Wladimir Schinkevitsch has a short but comprehensive paper on the anatomy of *Epeira*; on some points he differs from Bertkau, Leydig, Plateau, and Claparède. Zool. Anz. iv. pp. 234 & 23[illegible]

Epeira [?] *radiosa*, sp. n. (not described), H. C. M[illegible]ook, P. Ac. Philad. 1881, p. 163. The snare appears to be a compound o[illegible] that of *Epeira* and *Linyphia*. It is described as of an irregular orbicu[illegible]ar, or wheel, shape, drawn up in the middle so as to form a hollow cou[illegible] or funnel-shaped dome. The spiral lines are studded with viscid globu[illegible]es, as in the webs of other Epeirids. This snare is worked in the ordin[illegible]ary way, and also in the way described by Dr. B. G. Wilder, as peculiar to *Hyptiotes cavata*, Hentz; that is, by the sudden loosening of the slack portion (previously gathered up by the Spider) of a main line bearing upon the snare; this operation (in both cases), no doubt, tending to confuse and entangle the Spider's prey. The above modes of working (in respect both to *E. radiosa* and *H. cavata*) are fully described, and illustrated by figures.

Epeira pratrepida, sp. n., Keyserling, *l. c.* p. 549, pl. xvi. fig. 2, Georgia. *E. hilaris*, sp. n., Cambridge, P. Phys. Soc. Edinb. vi. p. 113, Newfoundland. *E. doriæ*, p. 81, Pulo Faor, New Guinea, *rani*, p. 93, Cape York, *arfakiana*, p. 96, Hatam, Mount Arfak, *rhombocephala*, p. 98, and *ephippiata*, p. 101, Cape York, *obesa*, p. 109, Cape York, Ramoi, New Guinea, *quinque-guttata*, p. 112, and *gestroi*, p. 116, Ramoi, *bulleri*, p. 119, Yule, New Guinea, *geminata*, p. 122, Hatam, spp. nn.: Thorell, Ann. Mus. Genov. xvii. *E. cavatica*, sp. n., *E. lathyrina*, sp. n., Holmberg, Period. Zool. Argent. i. p. 282, pl. vi. fig. 1, Argentine Republic [resembles *E. patagiata*, Clk.]. *E. lathyrina*, Holmberg, = *E. cærulea*, Bertk., *id.* An. Soc. Arg. xi. p. 378, and also = *E. montevidensis*, Keys., *id.* Informe, &c., p. 127, Rio Negro. *E solitudinis*, sp. n., *id. l. c.* p. 122, pl. iii. fig. 2, Chacabuco (Province of Buenos Aires), Sierra Pichy-Mahuida, and Guamini. *E. nox*, Sim., = *E. pilula*, Thor., and *E. laglaizii*, Sim., = *E. telura*, Thor.: Simon, Bull. Soc. Ent. Fr. (5) x. p. cxv. *E. pecuensis*, sp. n., Karsch, B. E. Z. xxv. p. 219, Peking. *E. mossambicana*, sp. n., P. Pavesi, Ann. Mus. Genov. xvi. p. 542.

Zilla guttata, p. 551, fig. 3, Amable Maria, Peru, and *Z. guyanensis*,

p. 554, fig. 4, Cayenne, spp. nn., Keyserling, Verh. z.-b. Wien, xxx. pl. xvi.

Larinia longissima, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 3, Zanzibar.

Gasteracanthidæ.

Gasteracantha sepulchralis, p. 1, *rufithorax*, p. 2, and *nigripes*, p. 3, Simon, Bull. Soc. Z. Fr. 1881, Madagascar. *G. albertisi*, p. 1, Yule Island, New Guinea, *G. wallacii*, p. 13, Andai and Kondo Island, *G. papuana*, p. 15, New Guinea, *G. ternatensis*, p. 18, and *G. bruijni*, p. 21, Ternate, *G. aruana*, p. 40, Wokan Island, Aru, and Amboina; Thorell, Ann. Mus. Genov. xvii.: spp. nn.

Cœrostris rutenbergi, sp. n., Karsch, Abh. Ver. Brem. vii. p. 191, pl. xii. fig. A, Madagascar.

Mutina furcifera, sp. n., Cambridge, P. Z. S. 1881, p. 771, pl. lxvi. fig. 4, Amazons.

Carepalxis suberosa, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 48, Yule Island.

Acraspis, Karsch. The genus characterized (as between *Carepalxis* and *Epeira*); id. *l. c.* p. 52. *A. tuberculifera*, sp. n., *id. ibid.* Cape York.

Miagrammopidæ.

Miagrammopes raffayi, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 5, Zanzibar.

Poltidæ.

Poltys furcifera, p. 4, and *P. larvata*, p. 5, spp. nn., *id. l. c.* Zanzibar.

Arcyidæ.

Eurymachus, g. n., p. 567. Nearly allied to *Oarces*, Sim., for *E. latus*, sp. n., p. 568, Amable Maria, Peru; Keyserling, Verh. z.-b. Wien, xxx. pl. xvi. fig. 16.

Stephanopidæ.

Stephanopis aruana, p. 317, Wokan Island, Aru, *S. yulensis*, p. 319, Yule Island, and *S. longimana*, p. 322, Cape York, spp. nn., Thorell, Ann. Mus. Genov. xvii.

Thomisidæ.

Thomisus labefactus, sp. n., Karsch, B. E. Z. xxv. p. 38, Japan.

Misumena arrogans, p. 334, Yule Island, and *M. innotata*, p. 335, Andai, New Guinea, spp. nn., Thorell, Ann. Mus. Genov. xvii. *M. exanthematica*, sp. n., Holmberg, Informe, &c., p. 155, pl. iv. fig. 10, Rio Colorado.

Runcinia rutenbergi, sp. n., Karsch, Abh. Ver. Brem. vii. p. 194, Madagascar.

Runciniopsis, g. n. Allied to *Runcinia*, Sim., for *R. flavida*, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 1, Zanzibar.

Pistius (*Misumena*) *elongatus*, L. Koch, name changed to *acuminatus* (for example from Cape York), the former name being preoccupied by a species of the same genus; Thorell, *l. c.* p. 333.

Cerinius irroratus, sp. n., *id. l. c.* p. 355, Cape York.

Diæa bitæniata, Thor., = *Misumena bitæniata*, Thor., and *D. nitida*, Thor., = *Misumena nitida*, Thor., *id. l. c.* p. 340. *D. jucunda*, Thor., Cape York, and *D. amicina*, p. 342, Wokan Island, Aru, spp. nn., *id. l. c.* *D. chlorophila*, sp. n., Holmberg, Informe, &c., p. 153, pl. iv. fig. 11, Sierra Pichy-Mahuida.

Xysticus cor, Canestrini, = *X. comptulus*, Sim., Simon, Bull. Soc. Ent. Fr. (5) x. p. cxv. *X. obscurus*, sp. n. [apparently allied to *X. bifasciatus*, C. L. Koch], R. Collett, Forh. Selsk. Chr. 1876, No. 2, p. 9, Norway.

Rhæbobates, g. n., p. 352. Differs from *Xysticus*, and other allied genera in the anterior row of eyes being distinctly longer than the posterior, for *R. lituratus*, sp. n. p. 353, Thorell, Ann. Mus. Genov. xvii. Hatam, New Guinea.

Demonax, g. n., p. 349. Closely allied to *Xysticus*, for *D. lugens*, sp. n., p. 350, *id. l. c.* Hatam.

Angæus, g. n., p. 345, forms a transition to the *Heteropodidæ* (Thor.), for *A. pudicus*, sp. n., p. 346, Island of Ceram, *id. l. c.*

Porropis callipoda, p. 359, Cape York and Yule Island, *P. nitidula*, p. 362, and *P. tristicula*, p. 364 (? = *nitidula* ♂ ?), p. 365, Cape York, spp. nn., *id. l. c.*

Thomisoides rupestris, sp. n., Holmberg, Informe, &c. p. 153, pl. iv. fig. 9, Sierra Pichy-Mahuida.

Platythomisus speciosus, sp. n., Thorell, *l. c.* p. 327, Cape York. *P. mechowi*, sp. n., Karsch, B. E. Z. xxv. p. 288, Quango, West Africa.

Holconia malagasa, sp. n., Karsch, Abh. Ver. Brem. vii. p. 192, pl. xii. fig. 8, Madagascar. *H. subdola*, sp. n., Thorell, *l. c.* p. 304, Cape York.

Ocypete pythagorica, sp. n., Holmberg, Period. Zool. Argent. i. p. 287, pl. vi. fig. 2, Buenos Aires to Paraguay [appears to belong to *Holconia*, Thor., Keys., and is probably *H.* (*Voconia*) *maculata*, Keys.].

Selenops buchneri, sp. n., Karsch, B. E. Z. xxv. p. 94, Angola.

Saroles peditatus and *forcipatus*, p. 38, spp. nn., Karsch, *l. c.* Japan.

Polydamna, g. n., p. 299. Allied to *Sparassus*, Walck., for *P.* (*Heteropoda*) *regina*, L. Koch, p. 300, Yule Island, Thorell, *l. c.*

Hemiclæa somersetensis, sp. n., *id. l. c.* p. 307, Somerset, Cape York.

Isopoda herculea, p. 293, and *I. deianira*, p. 296, Yule Island, spp. nn., *id. l. c.*

Pandercetes isopus, p. 309, Fly River, and *P. longipes*, p. 312, Jobi, spp. nn., *id. l. c.*

Heteropoda submaculata, p. 277, Andai, New Guinea, *H. analis*, p. 280, Fly River, *H. lycodes*, p. 282, Cape York, *H. cyanognatha*, p. 286, Yule Island, and *H. ruricola*, p. 290, Fly River, spp. nn., *id. l. c.*

Themeropis goramensis, p. 269, Goram Island, and *T. brevipes*, p. 271, Yule Island, spp. nn., *id. l. c.*

Sparassus hæmorrhoidalis, p. 256, Fly River, New Guinea, *S. rubriventris*, p. 261, Wokan, Aru, *S. insularis*, p. 263, Kei Island, and *S. zebra*, p. 266, Ternate, spp. nn., *id.* l. c. *S. fornasinii*, sp. n., P. Pavesi, Ann. Mus. Genov. xvi. p. 548. *S. beluinus*, sp. n., Karsch, Arch. f. Nat. xlvii. i. p. 10, pl. i. fig. 5, ♀, Taiserbo & Oasis Jibbene, and ? var. from Wadi Mimun.

Thanatus pictus, sp. n., Koch, Abh. Ges. Görl. xvii. p. 61, pl. ii. fig. 11, Niesky.

Aphantochilidæ.

Bucranium, g. n., allied to *Aphantochilus*, Cambr., but of a shorter form, and with no constriction at the posterior part of the cephalothorax; for *B. taurifrons*, sp. n., Cambridge, P. Z. S. 1881, p. 772, pl. lxvii. fig. 5, Amazons.

Perissoblemmatidæ.

Perissoblemma, g. n. A remarkable genus, with apparently no near allies. The eyes, however, are somewhat similar, in position, to those of *Selenops*, Duf.; for *P. thomisiforme*, sp. n., Cambridge, P. Z. S. 1881, p. 774, pl. lxvi. fig. 6, Amazons.

Podophthalmidæ.

Dendrolycosa lineata, p. 366, Cape York, and *D. exilis*, p. 369, New Guinea, spp. nn., Thorell, Ann. Mus. Genov. xvii.

Perenethis, L. Koch, differs but little from *Dendrolycosa*, excepting in its rigid tarsi; those of the latter being flexible; *id. l. c.* p. 373, Niesky.

Lycosidæ.

Ctenus argentinus, sp. n., Holmberg, An. Soc. Arg. xi. p. 177, Argentine Republic. *C. rubripes*, sp. n., Keyserling, Verh. z.-b. Wien, xxx. p. 577, pl. xvi. fig. 23, Panama.

Leptoctenus agræcoides, sp. n., Thorell, Ann. Mus. Genov. xvii. p. 386, Cape York.

Microctenus curvipes, sp. n., Keyserling, *l. c.* p. 579, fig. 24, Panama.

Phoneutria rufibarbis described and figured from New Freiburg, Brazil; *id. l. c.* p. 576, pl. xvi. fig. 22.

Pardosa abacata, sp. n., Karsch, Arch. f. Nat. xlvii. i. p. 9, Jebel Tarrhuna, Bir Milrha. *P. neglecta*, sp. n., Koch, Abh. Ges. Gorl. xvii. p. 65, pl. ii. fig. 12, Niesky. *P. occidentalis*, sp. n., Simon, An. Soc. Esp. x. p. 135, Algarves (Portugal). *P. cavannæ*, sp. n., Simon, Bull. Ent. Ital. xiii. Resoc. Adun. p. 21, Monte Amara, Abruzzo.

Lycosa læta, L. Koch, is a *Tarentula*, Sund.; Thorell, *l. c.* p. 384. *L. vigilans*, sp. n., Koch, *l. c.* p. 69, fig. 13, Niesky. *L. rapa*, Butaritari, and *L. parvipudens*, Tarrowa, spp. nn., Karsch, B. E. Z. xxv. p. 96; *L. parricida*, sp. n., *id. l. c.* pp. 220, Peking; *L. febricula*, p. xlv. fig. 2, New Orleans, and *L. exalbida*, p. lxvi. fig. 3, Brazil, spp. nn., Becker, CR Ent. Belg. xxv. pl. ii.

Tarentula, Sund. The question is discussed as to the propriety of retaining "*Tarentula*" as a genus of Spiders, since Fabricius gave it to the group now known as *Phrynus*, pp. 382 & 383, also in a note to p. 383, other objections by E. Simon and L. Koch to "*Tarentula*" are noticed; Thorell, *l. c.* *T. poliostoma*, C. L. Koch, Keys., described from Rio Negro, p. 160, and *T. mœsta*, described and figured from Buenos Aires, Rio Colorado, and Las Conchas, p. 161, pl. iv. fig. 12, Holmberg, Informe, &c.

Léon Becker, CR. Ent. Belg. xxiii. pp. clv.–clviii., observes upon *Tarentula narbonnensis*, Latr., from the South of France, as well as on a species (unnamed) from America. His remarks refer chiefly to the habit of forming a cylindrical tubular nest in the earth, above which is raised a chimney-like fortress, or rampart, of small sticks and other *débris*. This is of far greater size and ingenuity in its construction in the American than in the European species.

Tarentula nidifex, p. 396, figs. 1–3, 7 & 8, Virginian shores of Potomac, and *T. pikii*, p. 399, figs. 4–6, Brooklyn, U. S. A., spp. nn., George Marx, Am. Nat. xv. figs. 4–6.

Trabea jugorum, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 83, St. Martin Lantosque, Alpes Maritimes.

Lycosa tarentula, Latr. V. Bergsö gives particulars of nest and habits observed on the Roman Campagna. The entrance to the tubular nest is covered with grass and leaves woven into an arched covering; he remarks also on the bite of the *Tarentula*, and the means used for its cure. *Cf.* Nature, Nov. 25, 1881, and Zool. (3) v. p. 29.

Trochosa pulchella, p. 377, Fly River, New Guinea, and *T. timorensis* p. 379, Island of Timor, spp. nn., Thorell, *l. c.*

Anoteropsis papuana, sp. n., Thorell, *l. c.* p. 374, Hatam, New Guinea.

Oxyopidæ.

Oxyopes keyserlingi, p. 390, Ramoi & Sorong, *O. papuanus*, p. 395, Andai, New Guinea, Wokan Island, Aru, and Cape York, *O. hilaris*, p. 402, Island of Timor, and *O. brevis*, p. 404, Wokan, Thorell, Ann. Mus. Genov. xvii.: spp. nn.

Salticidæ.

Leptorchestes fornasinii, sp. n., P. Pavesi, Ann. Mus. Genov. xvi. p. 554, Inhambane, Mozambique.

Synemosyna lugens, sp. n., Thorell, *op. cit.* xvii. p. 406, Ternate.

Phyale roburiformis, sp. n., Holmberg, Period. Zool. Argent. i. p. 293, pl. vi. fig. 4, Buenos Aires.

Ecophrys sutrix, sp. n., *id. l. c.* p. 295, pl. i. fig. 5, Buenos Aires.

Diolenius amplectens, p. 412, Wokan Island, Aru, and Ramoi, *lugubris*, p. 414, Ramoi, *armatissimus*, p. 417, *venustus*, p. 421, and *vittatus*, p. 423, Ternate, *albo-maculatus*, p. 418, Ramoi, and *bifasciatus*, p. 425, Kei Island, spp. nn., Thorell, *l. c.* *D. phrynoides*, Walck., described and figured from Australia, Koch, Die Arachn. p. 1240, pl. cvi. fig. 4.

Discocnemius, g. n., p. 428, closely allied to *Diolenius*, Thor., and still

more closely to *Chirothecia*, Taez., for *D. lacertosus*, sp. n., Thorell, *l. c.* p. 429, Cape York.

Marptusa prensitans, p. 432, Katau, New Guinea, *M. rapax*, p. 434, and *M. leptochira*, p. 440, Fly River, *M. rubriceps*, p. 437, *M. vulpecula*, p. 452, and *M. longula*, p. 454, Cape York, *M. batamensis*, p. 444, Batam, *M. eriognatha*, p. 447, Andai, *M. inconspicua*, p. 449, Kapaor, *M.* ? *elata*, p. 457, Ramoi, spp. nn. ; *id. l. c.*

Icius (*Marpissa*) *dissimilis*, C. L. Koch, = *Marpissa incerta*, C. L. Koch, *Salticus convergens*, Dol., *S. nigro-limbatus*, Cambr., and *Marptusa marita*, Karsch ; *id. l. c.* p. 461.

Mavia agapeta, p. 471, Batam and Sorong Island, *monacha*, p. 474, New Guinea, *scalaris*, p. 477, Island of Ternate, *trabifera*, p. 480, Ramoi, *insultans*, p. 484, Yule Island ; *id. l. c.*

Cocalus protervus, p. 493, Pulo Faor Island, and *C. longipes*, p. 494, Ceram and Yule Islands, spp. nn. ; *id. l. c.*

Menemerus ? *paykulli*, Aud., New Guinea and Cape York, p. 501, = *Attus africanus*, Vins., and *Ecophrys delibuta*, Koch, p. 502 ; *id. l. c.*

Attus cyanothorax, p. 509, Ramoi, *perogaster*, p. 511, Yule Island, *varicans*, p. 514, and *albertisi*, p. 517, Cape York, spp. nn., *id.* l. c. *A. erraticus*, Walck., on the way in which it spins its web ; H. Lucas, Bull. Soc. Ent. Fr. (5) x. p. cviii.

Simætha, g. n. In some respects like *Philæus*, Thor., Sim., but in form of cephalothorax more like *Ballus*, C. L. Koch, and *Homalattus*, White, p. 520. For *S. thoracica*, p. 521, sp. n., Thorell, *l. c.*, Cape York.

Plexippus macrognathus, p. 531, Fly River, *elaphus*, p. 535, Dorei Hum, New Guinea, *P. cervus*, p. 537, *P. molossus*, p. 553, *P. brachygnus*, p. 613, *pumicatus*, p. 625, Yule Island, *hinnuleus*, p. 539, *severus*, p. 596, *frontalger*, p. 607, *pupulus*, p. 622, *wallacii*, p. 628, Cape York, *dorcas*, p. 541, *insulanus*, p. 577, (*P.* ?) *obesus*, p. 641, Ternate Island, *oscitans*, p. 544, Dorei Hum, *dilanians*, p. 548, Yule and Wokan Islands, *ædonychus*, p. 556, Fly River, *lacerans*, p. 559, Island of Goram, *ringens*, p. 562, Wokan Island, *expectans*, p. 589, Wokan and Yule Islands, Sorong, and Cape York, *brocchus*, p. 565, *aper*, p. 568, Ramoi, *catellus*, p. 571, Kapaor, New Guinea, *frendens*, p. 575, *latericius*, p. 580, Andai, *beccarii*, p. 582, New Guinea and Cape York, *dearmatus*, p. 588, Yule Island, Wokan, and Cape York, *argentosus*, p. 594, Wokan and Batam, *nimbatus*, p. 600, Batam and Andai, *mitellatus*, p. 604, Yule Island, Wokan, and Ternate, *ochropsis*, p. 611, Batam, *doryphorus*, p. 615, Sorong, *bernsteini*, p. 619, Andai and Wokan, *myiopotami*, p. 632, (*P.* ?) *karschi*, p. 637, Fly River and Wokan, spp. nn., Thorell, l. c. *P. montrouzieri*, Luc., var. n. *papuanus*, id. *l. c.* p. 526, Wokan and Fly River. *P.* (*Salticus*) *sinuatus*, Dol., = *Salticus floricola*, Dol., Ternate, Fly River, and Cape York, *id. l. c.* p. 603. *P. crassipes*, p. 38, Japan, and *P. planipudens*, p. 96, Tarowa, spp. nn., Karsch, B. E. Z. xxv.

Ephippus, g. n. Nearly allied to *Plexippus*, C. L. Koch, p. 643 ; type, *E.* (*Attus*) *durvillii*, Walck., Islands of Goram, Jobi, Mysol, and Aru, New Guinea, and Cape York, p. 653 ; also *E.* (*Salticus*) *lepidus*, Guér., p. 644, Ramoi, Andai, Kapaor, and Mysol, and *E. juliæ*, sp. n., p. 650, Fly River : Thorell, *l. c.*

Ictidops monoceros, sp. n., Karsch, B. E. Z. xxv. p. 96, Jaluit.

Euryattus, g. n., for *E. porcellus*, sp. n., Thorell, *l. c.* p. 660.

Ballus papuanus, sp. n., *id. l. c.* p. 665, Hatam.

Homalattus atratus, sp. n., Karsch, *l. c.* p. 39, Japan.

Omoedus, g. n., p. 668, for *O. niger*, p. 669, Thorell, *l. c.* Ramoi.

Coccorchestes, g. n., resembling some beetles (*e.g.*, *Chrysomela*), p. 671, for *C. rufipes*, sp. n., p. 672, Wokan. Query whether *Salticus coccinelloides*, Cambr., from New Freiburg, belongs to this genus; note to p. 672, Thorell, l. c. *C. blanda*, p. 675, and *C. subhirsutus*, p. 677, Gulf of Vandammen, New Guinea, *C. tarsalis*, p. 680, Andai and Pulo Faor, spp. nn., *id. l. c.*

Opisthoncus polyphemus, L. Koch, described and figured from Brisbane, Sydney, Rockhampton, Bowen, Peak Downs, Gayndah; L. Koch, Die Arachn. Austr. p. 1215, pl. civ. figs. 5 & 6. *O. abnormis*, p. 1221, pl. civ. figs. 1 & 2, Peak Downs and Sydney, *confinis*, p. 1225, Peak Downs, *albiventris*, p. 1228, pl. cv. figs. 4 & 5, *serratofasciatus*, p. 1233, fig. 1, Sydney, *unicolor*, p. 1235, fig. 2, Peak Downs, *necator*, p. 1227, fig. 3, Sydney, Rockhampton and Gayndah, pl. cvi., spp. nn., *id. l. c.*

Jotus, g. n., for *J. auripes*, p. 1243, fig. 1, Sydney, *microphthalmus*, p. 1246, figs. 2 & 3, and *albo-circumdatus*, p. 1250, fig. 4, Tahiti, *debilis*, p. 1252, fig. 5, Sydney, *braccatus*, p. 1254, figs. 6 & 7, Gayndah, pl. cvii., *minutus*, p. 1257, fig. 1, Peak Downs, *ultimus*, p. 1259, figs. 2 & 3, Australia, pl. cviii., spp. nn., *id. l. c.*

Ergane, g. n., p. 1260, for *E. cognata*, p. 1261, fig. 3, Pelew Island, *dialeuca*, p. 1263, fig. 4, Sydney, *insulana*, p. 1265, fig. 5, Pelew Island, and *scutulata*, p. 1268, figs. 6 & 7, Sydney, Rockhampton, Peak Downs, and Gayndah, spp. nn.; *id. l. c.*

Hasarius barbatissimus, p. 1272, figs. 1 & 2, Bowen, Peak Downs, Sydney, and Gayndah, *lineatus*, p. 1275, fig. 3, Sydney, *albo-cinctus*, p. 1277, fig. 4, Cape York, *infra-striatus*, p. 1279, fig. 5, Rockhampton and Peak Downs, *villosus*, p. 1281, fig. 6, Peak Downs, *insularis*, p. 1283, fig. 7, Tonga Island, pl. cix.; *orbiculatus*, p. 1285, figs. 1 & 2, Port Mackay, Peak Downs, Rockhampton, Gayndah, Sydney, and Cape York, *lautus*, p. 1287, fig. 3, Upolu, *garetti*, p. 1289, fig. 4, Ragatea, *albiventris*, p. 1291, fig. 5, Sydney, *nigriventris*, p. 1293, fig. 6, and *plumbeiventris*, p. 1295, fig. 7, Rockhampton, *xanthopus*, p. 1297, fig. 8, Gayndah, Rockhampton, Port Mackay, and Cape York, pl. cx.; *albescens*, p. 1299, fig. 1, Rockhampton, *pauperatus*, p. 1300, fig. 2, Port Mackay, *diloris*, p. 1302, fig. 3, Viti Island and Port Mackay, *vittatus*, p. 1304, figs. 4 & 5, Peak Downs, *chrysostomus*, p. 1307, fig. 6, Rockhampton, Bowen, and Port Mackay, *mulciber*, p. 1310, fig. 7, Port Mackay, *inhonestus*, p. 1312, fig. 8, Sydney, pl. cxi.; *clarovittatus*, p. 1313, fig. 1, and *obscurus*, p. 1315, fig. 2, Sydney, *pumilio*, p. 1317, Peak Downs, spp. nn.; *id. l. c.* pl. cxii.

Ascyltus penicillatus, Karsch, described and figured from Sydney, Rockhampton, and Bowen; *id. l. c.* p. 1319, pl. cxii. fig. 45.

Accompse concinnus, sp. n., *id. l. c.* p. 1322, pl. cxii. figs. 6 & 7, Gayndah and Peak Downs.

Eris squamifera, sp. n., Simon, An. Soc. Esp. x. p. 134, Algarves (Portugal).

Palaranea borassifoliæ, Fr. A fossil Spider from the Carboniferous formation at Swina, Bohemia; O. Novak, JB. geol. Reichsanst. xxx. [1880] p. 74.

PHRYNIDEA.

A. G. Butler answers Karsch's remarks [Zool. Rec. xvii. *Arachn.* p. 20] ; Ann. N. H. (5) viii. p. 69.

SCORPIONIDEA.

Scorpiones.

Karsch, F. Übersicht der europäischen Skorpione. B. E. Z. xxv. pp. 89–91.

Records 13 species, of which 1 species and 1 genus are new. The author gives the following division of this group :—i. *Buthidæ* ; ii. *Heterometridæ*. In the first of these are *Prionurus*, Ehrenb., including *P. gibbosus*, Brullé, *hottentotta*, Fabr., *quinque-striatus*, Ehrenb., *occitanus*, Amoreux, *leptochelys*, Ehrenb., *Androctonus*, Ehrenb., including *A. australis*, Linn., and *Orthodactylus*, g. n., p. 90, near *Phassus* and *Rhophirus*, Thor. ; for *O. olivaceus*, sp. n., p. 91, Sicily. Of the *Heterometridæ* are *Iurus*, Thor., including *O. dufourius*, Brullé, *Belisarius*, Sim., including *B. xambeui*, Sim., *Euscorpius*, Thor., including *E. italicus*, Herbst, *terminalis*, Brullé, *flavicaudis*, De Geer, and *carpathicus*, Linné.

Hadrurus poaschi, sp. n., Karsch, *l. c.* p. 290, Ecuador.

Buthus martensi, Karsch, = *B. confucius*, Sim., *id. l. c.* pp. 219 & 220, Peking and Tientsin.

Megacormus, g. n., allied to *Urodacus*, Pet., though differing in various particulars; type, *M. granosus* (Gerv.); F. Karsch, Arch. f. Nat. xlvii. i. p. 17, Cordova, Mexico.

Bothriurus vittatus, Guér., and *Cercophonius brachycentrus*, Thor., pl. iv. fig. 13, Rio Colorado, Holmberg, Informe, &c., p. 164.

Androctonus australis, Linn. The lateral eyes on left hand side deficient; P. Pavesi, Rend. Ist. Lomb. (2) xiv.

Cyclophthalmus senior, Cord. A fossil Scorpion, from the Carboniferous formation of Bohemia ; O. Novak, JB. geol. Reichsanst. xxx. [1880] p. 74.

Jousset de Bellesme, —. Essai sur le venin du Scorpion. Bibliothèque de l'École des hautes Études, Section des Sciences Naturelles, ix. No. 6, pp. 1–36, pl. xx. [Omitted from former vols. of Zool. Rec.]

The author reviews, in Part i., pp. 1–4, various opinions and observations in respect to the Scorpion, its habits and economy, and treats as a fable the statement, first made by Aristotle, that the Scorpion, when in danger from a surrounding line of burning charcoal, commits suicide. He describes, pp. 4–7, the habits of Scorpions, and mode of capturing them ; pp. 7–10, the consequences of their sting; pp. 10–14, the structure of the sting; pp. 14 & 15, the poison; pp. 15–17, mode of obtaining it. In Part ii., pp. 17–35, various experiments are detailed, proving the

strongly poisonous effects of the sting of Scorpions. [See this author's paper with the same title, C. R. lxxii. (1870) p. 407, noticed in Zool. Rec. viii. p. 207.]

Pavesi, P. Toradelfia in uno Scorpione. Rend. Ist. Lomb. (2) xiv. [Not seen by the Recorder.]

F. Karsch refers critically (JB. der. Zool. für Westfalen u. Lippe, 1879-80, pp. 29-39), to T. Thorell's "Études Scorpiologiques," Atti Soc. Ital. xiv. pp. 75-272.

Pseudoscorpiones.

Obisium (*Blothrus*) *torrii*, p. 299, Grotto of Oliero, near Bassano, Venetia, and *O.* (*Blothrus*) *stussineri*, p. 301, Grotto, near Laibach, spp. nn., both eyeless, Simon, Ann. Mus. Genov. xvi. *O. myops*, sp. n., *id.* Bull. Soc. Z. Fr. 1881, p. 91, Sospel, Maritime Alps.

Chelifer boucicus, sp. n., Karsch, B. E. Z. xxiv. p. 37, Japan. *C. excentricus*, sp. n., Holmberg, Period. Zool. Argent. i. p. 299, pl. vi. fig. 6, Buenos Aires. *C. subruber*, Sim., and *C. savignii*, Ramleh, *C. letourneuxi*, Mariout, p. 12, spp. nn., Simon, Bull. Soc. Z. Fr. 1881.

Garypus beauvoisi, Sav., p. 13, on the Coast of Lower Egypt, Simon, *l. c.*

Olpium pallipes, Luc., Ramleh, and *O. kochi*, Sim., near Great Pyramid, p. 13, *id. l. c.*

Minizza, g. n., nearly allied to *Olpium*, for *M. vermis*, sp. n., *id. l. c.* p. 14, Lake Mareotis.

Chthonius tetrachelatus, Preyss., *id. l. c.* p. 15, Ramleh.

Daday, E. Ueber den Circulations-apparat der Pseudoscorpione. Term. Füzetek, iv. [1880].

[The Recorder has not seen this paper.]

PHALANGIIDEA.

Loman, J. C. C. Bijdrage tot de Anatomie der Phalangiden. Amsterdam: 1881 (Academ. Proefschrift), 8vo, pp. 74, 3 pl. [Not seen by the Recorder.]

Sabacon viscayanus, sp. n., Simon, An. Soc. Esp. [illegible] p. x. p. 128, near Orduna.

Ischyropsalis nodifera, Sim., = *I. sharpi*, Sim., *id.* Ibid. *I. superbus*, p. 129, St. Jean de Luz, and *I. madalenæ*, p. 130, near Guéthary, Biscay, spp. nn., *id. l. c.*

Sclerosoma sicanum, Pav., = *Phalangium* (*Mastobunus*) *tuberculiferum*, H. Luc.; *id.* Bull. Soc. Ent. Fr. (5) x. p. cxvi., and Bull. Soc. Z. Fr. 1881, p. 88.

Astrobunus kochi, Thor., recorded from France and Italy; *id.* Bull. Soc. Z. Fr. 1881, p. 88.

Megabunus grouvellii, sp. n., *id. l. c.* p. 87, Treimouze, Hautes-Pyrénées.

Platybunus eques, sp. n., *id. l. c.*, p. 81, St. Martin, Lantosque.

Acantholophus granulatus, sp. n., G. Canestrini, Bull. Ent. Ital. iii. [1871] p. 384, Lugano and Lombardy.

Phalangium serrulatum, sp. n., Karsch, B. E. Z. xxv. p. 220, Peking.

Hoplites pavesii, Ticino, &c., and *H. levipes*, Lugano, &c., spp. nn., G. Canestrini, Bull. Ent. Ital. iii. [1871] p. 383.

Gagrella guttata and *G. pumilio*, spp. nn., Karsch, *l. c.* p. 36, Japan.

Mitopus mobilis and *M. genufuscus*, spp. nn., *id. l. c.*, p. 35, Japan.

Liodes, L. Koch (*Prosalpia*, L. Koch) = *Dicranopalpus*, Dol. (1852); type, *D. gasteinensis*, Dol., = *Prosalpia bibrachiata*, L. Koch (the name *gasteinensis* has priority): Simon, Bull. Soc. Z. Fr. 1881, p. 88.

Lacinius aspersus, sp. n., Karsch, *l. c.* p. 35, Japan.

Liobunum aurantiacum, sp. n., Simon, Bull. Soc. Z. Fr. 1881, p. 84, S. Martin, Lantosque, Alpes Maritimes. *L. manubriatum*, sp. n., Karsch, *l. c.* p. 35, Japan. *L. doriæ*, p. 384, Genoa, &c., and *L. agile*, p. 385, Venetia, spp. nn., G. Canestrini, Bull. Ent. Ital. iii. [1871].

Opilio targionii, p. 381, *O. argentatus*, p. 382, Sardinia, and *O. graniferus*, p. 382, Tuscany, spp. nn., Canestrini, *l. c.*

Amopaum sorensenii, Thor., recorded from Mentone; Simon, Bull. Soc. Z. Fr. 1881, p. 91.

Nemastoma centetes, p. 89, and *N. rude*, p. 90, spp. nn., St. Martin, Lantosque, *N. scabriculum*, Sim., recorded from Hautes-Pyrénées, p. 91; *id. l. c.*

PYCNOGONIDEA.

Dohrn, Anton. Die Pantopoden des Golfes von Neapel und der angrezenden Meeres. Leipzig: 1881, 4to. Sect. iii., Monogr. Fauna und Flora des Golfes von Neapel. [Reviewed by G. Cavanna, Bull. Ent. Ital. x. pp. 244–247, and Hoek, Arch. Z. expér. ix. pp. 535–539.]

Treats at considerable length upon the anatomy, external and internal, development, phylogeny, and literature of the *Pycnogonidea*. Synoptical tables of distinctive characters of genera and species are given; 25 species (of which 24 are new) are described. The *Pycnogonidea* are provisionally divided into 4 families (*Ammotheidæ*, *Nymphonidæ*, *Phoxichilidæ*, and *Pycnogonidæ*), containing 10 genera, distributed as follows:—Ammotheidæ, gg. *Barana*, Dohrn, 2 spp., *Ammothea*, Leach, 7 spp., *Clotenia*, Dohrn, 1 sp. (? = *Tanystylum*, Miers), and *Tryynus*, Dohrn, 1 sp.; Phoxichilidæ, gg. *Phoxichilus*, Latr., 2 spp., and *Phoxichilidium*, Milne Edwards, 4 spp.; Nymphonidæ, gg. *Pallene*, Johnst., 4 spp., and *Neopallene*, Dohrn, 1 sp.; Pycnogonidæ, gg. *Pycnogonum*, Linn., 2 spp., and *Rhynchothorax*, Costa, 1 sp.

Hoek, P. P. C. Nouvelle Étude sur les Pycnogonides. Arch. Z. expér. ix. pp. 445–542, pls. xxiii.–xxx.

Enters (pp. 445–452) into the existing literature on the *Pycnogonidæ*, and treating, i. (pp. 454–459) on the general form; ii. (pp. 459–480) of the external and internal anatomy; iii. (pp. 480–488) of the embryology; iv. (pp. 488–497) concludes, in respect to the position of the *Pycnogonidæ* in the zoological system and classification of the group, that the Pycnogonids should form a distinct class of the *Articulata*; v. (pp. 497 & 498)

treats of the Pycnogonids of the Breton coast, and of those of the coast of Holland, and gives (p. 523) a list of the works of the 27 authors cited. The following classification is proposed :—ARCHIPYCNOGONUM, comprising 4 families : i. *Nymphonidæ*, containing 2 genera, *Nymphon* and *Pallene*; ii. ASCORRHYNCHIDÆ, containing 8 genera, *Ascorrhynchus*, *Zetes*, *Ammothea*, *Bohmia*, *Lecythorrhynchus*, *Dorrhynchus*, *Tanystylum*, *Paribæa* ; iii. COLOSSENDEIDÆ, containing 3 genera, *Colossendeis*, *Endeis*, *Discoarachne*; iv. PHOXICHILIDÆ, containing 5 genera, *Pallenopsis*, *Phoxichilidium*, *Phoxichilus*, *Hannonia*, and *Pycnogonum*. 10 species, of which 1 is new, comprised in 6 genera, are described.

[HOEK, P. P. C.] Report on the *Pycnogonida*. Zoology of the Voyage of H.M.S. 'Challenger,' Pt. x. pp. 1–167, pls. i.–xxi. and 2 woodcuts.

Reviews (pp. 1–6) the more important publications on this group; gives (pp. 9–16) a list of the known genera, with remarks on their geographical distribution, and (pp. 17–36) a catalogue of known species, with indications of the habitat and range of depth of each. At pp. 36–93 is a description of the species dredged during the 'Challenger' Expedition; pp. 94–99 forms Appendix i., and describes the species dredged during the cruise of the 'Knight-Errant'; pp. 100–144, forms Appendix ii., and contains contributions to the anatomy and embryology of the *Pycnogonidæ*. The contents of the Report are summarised, pp. 145–148, from which it appears that 43 species obtained by the 'Challenger' and 'Knight-Errant' are described, 33 being new; 3 new genera are also characterized. The plates are excellent, and give highly magnified figures of dissections of various species, illustrating the internal and external structure and embryology.

——. The Pycnogonids dredged during the cruises of the 'Willem Barents' in the years 1878–79. Niederl. Arch. Zool. [illegible]. 1881, Suppl. i. pp. 1–26, pl. i.

Gives (p. 5) a list of species at present known to inhabit the higher northern latitudes. 8 species (1 new) are described and figured.

WILSON, E. B. Report on the *Pycnogonidæ*. Reports on the results of dredging, under the supervision of A. Agassiz, along the East Coast of the United States during the summer of 1880, by the United States Coast Survey steamer, 'Blake,' Commander J. R. Bartlett, U. S. Navy. Bull. Mus. C. Z. viii. pp. 239–256, pl. i. i.–v.

10 species (5 new) are mentioned or described; 5 genera are represented, 2 being characterized as new (see p. 147 of Report on the *Pycnogonida*, Zoology of H.M.S. 'Challenger,' where Hoek criticizes the new genera and species). Reference is made to the genera *Ascorrhynchus* and *Colossendeis*, as showing the independence of the accessory legs, and first pair of ambulatory legs, and the consequent disproof of the supposed Arachnid affinities of the *Pycnogonidea*. [Cf. Arch. Z. expér. x.; Notes et Revue, p. li., where an abstract and summary are given.]

AMMOTHEIDÆ.

Barana castelli, p. 125, pl. i. figs. 1–16, and ii. fig. 1, and *B. arenicola*, p. 129, pl. ii. figs. 2–8, Gulf of Naples, spp. nn.; A. Dohrn, *l. c.*

Ammothea fransiscana, p. 135, pl. iii., *A. fibulifera*, p. 141, pl. iv. figs. 1–22, *A. langi*, p. 146, pl. v. figs. 1–8, *magnirostris*, p. 147, pl. vi. figs. 1–11, *A. appendiculata*, p. 152, pl. vii. figs. 1–5, *A. uni-unguiculata*, p. 155, pl. vii. figs. 6–9, *A. bi-unguiculata*, p. 155, pl. vii. figs. 1–3, spp. nn., *id. l. c.*, Gulf of Naples.

Clotenia conirostris, sp. n., *id. l. c.* p. 161, pl. viii. fig. 11, and ix. figs. 1–5, Gulf of Naples.

Trygæus communis, sp. n., *id. l. c.* p. 164, pl. ix. figs. 7–14, and x. figs. 1–5, Gulf of Naples.

Phoxichilidæ.

Phoxichilus vulgaris, p. 169, pl. x. fig. 6, x.A, figs. 16–20, and xi. figs. 1, 10, 12, 13, 16, 27, *P. charybdæus*, p. 174, pls. x. figs. 7–13, x.A, figs. 14, 15, 21 & 22, and xi. figs. 11, 14, & 15, spp. nn., *id. l. c.*, Gulf of Naples.

Hannonia, g. n. Allied to *Pycnogonum*; mandibles rudimentary; palpi wanting; oviparous legs in both sexes 10-jointed. For *H. typica*, sp. n., Hoek, Zool. H.M.S. 'Challenger,' pt. x. p. 92, pl. xiv. figs. 8–11, Cape Town.

Phoxichilidium longicolle, p. 177, pl. xiii. figs. 1–8, *P. exiguum*, p. 181, pl. xii. figs. 19 & 22, *P. angulatum*, p. 184, pl. xii. figs. 1 & 2, and *P. robustum*, p. 188, pl. xii. figs. 13 & 18, spp. nn., Dohrn, *l. c.*, Gulf of Naples. * *P. insigne*, p. 82, pl. xiv. figs. 1–7, Bahia, *patagonicum*, p. 84, pl. xii. figs. 6–9, Stations 304, 306, & 313, spp. nn., *patagonicum* var. *elegans*, p. 86, pl. xii. fig. 10, *mollissimum*, p. 87, pl. xiii. figs. 6–9, Station 237, *oscitans*, p. 89, pl. xiii. figs. 1–5, Station 70, and *pilosum*, p. 90, pl. xiii. figs. 10–13, Stations 147 & 157, spp. nn., Hoek, Zool. H.M.S. 'Challenger,' pt. x. *P. fluminense*, Krōyer, Bahia, *id l. c.* p. 81, pl. xiv. figs. 1–4.

Nymphonidæ.

Pallene emaciata, figs. 10–21, and *P. phantoma*, figs. 1–9, p. 193, pl. xiv. *P. spectrum*, p. 197, pl. xv. figs. 1 & 2, *P. tiberii*, p. 198, pl. xvii. figs. 10 & 11, spp. nn., Dohrn, *l. c.*, Gulf of Naples.† *P. australiensis*, p. 76, pl. xi. figs. 1–7, Station 162 and Melbourne, *lævis*, p. 78, pl. xi. figs. 8–12, Station 162, *languida*, p. 79, pl. xii. figs. 1–5, Station 161, spp. nn., Hoek, Zool. H.M.S. 'Challenger,' pt. x. *P. malleolata*, sp. n., G. O. Sars, Arch. Math. Naturv. iv. p. 469, Arctic Ocean, 191–459 fath.

‡ *Pallenopsis*, g. n., for *P. forficifer*, p. 250, pls. iv. figs. 15–18, and v. fig. 23, Stations 317–319, and *P. longirostris*, p. 252, pls. v. figs. 19–22, and v. figs. 24 & 25, Station 891, spp. nn., Wilson, Bull. Mus. C. Z. viii.

Neopallene campanellæ, sp. n., Dohrn, *l. c.* p. 200, pl. xv. figs. 11–15, Gulf of Naples.

Nymphon hamatum, p. 36, Stations 146 & 147, pl. i., *longicoxa*, p. 38, Station

---

* Hoek places the genus *Phoxichilidium* in the family *Pallenidæ*.—Rec.

† This genus is placed by Hoek in the *Pallenidæ* with *Phoxichilidium*.—Rec.

‡ Placed in the *Pallenidæ* by F. B. Wilson.—Rec.

168, pl. ii. figs. 1–5, and xv. figs. 8 & 9, *procerum*, p. 39, Station 299, pl. ii. figs. 9–12, *longicollum*, p. 40, Station 298, pls. iii. figs. 1–3, and xv. fig. 11, *compactum*, p. 41, Station 168, pls. ii. figs. 6–8, and xv. fig. 10, *meridionale*, p. 43, Station 153, pl. iii. figs. 4–8, *brevicollum*, p. 45, Station 49, pls. iii. figs. 13–15, and xv. figs. 12 & 13, *brachy[r]rhynchus*, p. 47, Kerguelen Island, pl. iv. figs. 2–7, *fuscum*, p. 48, Station 149, pl. iv. figs. 8–11, *perlucidum*, p. 52, Station 196, pl. v. figs. 6–10, spp. nn.; *N. grossipes*, O. Fabr., p. 44, pls. iii. figs. 9–12, and iv. fig. 1, Station 49, and *N. brevicaudatum*, Miers, p. 49, pls. iv. figs. 12 & 13, and v. figs. 1–5, Station 149: Hoek, Zool. H.M.S. 'Challenger,' pt. x. *N. stromi*, Krŏyer, p. 94, Stations 5, 7 & 8, *N. grossipes*, O. Fabr., pp. 95 & 44, Station 8, *N. macronyx*, Sars, p. 95, Station 8, *N. robustum*, Bell, p. 97, woodcut p. 98, Stations 8 & 2, dredged by 'Knight-Errant,' Hoek, Zool. H.M.S. 'Challenger,' pt. x. *N. gallicum*, sp. n., *id.* Arch. Z. expér. ix. p. 501, pl. xxiii. figs. 6–9, Roscoff, *N. pallenopsis*, p. 470, Saltenfjord, Norway, 80–90 fath., and *N. serratum*, p. 471, Arctic Ocean, 180 fath., G. O. Sars, Arch. Math. Naturv. iv., Norway. *N. sluiteri*, sp. n., Hoek, Niederl. Arch. Zool. 1881, Suppl. i. p. 18, pl. ii. figs. 30–34, lat. 75° 16′ N., long. 45° 19′ E.

Colossendeidæ.

Ascorrhynchus glaber, p. 53, pls. vi. figs. 5–9, and xv. fig. 16, Station 146, *minutus*, p. 55, pl. vi., Station 161, *orthor[r]hynchus*, p. 57, pls. v. figs. 11–13, vi. figs. 1–4, and xv. figs. 14 & 15, Station 219, spp. nn., Hoek, *l. c.*

Oor[r]hynchus, g. n., p. 59. Allied to *Achelia*, Hodge, but body less rounded; palpi 9-jointed, and no auxiliary claws on the legs. For *O. aucklandiæ*, sp. n., *id. l. c.* p. 59, pl. vii. figs. 1–7, Station 169.

Colossendeis gigas, p. 61 (? = *C. colossea*, Wils.), pls. viii. figs. 1 & 2, and x. figs. 1–5, Stations 146, 147 & 300, *leptorhynchus*, p. 64 (? = *C. macerrima*, Wils.), pl. viii. figs. 3–7, Stations 146, 147, 300 & 310, *robusta*, p. 66, pl. ix. figs. 4 & 5, Kerguelen Island, *megalonyx*, p. 67, pl. ix. figs. 1–3, Stations 149, 313 & 314, *gracilis*, p. 69, pls. ix. figs. 6–8, and x. figs. 6 & 7, Stations 146 & 147, *media*, p. 71, pl. x. figs. 10 & 11, Station 298, *brevipes*, p. 72, pl. x. figs. 8 & 9, Station 325, *minuta*, p. 73, pl. x. figs. 12–14, Station 50, spp. nn., *id.* l. c. *C. proboscidea*, Sabine, dredged by 'Knight-Errant,' = *Anomor[r]hynchus smithi*, Miers (g. & sp. nn.), *id. l. c.* p. 98, Station 8. *C. colossea*, p. 244, pls. i. fig. 1, and iii. figs. 5 & 6, Stations 305, 307, 309 & 342, *C. macerrima*, p. 246, pls. i. fig. 2, iii. figs. 9–12, and v. fig. 32, Station 338, spp. nn., Wilson, *l. c.*

Discoarachne, g. n. Allied to *Endeis*, Philippi: palpi 5-jointed. For *D. brevipes*, sp. n., Hoek, *l. c.* p. 74, pl. vii. figs. 8–12, Cape Town.

Scaor[r]hynchus, g. n., p. 247, for *S. armatus*, sp. n., p. 248, pls. ii. fig. 34, and v. figs. 26–31, Station 308, Wilson, *l. c.*

Pycnogonidæ.

Pycnogonum nodulosum, p. 203, figs. 1–3, and *P. pusillum*, p. 207, figs. 4–8, spp. nn., Dohrn, *l. c.* pl. xvi., Gulf of Naples. *P. littorale*,

Strōm, dredged by 'Knight-Errant,' Hoek, Zool. 'Challenger,' pt. x. p. 99, Station 3.

Rhynchothorax mediterraneus, Costa, described and figured, from the Bay of Naples; Dohrn, *l. c.* p. 211, pl. xvii. figs. 1–9.

Anomor[r]hynchus, g. n. Allied to *Pasithoe*, Goodsir, but distinguished by the more numerous articulations of the appendages, the great development and basal constriction of the rostrum, and the simple claws. For *A. smithi*, sp. n., E. J. Miers, Ann. N. H. (5) vii. p. 50, pl. vii. figs. 6–8, Franz-Josef Land.

ACARIDEA.

CANESTRINI, G., & FANZAGO, F. Intorno agli Acari Italiani. Atti Ist. Venet. (5) iv. [1877–78], pp. 69 & 208, pls. ii.–vii. [Omitted from former Records.]

Discusses (pp. 69–74) the existing literature on the *Acaridea*, and divides the Italian genera (44 in number) of this order, in the succeeding pages, into 13 families: i. HOPLOPINI, gen. *Hoplopus*, C. & F.; ii. ORIBATINI, gg. *Pelops*, Koch, *Oribates*, Latr., *Liosoma*, Nic., *Cephus*, Koch, *Oppia*, Koch, *Eremæus*, Koch, *Nothrus*, Koch, *Bdella*, Haydn, *Hoplophora*, Koch; iii. GAMASINI, gg. *Gamasus*, Latr., *Nicoletia*, g. n., *Mejus*, Koch, *Dermanyssus*, Duj., *Notaspis*, Herm., *Trachynotus*, Kram.; iv. TROMBIDINI, gen. *Trombidium*, Latr.; v. RHYNCHOLOPHINI, gg. *Rhyncholophus*, Duj., *Erythræus*, Latr., *Stigmæus*, Koch, *Actineda*, Koch, *Scyphius*, Koch, *Cheyletus*, Latr.; vi. TETRANYCHINI, gg. *Tetranychus*, Duf., *Caligonus*, Koch, *Heteronychus*, C. & F., *Bryobia*, Koch; vii. EUPODINI, gg. *Eupodes*, Koch, *Linopodes*, Koch, *Penthalea*, Koch, *Tydeus*, Koch.; viii. ALYCHINI, gen. *Alychus*, Koch; ix. BDELLINI, gg. *Bdella*, Latr., *Eupalus*, Koch, *Scirus*, Herm.; x. IXODINI, gg. *Leodes*, Latr., *Hyalomma*, Koch, *Hæma[to]physalis*, Koch, *Rhipi[do]cephalus*, Koch; xi. ARGASINI, gen. *Argas*, Latr.; xii. TARSONEMINI, gen. *Tarsonemus*, C. & F.; xiii. ACARINI, gg. *Acarus*, Linn., *Claviceps*, g. n., *Trichodactylus*, Dug.

44 genera, containing 158 species, are recorded and described; 2 genera and 16 species being new.

GERARD, MAURICE. Note sur les Acariens qui se nourissent de végétaux vivants. J. Soc. Hort. Fr. 1880.

[Not seen by the Recorder.]

HALLER, G. Ueber den Larvenformen der Milben. MT. Ges. Bern, 1880, SB. pp. 20 & 21. [*Cf.* Zool. Anz. iv.]

——. Kurze Mittheilung über Brady's sogenannte "British Fresh-water Mites." Zool. Anz. iv. p. 17.

Points out that Brady [Zool. Rec. xiv. *Arachn.* p. 2], includes some species of *Trombidiidæ*, and 1 of *Sarcoptes*.

——. Die Mundtheile und systematische Stellung der Milben. *L. c.* pp. 380–386.

The *Acaridea* are considered to form a class (equivalent and next to the *Arachnida*), ACAROIDEA, containing two orders: i. *Acarina atracheata*;

ii. *Acarina tracheata*, chiefly on account of the mouth-organs and post-embryological development.

In Am. Nat. xv. p. 577, is a note of a communication from G. Haller to the effect that from the *Acaridea* having three pairs of maxillæ, a true labium with palpi, and two pairs of abdominal as well as cephalothoracic legs, he considers they are much more nearly allied to the *Crustacea* than to the *Arachnida*, and should form a class equivalent to the *Crustacea*, *Myriopoda*, *Arachnida*, and *Insecta*.

Oudemans, A. C., Junr. "Jets over Acarina in 't algemeen. Tijdschr. Ent. xxiv. pp. 101–108, pls. xi. & xii.

Trombidiidæ.

G. Cavanna, Bull. Ent. Ital. xii. [1880] p. 290, remarks upon the discovery by Sig. Pichard of a *Trombidium* which destroys the *Phylloxera*. Up to this time there were but two Acarideous enemies of the *Phylloxera* known, *Tyroglyphus phylloxeræ*, and *Hoplophora arctata*.

Trombidium deserticola, sp. n., Holmberg, Informe, &c., p. 165, pl. iv. fig. 14, N. Patagonia. *T. albicolle*, p. 300, fig. 7, and *T. sarcasticum*, p. 301, fig. 8, spp. nn., *id.* Periód. Zool. Argent. i. pl. vi. Buenos Aires. *T. fragum*, sp. n., Koch, Abh. Ges. Görl. xvii. p. 71, Niesky.

Rhyncholophus humeralis, sp. n., Karsch, B. E. Z. xxv. p. 36, Japan.

Linopodes? *gracilipes*, sp. n., *id. ibid.*, Japan.

Actineda astripus, sp. n., *id. l. c.* p. 37, Japan.

Eupodidæ.

The group *Eupodidæ* characterized; P. Kramer, Z. ges. Naturw. liv. p. 448.

Scyphius, Koch, recharacterized, *id. l. c.* p. 449, and *S. terricola*, Koch, described, p. 450, pl. iv. fig. 14.

Eupodes, Koch, recharacterized, *id. l. c.* p. 450, pl. iv. fig. 15.

Scyphius is placed by Canestrini and Fanzago in the family *Rhyncolophini*, Atti Ist. Venet. (5) iv. pp. 69–74.

Bdellidæ.

Oxynamba, g. n. (for *Eumæus*, and *Lionotus*, C. L. Koch, pre-occupied). *O. liliputana*, sp. n., F. Karsch, B. E. Z. xxv. p. 37, Japan.

Bdella longitarsa, sp. n., *id. l. c.* p. 37, Japan. *B. crassirostris*, sp. n., p. 442, fig. 7, *longirostris*, auctt. p. 443, fig. 8 *a*, *b*, *lapidaria* and *arenaria*, p. 444, fig. 10 *a*, *b*, *silvatica*, p. 445, fig. 11 *a*, *b*, *capillata*, p. 446, fig. 12, spp. nn., Kramer, Z. ges. Naturw. liv. pl. iv.

Scirus taurus, sp. n., *id. l. c.* p. 433, pl. iii. figs. 9–11.

Hydrachnidæ.

G. Haller, in "Die Arten und Gattungen der Schweizer Hydrachniden Fauna," MT. Ges. Bern, 1881, pp. 18–83, 4 pls., divides the *Hydrachnidæ* into two families: i. *Medioculatæ*; ii. *Lateroculatæ*. The former

comprises the genus *Eylais*, Latr. (1 sp.); the latter comprises *Arrhenurus*, Dugès (8 spp.); *Diplodontus*, Dugès (1 sp.); *Hydrodroma*, C. L. Koch (2 spp., 1 new); *Axona*, Kram. (1 sp.); *Forelia*, g. n. (2 spp., 1 new); *Limnesia*, C. L. Koch (4 spp.); *Hygrobates*, C. L. Koch (3 spp., 1 new); *Pachygaster*, Lebert (1 sp.); *Nesaea*, C. L. Koch (5 spp.); *Atax*, Fabr. (3 spp.).

F. Könike, Revision von H. Lebert's Hydrachniden des Genfer-sees. Z. wiss. Zool. xxxv. pp. 613-628, pl. xxx. fig. 7.

In part A, the author discusses the literature on the subject; in Part B, 19 known species are noted and described; some, with their structure and habits, at considerable length.

Hydrachna elliptica, Müll., and *H. orbiculata*, Müll., are discussed comparatively; *id. l. c.* pp. 600-603.

Midea, Bruz., recharacterized; *id. l. c.* p. 603, pl. xxx. figs. 1-6. *M. elliptica*, Müll., described, p. 604, and the species discussed at great length, pp. 606-612.

Hydrodroma helvetica, sp. n., Haller, *l. c.* p. 49, Switzerland.

Forelia ahumberti, sp. n., *id. l. c.* p. 60, Switzerland.

Hygrobates gracilis, sp. n., *id. l. c.* p. 68, Switzerland.

Arrhenurus perforatus, sp. n., C. F. George, Sci. Goss. 1881, p. 269, fig. 149, Britain.

Axona versicolor, Müll. The male described and figured; Kramer, Z. ges. Naturw. liv. pp. 438 & 439, pl. iv. figs. 4-6.

Atax histrionicus, Herm.: note by H. Lucas, Bull. Soc. Ent. Fr. (5) x. p. liv. *A. crassipes*, Müll.: F. Könike notes glands found in this species, similar to those found among the *Hydrachnidæ*, but excessively developed; Zool. Anz. iv. pp. 356 & 357.

Neumann, C. J. Sur le développement des Hydrachnides. Ent. Tidskr. i. p. 169.

[Not seen by Recorder.]

Gamasidæ.

Antonio Berlese, Bull. Ent. Ital. xiii. pp. 290-292, remarks upon the Polymorphism and Parthenogenesis of some species of *Gamasus*. The observations refer more especially to *G. tardus*, Koch, which can be developed from two different series of forms. There are also remarks (p. 292), on a case of pædogenesis.

Kramer, P. Ueber die Principien der classification bei den Gamasiden. Z. ges. Naturw. liv. pp. 638-642.

Refers to Michael's work (*infrà*), and divides the *Gamasidæ* into two groups: i. *Pteropodina*, larva 8-footed (*Pteroptus*); ii. *Uropodina*, *Gamasina*, larva 6-footed, *Uropoda*, *Trachynotus*, *Dermanyssus*, *Sejus*, *Gamasus* (*Nicoletia*).

Michael, A. D. Observations on the life-histories of *Gamasinæ*, with a view to assist in more exact classification. J. L. S. xv. pp. 297-309, 1881, pls. xxii. & xxiii.

Gives the results of observations made upon individuals bred in confine-

ment; showing chiefly that the division of the dorsal plate is no criterion of species; various species having this character in an immature stage. Its division is mostly a question of degree, and affords no sound basis for classification, as applied by Koch, Kramer, and other authors. The dorsal plates alter in size, shape, and development, when the Acarid changes its skin. Some conclusions of Mégnin upon this subject, and also in respect to the conditions and mode of copulation are dissented from. The species noted are *Gamasus coleoptratorum*, Linn., and *G.* (*Acarus*) *crassipes*, Linn.; both species are figured in various stages.

Gamasus halleri, *litoralis*, *falciger*, *mucronatus*, *pectinifer*, *krameri*, and *hamatus*, spp. nn., G. & R. Canestrini, Atti Ist. Venet. (5) vii. Venezia. *G. terreus*, sp. n., G. Canestrini & F. Fanzago, *op. cit.* iv. p. 116, Trentino, Veneto.

Nicoletia, g. n. Cephalothorax furnished with four horns; legs long and of uniform length. For *N. cornuta*, sp. n., Canestrini & Fanzago, Atti Ist. Venet. (5) iv. p. 120, pl. iv. fig. 2, Trentino.

Dermanyssus sylviarium, p. 124, parasitic on *Sylvia atricapilla*, and *D. richiardii*, p. 125, on *Xylocopa violacea* and *Cossus ligniperda*, spp. nn., *iid. l. c.*

Notaspis tridentinus, sp. n., *iid. l. c.* p. 126, Trentino.

Uropoda, De Geer. The Swiss species of this genus (6 in number, all known), are described by G. Haller, Arch. f. Nat. 1881, pp. 182–187, pl. ix. figs. 1–6.

Epicrius, Canestr. & Fanz. The Swiss species of this genus (3 in number, all known), are described; Haller, *l. c.* pp. 188–190, pl. ix. figs. 7–9. Gg. *Seius* and *Zercon* compared with *Gamasus*; Kramer, Z. ges. Naturw. liv. pp. 429–433, pl. iii. fig. 8.

Ixodidæ.

G. Haller, Zool. Anz. iv. pp. 165–167, with woodcuts, describes the organ of hearing in a species of *Ixodes*. This organ is on the first pair of legs.

P. Bertkau, SB. niederrhein. Ges. xxxviii. pp. 115–148, treats upon the propagation of *Ixodes ricinus*, and comes to a different conclusion, on the feeding of the adult male, from Mégnin (C. R. lxxxiii. p. 993). On the copulation of this species the views of De Geer, Von Siebold, Pagenstecher, and Mégnin, are discussed. The mode of transferring the spermatozoa appears doubtful. The differences between the spermatozoa in the testes and those in the receptaculum seminis are pointed out. The placing of the eggs in the bladder is described, and the function of this latter organ is conjectured to be the protection of the eggs from dessication.

Ixodes punctulatus, sp. n., Canestrini & Fanzago, *l. c.* p. 183, Italy, on *Cervus capreolus*.

Hyalomma dentatum, sp. n., Canestrini & Fanzago, *l. c.* p. 186, Pisa.

Hæma[to]physalis sulcata, p. 188, on *Lacerta viridis*; *H. punctata*, on *Dama vulgaris*, and *H. rhinolophi*, on *Rhinolophus ferrum-equinum*, p. 189, spp. nn., *iid. l. c.*

Rhipidocephalus bursa, sp. n., *iid. l. c.* p. 190, on the wild boar.

Oribatidæ.

Oribates aspidioti, sp. n., closely resembles *Nothrus ovivorus*, Packard, and is supposed to prey upon the "Orange Scale Insect," *Aspidiotus aloeæ*; W. H. Ashmead, Canad. Ent. xi. pp. 93 & 94, Jacksonville, Florida.

Sarcoptidæ.

G. Haller, Z. wiss. Zool. xxxvi. pp. 365–388, pls. xxiv. & xxv. (with woodcut), treats of the anatomy of the *Sarcoptidæ* under the following heads: 1. Mouth organs; 2. Alimentary canal and its glands; 3. Nervous system and sensory organs; 4. Sexual organs—male; 5. Sexual organs—female.

Sarcoptes anachantes, sp. n., described and figured in its three forms—larva, nymph, and adult; G. Roster, Bull. Ent. Ital. iv. [1872] pp. 169–174, pl. iii., Italy.

Cheyletus heteropalpus, Mégnin, its nidification noted upon; Mégnin, Bull. Soc. Ent. Fr. (5) x. p. lxxxiii. *C. eruditus*, Latr., its development; P. Kramer, Z. ges. Naturw. liv. pp. 421–428, pl. iii. figs. 2–7.

Glycyphagus ornatus, sp. n., Kramer, *l. c.* pp. 435–438, pl. iv. figs. 1 & 3.

Dermalichus stylifer, Buchholz, on its reproduction; *id. l. c.* pp. 417–421, pl. iii. fig. 1. *D.* (*Analges*, Nitsch) *heteropus*, sp. n., parasitic on the cormorant; A. D. Michael, J. R. Micr. Soc. (2) i. pp. 212–216, pl. iv., Land's End, Cornwall.

The following 22 new species of *Dermalichus* were described by G. Canestrini, Atti Soc. Pad. (5) v. pp. 1–28. [Noted in Zool. Rec. xvi *Arachn.* p. 55, as not seen by Recorder.]: *D. squatarolæ* (from *Squatarola helvetica*), *strigis-passerinæ* (from *Strix passerina*), *charadrii* (from *Charadrius hiaticulus*), *porzanæ* (from *Ortygometra porzana*), *lyra* (from *Strix otus*), *ardeæ* (from *Ardea minuta*), *anthi* (from *Anthus arboreus*), *cypseli* (from *Cypselus apus*), *nisi* (from *Nisus communis*), *ninnii* (from *Numenius arquatus*), *actitidis* (from *Actitis hypoleucus*), *ortygometræ* (from *Ortygometra pusilla*), *totani* (from *Totanus calidris*, *Mergus serrator*, *Tringa pugnax* and *T. alpina*), *numenii* (from *Numenius phæopus*), *vanelli* (from *Vanellus cristatus*), *colymbi* (from *Colymbus minor*), *buchholzi* (from *Limosa melanura*), *palcatus* (from *Cypselus apus*), *hirundinis* (from *Hirundo urbica*), *coturnicis* (from *Coturnix*), *crassipes* (from *Limosa melanura*, *Tringa pugnax*, *T. alpina*, and *Sterna minuta*), *cerambycis* (from *Cerambyx cerdo*).

Tyroglyphus carpio, sp. n. (no detailed description given), related to the *Dermalichidæ*, P. Kramer, Zool. Anz. iv. p. 619.

Histiostoma fimetarium = *H.* (*Tyroglyphus*) *rostro-serratum*, Mégnin, = *H.* (*T.*) *pectineum*, Kram.; G. Canestrini, Atti Soc. Pad. viii.

Pterolichus ciconiæ, on *Ciconia alba*, and *P. rahbergi*, on oyster-catcher, spp. nn., *id. l. c.*

Alloptes cypseli, on *Cypselus apus*, and *A. blaptis*, on a species of *Blaps*; id. *l. c.*

Acaridæ.

Acarus caudatus, sp. n., Canestrini & Fanzago, Atti Ist. Venet. (5) iv. p. 200, Italy.

Claviceps, g. n., for *C. hirtus*, p. 203, Trevigniano, Padua, *C. læviusculus*, p. 204, pl. vii. fig. 5, and *C. ruber*, p. 205, Padua, spp. nn., *iid. l. c.*

Phytoptidæ.

Phytoptus vitis, Land., described from Italy in a paper on Erinosis in the vine; Targioni-Tozzetti, Bull. Ent. Ital. ii. [1870] pp. 283–287.

The following have not been seen by the Recorder:—

Baraldi, G. Stato particolare di una ninfa d'Acaride (*Hypodectes carpophagæ*).

Canestrini, G. Contribuzione allo studio degli Acari parassiti degli Insetti. Atti Soc. Pad. (5) vii.

——. Osservazione intorno al genere *Gamasus*. *L. c.*

——, & Berlese, A. Nuovi Acari. *Op. cit.* viii.

Also the paper by Berlese in Atti Ist. Venet. (5) vii. p. 747 *et seq.*, containing a new genus, *Canestrinia*, referred to *infrà*, Ins. p. 24.

A note by Targioni-Tozzetti, in Ann. del R. Ministero di Agricultora, 1880, on a *Tetranychus* allied to *T. foliosum*, Schr., injurious to fruit, in the Commune of Santo Agnello, near Sorrento, and on *Tydeus aurantii*, sp. n., with directions for their destruction (*cf.* Bull. Ent. Ital. xii. 1880, pp. 249 & 250.)

MYRIOPODA.

BY

W. F. Kirby, M.E.S., &c.

The General Subject.

Cantoni, E. Miriapodi di Lombardia. Atti Soc. Ital. xxiii. pp. 314–362.

75 species enumerated, and discussed in considerable detail; 3 are new to Italy, and 14 to Lombardy. Full bibliography and synonymy are given.

Claus, C. Grundzüge der Zoologie zum wissenschaftlichen Gebrauche. 4 edn. i. Marburg: 8vo.

Includes *Myriopoda*, pp. 676–683.

Fanzago, F. I Miriapodi del Sassarese (Sardegna), Parte descrittiva. Fasc. i. Sassari: 1881, 8vo, pp. 15.

[Not seen by the Recorder.]

Karsch, F. Verzeichniss der während der Rohlfs'schen Africanischen Expedition erbeuteten Myriopoden und Arachniden. Arch. f. Nat. xlvii. pp. 14, pl. i.

9 *Myriopoda* noticed, 2 new; *cf.* also *id.*, in Rohlfs's "Kufra" (Leipzig: 1881, 8vo), pp. 378–380.

Mattozo, F. Santos. Les Myriapodes d'Afrique au Muséum de Lisbonne. J. Sci. Lisb. viii. pp. 177–196, plate.

20 species noticed, several new. Much synonymy is given.

Six, G. A. Overzicht van het Werk van R. Latzel: "Die Myriopoden der Oesterreichisch-Ungarischen Monarchie." Tijdschr. Ent. xxiv. pp. 97–100.

General characters of *Myriopoda* discussed.

The homologies and development of the *Protracheata* and *Myriopoda* are discussed by Balfour, Treatise on Comparative Embryology (London: 1880) i. chap. xvii. *Tracheata*, pp. 316–327.

Chilopoda.

Fanzago, F. Sulla secrezione ventrale del *Geophilus gabrielis*. Atti Soc. Venet. (5) vii. pp. 641–646.

The ventral pores of this species discharge a peculiar red secretion

which has been chemically examined by A. Soldaini, and proves to exhibit a strong resemblance to silk.

HAASE, E. Beitrag zur Phylogenie und Ontogenie der Chilopoden. Z. E. Ver. schles. (2) Heft viii. pp. 93–115.

——. Schlesiens Chilopoden. ii. *Chilopoda epimorpha*, *l. c.* pp. 66–92.

[These papers have not been seen by the Recorder.]

KARSCH, F. Zur Formenlehre der pentazonen Myriopoden. Arch. f. Nat. xlvii. pp. 19–35, pl. ii.

Includes critical remarks on previous publications, descriptions of the generative organs and accessory legs, tables of the genera *Spharotherium* and *Spharopæus*, Brandt, and descriptions of various new species. The figures represent details of various species of these genera.

KOHLRAUSCH, E. Gattungen und Arten der Scolopendriden. Arch. f. Nat. xlvii. pp. 50–132, pls. iv. & v.

Includes a table of genera, and a list of genera and species, the former being always, and the latter often, characterized, whether new or not. The following synonyms are given :—*Scolopocryptops sexspinosus*, Newp., pl. iv. figs. 1–3 (= *S. spinicauda*, Wood, = *S. mexicana*, Humb. & Sauss., = *Scolopendropsis helvola*, Koch, = *S. melanostoma* and *miersi*, Newp.) ; *S. lanatipes*, Wood (= *gracilis*, Wood, = *californica*, Humb. & Sauss.) ; *Newportia longitarsis*, Gerv. (? = *N. azteca*, and ? = *Scolopendrella mexicana*, Humb. & Sauss.) ; *Heterostoma sulcidens*, Newp., pl. iv. figs. 5–7 (= *H. sulcicornis*, *flava*, ? *megacephala*, ? *platycephala*, and *fasciata*, Newp.; = ? *H. browni*, Butl., = ? *Scolopendra rubriceps*, Brandt, = ? *rapax*, *cribrifera*, and ? *eydouxiana*, Gerv., = *S. trigonopoda*, Leach, = *Dacetum cupense*, Koch) ; *Branchiostoma nudum*, figured, pl. iv. fig. 9 ; *Alipes multicostis*, Imh. (? = *Eucorybas crotalus*, Gerst.) ; *Cormocephalus westwoodi*, Newp., pl. v. fig. 17 (= *miniatus* and *subminiatus*, Newp.) ; *C. fœcundus*, Newp. (= *violaceus*, Newp.), *C. aurantipes*, Newp., pl. v. fig. 18 (= *obscurus* and ? *pallipes*, Newp., = *brevispinatus*, Koch, = *Scolopendra puncticeps*, Gerv.), *Scolopendra dehaani*, Brandt (= *fissispina*, *horrida*, ? *ornata*, *gigantea*, ? *histrionica*, Koch, *silhetensis*, *concolor*, ? *inermis*, *childreni*, and *hardwickii*, Newp., *limicolor*, *cephalica*, *gracilis*, *bispinipes*, Wood, and *bicolor*, Humb. & Sauss.), *S. subspinipes*, Leach (= *plumbeolatus*, *dinodon*, *parvidens*, *byssina*, and *atra*, Wood, *rarispina*, *lucasi*, *sandwichiana*, *audax*, and ? *newporti*, Gerv., *borbonica*, Blanch., *ceylonensis*, *flava*, *planiceps*, *lutea*, *placea*, ? *gervaisi*, *sexspinosa*, and *ornata*, Newp., *mactans*, *sulphurea*, *pulchra*, and *ferruginea*, Koch), *S. multidens*, Newp. (? = *septemspinosa*, Newp.), *S. cingulata*, Latr. (= *morsitans*, Kutorga, Luc., = *cingulatoides*, *savignii*, *hispanica*, Newp., = *fulva*, Gerv., = *zwickiana*, ? *obscura*, *nigrifrons*, *zonata*, *penetrans*, *græca*, *italica*, *hæmatica*, Koch, = ? *doriæ* and *violantis*, Pirotta, *S. morsitans*, Linn., pl. v. figs. 19 & 20 (= *planipes*, *gervaisiana*, *scopoliana*, *infesta*, Koch, *algerina*, *leachi*, *fabricii*, *angulipes*, *tuberculidens*, *tigrina*, *formosa*, *longicornis*, *richardsoni*, *platypoides*, and ? *varia*, Newp., *angusta*, Luc., *fulvipes*, *elegans*, *erythrocephala*, *bilineata*, *platypus*, and *crassipes*, Brandt, *mossambica*, *brachypoda*, Peters, *porphyratænea*, *inæquidens*, *pella*, Wood, *brandtiana* and ? *tongana*,

Gerv., *californica*, *carinipes*, Humb. & Sauss., and ? *atomita*, Sauss., and *marginata*, Say); *S. polymorpha*, Wood (= *copeana*, *heros*, and *castaniceps*, Wood, and *mysteca*, Humb. & Sauss.); *S. cristata*, Newp. (= *herculeana*, and ? *costata*, Koch); *S. complanata*, Newp. (= *inæquidens*, Gerv., *multispinata*, *multispinosa*, ? *grayi*, Newp., *crudelis*, Koch, and *testacea*, Wood); *S. gigas*, Leach (= *gigantea*, Newp., *insignis*, Gerv., ? *sagræa*, Brandt, *epilæptica* and *prasinipes*, Wood); *S. alternans*, Newp. (= *morsitans*, Beauv., *sagræ*, Gerv., ? *torquata*, Wood); *S. prasina*, Koch (= *puncticeps* and *punctiscuta*, Wood); *Cryptops australis*, Newp., figured, pl. v. figs. 21 & 22; *C. scopolii*, Leach (? = *Scolopendra germanica*, Koch), *C. hyalinus*, Say (? = *asperipes*, Wood). The descriptions of pretended new genera and species in this paper are nothing more than amplifications of those already published in J. Mus. Godeffr. Heft xiv. [*Cf.* Zool. Rec. xvi. *Myr.* pp. 2–4].

Scudder, S. H. The structure and affinities of *Euphoberia*, Meek & Worthen, a genus of Carboniferous *Myriopoda*. Am. J. Sci. (3) xxi. pp. 182–186.

The *Euphoberiæ* differ so greatly from modern *Diplopoda*, that a distinct suborder, *Archipolypoda*, is proposed for their reception. The dorsal plate occupies only two-thirds or less of the circuit of the body, being opposed by broad ventral plates; this dorsal plate is not perforated for foramina repugnatoria, but is armed with two or three large spines on each side. The ventral plates occupy the entire ventral surface, and the legs are planted almost in the centre of the plate, and the legs of opposite sides are separated by a space equal to their own width. The stigmata are very large, and situated in the middle of each ventral plate.

Observations on *Chilopoda*; Sograf, Nachr. Ges. Mosc. xxxvii. pp. 53–55.

Orphnæus lividus, Mein., *Otostigmus orientalis*, Por., and *Scolopendra platypus*, Brandt, noticed from the Marshall Islands; the first species is very strongly phosphorescent, and leaves a luminous trail behind: Karsel & Finsch, B. E. Z. xxv. p. 15.

Scolopendra angulipes, Newp. (= *mossambicus* and *brachyopoda*, Peters, = *carinipes*, Humb. & Sauss, and ? *tuberculidens*, Newp.), *cingulata* and *savignii*, Newp., and *subspinipes*, Leach (= *septem-spinosa* and *haani*, Brandt, *gervaisi*, *leachi*, *ceylonensis*, *placeæ*, and *flava*, Newp., *aulax*, Gerv., and *morsitans*, Latr.), discussed; Mattozo, J. Sci. Lisb. viii. pp. 178–183. *S. calcarata*, Por., noticed from Peking, &c.; Karsch, B. E. Z. xxv. p. 219. *S. leachi*, Newp., recorded from Ascension; C. O. Waterhouse, Ann. N. H. (5) viii. p. 434.

Heterostoma newporti, Luc., = *trigonopoda*, Leach; Mattozo, *l. c.* p. 184.

Lithobius forficatus. The Russian treatise on its anatomy mentioned in Zool. Rec. xvii. *Myr.* p. 1, is by N. Sograf.

On the *Geophilidæ* of Turkistan; Selivanoff, Nachr. Ges. Mosc. xxvii. pp. 229–232.

Geophilus subterraneus (?), phosphorescence; Adams, Sci. Goss. xvii. p. 68.

Zephronia banksiana, Butl., = *Sphæropœus hercules*, Brandt; localities

also noticed, and details figured: Karsch, Arch. f. Nat. xlvii. pp. 23 & 34, pl. ii. figs. 8*a* & *b*.

Sphærotherium kochi, Butl., = *punctatum*, Brandt, *id. l. c.* p. 22; details figured, pl. ii. fig. 2. *S. hippocastanum*, Gerv. (= *actæon*, White, = *immune*, Karsch), discussed: Lenz, Ber. senck. Ges. 1880–81, pp. 153–155.

Bothriogaster signatus, Kessl., noticed and details figured; Selivanoff *l. c.* p. 231, plate, figs. 1–11.

New genera and species:—

Stylolæmus, Karsch, Arch. f. Nat. xlvii. p. 9. Allied to *Strigamia* and *Himantherium*; type, *L. peripateticus*, sp. n.; *l. c.* pl. i. figs. 3, 3*a*, & 3*b*, (*cf.* also *id.*, Rohlfs, Kufra, p. 379), Oasis of Kufra.

Plutonium zwierleini, g. & sp. nn., Cavanna, Bull. Ent. Ital. xiii. pp. 169–178, pl. i. Sicily. Allied to *Heterostoma*, Newp., and will form with it a new division, *Scolopendridæ plusiostigmi*, with 19 crebriform stigmata, and naked eyes.

Otostigmus politus, Karsch, B. E. Z. xxv. p. 219, Peking and Tientsin.

Sphærotherium immane, fig. 1, Madagascar, *insulanum*, fig. K, Mauritius, p. 30, *margine-punctatum*, fig. 4, Rockhampton, *walesianum*, figs. F & *f*, Sydney, p. 31; *id.* Arch. f. Nat. xlvii. pl. ii. (details only). *S. elegans* (? = *hippocastanum*, Gerv., ♂), Lenz, Ber. senck. Ges. 1880–81, p. 154, Nossi-Bé.

Sphæropœus montanus, fig. 6, Himalaya, p. 31, *sulcicollis*, fig. 7, Java, Borneo, Luzon, &c., *tricollis*, figs. 9, C & *c*, Sumatra, p. 32, *bicollis*, figs. H & *h*, *tuberculosus*, fig. 12, Borneo, p. 33, Karsch, *l. c.* pl. ii. (details only).

Lithobius pelliduus, Haase, Schles. Chil. i. [*cf.* Zool. Rec. xvii. *Myr.* p. 1], Silesia. *L. czekanowskii*, *giganteus*, *loricatus*, p. 15, *brandti*, *potanini* and *porathi*, p. 16, Selivanoff, Zool. Anz. iv., Siberia and Central Asia.

Mesocanthus porosus, id. Nachr. Ges. Mosc. xxxvii. p. 231, Turkistan.

Bothriogaster affinis, id. *l. c.* pl., figs. 12–19, Turkistan.

Mecistocephalus meinerti, id. *l. c.* p. 232. Turkistan.

Geophilus forficularius, Fanzago, Zool. Anz. iv. p. 378, Italy; *G. tenellus*, Koch, Verh. z.-b. Wien, xxxi. p. 672, Balearic Islands.

Chilognatha.

Karsch, F. Zum Studium der *Myriopoda Polydesmia*. Arch. f. Nat. xlvii. pp. 36–49, pl. iii.

Includes descriptions of new species, geographical and synonymic notes, and a table of species of *Oxydesmus*, Sauss. The following synonyms are given: *Polydesmus* (*Oxyurus*) *dilatatus*, Br. (= *P.* (*Leptodesmus*) *carneus*, Sauss.); *P.* (*Oxydesmus*) *granulosus*, Pal. de Beauv. (= *P.* (*Euryurus*) *tricuspidatus*, and *flavo-marginatus*, Peters). The figures represent details of several known species, in addition to new ones. An hermaphrodite *Polydesmus* (*Euryurus*) *tænia*, Peters, is also described; *l. c.* pp. 44 & 45, fig. 29.

[Karsch, F.] Neue Juliden des Berliner-Museums, als Prodromus einer Juliden Monographie. Z. ges. Naturw. (3) vi. pp. 1–79.

This article is prefaced by general and critical remarks on the difficulty of the subject, the characters, variations, geographical distribution, &c., of the *Iulidæ*, the writings of previous authors, and a table of genera, the following being admitted: *Stemmiulus*, Gerv., *Pæromopus*, Karsch, *Allopporus*, Porath, *Glyphipilus*, Gerv., *Iulus*, Linn., *Spirostreptus*, Brandt (divided into 2 sections, *Odontopyge* and *Nodopyge*, Brandt), *Spirobolus*, Brandt.

Ryder, J. A. List of the North American species of Myriapods belonging to the family of the *Lysiopetalidæ*, with a description of a blind form from Luray Cave, Virginia. P. U. S. Nat. Mus. iii. pp. 524–529, woodcuts.

8 species and a new genus. The group is considered to lack definition, as at present constituted. Abnormal respiration in *Trichopetalum lunatum*, as described, suggests more important differential characters than hitherto supposed. Some observations on cavernicolous animals with and without eyes, tend to support the origin from forms with eyes.

Polydesmus (*Paradesmus*) *pecuensis*, Karsch, noticed from Peking, &c., Karsch, B. E. Z. xxv. p. 219; *P. olfersi*, Brandt, is a *Cryptodesmus*, id. MT. Münch. ent. Ver. iv. p. 143.

Spirostreptus cephalotes, Voges, ? = *macrotis*, Gerst., ♀; *id.* Z. ges. Naturw. (3) vi. p. 3.

Spirobolus. Karsch gives the name *scobina* to a peculiar structure, which always occurs in pairs on the first segments, and which he finds useful as a sectional character, *l. c.* p. 3 & 4. *S. arboreus*, Sauss., variation noticed; 2 varieties are named respectively *krugi* and *gundlachi*, id. *l. c.* p. 9. *S. crassicollis*, Peters, is closely allied to, if not identical with, *pulvillatus*, Newp.; Mattozo, J. Sci. Lisb. viii. p. 195.

New genera and species:—

Rhinocricus, Karsch, Z. ges. Naturw. (3) vi. p. 11. Section of *Spirobolus*; base of several, or of most segments with scobina.

Pæromopus, id. *l. c.* p. 12. Allied to *Iulus*; eyes consisting of three transverse rows of ocelli; first pair of legs truncated; type, *P. lysiopetalinus*, sp. n., *l. c.*, California.

Zygonopus, g. n., Ryder, *l. c.* p. 527. Lysiopetalid, hairy: 6th pair of legs very robust, and with 3rd joint greatly swollen. *Z. whitii*, sp. n., *id. ibid.* pp. 1–3, Luray Cave, Virginia (nearly white, no eyes).

Polydesmus (*Oxydesmus*) *pectinatus*, fig. 2, Wito, *P.* (*O.*) *effulgens*, fig. 1, Somali-Land, p. 36, *P.* (*Pachyurus*) *abstrusus*, fig. 6, Puerto Cabello, *P.* (*Platyrrhacus*) *scheteli*, figs. 4 & 5, East Indies, p. 37, *P.* (*Paradesmus*) *vicarius*, fig. 8, Mayotte and Anjoan, *P.* (*P.*) *spectabilis*, fig. 9, Java, p. 38, *P.* (*P.*) *pekinensis*, fig. 10, Peking, *P.* (*Fontaria*) *furcifer*, fig. 12, California, *P.* (*F.*) *angelus*, fig. 13, Puebla, *P.* (*Rhacophorus*) *morantus*, Jameira, p. 39, *P.* (*Oxyurus*) *plataleus*, fig. 14, Puerto Cabello, *P.* (*O.*) *codicillus*, fig. 15, p. 40, *P.* (*O.*) *henseli*, fig. 16, Santa Cruz, *P.* (*O.*) *intaminatus*, California, *P.* (*O.*) *sanctus*, Santa Martha, p. 41, *P.* (*O.*)

parmatus, Sierra Geral, *P.* (*Scytonotus*) *cæsius*, New Zealand, *P.* (*Strongylosoma*) *innotatus*, Adelaide, *P.* (*S.*) *sagittarius*, fig. 17, Sydney, *P.* (*S.*) *ensiger*, fig. 18, New Zealand, p. 42, Karsch, Arch. f. Nat. xlvii. pl. iii.; *P. cafferoides*, Mattozo, J. Sci. Lisb. viii. p. 187, pl., fig. 3, Cabinda and Quango.

Eurydesmus falcatus, Djur, and *luridus*, Africa, Karsch, *l. c.* p. 43, pl. iii. figs. 24 & 25.

Rhachidomorpha mechowi, id. B. E. Z. xxv. p. 287, Quango, W. Africa.

Stenonia occidentalis, id. *ibid.* Quango.

Cryptodesmus laqueatus and *ornamentatus*, id. MT. Münch. ent. Ver. iv. p. 142, Cuba.

Lysiopetalum schistaceum, Asia Minor, *setigerum*, p. 143, and *costatum*, North America (?) p. 144, *id. l. c.*

Siphonophora cubana, id. *l. c.* p. 144, Cuba.

Platydesmus californicus, id. *ibid.* California.

Stemmiiulus compressus, id. Z. ges. Naturw. (3) vi. p. 11, Porto Rico.

Alloporus impatulus, Hungary, and *porathi*, S. E. Africa, *id. l. c.* p. 13.

Iulus curiosus, Porto Rico, *fucatus*, Colombia, p. 15, *pubescens*, Bosnia, *steini*, Dalmatia, p. 16, *hungaricus*, Hungary, *rasilis*, Puebla, p. 17, *cæsar*, Porto Rico, p. 18, *acriculus*, Japan, *lusitanicus*, Portugal, p. 19, *caucasicus*, Caucasus, and *tonginus*, Hongkong, p. 20, *id. l. c.*; *I. rimosus*, id. Arch. f. Nat. xlvii. p. 9, pl. i. figs. 4, 4*a*, and Rohlfs, Kufra, p. 379, Oasis of Kufra; *I. inconspicuus*, p. 673, *nigritarsis*, *gilvo-lineatus*, p. 674, *balearicus* and *insulanus*, p. 675, Koch, Verh. z.-b. Wien, xxxi., Balearic Islands.

Spirostreptus (*Odontopyge*) *mitellatus*, Zanzibar, *S.* (*O.*) *maculatus*, Wito, p. 21, *S.* (*O.*) *acutus*, Pungo, *S.* (*O.*) *tumidens*, Djur, *S.* (*O.*) *furcatus*, Accra, p. 22, *S.* (*Nodopyge*) *opinatus*, Tenasserim, p. 23, *S.* (*N.*) *foveatus*, Manilla, *S.* (*N.*) *constrictus*, Java, *S.* (*N.*) *crassanus*, Macassar, p. 24, *S.* (*N.*) *repandus*, Sumatra, *S.* (*N.*) *astrictus*, Zanzibar, p. 25, *S.* (*N.*) *lemniscatus*, Lombok, *S.* (*N.*) *falciferus*, p. 26, *S.* (*N.*) *amictus*, Borneo, *S.* (*N.*) *allevatus*, Siam, *S.* (*N.*) *caudiculatus*, Ceylon, p. 27, *S.* (*N.*) *spirobolinus*, Hantam, S. Africa, *S.* (*N.*) *horridulus*, Java, p. 28, *S.* (*N.*) *contemptus*, Ceylon, p. 29, *S.* (*N.*) *cycnodes*, Accra, *S.* (*N.*) *petersi*, Tette, p. 30, *S.* (*N.*) *excavatus*, Brazil, *S.* (*N.*) *hildebrandtianus*, Nossi-Bé, p. 31, *S.* (*N.*) *digitulatus*, Djur, *S.* (*N.*) *heterothyreus*, Santa Martha, p. 32, *S.* (*N.*) *montivagus*, Somali, *S.* (*N.*) *cavicollis*, Puerto Cabello, p. 33, *S.* (*N.*) *mellitus*, Sierra Geral, p. 34, *S.* (*N.*) *rotundanus*, Rio Janeiro, *S.* (*N.*) *trunculatus*, Java, p. 35, *S.* (*N.*) *tschudii* (Stein, MS.), Peru, *S.* (*N.*) *parilis*, Liberia, *S.* (*N.*) *abstemius*, Cuba, p. 36, *S.* (*N.*) *coruscus*, Peru, *S.* (*N.*) *mathematicus*, Brazil, p. 37, *S.* (*N.*) *thalpogenitus*, Pungo, *S.* (*N.*) *amputus*, Lahat, Lumbok, p. 38, *S.* (*N.*) *marus*, Sierra Geral, *S.* (*N.*) *sculpturatus*, Porto Rico, p. 39, *S.* (*N.*) *punctulatus*, San Fernando de Apure, *S.* (*N.*) *atratus*, Nossi-Bé, p. 40, *S.* (*N.*) *amphibolius*, Lahat, Lombok, *S.* (*N.*) *julinus*, Anjoan, p. 41, *S.* (*N.*) *plananus*, Guinea, *S.* (*N.*) *arcanus*, locality unknown, p. 42, *S.* (*N.*) *chamissoi*, Radak, *S.* (*N.*) *ampussis*, Puebla, p. 43, *S.* (*N.*) *confragosus*, Costa Rica, *S.* (*N.*) *specificus*, Guayaquil, p. 44, *S.* (*N.*) *lingulatus*, Congo, *S.* (*N.*) *meracus*, Guiana, p. 45, *S.* (*N.*) *alticinctus*, Malacca, *S.* (*N.*) *biplicatus*, Brazil, p. 46, *S.* (*N.*) *plicatulatus*, Ataba, *S.* (*N.*) *christianus*, Jerusalem, *S.* (*N.*) *acutanus*, Egypt, p. 47, *S.*

(*N.*) *plicaticollis*, Djur, *S.* (*N.*) *alligans*, Madagascar, p. 48, *S.* (*N.*) *micus* Mayotte, *S.* (*N.*) *chirographus*, Colombia, p. 49, *S.* (*N.*) *galeanus*, Caracas, *S.* (*N.*) *angulicollis*, p. 50, *S.* (*N.*) *subpartitus*, S.E. Africa, *S.* (*N.*) *tumuliporus*, Djur, p. 51, *S.* (*N.*) *ponderosus*, Dur Roserer, *S.* (*N.*) *anctior*, Abyssinia, p. 52; Karsch, Z. ges. Naturw. (3) vi. *S.* (*Odontopyge*) *angolensis*, id. B. E. Z. xxv. p. 93, Angola. *S. reuteri* and *fasciatus*, Lenz, Zool. Anz, iv. pp. 506 & 507, Nossi-Bé. *S. bocagii*, Benguela, figs. 2 & 2 *a*, p. 188. *gongolo*, figs. 1, 1 *a* & 1 *b*, p. 190, *medius*, Dondo, figs. 5 & 5 *a–c*, p. 192, *ocrestus*, Quilo, figs. 4 & 4 *a–c*, p. 193; Mattozo, J. Sci. Lisb. viii. p. 196. (*S. gongolo*, Mattozo, is also figured by Capello & Ivens, in "De Benguella 'as Terras de Iácca," i p. 299, figs. 1–5).

Spirobolus globulanus, Anjoan and Mayotte, *brandti* (Stein, MS.), Peru, p. 54, *vulvanus*, Puebla, *spirostreptinus*, Ceylon, p. 55, *dissentaneus*, Minahassa, p. 56, *exquisitus*, Peking, *detornatus* (Koch, MS.), Viti Levu, p. 57, *multiforus*, Porto Rico, *octoporus*, Atapupu, *mundulus*, Cape, p. 58, *vogesi*, New Hanover, p. 59, *caudulanus*, Siam, *punctiplenus*, Amboina, Sumatra, Timor, Banda, p. 60, *signifer* (Koch, MS.), Viti Levu, *comorensis*, Mayotte, p. 61, *decoratus* (Koch, MS.), Viti Levu, p. 62, *bivirgatus*, Anjoan and Madagascar, p. 63, *olympiacus*, Nossi-Bé, p. 64, *inloides*, Samar, *phranus*, Bangkok, *punctidives*, Saigon, p. 65, *biconicus*, Mauritius, *adipatus*, Salawatti, p. 66, *impudicus*, Dodinga, Ternate, *cælatus*, New Guinea, &c., p. 67, *S.* (*Rhinocricus*) *parcus*, Porto Rico, p. 68, *S.* (*R.*) *undulatus*, Viti Levu, p. 69, *S.* (*R.*) *latus*, Colombia, Caracas, Guiana, and Ternate, &c., *S.* (*R.*) *angusticollis*, Puebla, p. 70, *S.* (*R.*) *gracilipes*, Cuba, p. 71, *S.* (*R.*) *facatus*, *S.* (*R.*) *flavo-cinctus*, Caracas, p. 72, *S.* (*R.*) *excisus*, Jamaica, *S.* (*R.*) *carinatus*, Viti Levu, p. 73, *S.* (*R.*) *callosus* (Koch, MS.), Pelew Islands, *S.* (*R.*) *crepidatus* (Koch, MS.), Port Mackay, p. 74, *S.* (*R.*) *scrobiculatus*, Amboina, Buru, *S.* (*R.*) *segmentatus*, Luzon, p. 75, *S.* (*R.*) *miniatipus*, New Granada, *S.* (*R.*) *brevipes* (Koch, MS.), Queensland, p. 76, *S.* (*R.*) *duvernoyi*, Cuba, p. 77. *S.* (*R.*) *fundipudens*, Santa Martha, New Granada, p. 78; Karsch, Z. ges. Naturw. (3) vi.

Symphula.

Packard, A. S. *Scolopendrella* and its position in Nature. Am. Nat. xv. pp. 698–704, figs.

The author collates his own observations on a slight American variety of the European *S. immaculata*, Newp., with those of Ryder, and concludes that the *Symphula* form a third suborder of *Thysanura*, equivalent to the *Collembola* and the *Cinura*. He also considers that the Hexapods, Arachnids, and Myriopods, are too closely related to be regarded as independent classes, and should be regarded as subdivisions (sub-classes) of *Tracheata*.

Ryder, J. A. The Structure, Affinities, and Species of *Scolopendrella*. P. Ac. Philad. 1881, pp. 79–86.

Includes a synopsis of Menge's observations on *S. immaculata*, which disagree with Ryder's as to the position of the genital organs, and the

supposed tracheal arches. Menge is mistaken in thinking that the posterior tracheal arches are continuous, as Ryder finds that they are broken at the dorsal vessel. He finds four Malphigian tubercles in *S. immaculata*, but there are but two in *S. notacantha*. The number of legs, and of joints of the antennæ, appears to be variable. Dissimilar as are *Lepisma*, *Machilis*, *Lepismina*, *Nicoletia*, *Campodea*, and *Iapyx*, their principal characters forcibly suggest an affiliation with *Scolopendrella*. *S. notacantha* is figured (p. 85, fig. 2); and *S. gratia* (only indicated in Am. Nat. xiv. p. 375, 1880) is described and figured, *l. c.* fig. 1.

Scolopendrella microcilpa, sp. n., Muhr, Zool. Anz. iv. pp. 59–61, figs. 1, 2 & 4, Prague (figs. 3 & 5 represent details of *S. notacantha*, Gerv., figured for comparison).

Malacopoda.

Ernst, A. Some remarks on *Peripatus edwardsii*, Blanch. Nature, xxiii. pp. 446–448, woodcuts.

Important observations on structure, reproduction, &c. The sexes are certainly separate.

Peripatus edwardsi is the only species showing any traces of segmentation, and Schmarda, in characterizing the group as possessing thirteen to thirty-six segments, probably intended that each pair of legs indicated a segment: Pascoe, P. E. Soc. 1881, p. ii.

INSECTA.

THE GENERAL SUBJECT.

By W. F. Kirby, M.E.S., &c.

Balbiani, —, & Maillet, —. Les insectes utiles à l'Exposition Universelle Internationale de 1878 à Paris. Paris: 1881, 8vo, 60 pp.

Balfour, F. M. A Treatise of Comparative Embryology. 8vo, 2 vols. London: 1880 & 1881. (*Cf.* Ent. M. M. xvii. pp. 237–240.)

Vol. i., chap. xvii., *Tracheata* (pp. 316–379) is devoted to *Myriopoda*, *Insecta*, and *Arachnida*. The principal subjects discussed under *Insecta* (pp. 327–356) are the embryonic membranes, formation of layers and organs, special types of larvæ, metamorphoses and heterogeny.

Bastian, H. C. The Brain as an Organ of Mind. London: 1880, 8vo, pp. xii. & 708.

Contains much matter (not original) on the nervous system and intelligent actions of Insects.

Behrens, W. *Caltha dionæafolia*, eine neue insectivore Pflanze. Kosmos, ix. pp. 11–14, woodcuts.

The structure of the leaves is so similar to that found in *Dionæa muscipula*, that there is no doubt that they are also used for entrapping insects.

Berg, C. Informe Oficial de la Comision Cientifica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia) in 1879, bajo las órdernes del General J. A. Roca. Entrega i. Zoologia. Buenos Aires: 1881, 4to. Insectos, pp. 77–115, plate.

Includes notes on species of all orders, with figures of several previously described, and descriptions of a few new ones. The *Diptera* are by Arribálzaga.

——. Entomologisches aus dem Indianergebiet der Pampa. S. E. Z. xlii. pp. 36–71.

128 species of various orders enumerated, some new.

Bergroth, E. Bemerkungen zu Hagen's "Bibliotheca Entomologica," die nordische Literatur betreffend. S. E. Z. xlii. pp. 73–75.

Bethune, C. J. S. Noxious Insects in England. Rep. E. S. Ont. 1880, pp. 42–48, figs. 21–30.

A series of extracts from Miss Ormerod's "Notes and Observations of Injurious Insects," 1877–79, with numerous critical remarks.

Brauer, F. Biologisches über blutsaugende Insecten mit besonderer Berücksichtigung ihrer Mundtheile. Schr. nat. Kennt. xxi. pp. 255–273.

A popular rather than a scientific article, relating to the habits and structure of *Pulicidæ*, *Culicidæ*, *Cimicidæ*, and *Anoplura*, and concluding with observations on phthiriasis.

Brehm, A. E. Merveilles de la Nature; Les Insectes. Paris: 1881, roy. 8vo.

Brischke, C. G. A. Die Blattminirer in Danzig's Umgebung. Schr. Ges. Danz. (2) v. pp. 233–290, woodcuts.

Contains a list of plants in systematic order, with notices of the various insects by which they are mined. A table of Dipterous miners and of the plants which they attack is appended.

Brongniart, C. J. E. Les Hyménoptères fossiles. Annexe au "Species des Hyménoptères d'Europe, par E. André." Recherches pour servir à l'histoire des insectes fossiles. 1ière fasc. Paris: 1881, 8vo, pp. xxii.

Contains only introductory matter (not specially concerning *Hymenoptera*) relative to the part played by insects in nature, the various modes in which remains of fossil insects have been preserved, a brief notice of the formations in which fossil insects have occurred, and a list of those found in the Devonian, Carboniferous, Trias, and Lias formations.

Bronn, F. G. Klassen und Ordnungen des Thierreichs. Fortgesetzt von A. Gerstaecker, Band. v. Abth. 2, Gliederfüssler. *Arthropoda*, Lief. 1–3. Leipzig: 1881, 8vo, pp. 96, 8 pls.

Büchner, L. Mind in Animals. Translated by Annie Besant. London 1881, 8vo. (*Cf.* Nature, xxiii. pp. 501–503.)

Relates chiefly to *Hymenoptera*, *Orthoptera*, *Arachnida*, and *Coleoptera*.

Chatin, J. Contributions expérimentales à l'étude de la Chromatopsie chez les Batraciens, les Crustacés, et les Insectes. Paris: 1881, 8vo.

Claus, C. Grundzüge der Zoologie zum wissenschaftlichen Gebrauche. 4th edn. i. Marburg: 1880.

Includes *Hexapoda*, pp. 683–821.

Comstock, J. H. Report of the Entomologist of the United States Department of Agriculture for the year 1879. Ann. Rep. Dep. Agr. 1879, pp. 185–263, pls. i.–vi.

——. Report of the Entomologist of the United States Department of Agriculture for the year 1880. Ann. Rep. Agr. 1881, pp. iv. 235–373, pls. i.–xxiv.

The numerous new species in these Reports are described by various specialists.

Cook, A. J. Insects in Winter. Psyche, iii. pp. 182–185.

Most insects freeze in winter, and it is only occasionally that they suffer from the effects of actual cold. Hive-bees, however, pass the winter without hibernation, but remain quiet, only taking food enough to support life; and an unusual degree of either heat or cold in winter is highly injurious to them.

Cuni y Martorell, M. Datos para una Flora de los Insectos de Cataluña. An. Soc. Esp. x. pp. 433–461.

Cyrus, C. Ninth Report of the State Entomologist on the Noxious and Beneficial Insects of the State of Illinois. Springfield : 1880, pp. 142, woodcuts.

Includes articles on Cabbage Insects, Sheep Parasites, and *Acridiidæ*, the last being monographed.

Dalla Torre, K. W. v. Addenda und Corrigenda zu Hagen's Bibliotheca Entomologica. iii. Ent. Nachr. vii. pp. 45–48, 163–170.

De Borre, P. Quelques mots sur l'organisation et l'histoire naturelle des animaux articulés. (Extrait des Bull. Soc. Linn. Brux.) 8vo, pp. 19.

A popular lecture.

Dewitz, H. Ueber die Flügelbildung bei Phryganiden und Lepidopteren. B. E. Z. xxv. pp. 53–60, pl. iv. figs. 1 & 2.

The writer traces the development of the wings from their first appearance in the young larva as a folded layer of chitin, which gradually increases with the development of the insect in such a manner as to prove that its outer integument is thrown off at each moult, and that there is no difference in this respect between insects with perfect and those with imperfect metamorphoses.

Duncan, P. M. Cassell's Natural History. London : 1881, 4to, woodcuts.

Parts 57–72 include the following entomological matters. Class *Insecta* : Chapter i. Anatomy of Insects, by W. S. Dallas (vol. iv. pp. 281–295); chapters ii.–v. *Coleoptera*, by H. W. Bates (vol. iv. pp. 296–352); chapters vi. (vol. v. pp. 353–384) & vii. (vol. vi. pp. 1–8), *Hymenoptera*, by W. S. Dallas; chapter viii. *Neuroptera*, by W. S. Dallas (vol. vi. pp. 9–20); chapters ix.–xi. *Lepidoptera*, by W. F. Kirby (vol. vi. pp. 21–69); chapter xii. *Diptera* and *Aphaniptera*, by W. S. Dallas (commencement, vol. vi. pp. 70–72).

Eimer. Eine Dipteren- und Libellenwanderung beobachtet in September, 1889. Biol. Centr. i. pp. 549–558.

A migration of *Melithreptus*, sp., *Eristalis*, sp., and *Libellula scotica*, observed in the Upper Engadine. The insects were travelling in the direction of Italy.

Fletcher, J. On the chief benefits derived by farmers and horticulturists from a knowledge of Entomology. Rep. E. Soc. Ont. 1880, pp. 57–68, figs. 44–54.

Includes a brief notice of the principal groups of Insects.

FRIEDENFELS, E. v. Ueber *Artemia salina* und andere Bewohner der Soolenteiche in Salzburg. Verh. siebenb. Ver. xxx. pp. 112–178, plate.

The habits, &c., of the following insects are discussed at some length: *Culex annulipes*, *Stratiomyia longicornis*, *Tabanus autumnalis*, *Berosus spinosus*, *Hydroporus nigrolineatus* (?), *Cybisterræseli*, *Helochares dilutus*, *Ranatra linearis*, and *Corixa*, sp.

FRIPP, H. E. On Insect Sounds. P. Brist. Soc. ii. pp. 219–245 [1877].

——. The Faculty of Hearing, and the Tympanal Organ of certain *Orthoptera*. L. c. pp. 351–373 [1878].

——. An Account of some Experiments on Insect Hearing. *L. c.* pp. 374–382 [1878].

These papers consist partly of a comparison of the nerves of Insects with those of the higher animals, and partly of an abstract of the observations and experiments of Landois, Graber, and others.

GARDEN PESTS and their Eradication. With numerous illustrations of the perfect insects and their larvæ which are particularly hurtful to garden plants. London: 1881, 8vo, 80 pp. figs. 52.

A popular handbook, alphabetically arranged.

GEDDES, P. Insectivorous Plants. Encycl. Brit. xiii. pp. 134–140.

GIUNTI, M. Ricerche sulla diffusione del rame nel regno Animale. Ann. Scuola Agric. Portici, ii.

Treats of *Mammalia*, *Insecta*, *Myriopoda*, and *Crustacea*.

GODMAN, F. DUCANE, & SALVIN, O. Biologia Centrali-Americana; or Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. ZOOLOGY. Pts. ix.–xiv.

The portion published in 1881, includes the following sections relating to Entomology:—*Rhopalocera*, by F. D. Godman & O. Salvin, pp. 89–163, pls. ix.–xviii. *Heterocera*, by H. Druce, pp. 1–24, pls. i. & ii., *Coleoptera*, i. (1) by H. W. Bates, pp. 1–40, pls. i. & ii. *Coleoptera*, iii. (2) by H. S. Gorham, pp. 25–112, pls. iii.–vi. *Coleoptera*, v., by H. W. Bates, pp. 153–224, pls. xii.–xv. *Coleoptera*, vi. (1), by M. Jacoby, pp. 73–144, pls. iv.–vii. *Rhynchota*, by W. L. Distant, pp. 89–168, pls. ix.–xv. *Rhynchota Homoptera*, by W. L. Distant, pp. 1–16, pls. i. & ii.

GOLDENBERG, F. Beitrag zur Insectenfauna der Kohlenformation von Saarbrücken. Verh. Ver. Rheinl. xxxviii. pp. 184–187, woodcuts (vide *Blattidæ*).

GRABER, V. Über die stifteführenden oder chordotonalen Sinnesorgan bei den Insecten. Zool. Anz. iv. pp. 450–453.

These peculiar organs occur in all Insects. They may be divided into truncal and membral. The former exhibit a strongly segmental character, and are tolerably uniform in character from segment to segment, in the same insect, and sometimes consist of only one pair, and sometimes of several; in the latter case they are generally not uniform. The membral organs may be either pteral or pedal. The pteral organs are

met with in all winged insects; and the pedal organs may occur in several parts of the legs (*Coleoptera*, *Phryganeidæ*), or may be restricted to certain parts. They may be either femoral (*Pediculidæ*), tibial (*Orthoptera*, *Pseudoneuroptera*, *Formicidæ*), or tarsal, (*Coleoptera*, &c.). The tympanal organs in the front legs of *Locustidæ* and *Gryllidæ* correspond to atympanal organs in the other legs. The occurrence of these differentiated and undifferentiated organs in these insects, as well as in the *Blattidæ*, and especially in the *Acridiidæ*, which are also provided with abdominal tympanal organs, is highly interesting; and the author can scarcely doubt that these peculiar structures are organs of hearing.

GREENE, J. The Insect Hunter's Companion; being instructions for collecting and preserving Butterflies, Moths, Beetles, Flies, &c. Third Edition, revised and extended by A. B. Farn. The chapter on *Coleoptera* by E. Newman, 12mo. London: 1880, pp. viii. & 114

HAGEN, H. A. Papers on Galls in Botanical Serials. P. Bost. Soc. x. pp. 406–409.

Includes notices, from Bot. Jahresb. 1879, of three papers, by H. W. Boyerick, published in 1877, in Bot. Zeit. xxxv., and Arch. Nijmegen (2) iii. An abstract of Boyerick's classification of galls is given.

——. Einwürfe gegen Dr. Palmén's Ansicht von der Entstehung des geschlossenen Tracheensystems. Zool. Anz. iv. pp. 404–406.

The writer argues that the stigmatal striæ (Stigmenstränge) ought not to be regarded as rudimentary organs.

HANSEN, H. J. Faunula Insectorum Færœensis, fortegnelse over de ne bidtil samlede Insekter. Nat. Tidskr. (3) xiii.

KÜCHENMEISTER, Aufl. Lief. 3 (Schiu. orded from the Färoe Islands: 65 *Coleoptera*,

KUNCKEL, J., & GAZAGNAIRE, 15 *Lepidoptera*, 86 *Diptera*, 2 *Orthoptera*, lules nerveuses périphériques avec ... as new. Insectes. C. R. xcii. pp. 471-473. sectes

Every nervous centre in insects consists essentially of a bipolar cellule, which is the true nervous termination, connected at one end with the cylinder-axis of the nervous fibre, and on the other side prolonged into a nervous rod, surmounted by a true, or else by a transformed hair.

LEYDIG, F. Ueber Verbreitung der Thiere im Rhöngebirge und Mainthal mit hinblick auf Eifel und Rheinthal. Verh. Ver. Rheinl. xxxviii. pp. 43–183 (Insecten, pp. 116–137; Myriapoden, pp. 139–141).

The insects, &c., which present the most remarkable peculiarities in their distribution are noticed. Some species formerly met with in various localities have become rare, or have disappeared, such as *Lytta vesicatoria*, once common at Rothenburg and now rare, and *Mantis religiosa*, met with during the last century at Würzburg and Frankfort-on-Main.

LUDWIG, F. Die Anpassungen der Gattung *Erodium* an Insektenbestäubung. Kosmos, viii. pp. 357–362.

met with in all winged insects; and the pedal organs may [op.
several parts of the legs (*Coleoptera*, *Phryganeidæ*), or may [stricted
certain parts. They may be either femoral (*Pediculidæ* [al (*Ortho-
ptera, *Pseudoneuroptera*, *Formicidæ*), or tarsal, (*Coleop* [&c.). The
tympanal organs in the front legs of *Locustidæ* and *G* [correspond
atympanal organs in the other legs. The occurrenc [hese differen-
tiated and undifferentiated organs in these insects, [vell as in the
Blattidæ, and especially in the *Acridiidæ*, which are [provided with
abdominal tympanal organs, is highly interesting; [he author can
scarcely doubt that these peculiar structures are org [hearing.

GREENE, J. The Insect Hunter's Companion; be [nstructions for
collecting and preserving Butterflies, Moths [es, Flies, &c.
Third Edition, revised and extended by A [n. The chapter
on *Coleoptera* by E. Newman, 12mo. Lond [380, pp. viii. & 114.

HAGEN, H. A. Papers on Galls in Botanical [P. Bost. Soc. xx.
pp. 406–409.

Includes notices, from Bot. Jahresb. 1879, [ee papers, by H. W.
Boyerick, published in 1877, in Bot. Zeit. xxx [Arch. Nijmegen (2)
iii. An abstract of Boyerick's classification [is given.

——. Einwürfe gegen Dr. Palmén's Ansi [n der Entstehung des
geschlossenen Tracheensystems. Zool. [iv. pp. 404–406.

The writer argues that the stigmatal [(Stigmenstränge) ought
not to be regarded as rudimentary organs

HANSEN, H. J. Faunula Insectorum [nsis, fortegnelse over de
and Cenne bidtil samlede Inse [Nat. Tidskr. (3) xiii.

The portion p[
to Entomology:—*Rh* [orded from t[e Islands: 65 *Coleoptera*,
pls. ix.–xviii. *Heteroce* [a, 15 *Lepid* [as new.
(1) by H. W. Bates, pp. 1-[ ], p[ ] [ ]
ham, pp. 25–112, pls. iii.–vi. *Coleoptera*, v., [sectes [ ]p. 153–224,
pls. xii.–xv. *Coleoptera*, vi. (1), by M. Jacoby, [p. 73–144, pls. iv.–vii.
Rhynchota, by W. L. Distant, pp. 89–168, pls. ix.–xv. *Rhynchota Homo-
ptera*, by W. L. Distant, pp. 1–16, pls. i. & ii.

GOLDENBERG, F. Beitrag zur Insectenfauna der Kohlenformation von
Saarbrücken. Verh. Ver. Rheinl. xxxviii. pp. 184–187, woodcuts
(vide *Blattidæ*).

GRABER, V. Über die stifteführenden oder chordotonalen Sinnesorgan
bei den Insecten. Zool. Anz. iv. pp. 450–453.

These peculiar organs occur in all Insects. They may be divided into
truncal and membral. The former exhibit a strongly segmental charac-
ter, and are tolerably uniform in character from segment to segment, in
the same insect, and sometimes consist of only one pair, and sometimes
of several; in the latter case they are generally not uniform. The
membral organs may be either pteral or pedal. The pteral organs are

ing from the lower ganglia (Schlundknoten), and the other from the digestive system. The distribution of the nerves differs in the three sections of the silk-glands (gland, reservoir, and excretory organ). These glands are visible even in the newly-emerged larva, and their gradual changes and development in different insects are noticed. Silk is really a modified chitinous cuticular substance, secreted in the form of threads.

KARSCH, F. See ROHLFS.

KERVILLE, H. GADEAU DE. Les insectes phosphorescents. Rouen: 1880, 8vo, 4 col. pls.

KOLBE, H. Eigenthümlichkeiten in der geographischen Verbre[illegible] com- einiger Insekten-Gattungen durch die Flussgebiete der E[illegible] *leoptera* Yssel im Münsterlande. JB. Zool. Sect. Westf. Ver. ix. p[illegible] descend

Many species of insects are either confined to one or ot[illegible]ary cardines adjacent river districts, or are much more common in one dis[illegible] beetle are in the other. [illegible] ridges which [illegible]*ra* alone have

KRANCHER, C. Der Bau der Stigmen bei den Insecten. Z[illegible] The paper xxxv. pp. 505–574, pls. xxviii. & xxix. [illegible]nes.

After a sketch of what has been done by previous authors, the w[illegible]brati. gives an account of his general results (already published in Zool. An[illegible] iii. pp. 584–588; *cf.* Zool. Rec. xvii. *Ins.* p. 5), and then details his observations on a considerable number of perfect insects and larvæ belonging to various Orders. In conclusion, he remarks that the form and structure of the stigmata are too varied to be of any systematic value, though of great morphological interest and importance; and he describes the method he employs in the examination of objects.

KÜCHENMEISTER, —, & ZIEN, —. Die Parasiten der Menschen, 2te. Aufl. Lief. 3 (Schluss). Nematoden, Insecten. Leipzig: 1881, 8vo.

KUNCKEL, J., & GAZAGNAIRE, J. Rapport du cylindre-axe et des cellules nerveuses périphériques avec les organes des sens chez les Insectes. C. R. xcii. pp. 471–473.

Every nervous centre in insects consists essentially of a bipolar cellule, which is the true nervous termination, connected at one end with the cylinder-axis of the nervous fibre, and on the other side prolonged into a nervous rod, surmounted by a true, or else by a transformed hair.

LEYDIG, F. Ueber Verbreitung der Thiere im Rhöngebirge und Mainthal mit hinblick auf Eifel und Rheinthal. Verh. Ver. Rheinl. xxxviii. pp. 43–183 (Insecten, pp. 116–137; Myriapoden, pp. 139–141).

The insects, &c., which present the most remarkable peculiarities in their distribution are noticed. Some species formerly met with in various localities have become rare, or have disappeared, such as *Lytta vesicatoria*, once common at Rothenburg and now rare, and *Mantis religiosa*, met with during the last century at Würzburg and Frankfort-on-Main.

LUDWIG, F. Die Anpassungen der Gattung *Erodium* an Insektenbestäubung. Kosmos, viii. pp. 357–362.

M'Alpine, D. A Zoological Atlas (including Comparative Anatomy) with Practical Directions and Explanatory Text. For the use of Schools. 249 coloured figures and diagrams. Pt. ii. *Invertebrata*. Edinburgh and London : 1881. (*Cf.* Nature, xxv. pp. 122 & 123.)

McLachlan, R. Insects. Encyclopædia Britannica, 9th edn., xiii. pp. 141–154.

About half this paper is devoted to habits, structure, and other general matter, and the remainder to classification.

——. Notes on the Insects collected by A. H. Markham (in Novaya Zemlya). Markham's "Polar Reconnaisance" (London : 1881, 8vo), pp. 350–352.

Notes on *Hymenoptera* (1), *Coleoptera* (1), *Lepidoptera* (7), *Trichoptera* (1), *Diptera* (9), and *Mallophaga* (1).

MacLeod, J. Concours universitaire de 1878–79. Question de Zoologie. Mémoire Couronné. La Structure des Trachées et la Circulation péritrachéenne. Bruxelles : 1880, 8vo, pp. 72, pls. iv. (*cf.* Am. Nat. xiv. pp. 213 & 214).

The following subjects are discussed :—Structure of the tubular tracheæ, tracheal vesicles, interstigmatic-masses (manchons), leaf-like tracheæ of *Araneida* and *Scorpionides*, and analogous organs; Relations of the tracheæ to the tissues in which they are embedded, and mode of their termination; Theory of peritracheal circulation; Bibliography. The author's conclusions have been derived from the examination of a considerable number of insects and other *Articulata tracheata*. He sums up his principal results in the following eight theses :—The wall of the trachea consists of three layers, an outer layer, probably connective, a middle chitin-forming, and an internal chitinous layer. (2) The spiral thread does not properly belong to the tubular trachea. (3) The spiral thread does not differ from the rest of the intima in thickness only, but more especially in its properties. (4) The tubular tracheæ, and especially their intima, exhibit numerous variations, even within a special group, such as that of the insects. (5) The chitin-forming tunic of the trachea is not formed by cells fused together, but is a true epithelium. (6) The intermediate layer remains independent along the whole length of the trachea. (7) Peritracheal circulation is anatomically impossible. (8) In many larvæ, the intima exhibit other portions besides the spiral thread, differing in their properties.

Macloskie, G. The Endocranium and Maxillary Suspensorium of the Bee. Am. Nat. xv. pp. 353–362, figs.; P. Am. Ass. 1880, pp. 660–666, figs.

The chitinous wall which covers an insect's body is folded inwards or outwards into processes which impart additional strength or protection, or for the attachment of muscles. The outgoing plates, or exodemes, have their counterparts in the internal processes (or endodemes), which are more or less hardened in particular parts, thus forming an endoskeleton, which is best developed in the ventral part of the thorax, and where it forms the endocranium, or internal buttresses of the skull. The hard processes of the pharynx and stomach may be collectively termed

the splachnodemes. The upper part of the cranium of the bee is described; it is strengthened by the endocranium, which consists of a pair of pillars arising by strong roots from the cranial floor, and fixed above to the clypeus. A similar structure is found in the ant (in which there are short tendons in the neck serving to antagonize them), as well as in insects of the other principal orders. On examining the mouth of the bee, the maxillæ and labium are found to be strung upon a long framework, with elbows and hinges, by which they can be thrust out or drawn in; and for this structure the name "maxillary suspensorium" is proposed. These structures are then described in the bee, and are compared with the corresponding formations in other insects. In *Coleoptera* the mesocephalic pillars appear as involutions of the wall, and descend to the region of the submentum, and near them the maxillary cardines are inserted. It appears that the basi-cranial parts of a beetle are in other insects condensed into the strong complex system of ridges which border the front of the occipital opening. The *Coleoptera* alone have these parts resolved so as to show the primitive arrangement. The paper concludes by some brief observations on the cranial splachnodemes.

Magretti, P. Intorno ad alcune casi di albinismo negli Invertebrati. Bol. Sci. Pavia. i. Aprile, 1881.

Relates to *Lasius niger*, Linn., *Bombus senilis*, Fabr., and other bees, and *Armadillus vulgaris*, Latr.

Malfatti, G. Bibliografia degli Insetti fossili Italiani finera conosciuti. Atti Soc. Ital. xxiv.

[Not seen by the Recorder.]

Mignault, L. D. Quelques notes sur la fertilisation des plantes. Nat. Canad. xii. pp. 242–250, woodcuts.

Müller, H. Die Entwickelung der Blumenthätigkeit der Insekten, Kosmos, ix. pp. 204–215, 258–272, 351–370, & 415–432.

The author discusses the gradual increase of flower-diet among insects and the development of the mutual modification and interdependence of flowers and insects in *Coleoptera* and *Hymenoptera*. These relations sometimes differ in the sexes of the same species. Several tables are added, showing the adaptibility of bees to their food.

——. Die Wechselbeziehung zwischen den Blumen und den ihre Kreuzung vermittelnden Insecten. Schenk's Handbuch der Botanik. i. Breslau: 1879, 8vo.

Muhr, J. Die Mundtheile der Insecten dargestellt auf funf Wandtafeln. Prag: 1878 & 1879.

Noticed in Psyche, iii. p. 283.

Nickerl, O. Bericht über die im Jahre 1880 der Landwirthschaft Böhmens schädlichen Insecten. Prag: 1881, 8vo, pp. 11.

Only 20 species of various orders noticed.

OATES, F. Matabele Land and the Victoria Falls: A Naturalist's Wanderings in the Interior of South Africa. From the letters and journals of the late F. Oates; edited by C. G. Oates. London: 1881, 8vo.

Appendix K. (Entomology, pp. 331–365, pls. E–H), by J. O. Westwood, contains an account of the insects collected on the expedition, the *Lepidoptera* being treated in most detail. Various other references to insects are scattered through the book.

ONTARIO. Eleventh Annual Report of the Entomological Society of the Province of Ontario (for the year 1880). Toronto: 1881, 8vo, pp. iv. 89: woodcuts.

Includes numerous notices, generally of a popular character, and copiously illustrated, of many interesting or important Canadian insects of various orders.

ORMEROD, E. A. A Manual of Injurious Insects, with notices of prevention and remedy for their attacks on food-crops, forest-trees, and fruit, and with short Introduction to Entomology. London: 1881, 8vo, pp. xxxvii., 323: woodcuts.

Includes a brief sketch of the Orders of Insects, and an account of the various insects which are injurious to food-crops, forest-trees, and fruit-crops, each section being arranged according to the alphabetical order of the plants mentioned. The whole work is very fully illustrated.

——. Notes of Observations of Injurious Insects. Report, 1880. London: 1881, 8vo, pp. 48, woodcuts.

Includes notices of about 36 species, most of which are figured, often with transformations.

OSTEN-SACKEN, C. R. Verzeichniss der entomologischen Schriften von C. Rondani, als Nachtrag und Fortsetzung den betreffenden Artikel in H. A. Hagen's Bibliotheca Entomologica. Verh. z.-b. Wien, xxxi. pp. 337–344.

PACKARD, A. S. The Brain of the Locust. Am. Nat. xv. pp. 285–302, pls. i.–iii.

——. The Brain of the Embryo and Young Locust. *L. c.* pp. 372–379, pls. iv. & v.

Includes a general description of the brain of Insects, and remarks on its analogy to that of vertebrate animals; and a description of the brain of *Caloptenus spretus*, which is compared with that of other Insects. Considerable differences in the development of the brain exist in the same sub-class of Insects, and that of the locust is more highly developed than in most other Insects, except in ants, bees, and wasps. The character of the second paper is explained by its title. Both are adapted from 2nd Rep. U. S. Ent. Comm. (1880).

——. Insects Injurious to Forest and Shade Trees. Bull. U. S. Ent. Comm. No. 7. Washington: 1881, pp. 275, woodcuts.

This work is arranged first according to the tree, and then according to the part attacked. Many Insects are noticed in great detail;

and although a large part of the work is a compilation, yet it will be found very useful, as many of the quotations are taken from authors whose works are very scarce in Europe. No new species are described.

PIKE, J. W. Preservation of Fossil Insects and Plants on Mazon Creek. P. Am. Ass. 1880, pp. 520–524.

PRYER, W. B. Tropical Notes. Ent. M. M. xvii. pp. 241–245.

Remarks on the general apparent scarcity of insects in the Tropics.

REINHARD, H. Beiträge zur Gräber-Fauna. Verh. z.-b. Wien, xxxi. pp. 207–210.

The following insects, &c., were found in graves in various localities: *Conicera atra*, Meig., *Alysia fuscicornis*, Hal., *Homalomyia scalaris*, Fabr., *Iulus terrestris* or *sabulosus*, *Homalota divisa*, *Rhizophagus parallelocollis*, Gyll., and *Trichonyx sulcicollis*, Reich. (but *cf.* Reitter, SB. z.-b. Wien, xxxi. p. 28).

REUTER, O. M. Om anormala kopulationsförhållenden hos insekterna och i sammanhang dermed stående frågor. (On abnormal pairing in insects, and the questions arising therefrom.) Œfv. Finsk. Soc. xxiii. pp. 1–30.

The writer discusses the various instances which have occurred in various orders of Insects of different species, or even genera, pairing; and also copulation "*inter mares*." In the course of his remarks he endorses the Recorder's opinion that hybridity has a direct tendency to promote hermaphroditism.

RILEY, C. V. General Index and Supplement to the Nine Reports on the Insects of Missouri. Bull. U. S. Ent. Comm. No. 6. Washington: 1881, 8vo, pp. 178.

The descriptions of all the species described as new in the Reports are here reprinted. Many corrections of synonymy, and some additional matter (mentioned in its place), as well as very full indices, are also given.

ROHLFS, G. Kufra. Reise von Tripolis nach der Oase Kufra. Ausgeführt im Auftrage der Afrikanischen Gesellschaft in Deutschland. Pt. vi. Gliederthiere der Expedition nach Kufra, von Dr. Karsch, pp. 370–385. Leipzig: 1881, 8vo.

RONDANI, C. See OSTEN-SACKEN.

SAUNDERS, W. Annual Address of the President of the Entomological Society of Ontario. Canad. Ent. xiii. pp. 197–205.

Includes notices of the following injurious insects: *Butalis cerealella*, *Leucania unipuncta*, *Crambus vulgivagella*, *Lachnosterna fusca*, *Diabrotica longicornis*, *Doryphora* 10-*lineata*, *Carpocapsa pomonella*, and *Caloptenus spretus*. (Cf. also on injurious Canadian insects, *op. cit.* pp. 234–236.)

SCHMIDT-GÖBEL, H. M. Die schädlichen und nützlichen Insecten in Forst, Feld, und Garten. 2 Abtheilungen mit Supplement. Wien: 1881, 8vo, 14 col. pls., and woodcuts.

SCUDDER, S. H. The Devonian Insects of New Brunswick, with a note on the Geological Relations of the Fossil Insects from the Devonian of New Brunswick. Anniv. Mem. Bost. Soc. pp. 41, plate.

Relates to fossil wings apparently referable to the *Ephemeridæ*, and other families related to the *Neuroptera*. The author arrives at the following general conclusions: The earliest known Insects were hexapods, and the general type of wing-structure has remained unaltered. They were all lower *Heterometabola*, and nearly all are synthetic types of a comparatively narrow range, and bearing marks of affinity to the Carboniferous *Palæodictyoptera*, though frequently of a more complicated structure, and with a distinct facies of their own. The Devonian Insects were of great size, with membranous wings, and probably aquatic in early life; some are plainly precursors of existing forms, whilst others seem to have left no trace. They show a remarkable variety of structure, indicating an abundance of insect life; and they differ remarkably from all other known types, ancient or modern, and some appear to be even more complicated than their nearest living allies. We are, therefore, no nearer the beginning of things in the Devonian epoch than in the Carboniferous; and while there are some forms which partially accord with the general derivative hypothesis of structural development, there are quite as many which cannot at present be explained by that theory. A summary of the author's conclusions is given in Am. J. Sci. (3) xxi. pp. 111–117; Ann. N. H. (5) vii. pp. 255–261; Kosmos, x. pp. 217–222. Hagen, however, argues (Bull. Mus. C. Z. viii. pp. 275–282) that Scudder's determinations and conclusions are entirely erroneous. He also states (Nature, xxiv. pp. 356 & 357) that the oldest known Insects cannot be assigned with certainty to an older formation than the Lower Carboniferous.

——. The Tertiary Lake-Basin of Florissant, Colorado, between South and Hayden Parks. Bull. U. S. Geol. Surv. vi. pp. 279–300, map.

Contains a geological and palæontological account of the locality, with special reference to the fossil remains of Insects.

——. Two new British Carboniferous Insects, with remarks on those already known. Geol. Mag. (2) ii. (8) pp. 293–300, woodcuts.

The species discussed are *Neuroptera* (q. v.) 4, *Orthoptera*, 2, and *Coleoptera*, 1.

——. The Entomological libraries of the United States: Library of Harvard University. Bibliographical Contributions, No. 11, Cambridge: 1880, 8vo, pp. 6.

——. A Bibliography of Fossil Insects. (Republished from Bull. Harv. Univ.) Bibli. Contr. Harvard Univ., No. 13. Cambridge: 1882, pp. 47.

This important Bibliography is here included, although dated 1882, because a considerable portion was published in or before 1881.

[Scudder, S. H.] Problems in Entomology. An Address as President of the Entomological Club of the American Association for the Advancement of Science. P. Am. Ass. 1880, pp. 609–615. [*Cf.* Zool. Rec. xvii. *Ins.* p. 8.]

Points out how much yet remains to be done in the investigation of the embryology, morphology, and anatomy of insects.

Semper, K. The Natural Conditions of Existence, as they affect Animal Life. London: 1881, 8vo, pp. xvi. & 472.

Contains various matter relating to insects, but little original.

Snellen von Vollenhoven, S. C. See Van der Wulp.

Spedizione Italiana nell' Africa Equatoriale. Risultate Zoologici. Ann. Mus. Genov. xvi. pp. 200–298.

Includes new species of *Coleoptera*, by Gestro; *Orthoptera*, by Bormans; *Odonata*, by Selys-Longchamps; *Hymenoptera*, by Gribodo; *Formicidæ*, by Emery; and *Hemiptera*, by Lethierry.

Targioni-Tozzetti, A. Relazione intorno ai lavori della R. Stazione di Entomologia agraria di Firenze per gli anni 1877–78. Parte Scientifica. Annali di Aggricoltura, 1881, No. 34. Roma: 1881, 8vo, pp. 194, pls. 3, & figs.

Thomson, G. M. The Flowering Plants of New Zealand, and their relation to the Insect Fauna. Tr. Bot. Soc. Edinb. xiv. pp. 91–105.

Diptera appear to take the place of *Hymenoptera* in New Zealand, in fertilizing flowers.

Trelease, W. On the Fertilization of *Calamintha nepeta*. Am. Nat. xv. pp. 11–15, woodcuts.

The purple spots at the mouth of the corolla tube attract insects, but those which are too small to assist in the conveyance of pollen are prevented from entering by dense ridges of stiff hairs on each side.

Tricht, — Van. Nos Insectes. Deux Causeries. 2 édn. Namur: 1881, 12mo, pp. 152.

Van der Wulp, F. M. S. C. Snellen von Vollenhoven als Entomolog geschetst. Tijdschr. Ent. xxiv. pp. lxxxix.–cviii., portrait.

An obituary notice of Vollenhoven, with a complete list of his publications.

Walker, J. J. Entomological Collecting on a Voyage to the Pacific. Ent. M. M. xviii. pp. 81–86.

Notes on insects of various orders collected or observed in the Azores, Straits of Magellan, Chili and Peru, &c.

Wallengren, H. D. J. Et försök att bestämma en del af de utaf H. Ström, beskrifna Norska Insecter. Förh. Selsk. Chr. 1880, No. 2, pp. 31.

Relates to *Lepidoptera* and *Neuroptera*. Entirely of bibliographical interest.

Westwood, J. O. See Oates, F.

Weyenbergh, D. H. Sobre la Pædogenesis. Nat. Arg. i. pp. 105, & 214–218.

ZEITSCHRIFT für Entomologie, herausgegeben von dem Verein für schlesischen Insectenkunde zu Breslau. Neue Folge. Heft 8. Breslau : 1881, 8vo.

[Not seen by the Recorder.]

Physiology, Habits, &c.

Meteorology and Insects ; Swinton, Sci. Goss. xvii. p. 41.

Insect swarms ; Anderson, *tom. cit.* pp. 223 & 224.

On the sense-organs of Insects ; Franck, Feuil. Nat. xi. pp. 100 & 101.

Discussion on the uses of antennæ ; Isis, 1877, p. 133.

Effect of cold on Insects ; Vastel & Lhotte, Bull. Soc. Rouen (2) xvi. pp. 135 & 136 ; Camerano, Ann. Agric. Tor. xxiv.

Retarded development in Insects ; Riley, Am. Nat. xv. pp. 1007 & 1008 ; Canad. Ent. xiii. pp. 180 & 181.

Brandt's remarks on the Comparative Anatomy of the Nervous System of Insects is translated from C. R. xxi. pp. 935–937 [*cf.* Zool. Rec. xvii. *Ins.* p. 2], Ann. N. H. (5) vii. pp. 71–73.

Oxygenation of the blood in insects ; Semper, Natural Conditions of Existence, pp. 445 & 446.

On the development of the muscles of insects ; Viallanes, Le Nat. iii. p. 436.

Queries respecting the attractive power of light on insects ; Borgmann, Ent. Nachr. vii. pp. 88–90.

On the reasoning faculty of insects ; James, Am. Nat. xv. pp. 605–608, 611 & 612.

Müller's Alpenblumen [*cf.* Zool. Rec. xvii. *Ins.* p. 6] noticed or reviewed : Nature, xxiii. pp. 333–335 ; Kosmos, viii. pp. 480–484 ; Biol. Centralbl. i. pp. 3–7 ; Psyche, iii. p. 175. [A large number of botanical periodicals, &c., now contain papers on insect-fertilization, and on insectivorous plants.]

Relations of insects to plants ; Kiesenwetter, Isis, 1877, pp. 63 & 64.

The China Tree (*Melia azedarach*) is free from the attacks of insects, except *Lecanium* sp., *Ceroplastes* sp., and *Atta fervens* ; Am. Nat. xv. pp. 401 & 402.

On the constancy of insects in visiting flowers ; Bennett & Powell, Nature, xxiv. pp. 501–509.

On insect fertilization ; Carruthers, Rep. Dulwich Soc. iv. pp. 14 & 15.

List of insects of various orders found infesting a rotten beech-tree ; Schaupp, Bull. Brooklyn Soc. ii. p. 24.

Oak-galls and their inhabitants ; Hofmann, JB. Ver. Württ. xxxvii. pp. 39–41.

Hybridity in insects ; Semper, Natural Conditions of Existence, p. 356.

On the nomenclature of the neuration of the wings of insects ; Spångberg, Ent. Tidskr. ii. pp. 2 & 55.

On insects found in the sea ; Semper, Natural Conditions of Existence, pp. 144, 434 & 435.

Swarms of moths and *Libellulidæ* at sea 50 or 60 miles from the coast

of South America, a sign of the approach of the 'Zampero,' a violent S.W. wind; Schaupp & Thalenhorst, Bull. Brooklyn Soc. ii. p. 73.

Enumeration of cave insects; Ebert, Isis, 1877, p. 133.

Abundance of insects in 1880; Hart, Ent. xiv. pp. 22 & 23.

Insects crossing the Channel by steamer; Leech, Ent. xiv. p. 19.

Local Faunæ and Observations.

A Journal called "Naturen" published at Christiania, contains occasional notes on insects, but apparently of little importance.

Notices of the Insectarium in the Zoological Gardens in Ent. M. M. xviii. pp. 15 & 16; Ent. xiv. pp. 151–153; Nature, xxiv. pp. 38, 193 & 194.

Notes on the insects of Essex; Tr. Epp. Forest, i. pp. 9 & 10, vi. ix.–xii. xx. xxii. xxiii. & xlvi.

Captures of *Coleoptera* and *Hemiptera* in Holland; Tijdschr. Ent. xxiv. pp. xviii.–xx. & xxiv.

List of insects of various orders captured on the Island of Spiekerooge; Hesse, Abh. Ver. Brem. vii. pp. 135–138.

Notes on new or rare Swedish insects of various orders; Sandahl, Tijdschr. Ent. ii. pp. 209–215.

Catalogue of Insects added to the University Museum at Helsingfors, from 1877–81; Medd. Soc. Fenn. vi. pp. 273–281.

Entomological excursion in South Switzerland, with lists of *Lepidoptera* and *Coleoptera* captured; Rätzer, MT. schw. ent. Ges. vi. pp. 165–198.

Notes on *Coleoptera* and *Hymenoptera* of Sciacca; De Stefani, Nat. Sicil. i. pp. 38–42.

Natural History excursion to Sardinia, with lists of insects, &c., captured in various localities; Magretti, Atti Soc. Ital. xxiii. pp. 18–41, map.

Capture of *Lepidoptera*, *Coleoptera*, *Orthoptera*, *Neuroptera*, *Hemiptera*, *Hymenoptera*, *Diptera*, and *Arachnida* in Catalonia; Cuni y Martorell, An. Soc. Esp. x. pp. 370-380, & 385–389.

Entomological excursion to the Balearic Islands; Wild, Ent. Nachr. vii. pp. 22–27, 40–45, 65–74, & 94-98.

List of insects of various orders collected in the interior of Angola; Girard, J. Sci. Lisb. viii. pp. 225–231, and Capello & Ivens, De Benguella ás Terras de Iácca, ii. pp. 365–370.

Notices of insects (chiefly *Coleoptera*) from Novaya Zemlya, Vaygat's Island, Cape Chelyuskin, Chukchi Peninsula, and Bering's Island; Nordenskiöld, Voyage of the 'Vega,' i. pp. 148 & 343, ii. pp. 53–55, 242 & 292.

Blanchard argues from the similarity of the insects, &c., of South Europe and North Africa, that the Mediterranean Sea is of quite recent origin; C. R. cxiii. pp. 1042–1048; discussion, pp. 1048–1050.

Census of known Indian *Arthropoda*; Blanford, J. A. S. B. l. pt. 2, pp. 268–272.

C. O. Waterhouse, Ann. N. H. (5) viii. pp. 434–436, enumerates a few insects from Ascension: *Coleoptera* (7), *Hymenoptera* (1), *Lepidoptera* (8), *Diptera* (2), *Neuroptera* (2), and *Orthoptera* (4).

Bethune concludes his series of descriptions of insects from Kirby's Fauna Boreali-Americana; Canad. Ent. xiii. pp. 162–170.

List of 8 insects (chiefly *Coleoptera*) taken on the highest peak of Mount Ktaadu, in September, 1881; Hamlin, Ins. inj. Trees, p. 262.

Notice of cave insects, &c., in Virginia; Packard, Am. Nat. xv. pp. 231 & 232.

Notes on collecting in Florida; Hulst, Bull. Brooklyn Soc. pp. 19 & 20.

Notes on collecting in Guatemala; Fletcher, Ent. M. M. xvii. p.

Notes on insects observed in the Argentine Republic; White, Cas. from the Silver Land, i. pp. 110, 112, & 263. 01.

Lists of *Coleoptera*, *Lepidoptera*, *Orthoptera*, and *Hemiptera*, collected in the Straits of Magellan and on the coast of Patagonia, during the survey of H.M.S. 'Alert'; Waterhouse & Butler, P. Z. S. 1881, pp. 80–87.

Economic Entomology.

Pyrethrum as an insecticide; Cook & Riley, Am. Nat. xv. pp. 145–147, 569–572, 744–747, & 817–819.

Fungi as insecticides; Comstock, Rep. Dep. Agric. 1879, pp. 260 & 261; Am. Nat. xv. pp. 52 & 53.

Carbolic acid as a preventative of insect ravages; A. J. Cook, Canad. Ent. xiii. pp. 189–191.

Numbers of insects destroyed by the house wren; Aldrich, Am. Nat. xv. pp. 328 & 329.

On the insect food of the blue-bird in August and September; Forbes, Am. Nat. xv. pp. 66 & 67.

Insects injurious to the olive; Péragallo, Bull. Soc. Ent. Fr. (6) i. pp. lxxi. & lxxii.

Notes on various insects injurious to the crops in Italy; Bull. Ent. Ital. xiii. pp. 208–212; Resoconti, 1881, pp. 12–14.

Insects injurious to the rice-plant; Riley, Am. Nat. xv. pp. 148 & 149, 482 & 483, & 751.

On the destruction of firs, &c., by insects; Packard, Ins. Inj. Trees, pp. 219–227.

Bibliography.

Parts ii.–x. of Waterhouse's "Aid to the Identification of Insects" have appeared within the year (pls. ix.–lxxxiii.).

On the Proceedings of the Entomological Society of London for 1840–46; Kraatz, Deutsche E. Z. xxv. pp. 239 & 240.

On the Appendix to Fabricius's Species Insectorum; Schmidt-Göbel & Dohrn, S. E. Z. xlii. pp. 330–332.

W. L. Distant gives a list of all the existing papers on the Entomology of the Peninsula of Malacca, including Penang and Singapore; Field, lviii. p. 897.

Are generic names to date from the original author, or from the author who uses them in a modified sense, or defines them most accurately? Karsch, B. E. Z. xxv. pp. 229–231.

List of insects (chiefly fossil) described by Weyenbergh ; Period. Zool. Argent. iii. pp. 355–360.

Dates of publication of Entomological Reports ; Comstock, Rep. Dep. Agric. 1880, p. 275.

Kraatz gives an index to his papers published in B. E. Z. or Deutsche E. Z. from 1857 to 1880 ; Deutsche E. Z. xxv. pp. 1–9.

Dyseritina longisetosa, g. & sp. nn., Westwood. Tr. E. Soc. 1881, pp. 601–603, pl. lxii. figs. 1, 1*a*–1*i*; Ceylon. (Affinities altogether doubtful ; apparently belongs to the *Neuroptera* or *Orthoptera*.)

Collecting, Preserving, &c.

New collecting net ; Hoyt, Bull. Brooklyn Soc. i. p. 27, woodcut.

Remarks on insect boxes ; Horn, Am. Nat. xv. p. 401.

On pinning insects ; Borgmann, Ent. Nachr. vii. pp. 13 & 14.

Plan for a combined insect-cabinet and book-cupboard ; Kraatz, Ent. Monatsbl. ii. pp. 41–43.

On labelling specimens ; Stainton, P. E. Soc. 1881, pp. lv.–lx.

Necrology for 1880 [Obituary notices of Entomologists] ; Psyche, iii. pp. 177 & 178.

COLEOPTERA.

BY

W. F. Kirby, M.E.S., &c.

The General Subject.

Abeille de Perrin, E. Contribution à la Faune Coléoptérologique d'Europe et des pays voisins. Ann. Soc. Ent. Fr. (6) i. pp. 97–128.

Includes notes on various known species (in addition to new ones) chiefly supplementary to Peyron's recent monograph of the *Malachiidæ*, in l'Ab.

——. Contribution à la Faune Coléoptérologique de la Méditerranée. Bull. Soc. Toulouse, xiv. pp. 233–262.

Remarks on new or interesting species of *Rhipidophoridæ*, *Cantharidæ*, and *Œdemeridæ*.

Arribálzaga, E. L. Catalogo de la coleccion entomologica de E. L. Holmberg. Nat. Arg. i. [1878] pp. 300–314 & 344–352.

Extends as far as the genus *Selenophorus*. Several of the more interesting species are discussed, and a few new ones described.

BATES, H. W. Biologia Centrali-Americana (*cf. Insecta*, General Subject, sub Godman & Salvin) *Coleoptera*, i. (1) pp. 1–40, pls. i. & ii.

Extends from *Tetracha* to *Panagæus*.

BEDEL, L. Faune des Coléoptères du Bassin de la Seine. 1ière partie Tome i. *Carnivora—Palpicornia.* (Ann. Soc. Ent. Fr. vol. hors série), plate.

The first volume of this work is now concluded. The portion published in 1881 includes pp. xxiv. (preface, abbreviations, vocabulary, and errata) and 289–360 (*Palpicornia*). 2 new genera and 3 new species are described, and 2 species are renamed. The plate illustrates the structure of *Coleoptera* generally.

BROUN, T. Manual of the New Zealand *Coleoptera*. Part ii. Wellington: 1881, 8vo, pp. viii. xxi.–xxiii. 653–744.

Includes index to genera, and descriptions of 180 new or previously omitted species, bringing up the total number of New Zealand *Coleoptera* to 1321. Many new genera are also described.

CHAUDOIR [BARON]. See SALLÉ.

DESBROCHERS DES LOGES, —. Coléoptères nouveaux du Nord de l'Afrique. Bull. Acad. d'Hippone, No. 16.

[Not seen by the Recorder.]

FAIRMAIRE, L. Essai sur les Coléoptères des îles Viti (Fidgi). Ann. Soc. Ent. Fr. (6) i. pp. 243–318, 461–492.

Many known species, chiefly those described by the author in Pet. Nouv. and Le Nat., are here redescribed.

FIORI, A. Saggio di un Catalogo dei Coleotteri del Modenese e del Reggiano. *Cicindelidæ & Carabidæ.* Ann. Soc. Mod. (3) xv. pp. 61–100.

GOBERT, —. Catalogue raisonnée des Coléoptères des Landes. Bull. Soc. Toulouse, xii. pp. 55–93, 156–179, xiv. pp. 46–164. [*Cf.* Zool. Rec. xvii. *Ins.* p. 12.]

Extends from *Copridæ* to *Ptinidæ*, and *Tentyriidæ* to *Trichosomidæ*. Includes numerous notes on larvæ, &c.

GORHAM, H. S. Biologia Centrali-Americana (*cf. Insecta*, General Subject, sub Godman & Salvin). *Coleoptera*, iii. (2) pp. 25–112, pls. iii.–vi.

Extends from *Platyceros* to *Atractocerus*.

HEYDEN, L. VON. Catalog der Coleopteren von Sibirien, mit Einschluss derjenigen der turanischen Länder, Turkestans, und der chinesischen Grenzgebiete. Mit specieller Angabe der einzelnen Fundorte in Sibirien und genauer Citirung der darauf bezüglichen einzelnen Arbeiten nach eigenem Vergleich, sowie mit besonderer Rücksicht auf die geographische Verbreitung der einzelnen Arten über die Grenzländer, namentlich Europa und Deutschland. Herausgegeben von der Deutschen entomologischen Gesellschaft als besonderes Heft der Deutschen entomologischen Zeitschrift. Berlin: 1880–81, 8vo, pp. 24, 224.

The nature of this work is sufficiently indicated by the lengthy title.

[Heyden, L. von.] Zweites Verzeichniss von Coleopteren aus Asturien. Deutsche E. Z. xxv. pp. 241–246.

Includes occasional notes on some of the species enumerated.

Karsch, F. Die Käfer der Rohlfs'schen Afrikanischen Expedition, 1878–79. B. E. Z. xxv. pp. 41–50, pl. ii. *Cf.* also Rohlfs's Kufra (*supra*, p. 11), pp. 370–378.

List of captures, and descriptions of new species.

——. Zur Käferfauna der Sandwich-, Marshall-, und Gilberts-Inseln. B. E. Z. xxv. pp. 1–14, pl. i.

Includes lists of the known species obtained by Finsch in 1872, and descriptions of several new ones.

Kolbe, H. Bemerkungen über das Variieren der Arten, und die Bestimmung ihres relativen Alters unter den Gattungsgenossen. JB. zool. Sect. Westf. Ver. ix. pp. 48–52.

Whereas *Cicindela sylvatica* varies little, and has few allies, the contrary is the case with *C. hybrida*. These are typical of different grades of species, which may be termed isolated and communal. Isolated forms are generally much rarer than communal, and represent old and moribund species. These remarks are illustrated by references to various other *Coleoptera*.

Kraatz, G. Ueber die Wichtigkeit der Untersuchung des männlichen Begattungsgliedes der Käfer für Systematik und Art-Unterscheidung. Deutsche E. Z. xxv. pp. 113–126.

The bulk of this paper is occupied with analyzing the opinions or observations of previous writers. The author's own conclusions are as follows: 1. Large natural groups generally, but not always, exhibit a typical form of penis; 2. The validity of genera can sometimes be tested by a different form of penis, when more obvious external characters are deficient; 3. Closely allied species sometimes exhibit a very different character of penis. In conclusion, the general structure of the penis, especially in the families *Carabidæ*, *Dytiscidæ*, and *Cetoniidæ*, is discussed.

Leconte, J. L. List of *Coleoptera* collected in 1880 in Manitoba, and between Lake Winnipeg and Hudson's Bay. Rep. Progress Surv. Canada, 1879–80, c. pp. 70–74.

Lewis, G. On the supposed effect of the winters in Japan on the smaller *Coleoptera*. Ent. M. M. xviii. pp. 5–7.

The author attributes the scarcity of small *Coleoptera* in Japan to the dryness of the winter season.

——. The influence of Volcanoes on Flying *Coleoptera*. Ibid. p. 138.

Observations on a volcano in South Yezo. *Elateridæ* and *Silphidæ* were carried up almost to the crater by the breeze.

Lorifern, — & Poulain, —. Catalogue des Coléoptères du département de l'Yonne. 1ière partie, 8vo, pp. 77.

This catalogue, noticed in Nouv. et faits, ii. pp. 147 & 148, extends to the Lamellicorns.

MÄKLIN, W. *Coleoptera* insamlade under den Nordenskiöld'ska Expeditionen 1875 på några öar vid Norges Nordvestkust, på Novaja Semlya och ön Waigatsch samt vid Jennissej i Sibirien. Sv. Ak. Handl. (2) xviii. 4, pp. 48.

A few new species and varieties are described, and the descriptions of others published by Mäklin in Œfv. Finsk. Soc. 1876–77, are repeated. Several pages of introductory matter are prefixed.

MESTRE, G. De l'exploration des grottes au point de vue Entomologique. Bull. Soc. Toulouse, xiii. pp. 22–29.

Relates chiefly to the best means of collecting cave-haunting *Coleoptera*.

NÖRDLINGER, A. Lebensweise von Forstkäfern, oder Nachträge zu Ratzeburg's Forstinsecten. 2te vermehrte Auflage. Stuttgart : 1880, pp. 6 & 74, figs.

[Not seen by the Recorder.]

PIOLTI, G. I Coleotteri di Rivoli (Piemonte): studio. Ann. Acc. Agric. Tor. xxiii.

[Not seen by the Recorder.]

RAGUSA, E. Addenda: *Carabidæ*, *Dytiscidæ*, *Gyrinidæ*, *Hydrophilidæ*, *Staphylinidæ*, *Pselaphidæ*, *Clavigeridæ*, et *Silphidæ* Siciliæ. Palermo: 1881.

[Not seen by the Recorder.]

REICHENAU, W. VON. Ueber den Ursprung der secundären männlichen Geschlechtscharaktere, insbesondere bei den Blatthornkäfern. Kosmos, x. pp. 172–194, pl. v.

After discussing sexual selection in insects, the writer concludes that the horns and appendages of the *Lucanidæ*, *Dynastidæ*, &c., cannot have originated in this manner, but are due to the law of compensation of growth.

REITTER, E. Bestimmungs-Tabellen der europäischen Coleopteren. IV. Enthaltend die Familien *Cistelidæ*, *Georyssidæ*, und *Thorictidæ*. Verh. z.-b. Wien, xxxi. [for 1881, published in 1882] pp. 67–96.

A few new species are described and corrections to former papers added. *Cistela*, Geoffr., as used by the author, = *Byrrhus*, Linn., and *Anobium*, Fabr., takes the name of *Byrrhus*, Geoffr. The plate represents the male organs of *Cistelidæ*.

——. Bestimmungs-Tabellen der europäischen Coleopteren. V. Enthaltend die Familien: *Paussidæ*, *Clavigeridæ*, *Pselaphidæ*, und *Scydmænidæ*. L. c. pp. 443–592, pl. xix.

The plate represents the antennæ of various species of *Machærites* and *Bythinus*.

——. Zur Pselaphiden- und Scydmæniden-Fauna Syriens. *L. c.* pp. 331–336.

22 species enumerated, many new.

[Reitter, E.] 60 synonymische Bemerkungen. Ent. Monatsbl. ii. pp. 85–88.

Relates to species of *Euplectus*, *Corticaria*, *Dermestes*, *Ptinus*, *Helops*, &c., but the notes are too numerous to be noticed here in detail.

——. Neue und seltene Coleopteren im Jahre 1880, in Suddalmatien und Montenegro gesammelt und beschrieben. Deutsche E. Z. xxv. pp. 177–228, pls. vi. & vii.

Includes a list of the more interesting species obtained, with remarks on localities, variation, &c. 42 new species are subsequently described by Reitter and others. Pl. vi. chiefly consists of details.

Sallé, A. Notice necrologique de le baron de Chaudoir. Ann. Soc. Ent. Fr. (6) i. pp. 181–188.

Includes a list of his publications.

Schaufuss, L. W. Zoologische Ergebnisse von Excursionen auf den Balearen. Verh. z.-b. Wien, xxxi. pp. 619–624, pl. xxi.

Relates almost exclusively to *Coleoptera*.

Schaupp, F. G. List of the described Coleopterous larvæ of the United States, with some remarks on their classification. Bull. Brooklyn Soc. ii. pp. 1–3, 9, 10, 21, 22, 29 & 30.

Sharp, D. Insecta Scotica. The *Coleoptera* of Scotland (concluded). Scot. Nat. vi. pp. 47, 48, 88–96 & 192.

Extends from *Timarcha* to *Cassida*.

——. On some new *Coleoptera* from the Hawaiian Islands. Tr. E. Soc. 1881, pp. 507–534.

Includes species of *Nitidulidæ*, *Anobiidæ*, *Aglycerida*, and *Cerambycidæ*, with general remarks.

——. Some new species and genera of *Coleoptera* from New Zealand. Ent. M. M. xviii. pp. 46–51.

A few general observations are prefixed.

Wallengren, H. D. J. Coleoptera Transvaliensia. Bidrag till Kännedom om Transvaal-Landets i S. Afrika Coleopter-Fauna. Ent. Tidskr. ii. pp. 9–22.

Waterhouse, C. O. On the Coleopterous Insects collected by I. Bayley Balfour in the Island of Socotra. P. Z. S. 1881, pp. 469–478, pl. xliii.

24 species enumerated, showing decidedly African affinities. 2 new genera and 12 new species are described.

Westhoff, F. Die Käfer Westphalens zusammengestellt von F. Westhoff. I. Abtheilung. Verh. Ver. Rheinl. xxxvii. Supplement. Bonn: 1881, 8vo, pp. xxviii. & 140.

Extends to the *Heterocerida*. The Introduction includes remarks on the character of the district, and its fauna as compared with that of other parts of Germany, and list of authorities.

Europe.

Additions and corrections to Stein & Weise's "Catalogus Coleopterorum Europæ"; Schaufuss, Ent. Nachr. vii. pp. 98–100.

Von Heyden states that his collection of *Coleoptera* of the European region consists of 12,721 good species; Deutsche E. Z. xxv. p. 256, Ent. Monatsbl. ii. p. 156.

Captures of *Coleoptera* in 1881, T. Wood, Ent. M. M. xviii. p. 159; in the Forest of Dean, Hodgson, *op. cit.* xvii. pp. 207 & 208; at Hastings, Bloomfield & others, *op. cit.* xviii. pp. 40 & 139; in Warwickshire, Blatch., *op. cit.* pp. 112 & 113; at Askham Bog, York, and in the Isle of Wight, Fowler, *op. cit.* xviii. pp. 7–9, and xvii. p. 235, xviii. pp. 70 & 71.

Additions to the *Coleoptera* of Dulwich; Wood & Pim, Rep. Dulwich Soc. iv. pp. 42–44.

Captures of *Coleoptera* in France, Becker, CR. Ent. Belg. xxv. pp. xlix. lxxix. lxxx. & lxxxii.; at Cannes, Colfort, Feuil. Nat. xii. p. 22; at Fontainebleau, Bonnaire, Bull. Soc. Ent. Fr. (6) i. p. xix.; at Nice, &c., Péragallo, *op. cit.* pp. lxxiv. & lxxv.; on the Pic du Midi, Larcenne, Bull. Soc. Toulouse, xiv. pp. 231 & 232; on the Pic d'Alaric, Gavoy, Feuill. Nat. xi. pp. 122–125.

Kraatz calls attention to Companyo's Catalogue of the *Coleoptera* of the Eastern Pyrenees, and to Gordon's Catalogue of the *Coleoptera* of Lorraine, as unnoticed by Hagen and others; Ent. Monatsbl. ii. pp. 81–83.

The number of Dutch *Coleoptera* now known is estimated at 2638 species, as against 752 known in 1848; Everts, Tijdschr. Ent. xxiv. pp. cxv. & cxvi. He adds (*l. c.* pp. cxxix.–cxl.) additions and corrections to former lists of Dutch *Coleoptera*, and a list of species occurring near the frontier, which may be expected to be added to the fauna.

De Borre, and others, have published the commencement of several local lists of Belgian *Coleoptera* under the titles of "Matériaux pour la Faune Entomologique de la Province d'Anvers—du Brabant—Province de Namur—du Luxembourg Belge—des Flandres & du Nord." These appear in Bull. du Cercle Floral d'Anvers; Bull. Soc. Linn. Belg.; Bull. Soc. Nat. Dinantais; Publ. Luxemb. xix.; and Bull. Sci. Nord.; they have also been published separately.

On the geographical distribution of Belgian *Coleoptera*, Leesberg & Kerremans, Tijdschr. Ent. xxiv. pp. cxi.–cxiv. Additions to the *Coleoptera* of Belgium and list of captures; CR. Ent. Belg. xxv. pp. xxxiv.–xxxvi., l. & li., lxx., lxxxiv., xcvii.–xcix., cviii.–cx., cxxi., cxxxviii., cxxxix. & clix.

Kittel continues his catalogue of the *Coleoptera* of Bavaria, from *Cyphon* to *Ceutorrhynchus*; CB. Regensb. xxxiv. pp. 29–32, 35–48, 61–80, 89–96, 104–112, 127, 128, 143–160, 181–192, xxxv. pp. 35–48, 71–80, 89–96, 101–112, 129–144, 147–160, 173–176.

Captures of *Coleoptera* in Germany; Preudhomme de Borre, CR. Ent. Belg. xxv. pp. xix.–xxi., xlvii.–l., lxxviii.–lxxxi. Notes on various *Coleoptera* occurring near Munich; Harold, MT. Münch. ent. Ver. v. pp. 93–104. Additions to the *Coleoptera* of Silesia; Letzner, JB. schles. Ges. lviii.

pp. 209 & 210. List of *Coleoptera* captured on the Island of Arngast; Huntemann, Abh. Ver. Brem. vii. pp. 142 & 143.

Resemblance between the *Coleoptera* found near the salt lake of Eisleben and those of the Volga and South France; Kiesenwetter, Isis, 1877, p. 145.

After a thaw and flood in winter, *Coleoptera*, &c., are frequently washed up on the banks of streams in great abundance; a list of 157 *Carabidæ* captured in this manner is added: Teuckhoff, JB. Westf. Ver. ix. pp. 24–30.

Dapsa denticollis, Germ., *Lycoperdina bovistæ*, Linn., *Tychius hæmatocephalus*, Gyll., and *Ceutorrhynchus smaragdinus*, Bris., noticed from Thuringia; Krause, Ent. Nachr. vii. pp. 354 & 355.

Captures of *Coleoptera* in Istria; Stussiner, Deutsche E. Z. xxv. pp. 81–103.

Excursion to South Hungary in May, 1880, with list of *Coleoptera* captured on railway embankments, &c.; Bodenmeyer-Heinrichau, Ent. Nachr. vii. pp. 245–255, 257–271; Ent. M. M. xviii. pp. 111 & 112.

Entomological excursion to Dalmatia, the Herzegovina, and Montenegro, in 1880, with list of *Coleoptera* captured; Hopffgarten, Ent. Nachr. vii. pp. 101–107, 123–130, & 137–143; *cf.* also Schirmer, *op. cit.* pp. 233–238.

List of *Coleoptera* of Cracow; Lomnicki & Jachno, Sprawoyd. Kom. Fizyjogr. xiv. (pt. 2), pp. 3–12, & 251–253.

Second supplementary list of *Coleoptera* of Jaroslav; Kokujew, Bull. Mosc. lv. 2, pp. 23–32.

North Africa.

Captures of *Coleoptera* in Upper Egypt; Gredler, SB. z.-b. Wien, xxxi. pp. 21 & 22.

General characteristics of Algerian desert beetles; Vogt, Natur, Sept. 1881 (*cf.* Kosmos, x. p. 382).

America.

Austin, E. P. Supplement to the Check List of the *Coleoptera* of America, north of Mexico. Boston: 1880, 8vo, pp. 67.

Notes on *Coleoptera* for beginners; Siewers, Rep. E. Soc. Ont. 1880, p. 34.

List of papers on North American *Coleoptera*, published in various journals; Schaupp, Bull. Brooklyn Soc. iii. pp. 64, 82, 90, 94, & 100; iv. pp. 8, 15, 16, 24, 31, 32, 36 & 46.

Synoptic tables of the North American species of the following genera are given in Bull. Brooklyn Soc. i.–iv. i. pl. i., with occasional woodcuts, &c.: *Homophron*, *Elaphrus*, *Amblychila*, *Omus*, *Tetracha*, *Diachila*, *Blethisa*, *Loricera*, *Trachypachys*, *Notiophilus*, *Opisthius*, *Nebria*, *Pelophila*, *Leistus*, *Calosoma*, *Carabus*, *Nomaretus*, *Cychrus*, *Sphæroderus*, *Scaphinotus*, *Pemphus*, *Brennus*, *Metrius*, *Promecognathus*, *Pasimachus*, *Scarites*, *Dyschirius*, *Ardistomis*, *Aspidoglossa*, *Clivina*, *Schizogenius*, *Pachyteles*, *Brachynus*, *Panagæus*, *Micrixys*, *Morio*, *Helluomorpha*, *Galerita*, *Zuphium*, *Diaphorus*, *Casnonia*, *Leptotrachelus*, *Ega*, *Lachnophorus*,

Anchonoderus, *Anchus*, *Plochionus*, *Loxopeza*, *Lebia*, *Dianchomena*, *Aphelogenea*, *Loxandrus*, *Evarthrus*, *Lophoglossus*, *Holciophorus*, *Dicælus*, *Diplochila*, *Licinus*, *Evarthrus*, *Anisodactylus*, *Chlænius*, *Brachylobus*, *Anomoglossus*, *Lachnocrepis*, *Anatrichis*, *Oodes*, *Evolenes*, *Tetragonoderus*, *Nematotarsus*, *Dromius*, *Axinopalpus*, *Metabletus*, *Apenes*, *Pinacodera*, *Cymindis*, *Apristus*, *Blechrus*, *Tecnophilus*, *Philophuca*, *Eucærus*, *Callida*, *Euproctus*, and *Oneta*.

Hints on collecting *Coleoptera* in America; Schaupp, Schmelter & Jülich, Bull. Brooklyn Soc. i. pp. 7 & 11, 17 & 18, 25, 26, 33, 34, & 41; iii. pp. 40, 96 & 99; iv. pp. 10 & 14.

Biological notes on various *Coleoptera*; Schaupp, *l. c.* iv. p. 23.

On rearing beetles in captivity; *id. l. c.* i. pp. 2 & 3, 35, 36, 67, 69–72, & 78; ii. p. 98.

On collecting *Coleoptera* on Coney Island; *id. l. c.* ii. pp. 79–81.

Supposed carnivorous beetles often herbivorous; Riley, Am. Nat. xv. pp. 305–307.

22 species of *Coleoptera* obtained from hickory twigs; Leconte, Rep. E. Soc. Ont. 1880, p. 16.

Captures of *Coleoptera* at Belleville, Canada, in 1880; J. T. Bell, Canad. Ent. xiii. pp. 58–60.

List of *Coleoptera* observed and collected in the neighbourhood of Buffalo; Zesch & Reinecke, Bull. Buff. Soc. iv. pp. 2–17.

Notes on *Coleoptera* in Chiriqui; Champion & Fowler, Ent. M. M. xviii. p. 158.

Physiology, Bibliography, &c.

Semper remarks on mimicry in *Coleoptera*, and figures five pairs of mimics; Natural Conditions of Existence, p. 390, fig. 103.

Subelytral air-passages in various *Coleoptera* described; Gessler, P. Am. Ass. 1880, pp. 667–669, woodcut.

36 monstrosities of various *Coleoptera* described and figured by Heyden & Kraatz; Deutsche E. Z. xxv. pp. 105–112, pls. ii. & iii.

Procrustes coriaceus, *Dorcus parallelipipedus* and *Chrysomela tenebricosa* are liable to the attacks of *Acari* belonging to the new genus, *Canestrinia*; Berlese, Atti Ist. Venet. (5) vii. pp. 747–751, plate.

Suggestions for accurately measuring the dimensions of small *Coleoptera*; Paasch, B. E. Z. xxv. p. 232.

On the localities of various *Coleoptera*; Dohrn, S. E. Z. xlii. pp. 369 & 370.

List of species described by Mannerheim in Hummel's Essais; Heyden, Deutsche E. Z. xxv. p. 253.

High prices paid for exotic *Coleoptera*; Ent. M. M. xvii. p. 236.

CICINDELIDÆ.

DUGÉS, E. Descripciones de Coleópteros indígenas. Nat. Mex. v pp. 17–30, pl. ii.

Includes descriptions and figures of the Mexican species of *Tetracha* and *Cicindela*; none new.

Critical synonymic list of the *Cicindelidæ* and *Carabidæ* described from New Caledonia by Montrouzier & Perroud; Fauvel, Bull. Soc Ent. Fr. (6) i. pp. cxvii.–cxix.

The following known species of *Cicindelidæ* are figured or specially noticed by H. W. Bates [Biol. Centr. Am. *Col.* i. (1)]: *Tetracha carolina*, L., var. *cyanides* from Mexico, p. 1, *sobrina*, Dej. (and varr. *geniculata*, Chevr., and *ignea*, Bates) p. 2, *angustata*, Chevr. (= *fuliginosa*, Bates), fig. 1, p. 3, *Pseudoxychila tarsalis*, Bates, fig. 2, *Oxychila polita*, Bates, fig. 3, *Oxygonia boucardi*, Chevr., fig. 25, p. 4, *Cicindela viatica*, fig. 4, *semicircularia*, Klug, fig. 19, p. 6, *hydropheba*, Chevr., fig. 6, *mellii*, Chaud. (= *calochroides*, Chaud.) fig. 7, p. 8, *flohri*, Bates, fig. 10, *mexicana*, Klug, (= *decastigma*, Chevr., = *belti*, Bates), *roseiventris*, Chevr., fig. 8, *carthagena*, Dej., fig. 9, *klugi*, Dej., fig. 11, p. 9, *flavo-punctata*, Chevr., fig. 12, *ponderosa*, Thoms., fig. 18, p. 10, *pallifera*, Chaud., fig. 12, *graphiptera*, Dej. (and var. *obliquata*, Motsch., = *obliquans*, Chaud.), p. 11, *macrocnema*, Chaud., fig. 17, *panamensis*, Bouc., (and var. *chevrolati*, Bouc., *vide* infrà), *aurora*, Thoms., var. fig. 15, p. 12, *papillosa*, Chaud., fig. 14, *cyaneiventris*, Chevr. (= *cervina*, Lec.), p. 13, *nebulosa*, Bates, fig. 16, *hemichrysea*, Chevr., (= *inspersa*, Chevr., = *cyanosparsa*, Chaud.), p. 14, *Odontochila salvini*, Bates, fig. 24, p. 16, and *Ctenostoma maculicorne*, Chevr. (= *sigma*, Bates), fig. 21, pl. i. p. 18.

Notes on French *Cicindelidæ*; Xambeu, Feuill. Nat. xi. pp. 67–70. On collecting; Decaux, *op. cit.* p. 73.

Cicindelidæ popularly discussed, and several Canadian species figured; Rogers, Rep. E. Soc. Ont. 1880, pp. 22–25, figs. 4–9.

List of *Cicindelidæ* of the neighbourhood of New York; Bull. Brooklyn Soc. i. p. 28.

On collecting larva of *Cicindelidæ*; Schaupp, *op. cit.* ii. pp. 23 & 24.

Tetracha australis, Chaud., and *Styphloderma asperatum*, Waterh.; figured by Waterhouse, Aid, &c., i. pls. xvii. & li.

Cicindela hemicycla, Montr., = *interrupta*, Fabr.; Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxvii. *C. flexuosa*: after the white markings have become obliterated, they may be restored by soaking the specimens in petroleum for a fortnight, and then drying them; Caulle, Feuill. Nat. xii. p. 12. *C. littoralis*, varr. *lugens*, Dahl, and *aphrodisia*, Truq., from Sicily noticed, and the former figured; Ragusa, Nat. Sicil. i. p. 5, pl. i. fig. 1. *C. maritima*, Dej.: Kraatz maintains that this is a good species, and not a var. of *C. hybrida*; Deutsche E. Z. xxv. p. 250. *C. maura*: on its occurrence in France; Bourgeois, Feuill. Nat. xi. p. 91. *C. turkestanica*, Ball., and *maracandensis*, Solsky, differentiated; Kraatz, *l. c.* pp. 321 & 322. *C. witchilli*, Hope, and *rufo-marginata*, Boh., noticed; Dohrn, S. E. Z. xliii. pp. 310 & 318. *C. vitiensis*, Blanch., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 214.

New genera and species:—

Vata, Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxvii. Not characterized; type, *Cicindela thomsoni*, Perroud.

Pœcilocaulus, Fairmaire, Le Nat. iii. p. 349, Ann. Soc. Ent. Fr. (6) i. p. 466. Allied to *Stenocera* (?); type, *P. picturatus*, sp. n., *ll. cc.* Viti.

Megacephala revoili, Lucas, Bull. Soc. Ent. Fr. (6) i. p. ci. South Africa.

Iresia pulchra, Bates, Biol. Centr. Am. *Col.* i. (1) p. 17, Chontales.

Oxygonia boucardi, Chrevrolat, Bull. Soc. Ent. Fr. (6) i. p. vii., Panama.

Cicindela ioessa, p. 5, *hægii*, fig. 5, *clarina*, p. 6, *dysenterica* (Chaud. MS.), p. 7, *æneicollis* (Chaud. MS.), fig. 13, p. 13, and *viridisticta* (Chaud. MS.), fig. 20, p. 14, Bates, *l. c.* Mexico; *C. galathea*, Thieme, B. E. Z. xxv. p. 97, Turkistan; *C. nitidipes*, p. 9, *minax* and *inanis*, p. 10, Wallengren, Ent. Tidskr. ii., Transvaal; *C. virida*, Dohrn, S. E. Z. xlii. p. 81, Bagamoyo.

Odontochila leptalis, pl. i. fig. 23, Mexico, p. 15, *championi* and *cinctula*, Guatemala, p. 16, *chiriquina*, Panama, p. 17, Bates, *l. c.*

Phyllodroma argentina, Arribálzaga, Nat. Arg. i. p. 309, Salta, Buenos Aires.

Dromica fossulata, Wallengren, *l. c.* p. 11, Transvaal; *D.* (*Myrmecoptera*) *oatesi*, Westwood, Oates, Matabele Land, p. 359, pl. G, fig. 5, & pl. H, figs. 1, 1*a*, 1*b*; *D.* (*M.*) *holubi*, Dohrn, *l. c.* p. 318, both from S. Africa.

Carabidæ.

L'Abeille, vol. xviii. pp. 289–524, includes descriptions of various *Carabida* (*Feronia* to *Anillus*), by De Marseul.

Homophronides.

Homophron oblongiusculus, Chevr., noticed and figured by Bates, Biol. Centr. Am. *Col.* i. p. 19, pl. ii.

Elaphrides.

Notiophilus biguttatus, Fabr. Irregular punctuation; T. Wood, P. E. Soc. 1881, p. xxvii.

Notiophilus specularis, sp. n., Bates, Biol. Centr. Am. *Col.* i. (1) p. 19, pl. ii. fig. 2, Mexico, Guatemala.

Carabides.

Nebria gyllenhali, Schönh. Varieties from North Norway noticed; Mäklin, Sv. Akad. Handl. (2) xviii. (4) p. 11.

Procrustes rugosus, Dej. var. *nitidior*, from Lesina noticed; Reitter, Deutsche E. Z. xxv. p. 180.

Carabus. Short notes on various species; Kraatz, Ent. Monatsbl. ii. pp. 53–56. Notes on the species occurring at Corbières; Mayet, Bull. Soc. Ent. Fr. (6) i. pp. cvii.–cx; *cf.* also Géhin, *op. cit.* pp. cxxiii.–cxxv. *C. auro-nitens* and *punctato-auratus* are not specifically distinct; Mayet, *l. c.* pp. clxi. & clxii. *C. auratus* var. *siculus*, described; Ragusa, Nat. Sic. i. p. 62. *C. comptus*, Dej., and varieties discussed, varr. nn. *hopffgarteni*, *merkli*, and *auro-sericeus*, described; Kraatz, Ent. Monatsbl. ii. pp. 49–53. *C. emarginatus* var. *bohatschi*, from North India, described; Reitter, Deutsche E. Z. xxv. p. 269. *C. intricatus* and its varieties discussed; Haury, Le Nat. iii. pp. 438, 446, & 447. *C. latreillii*, Dej., and its varieties discussed and differentiated from *C. alpinus*; Stierlin, MT.

schw. ent. Ges. vi. pp. 154–159 (noted as pre-occupied, and renamed var. *stierlini* ; Heyden, *op. cit.* p. 198). *C. monilis*, Fabr., variation discussed with reference to Géhin's remarks; Kraatz, Deutsche E. Z. xxv. pp. 167–169. *C. obliquus*, Thoms., its claim to be considered distinct from *violaceus* discussed ; *id. l. c.* p. 272. *C. olympiæ*, Sella, var. *sellæ*, described ; Stierlin, *l. c.* pp. 141 & 142. *C. purpurascens* var. *palliardii* (= *purpureus*, Pall.), from Egerland, described ; Gradl., Ent. Nachr. vii. p. 308. *C. regalis*, Fisch., var. *jacutus*, Mannerh., and *C. æruginosus* and var. *æreus*, Fisch., noticed ; Mäklin, Sv. Ak. Handl. (2) xviii. (4) p. 19. *C. truncaticollis*, Esch., noticed and figured ; Nordenskiöld, Voyage of the Vega, ii. p. 55. *C. violaceus*, several doubtful forms near this discussed ; Preudhomme de Borre, CR. Ent. Belg. xxv. pp. lxxxii. & lxxiii., cvii. & cviii.

Ceroglossus chilensis var. *fallaciosus*, described ; Kraatz, Ent. Monatsbl. ii. p. 56.

Calosoma. The following known species are figured or specially noticed by Bates (Biol. Centr. Am. *Col.* i. (1) : *C. auro-cinctum*, Chaud. (= *splendidum*, Perb.), fig. 10, p. 20, *angulatum*, Chevr., fig. 12, *peregrinator*, fig. 11, p. 21, *lave*, Dej. (= *chevrolati*, Dej.), fig. 8, p. 22, *striatipenne*, Chaud., fig. 9, *blaptoides*, Putz., fig. 7, *dolens*, Chaud., fig. 20, and *depressicolle*, Chaud., fig. 6, p. 23, pl. ii. *C. blaptoides*, Putz. : both sexes described in full ; Géhin, Bull. Soc. Ent. Fr. (6) i. pp. cxxxii.–cxxxiv. *C. calidum* and *scrutator*, Fabr., popularly described and figured ; Fletcher, Rep. E. Soc. Ont. 1880, pp. 20 & 21, figs. 1 & 2. *C. scrutator*, habits ; Murray, Canad. Ent. xiii. pp. 18 & 19.

Pantophyrtus, g. n., Thieme, B. E. Z. xxv. p. 98. Allied to *Carabus* : mentum emarginate, middle tooth subacute, shorter than the lateral lobes ; head robust, long, cheeks laterally dilated, prominent, mandibles strong, long, scarcely arched : type, *P. turcomannorum*, sp. n., *l. c.* Margelan.

New species :—

Brachycœlia concolor, Waterhouse, P. Z. S. 1881, p. 80, Puerto Bueno.

Carabus cavernicola, Kraatz, Ent. Monatsbl. ii. p. 157, Dobrudscha. *C. dekraatzi*, p. 265, *semi-coriaceus*, p. 266, *gracilentus*, p. 267, *crassisculptus* and *manifestus*, p. 268 ; *id*, Deutsche E. Z. xxv. China.

Sphodristus separandus (= *bohemani*, Feld., *nec.* Mén.), *id. l. c.* p. 170, Talyche.

Calosoma abyssinicum, Gestro, Ann. Mus. Genov. xvi. p. 201, Shoa. *C. simplex*, Leconte, Bull. Brooklyn Soc. i. p. 61, California.

Cychrides.

Cychrus feeding on snails ; Schaupp, Bull. Brooklyn Soc. i. p. 20.

Damaster capito, sp. n., Lewis, Ent. M. M. xvii. p. 197, Japan.

Cychrus balcanicus, sp. n., Hopffgarten, Ent. Nachr. vii. p. 21, Bulgaria.

Ctenodactylides.

Pionycha rubricollis, sp. n., Arribálzaga, Nat. Arg. i. p. 313, Buenos Aires.

Galeritides.

Drypta iris, Waterh. (*nec* Cast.), renamed *waterhousii*; R. Oberthür, Bull. Soc. Ent. Fr. (6) i. p. lxiii.

Polystichus inornatus, sp. n., Gestro, Ann. Mus. Genov. xvi. p. 658, Shoa.

Zuphium longicolle, sp. n., Leconte, Bull. Brooklyn Soc. ii. p. 62, California, Texas.

Brachynides.

Rougemont, P. de. Observations sur l'organe detonant de *Brachinus crepitans*, Oliv.; MT. schw. ent. Ges. vi. pp. 99–115.

Contains an elaborate anatomical description, in the main confirmatory of the account previously given by Dufour, with observations on the chemical properties of the gas, &c.

Lebiides.

Cymindis fascipennis, Küst., noticed and figured; Ragusa, Nat. Sicil. i. p. 5, pl. i. fig. 2.

Dromius clathratus, Klug, noticed; Dohrn, S. E. Z. xlii. p. 318.

Lebia grandis, Hentz, destructive to *Doryphora decemlineata*, noticed and figured; Comstock, Rep. Dep. Agric. 1879, p. 245, pl. v. fig. 3.

Endynomena hubneri, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (1) i. p. 245.

Uvea, g. n., Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxviii. Not characterized; type, *Cymindis stigmula*, Chaud., = *C. geophila*, Montr.; Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxviii.

New species:—

Callida platynoides, Horn, Bull. Brooklyn Soc. iv. p. 55, California, Utah.

Philophuga castanea, id. *l. c.* p. 54, California.

Pinacodera semisulcata and *sulcipennis*, d. *l. c.* p. 40, California.

Hystricopus pudens, Wallengren, Ent. Tidskr. ii. p. 11, Transvaal.

Tetragonoderus flavo-vittatus, Waterhouse, P. Z. S. 1881, p. 471, Socotra.

Pericalides.

Pectinitarsus, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 245. Allied to *Thyreopterus* and *Nycteis*; type, *P. holomelas*, sp. n., *l. c.* p. 216, Viti.

Pamponerus, g. n., Fairmaire, Le Nat. iii. p. 381. Allied to *Catascopus* and *Thyreopterus*; type, *P. godeffroyi*, sp. n., *l. c.*, Duke of York Island.

Catascopus obliquatus, sp. n., *id. l. c.* New Britain.

Ozenides.

Bates (Biol. Centr. Am. i.) notices and figures *Pachyteles funcki*, Chaud., fig. 5, *verticalis*, Chaud., fig. 16, p. 25, *seriatoporus*, Chaud., fig. 22, p. 26, *cyanipennis*, Chaud. (= *Ozæna cyanoptera*, Thoms.), fig. 17, *Physea hirta*, Lec. (= *latipes*, Schaum), fig. 4, p. 27, pl. ii.

Eustra, sp. Habits in Japan; G. Lewis, Ent. M. M. xviii. pp. 39 & 40,

Pachyteles bacillus, sp. n., Bates, *l. c.* p. 26, Chontales.

Siagonides.

Luperca lævigata, Fabr., and *gorii*, Guér., noticed ; Dohrn, S. E. Z. xlii. p. 309.

Graphipterides.

Piezia lineolata and *laticollis*, Boh., noticed; Dohrn, S. E. Z. xlii. pp. 319 & 320.

Graphipterus gadameri and *adspectabilis*, Wallengren, Ent. Tidskr. ii. p. 12, Transvaal, spp. nn.

Piezia albo-lineata, id. *l. c.*, Transvaal ; *P.* (?) *transfuga*, Dohrn, S. E. Z. xlii. p. 319, S. Africa : spp. nn.

Anthiides.

Anthia. Dohrn discusses various South African species; S. E. Z. xlii. pp. 320–327. *A. ferox*, Thoms., described ; Lucas, Bull. Soc. Ent. Fr. (6) i. p. xliv.

Anthia megæra and *revoili*, id. *l. c.* p. lxxx., *A. æmiliana*, p. 322, *ænigma* and *baucis*, p. 326, Dohrn, S. E. Z. xlii., all from South Africa; *A. immaculata*, Wallengren, Ent. Tidskr. ii. p. 13, Transvaal; *A. helluonoides*, Ancey, Le Nat. iii. p. 461, Uzagara, E. Africa : spp. nn.

Polyhirma piaggiæ, sp. n., Gestro, Ann. Mus. Genov. xvi. p. 201, Shoa.

Morionides.

Morio polynesiæ, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 246.

Scaritides.

Bates (Biol. Centr. Am. *Col.* i. pl. ii.) notices and figures *Pasimachus californicus*, Chaud. (= *punctulatus* and *validus*, Lec.), *mexicanus*, Gray, fig. 13, *sallæi*, Chaud., fig. 15, p. 28, *subangulatus*, Chaud., fig. 18, *rodriguezi*, Putz., fig. 14, *rotundipennis*, Chevr. (and var. *rotundipennis*, Lec.), fig. 19, p. 29, *Clivina distigma*, fig. 24, p. 32, *Ardistomis convexa*, Putz., fig. 25, p. 34, *labialis*, Chaud. (variation), p. 35, *Aspidoglossa distincta*, Putz. (= *mexicanus*, Chaud.), fig. 21, p. 36, and *Schizogenius tristriatus* Putz. (var. *longipennis*, Putz.), fig. 23, p. 37.

Dyschirius (?) *strigifrons*, Fairmaire, redescribed by him ; R. Z. (3) vii. p. 178.

New species :—

Distichus septentrionalis, Bates, Biol. Centr. Am. *Col.* i. (1) p. 30, Chontales.

Scarites ebeninus and *punctaticeps*, Arribálzaga, Nat. Arg. i. pp. 348 & 350, Buenos Aires ; *S. fatuus*, Karsch, SB. Nat. Fr. 1881, p. 55, Guinea Islands.

Camptodontus isthmius, Bates, *l. c.* p. 30, Panama.

Reichia frondicola, Reitter, Deutsche E. Z. xxv. p. 189, Herzegovina, South Dalmatia.

Dyschirius guatemalenus, Bates, *l. c.* p. 31, Guatemala.

Ardistomis educta, Bates, *l. c.* p. 34, Guatemala.

Schizogenius optimus, p. 37, *auripennis* and *tenuis*, p. 38, *id. l. c.* Guatemala.

Panagæides.

Loricera rotundicollis, Chaud., noticed and figured ; *id. l. c.* p. 24, pl. ii. fig. 3.

Pamborides.

Tefflus delegorguei, Guér., noticed ; Dohrn, S. E. Z. xlii. p. 445.

Chlæniides.

Chlænius biguttatus and *viridis*, Montr., = *binotatus*, Dej., and *ophonoides*, Fairm., respectively ; Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxviii. *C. vestitus*, var. *oreteus* from Sicily, noticed and figured ; Ragusa, Nat. Sicil. i. p. 6, pl. i. fig. 3. *C. laticollis*, Say, and *leucoscelis*, Chevr. : larvæ described and details figured ; Schaupp, Bull. Brooklyn Soc. iii. pp. 17, 18, 25 & 26, pl. figs. B & C.

Chlænius (*Rhysotrachelus*) *teani*, sp. n., Gestro, Ann. Mus. Genov. xvi, p. 201, Shoa.

Rhysotrachelus latiusculus, sp. n., Wallengren, Ent. Tidskr. ii. p. 13, Transvaal.

Licinides.

Dicælus dilatatus, *elongatus*, and *politus*. Larvæ described, and the first figured ; Schaupp, Bull. Brooklyn Soc. i. p. 3, fig. 1, pp. 43 & 44.

Licinus asiaticus, Cast., = *agricola*, Oliv. ; Bedel, Bull. Soc. Ent. Fr. (6) i. p. cii.

Licinus merkli, sp. n., Frivaldszky, Term. füzetek, iv. p. 260, Bithynia.

Rembus gorii, Montr., = *Dicrochile artensis*, Perr. ; Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxviii.

Cnemacanthides.

Cascellius nitidus, G. R. Waterh., = *gravesi*, Curt., and *C. kingsi*, Curt., = *Feronia* (*Creobius*) *eydouxi*, Guér. ; C. O. Waterhouse, P. Z. S. 1881, p. 80 and note.

Miscodera dænitzi, sp. n., Harold, MT. Münch. ent. Ver. v. p. 86, Nikko.

Mecodema fulgida and *constricta*, Broun, Man. N. Z. Col. p. 653, New Zealand, spp. nn.

Promecoderus fossulatus, sp. n., Karsch, B. E. Z. xxv. p. 4, pl. i. fig. 5, Sandwich Islands.

Stomides.

Pelecium aterrimum, Chaud. (= *nitidum*, Chaud.) noticed and figured ; Bates, Biol. Centr. Am. *Col.* i. (1) p. 39, pl. iii. fig. 1.

Anisodactylides.

HORN, G. H. A Review of the species of *Anisodactylus* inhabiting the United States. P. Am. Phil. Soc. xix. pp. 162–178.

31 species are enumerated (3 new) divided into three main sections, each of which is again subdivided. The chief characters relied on are the form of the anterior tibial spur; the presence of one or two setigerous punctures on each side of the clypeus near the anterior margin; and the structure of the underside of the male tarsi. The following synonymy is given: — *A. dilatatus*, Dej. (*hirsutus*, Mén.), *piceus*, Mén. (*brunneus*, Mann., *villosus* and *irregularis*, Motsch., *parallelus*, Lec.), *dulcicollis*, Ferté (*ellipticus*, Lec.), *opaculus*, Lec. (*elongatus*, Chaud.), *rusticus*, Say (*tristis*, Dej., *merula*, Germ., *pinguis*, *crassus*, and *gravidus*, Lec., and *haplomus*, Chaud.), *carbonarius*, Say (*luctuosus*, Dej., *rufipennis*, Lec.), *semipunctatus*, Lec. (*similis*, Lec., *puncticollis*, Chaud.), *consobrinus*, Lec. (*brevicollis*, Lec.), *californicus*, Dej. (*confusus*, Lec.), *interpunctatus*, Kirb. (*nigrita*, Lec., *lecontii*, Chaud.), *agricola*, Say (*paradoxus*, Hald., *striatus*, Lec.), *nigerrimus*, Dej. (*laticollis*, Kirb., *punctulatus*, Lec.), *melanopus*, Hald. (*agricola*, Lec.), *baltimorensis*, Say (*sanctæ-crucis*, Fabr.), *porosus*, Motsch. (*sublævis* and ? *alternans*, Motsch., *chalceus*, *alternans*, *viridescens*, and *rudis*, Lec., *lecontii*, Harr.), *cœnus*, Say (*subæneus* and *obscurus*, Lec.), and *sericeus*, Harr. (= *femoratus*, Dej.).

Anisodactylus confusus said to be injurious to strawberry plants in California; Rivers, Am. Nat. xv. p. 1011.

Anisodactylus pilosus, *immanis*, p. 165, and *nivalis*, p. 172, Horn, *l. c.*, California, &c.; *A. cuneatus*, Karsch, B. E. Z. xxv. p. 3, pl. i. fig. 4, Sandwich Islands: spp. nn.

Harpalides.

HORN, G. H. Critical Notes on the *Selenophorus* of the United States. P. Am. Phil. Soc. xix. pp. 178–183.

10 species enumerated, 1 new. The following synonymy is given:—*S. palliatus*, Fabr. (*stigmosus*, Germ., *impressus*, Dej., *lævis*, Lec.), *pedicularius*, Dej. (*troglodytes*, Dej., *æreus* and *planipennis*, Lec.), *fatuus*, Lec. (*excisus*, Lec.), *iripennis*, Say (*varicolor*, Lec.), *gagatinus*, Dej. (*maurus*, Hald., *viridescens*, Lec.), *opalinus*, Lec. (*iripennis*, Lec.), *ellipticus*, Dej. (*granarius* and *pulicarius*, Dej.).

Bradycellus biguttatus, Perroud, = *Tachys artensis*, Montr.; Fauvel, Bull. Soc. Ent. Fr. (6) i. p. cxix.

Ophonus (?) *billardierii*, Montr., = *Gnathaphanus melanarius*, Dej.; *id. l. c.* p. cxviii.

Selenophorus breviusculus, sp. n., Horn, *l. c.* p. 181, Indian Territory.

Acupalpus biseriatus, sp. n., Karsch, B. E. Z. xxv. p. 2, pl. i. fig. 1, Sandwich Islands.

Feroniides.

Feronia dejeani, Waterh., = *Feroniomorpha mœrens*, Brullé; Berg, Exped. Rio Negro, Zool. p. 96; S. E. Z. xlii. p. 51.

Feronia unctulata, Duft., *subsinuata*, Dej. & *F.* (*Haptoderus*) *apennina*,

Dej., and varieties discussed, with general remarks on the subgenus *Haptoderus*, and the description of a new species; Letzner, JB. schles. Ges. lviii. pp. 205–208.

Feronia (*Platysma*) *borealis*, Ménétr., varieties from Waigatsch, and *F.* (*P.*) *gelida*, Mäkl. var. *degenerata*, described; Mäklin, Sv. Ak. Handl. (2) xviii. p. 15.

Pœcilus cupreus, var. *reichii*, Waltl, noticed; Ragusa, Nat. Sicil. i. p. 6.

Adelosia lyrodera, Chaud., redescribed from the Crimea; Heyden, Deutsche E. Z. xxv. p. 254.

Ceneus speculiferus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 247.

Pterostichus lucublandus and *mutus*, Say., larvæ described and details figured; Schaupp, Bull. Brooklyn Soc. iii. pp. 88 & 89, pl. figs. D & E.

Molops promissus and *plitvicensis*, Heyden, discussed by him. The former probably = *longipennis*, Dej.; Deutsche E. Z. xxv. pp. 247 & 248.

Zabrus gibbus destructive to corn in Germany; Keferstein, S. E. Z. xlii. p. 77 (*cf.* also Treuge, Ent. Nachr. vii. pp. 279 & 280.)

New species :—

Feronia (*Haptoderus*) *sinuata*, Letzner, JB. schles. Ges. lviii. p. 207, Salzburg and Pennine Alps.

Haptoderus ehlersi, Heyden, Deutsche E. Z. xxv. pp. 231 & 241, Asturias.

Platyderus brunneus (Klug, MS.), Karsch, B. E. Z. xxv. p. 43, pl. ii. fig. 5, and Rohlfs, Kufra, p. 371, North Africa, Syria.

Holcaspis pellax, p. 656, *thoracicus*, p. 657, *sternalis* and *placidus*, p. 658, Broun, Man. N. Z. Col., New Zealand.

Pterostichus sellæ, Stierlin, MT. schw. ent. Ges. vi. p. 142, Maritime Alps.

Abax sexualis, Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. xliii. Catalonia.

Trichosternus rectalis, Broun, *l. c.* p. 656, New Zealand.

Molops hopffgarteni, Heyden, *l. c.* p. 247, Croatia.

Celia consobrina, Mäklin, Œfv. Finsk. Soc. xxii. p. 81; Sv. Ak. Handl. (2) xviii. (4) p. 35, Krasnoyarsk.

Anchomenides.

Pristonychus oblongus, Dej., longevity; Girard, Bull. Soc. Ent. Fr. (6) i. p. xxviii.

Taphria nivalis, Payk., noticed; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 20.

Anchomenus marginatus, Linn., habitat; Pim & Fowler, Ent. xiv. pp. 70, 91 & 92.

Platynus muelleri, var. *chalibæus* from Egerland described; Gradl, Ent. Nachr. vii. p. 303. *P. extensicollis*, Say: larva described and details figured; Schaupp, Bull. Brooklyn Soc. iii. p. 91, pl., fig. A.

Parabaris, g. n., Broun, Man. N. Z. Col. p. 654. Allied to *Abaris* in the *Anchomenidæ*, but with the facies of a *Feronia*. Type, *P. atratus*, sp. n., *l. c.* p. 655, New Zealand.

New species :—

(*Pargus collatatus*, Karsch, SB. nat. Fr. 1881, p. 56, Guinea Islands.

Henochus terebratus, Blackburn, Ent. M. M. xvii. p. 227, Maui.

Anina, Fomenus *patruelis*, id. *ibid.*, Maui ; *A. helmsi*, Sharp, *op. cit.* xviii. p. New Zealand.

Tachyprax unctus, p. 227, *lætus* and *robustus*, p. 228, Blackburn, *l. c.*, M. Tachin

Pinalynus planus, Karsch, B. E. Z. xxv. p. 2, pl. i. fig. 2, Sandwich Islands.

Colpodes octo-ocellatus, id. *l. c.* p. 3, pl. i. fig. 3, Sandwich Islands; *C. truncatellus* and *xanthocnemus*, Fairmaire, Le Nat. iii. p. 348, and Ann. Soc. Ent. Fr. (6) i. pp. 247 & 248 ; *C. nigratus*, id. Ann., *l. c.* p. 248, all from Viti.

Tropopterus patulus, Broun, Man. N. Z. Col. p. 655, New Zealand.

Trechides.

Abeille de Perrin. Tableau synoptique des *Trechus* aveugles françaises. Bull. Soc. Toulouse, xiii. pp. 30–34.

22 species enumerated, including *T. cerberus*, Dieck, var *inequalis*, Ab., and several apparently new species.

Patrobus longicornis : larva described ; Schaupp, Bull. Brooklyn Soc. iv. p. 56.

Anophthalmus. Notes, with descriptions of 2 new species ; Schaufuss, Bull. Soc. Ent. Fr. (6) i. pp. lxxxiv.–lxxxvi. *Cf.* also Abeille de Perrin, *op. cit.* pp. cx. & cxi.

Trechus mayeti, *delphinensis*, p. 30, *oblersi*, p. 31, *brisouti*, p. 33, and *trophonius*, p. 34, Abeille de Perrin, Bull. Soc. Toulouse, xiii., France ; *T. cavernicola*, Frivaldsky, Term. füzetek, v. p. 26, Croatia : spp. nn.

Anophthalmus hegeduesi, Hungary, and *turcicus*, Constantinople, *id. l. c.* iv. pp. 179 & 261 ; *A. eurydice* and *acherontius*, Schaufuss, *l. c.* p. lxxxvi., Croatia : spp. nn.

Bembidiides.

Bembidium femoratum, Sturm, and *Dichirotrichus* (*Bradycellus*) *obsoletus* and *pubescens*, recorded as occurring at light ; Lucas, Bull. Soc. Ent. Fr. (6) i. pp. lxix. & lxx. ; *cf.* also Olivier, *op. cit.* p. lxxxii. *B. minimum*, Fab., var. *quadrispilotum*, from Malorca, described ; Schaufuss, Verh. z.-b. Wien, xxxi. p. 620. *B. nevadense*, Ulke, redescribed ; Bull. Brooklyn Soc. iv. p. 41. *B.* (*Leia*) *grapii*, Gyll, var. *brunnipes*, Sahlb., and *B.* (*Peryphus*) *andreæ*, Fabr., var. *femoratum*, Sturm, noticed ; Mäklin, Sv. Ak. Handl. (2) xviii. (4) p. 21.

Eurytrachelus lansbergii, Gestro, = *eurycephalus*, Burm., var. max., and *E. coranus*, Gestro, = *arfakianus*, Lansb., var. minor ; Ritsema, Notes Leyd. Mus. iii. p. 82.

Bembidium (*Notaphus*) *spurcum* and *B.* (*Lopha*) *teres*, Blackburn, Ent. M. M. xvii. pp. 228 & 229, Maui, spp. nn.

Dytiscidæ.

Acilius sulcatus and *Dytiscus marginalis*, voracity; Roland, Feuil' ...sch, and xi. p. 74.

Hydroporus dorsalis, Fabr., varr. *figuratus*, Gyll, and *sibirica*... Handl. Mäklin, Sv. Ak. Handl. (2) xviii. p. 22. *H. strigosulus*, Fair... described by him; Ann. Soc. Ent. Fr. (6) i. p. 250. ...cil. i. p. 6...

Noterus crassicornis, Cl. Curious structure of the larva described; a similar larva from amber has been described by Berendt as one of the *Lepismatidæ* (*Glossaria rostrata*, Ber.); Martens, SB. Nat. Fr. 1881, p. 107.

Colymbetes fuscus var. *affinis*, from Berlin, described; Karsch, B. E. Z. xxv. pp. 222 & 223.

Agabus subquadratus, Motsch., and var. *saturatur*, from Novaya Zemlya and Waigatsch, noticed, and *A. altaicus*, Gebl., var. *cincticollis*, from Siberia, described; Mäklin, Sv. Ak. Handl. (2) xviii. 4, pp. 16 & 22. *A. masteri*, Mael., = *spilopterus*, Germ.; Harold, MT. Münch. ent. Ver. iv. p. 149. *A. nebulosus*, Fœrst., var. *pratensis*, from Malorca, described; Schaufuss, Verh. z.-b. Wien, xxxi. p. 620.

Dytiscus. Notes on habits and coloration; Dohrn, S. E. Z. xlii. pp. 155 & 156. Larva attacked by mould; Sci. Goss. xvii. p. 143. *D. dimidiatus*, Berg, polymorphism in ♀; Fiori, Bull. Ent. Ital. xiii. pp. 274–277. *D. lapponicus*, Gyll, habits; White, Scot. Nat. vi. pp. 145–147.

Hydaticus transversalis, aberration; Dohrn, S. E. Z. xlii. pp. 121 & 122.

Hydroporus dorso-plagiatus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 249, Viti.

Hydrovatus pusillus, sp. n., Regimbart, Ann. Mus. Genov. xvi. p. 620, Sumatra.

Rhantus mixtus, sp. n., Waterhouse, P. Z. S. 1881, p. 81, Tom Bay.

Agabus brandti, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 148, Peking.

Hydaticus concinnaticius and *concolorans*, Wallengren, Ent. Tidskr. ii. pp. 14 & 15, Transvaal, spp. nn.

Gyrinidæ.

Gyrinus. Cocoon noticed; Leprieur, Bull. Soc. Ent. Fr. (6) i. pp. lvii. & lviii. *G. natator* and parasites, noticed; Parfitt & Hellins, Ent. M. M xviii. pp. 79, 88 & 89, and Rep. Devon. Ass. xiii. p. 261.

Dineutes ianthinus, Blanch., redescribed; Fairmaire, Ann. Soc. Ent. Fr (6) i. p. 250.

Orectochilus villosus, Fabr., habits; Leesberg, Tijdschr. Ent. xxiv. p. xxiii.

Orectochilus semisericeus, sp. n., Gestro, Ann. Mus. Genov. xvi. p. 202, Shoa.

Hydrophilidæ.

Krakenberg, C. F. W. Ueber die *Hydrophilus*-Lymphe und über die Hämolymphe von *Planorbis*, *Lymnæus*, und *Paludina*. Verh. Ver. Heidelb. (2) iii. pp. 79–88.

The lymph of *Hydrophilus piceus* darkens on exposure to the air, and

this darkening appears to have some connection with the black colour of the insect itself. The appearances induced by various reagents are described.

ina, Fa

, Bull. Soc. Ent. Fr. (6) i. pp. xciv. & xcv., remarks on species *Tach*[illegible] by Brullé, *Hydrophilus ensifer* and *ovalis*, B., = *ater*, Oliv.; *Tachinus* and *irinus*, B., belong to *Hydrocharis*; *Tropisternus dorsalis* and *lepidus*, B., = *sellatus* and *scutellaris*, Cast., respectively; *Philhydrus pallipes*, *gibbus*, and *femoratus*, B., belong to *Helochares*; *P. striatus*, B., belongs to *Helopeltis*, Horn; *Trichopoda cassidiformis*, B., belongs to *Dactylosternum*.

Hydræna pallidipennis, Cast., = *Ochthebius marinus*, Payk., var.; *Empleurus opalisans*, Motsch., *Helophorus acutipalpus*, Muls., and *subcostatus*, Kol., = *H. micans*, Fald.; *Hydræna striata*, Cast., is an *Ochthebius*; *Hydrobius artensis*, Montr., is a *Sternolophus*; *Laccobius atrocephalus*, Reitt., and *nigriceps*, Thoms., = *sinuatus*, Motsch.; *L. kiesenwetteri*, Reitt., = *Anacæna bipustulata*, Marsh.; *id. l. c.* pp. lxxxvi. & lxxxvii.

Hydrophilus piceus and *Hydrobius fuscipes*, egg-cases redescribed; Laker, Ent. xiv. pp. 82–84.

Hydrophilus setiger, Germ., = *Tropisternus glaber*, Herbst; Berg, S. E. Z. xlii. p. 53, and Exped. Rio Negro, Zool. p. 98. *H. triangularis*, Say, egg-case and larva, especially the tracheal system of the latter, described; Garman, Am. Nat. xv. pp. 660–663, figs.: transformations described and figured; Riley, *op. cit.* pp. 814–817, figs.

Hydrobius sahariensis, Fairmaire, noticed by him; R. Z. (3) vii. p. 179.

Limnoxenus grandis, Motsch., = *Hydrobius convexus*, Brullé; Bedel, *l. c.* p. cii.

Anacæna, Thoms., = *Creniphilus*, Motsch.; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxv.

Philhydrus agrigentinus, Rottenb., noticed and figured by Ragusa, Nat. Sicil. i. p. 6, pl. i. fig. 4, from Sicily.

Limnebius atomus, Gerh., *nec* Duftschm., renamed *aluta*, Bedel, Faune Col. Seine, i. p. 315.

Helophorus borealis, Sahlb. (*pallidipennis*, Thoms.), = *pallidus*, Gebl.; *H. elegans*, Ball., ? = *micans*, Fald. (*subcostatus*, Kol.; *id.* Bull. Soc. Ent. Fr. (6) i. p. cii. *H. griseus*, Er. (*nec* Herbst), = *granularis*, Thoms. (*nec* Linn.), renamed *H. brevipalpis*; id. Faune Col. Seine, i. p. 301.

Ochthebius numidicus, Reit., redescribed by Fairmaire; R. Z. (3) vii. p. 182.

Sphæridium. Notes on 6 Fabrician species; Bedel and Waterhouse, Bull. Soc. Ent. Fr. (6) i. p. lxxxi. *S. dytiscoides*, F., is a *Dactylosternum*; *S. atomarium*, F. (*nec* Linn.), probably = *Cercyon impressus*, Sturm; *S. hæmorrhoidalis*, F., = *Cercyon flavipes*, auct.; but *S. hæmorrhoidalis*, auct. rec., = *impressus*, Sturm; *S. quadripustulatum*, F., is a *Scaphidium*; *S. fimetarium*, F., is a *Phalacrus*, and *S. minutum*, Fabr., is a *Cryptopleurum*; *Cercyon minutus*, auct., must now take the name of *tristis*, Ill.

Sphæridium melanum, Germ., = *Hydrobius gibbosus*, Say; *S. melanopterum*, Montr. ? = *Dactylosternum dytiscoides*, Fabr.; *Cercyon ovillum*, Motsch., = *melanocephalus*, Linn.; *C. posticatus*, Mannerh., is a *Mega-*

sternum; *C.* (*Pelosoma*) *lafertii*, Muls., is from Brazil, not India: Bedel, *op. cit.* pp. lxxxvi. & lxxxvii.

New genera and species:—

Crenitis, Bedel, Faune Col. Seine, i. p. 306, note. Allied to *Hyd*[illegible]ch, and Handl. tibiæ scarcely spined, mesosternum simple, and pronotum not ri[illegible] the base; type, *H. punctato-striatus*, Letzn. [illegible]eil. i. p. 6

Cymbiodyta, id. *l. c.* p. 307. Allied to *Philhydrus*; mesosternum trapeziform, base of pronotum with no trace of a ridge. Type, *P. marginellus*, Fabr.; add *P. fimbriatus*, Lec.

Laccobius pommayi, id. *l. c.* p. 313, note, Algeria.

Helophorus (*Empleurus*) *porculus*, France, Spain, Algeria, p. 298, note and *H. oxygonus*, Algeria, p. 299, note, *id. l. c.*; *H. singularis*, Miller, Deutsche E. Z. xxv. p. 189, Dalmatia; *H. punientanus* and *filitarsis*, Schaufuss, Verh. z.-b. Wien, xxxi. pp. 620 & 621, Malorca.

Ochthebius parvicollis, Boghari, p. 179, *auro-pallens*, Biskra, *atriceps*, p. 180, *crenatulus*, Boghari, *grandipennis*, Batna, p. 181, Fairmaire, R. Z. (3) vii.; *O. montanus*, Frivaldsky, Term. füzetek, v. p. 27, Mehadia.

Staphylinidæ.

Harold, E. v. J. Sahlberg's Enumeratio Coleopterorum Brachelytrorum Fennicæ (Helsingfors, 1876), im Auszüge mitgetheilt. MT. Münch. ent. Ver. v. pp. 142–151.

An analysis of the work in question.

Eppelsheim (Deutsche E. Z. xxv. pp. 299 & 300) publishes the following notes on Caucasian *Staphylinidæ*: *Bolitochara venusta*, Hochh., = *Leptusa analis*, Gyll.; *Aleochara calida*, Hochh., and *carinata* and *tuberculata*, Saulcy, probably = *crassicornis*, Lec.: *A. filum*, Kraatz, = *melanocephala*, Motsch.; *Myrmedonia bituberculata*, Bris., = *fussi*, Kraatz, = *confragosa*, Hochh.; *Homalota lithuanica*, Motsch., = *humeralis*, Kraatz; *Gyrophæna glacialis*, Kolen., = *Oligota inflata*, Maunerh., but *G. glacialis*, Hochh., = *strictula*, Er.; *Bolitobius flavicollis*, Hochh., = *kraatzi*, Pand., = *trimaculatus*, Payk. var.; *Dolicaon angusticollis*, Hochh. (*nec* Kies.), = ? *Lathrobium bicolor*, Baudi; *Stenus minutus*, Hochh., = *crassus*, Steph.

Aleocharides.

Aleochara rhopalocera, and *Gyrophæna discoidalis*, Fauv., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 254.

Callicerus atricollis, Aubé, var. *fulvicornis* from the Herzegovina noticed; Eppelsheim, Deutsche E. Z. xxv. p. 181.

New species:—

Echidnoglossa ventricosa, Quedenfeldt, B. E. Z. xxv. p. 293, Spain, Morocco.

Leptusa hopffgarteni, and *arida*, Eppelsheim, Deutsche E. Z. xxv. pp. 190 & 191, Dalmatia, &c.

Myrmedonia reitteri, id. *l. c.* p. 193, Herzegovina.

Oxypoda exortiva, Mäklin, Œfv. Finsk. Soc. xxii. p. 81, & Sv. Ak. Handl. (2) xviii. 4, p. 36, Siberia.

Homalota (*Alianta*) *sibirica*, id. *ll. cc.*, pp. 82 & 36, Siberia. *H. leporina*, Fauvel, Nat. Sicil. i. p. 65, Sicily.

Tachyporides.

Tachinus arcticus, Motsch. Varieties from Siberia described; Mäklin, Sv. Åk. Handl. (2) xviii. 4, p. 23.

Staphylinides.

Schaupp (Bull. Brooklyn Soc.) describes the larvæ of *Leistotrophus cingulatus* (iii. p. 9), *Staphylinus maculosus* (i. pp. 42 & 43), and *S. vulpinus* (iii. p. 92.)

Ocypus destroying *Bombi*; Hughes, Nature, xxiv. p. 357.

Euryporus argentatus, sp. n., Fauvel, Notes Leyd. Mus. iii. p. 164, Sumatra.

Quedius vexans, sp. n., Eppelsheim, Deutsche E. Z. xxv. p. 297, Königsberg, Danzig.

Homorocerus robustus, sp. n., Gestro, Ann. Mus. Genov. xvi. p. 658, Shoa.

Philonthus africanus, Fauvel, *op. cit.* p. 202, Shoa; *P. bodemeyeri*, Eppelsheim, S. E. Z. xlii. p. 376, S. Hungary: spp. nn.

Xantholinides.

Pachycorynus tabuensis, Fauv., and *Xantholinus holomelas*, Perr., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 252 & 253.

Belonuch[illegible] abyssinus, sp. n., Fauvel, Ann. Mus. Genov. xvi. p. 203, Shoa.

Xantholinus coloratus, Karsch, B. E. Z. xxv. p. 44, Rohlfs, Kufra, p. 371, Oasis of Kufra; *X. caruleopennis*, Quedenfeldt, B. E. Z. xxv. p. 293, Angola, and *X. cicatricosus*, Fauvel, Notes Leyd. Mus. iii. p. 163, Sumatra: spp nn.

Pæderides.

Pæderus vitiensis, Fauv., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 251.

Lathrobium artum (sic) Karsch, B. E. Z. xxv. p. 45, Rohlfs, Kufra, p. 372, Oasis of Kufra; *L. angolense*, Quedenfeldt, *op. cit.* p. 294, Angola: spp. nn.

Achenium brevipenne, sp. n., *id. l. c.* p. 291, Morocco.

Lithocharis nitida, Tangiers, and *simoni*, Andalusia, *id. l. c.*: spp. nn.

Pæderus fauveli, sp. n., *id. l. c.* p. 292, Morocco, Abyssinia.

Pinophilides.

Palaminus vitiensis, Fauv., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 252.

Stenides.

Stenus tythus, Schaufuss, Verh. z.-b. Wien, xxxi. p. 621, Minorca; *S*

inspector and *borealis*, Mäklin, Œfv. Finsk. Soc. xxii. pp. 82 & 83, and Sv. Ak. Handl. (2) xviii. 4, pp. 37 & 38, Siberia; *S. planiceps*, Bolivia, and *quedenfeldti*, Zanzibar, Harold, MT. Münch. ent. Ver. iv. p. 149, and v. p. 155: spp. nn.

Oxytelides.

Bledius vitulus and *niloticus*, Erichs., redescribed by Fairmaire, R. Z. (3) vii. pp. 178 & 179.

Oxytelus syriacus, sp. n., Eppelsheim, S. E. Z. xlii. p. 377, Syria.

Homaliides.

Deliphrum, Erichs., and *Mannerheimia*, Mäkl., recharacterized; Mäklin, Œfv. Finsk. Soc. xvii. p. 80, and Sv. Ak. Handl. (2) xviii. 4, p. 29.

Micralymma brevipenne: note on habitat; Blatch, Ent. M. M. xviii. p. 140. *M. dicksoni*, Mäkl.: the only beetle found at Cape Chelyuskin, noticed and figured; Nordenskiöld, Voyage of the 'Vega,' i. p. 343.

Cylletron (?) *hyperboreum*, sp. n., Mäklin, Œfv. Finsk. Soc. xxii. p. 84, and Sv. Ak. Handl. (2) xviii. 4, p. 41, Novaya Zemlya.

Piestides.

Leptochirus samoensis, Blanch., and *forticornis*, Fauv., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 250 & 251.

PSELAPHIDÆ.

Tychus rufus, Motsch., and var. *morio* discussed; Reitter, Deutsche E. Z. xxv. p. 183.

Bythinus (*Machærites*) *plicatulus*, Schauf., = *subterraneus*, Motsch., *id.* Verh. z.-b. Wien, xxxi. p. 479; *B. curtisi*, Denny, var. *hungaricus* described; *id. l. c.* p. 498.

Euplectus comstocki, Howard, noticed and figured; Comstock, Rep Dep. Agric. 1880, p. 275, pl. ii. fig. 1.

Panaphantus atomus, Kies., noticed; De Tinseau, Feuill. Nat. xi. p. 101.

Trimium cavicolle, Reitter, ♀ described by him; Deutsche E. Z. xxv. p. 183.

Claviger. On collecting; De Tinseau, *l. c.* p. 165. *C. foveolatus* noticed; Kiesenwetter, Isis, 1877, p. 62.

New genera and species:—

Desimia, Reitter, Verh. z.-b. Wien, xxxi. p. 457, = *Tetracis*, Sharp, *nec* Guenée.

Sognorus, id. *l. c.* p. 458. Subgenus of *Ctenistes*, to contain *C. calcaratus*, Baudi, and *oberthueri*, Perez.

Zeatyrus, Sharp, Ent. M. M. xviii. p. 48. Allied to *Tyrus*; type, *Z. lawsoni*, sp. n., *l. c.*, New Zealand.

Amauronyx, Reitter, *l. c.* p. 519. Allied to *Trichonyx*; types, *T. markeli*, Aubé, and *T. euphratæ*, *barnevillii*, *brevipennis*, and *kraatzi*, Saulcy.

Abatrisops, id. *l. c.* p. 518. Intermediate between *Batrisus* and *Trichonyx*; type, *B. thoracicus*, Motsch.

Batraxis, id. *l. c.* p. 464. Intermediate between *Batrisus* and *Bryaxis*; type, *B. hampei*, sp. n., *l. c.*, Greece.

Parmipalpus, Broun, Man. N. Z. Col. p. 662. Allied to *Bryaxis*; type, *P. montivagus*, sp. n., *l. c.*, New Zealand.

Biblioplectus, Reitter, *l. c.* p. 529. Subgenus of *Euplectus*; types, *E. ambiguus*, Reich., *tenebrosus*, Reitt., and *minutissimus*, Aubé.

Pseudoplectus, id. *l. c.* p. 531. Intermediate between *Euplectus* and *Trimium*; type, *E. perplexus*, Duval.

Chennium steigerwaldi, Croatia, and *antennatum*, Caspian; *id. l. c.* p. 456.

Pselaphus hirtus and *clavigeroides*, Beyrut, p. 333, *caspicus*, Caucasus, Caspian, p. 504, *revelierii*, *argutus*, p. 506, *ganglbaueri*, Corsica, p. 507, *simonis*, Algeria, p. 508; *id.* l. c. *P. stussineri*, De Saulcy, Deutsche E. Z. xxv. p. 95, Istria. *P. dulcis*, Broun, Man. N. Z. Col. p. 660, New Zealand.

Tychus angulifer, Lenkoran, p. 509, *rufo-pictus*, p. 511, *anophthalmus*, Corsica, *lenkoranus*, Lenkoran, p. 512, *integer*, Sicily, *corsicus*, Corsica, *dentifrons*, Tangiers, p. 513, *grandiceps*, Tangiers, Tetuan, p. 515; Reitter, *l. c.*

Pygoxyon (recharacterized, p. 199) *lathridiiforme*, id. Deutsche E. Z. xxv. p. 200, pl. vi. figs. 1–3, Dalmatia, &c.

Trichonyx talychensis, id. Verh. z.-b. Wien, xxxi. p. 520, Lenkoran, Tyrol.

Amaurops syriaca, id. *l. c.* p. 332, Beyrut.

Bryaxis paganus and *ignotus*, Broun, *l. c.* pp. 660 & 661, New Zealand.

Sagola genale, id. *l. c.* p. 663, New Zealand.

Bryaxis (*Reichenbachia*) *quedenfeldti*, Reitter, *l. c.* p. 477, Tangiers.

Bythinus dalmatinus, figs. 4, 5 & 16, South Dalmatia, Herzegovina, p. 194, *melinensis*, figs. 6, 7 & 15, p. 195, South Dalmatia, *solidus*, figs. 8 & 9, Montenegro, p. 196, *scapularis*, figs. 10 & 11, Herzegovina, p. 197, *armipes*, figs. 12, 13 & 14, Montenegro, p. 198, pl. vi., *B.* (*Decatocerus*) *bicornis*, Balearic Islands, p. 478, *B.* (*Macharites*) *ludii*, Botzen, p. 481, *revelierii* and *myrmido*, Corsica, p. 482, *B. caviceps*, Lenkoran, p. 484, *grouvellii*, Nice, p. 487, *marthæ*, Etruria, *verruculus*, Corsica, p. 488, *pedator*, Tuscany, p. 489, *dichrous*, Spain, *etruscus*, Tuscany, p. 491, *ursus*, Carniola, p. 493, *porzenna*, Tuscany, p. 496, *ælistæ*, Corsica, p. 497, *chlersi*, Portugal, p. 498, *ærtzeni*, Tyrol, p. 499, *hopffgarteni*, South Hungary, p. 500, *stussineri*, Silesia, Austria, Hungary, &c., p. 501, *viertli*, Mehadia, p. 542; *id. l. c.*

Zibus adustus, Sicily, *læviceps*, Lebanon, Beyrout; *id. l. c.* p. 517.

Euplectus carpathicus, Hungary, Silesia, *aubeanus*, Mecklenberg, p. 523, *bescidicus*, Silesia, Moravia, p. 524, *occipitalis*, Lenkoran, p. 526, *afer*, South Spain, Portugal, North Africa, *bonvouloiri*, Corsica, p. 527, *marentinus*, Dalmatia, p. 529; *id. l. c.*

Bibloporus variicolor, id. *l. c.* p. 531, Lenkoran.

Trimium hopffgarteni, id. Deutsche E. Z. xxv. p. 203, Herzegovina, Montenegro. *T. diecki*, Corsica, p. 533, *imitatum*, South Portugal, *domo-*

gleti, Mehadia, *amonæ*, Germany, Carniola, Croatia, p. 535; *id.* Verh. z.-b. Wien, xxxi.

Claviger perezi, Spain, *carniolicus*, Carniola, p. 448, *caspicus*, Caspian, p. 449, *id. l. c.*

Paussidæ.

Paussus cornutus, Chevr. (= *dentifrons*, Westw.), redescribed by Fairmaire; R. Z. (3) vii. p. 179.

Paussus antinorii, Gestro, Ann. Mus. Genov. xvi. p. 658, Shoa; *P. howa*, Dohrn, S. E. Z. xlii. p. 91, Madagascar: spp. nn.

Scydmænidæ.

Leptomastax, Piraz, monographed by Reitter & Simon, Deutsche E. Z. xxv. pp. 145–164, pls. iv. & v. 14 species are described, the following being already known:—*L. hypogæus*, Piraz (= *mehadiensis*, Friv.) fig. 1, *delarouzii*, fig. 4, *raymondi*, Saulcy, *coquereli*, Fairm., fig. 8, pl. iv., *stussineri*, Reitt., fig. 1, and *simonis*, Stuss., fig. 4, pl. v.

New genera and species:—

Euthiconus, Reitter, Verh. z.-b. Wien, xxxi. p. 545, = *Conoderus*, Saulcy, *nec* Esch. (*Elateridæ*).

Adrastia, Broun, Man. N. Z. Col. p. 663. Allied to *Scydmænus*, but its abbreviated elytra render it a connecting link between the *Scydmænidæ* and *Pselaphidæ*; type, *A. latans*, sp. n., *l. c.* New Zealand.

Eustemmus, Reitter, Verh. z.-b. Wien, xxxi. p. 582. Section ii. of *Eumicrus*, to include *E. antidotus*, Germ., *punctipennis*, Fairm., *conspicuus*, Schaum, and *tuerki*, Reitt.; add *E. olivieri* and *georgi*, Algiers, and *spartacus*, Taygetus, spp. nn., *l. c.*

Eudesis, id. *l. c.* p. 583. Allied to *Eumicrus*; type, *E. aglena*, sp. n., *l. c.* p. 584, Corsica.

Chevrolatia egregia, id. Deutsche E. Z. xxv. p. 207, pl. iii. fig. 1, South Dalmatia; *C. maroccanna*, id. Ent. Monatsbl. ii. p. 169, Morocco.

Neuraphes lederianus, Caucasus, *solitarius*, Portugal, p. 556, *eximius*, Caucasus, p. 557, *capellæ*, Austria, Carniola, Croatia, p. 558, *leptocerus*, Tuscany, Mehadia, p. 560, *tenuicornis*, Sardinia, *margaritæ*, Algeria, *proximus*, *similaris*, Corsica, *ehlersi*, Portugal, p. 561, *titan*, Spain, *pusillimus*, Greece, p. 562, *mulsanti* (= *longicollis*, Muls.), South France, *dubius*, Corsica, *brucki*, Tuscany, p. 564, *diocletianus*, South Dalmatia, *nigrescens*, Mehadia, p. 566, *revelierii*, Corsica, p. 567; *id.* Verh. z.-b. Wien, xxxi.

Scydmænus lustrator, *appli*, and *frater*, Beyrut, p. 335, *damrii*, Corsica, *baudii*, Sardinia, p. 569, *leptoderus*, Syria, *microphthalmus*, Corsica, p. 570, *picipennis*, Lenkoran, *globulipennis*, Corsica, p. 572, *id.* l. c. *S. filicornis*, pl. vii. fig. 2, Herzegovina, p. 208, *tricavulus*, figs. 20 & 21, p. 209, *sulcipennis*, figs. 22 & 23, Montenegro and Herzegovina, &c., *flaveolus*, Ragusa, fig. 23, pl. vi. p. 210, *S. frondosus*, Asturias, p. 231, *id.* Deutsche E. Z. xxv.; *S. protervus* and *ditomus*, Algeria, *id.* Ent. Monatsbl. ii. p. 168.

Euconnus barbatus, id. *l. c.* p. 167, Abyssinia; *E. ganglbaueri*, Beyrut, p. 336, *barbatulus*, Lenkoran, p. 573, *puniceus*, South Dalmatia, p. 574, *robustus*, Caucasus, p. 575, *sanguinipennis*, North Dalmatia, p. 577, *gredleri*, Tyrol, p. 578, *kraatzi*, Andalusia, p. 581, *id.* Verh. z.-b. Wien, xxxi. ; *E. microcephalus*, pl. vii. fig. 3, Dalmatia, &c., p. 211, *nikitanus*, fig. 25, Montenegro, *subterraneus*, fig. 26, Lesina, p. 212, *dorotkanus*, fig. 27, pl. vi. Dalmatia, p. 213, *id.* Deutsche E. Z. xxv.

Scydmaenus abyssinicus and *raffrayi*, id. Ent. Monatsbl. ii. pp. 166 & 167, Abyssinia ; *E.* (*Heterognathus*) *perrisi*, id. Verh. z.-b. Wien, xxxi. p. 583, France, Hungary, &c.

Leptomastax sublævis, id. *l. c.* p. 585, Nice ; *L. nemoralis*, fig. 2, Piedmont, p. 151, *grenieri* (Saulcy, MS. ?), fig. 3, Corsica, Sardinia, p. 152, *grandis*, fig. 5, Italy, p. 155, *syriacus*, fig. 6, Syria, p. 156, *bipunctatus*, fig, 7, pl. iv. Greece, p. 157, *emerii* (Saulcy, MS.), fig. 2, Naples, p. 161, *kaufmanni*, fig. 3, Dalmatia, Herzegovina, p. 162, and *lapidarius*, fig. 5, pl. v. Brussa, p. 164, Reitter & Simon, Deutsche E. Z. xxv. ; *L. mehadiensis*, Frivaldsky, Term. füzetek, iv. p. 180, Hungary.

Euthia clavata, Reitter, Deutsche E. Z. xxv. p. 206, note, Hungary ; *E. formicetorum*, id. Verh. z.-b. Wien, xxxi. p. 546, France, Dalmatia, Caspian.

Cephennium judæum, Lebanon, Beyrut, pp. 334 & 552, *nicaense*, Maritime Alps, *majus*, Carniola, Croatia, *difficile*, Central Hungary, p. 548, *simile*, Tuscany, *carnicum*, Carniola, Croatia, p. 549, *hungaricum*, Transylvania, p. 550, *algeciranum*, Algesiras, p. 552, *apicale*, Tuscany, *aubei*, Corsica, *minimum*, Corsica, Sardinia, p. 554, *rotundicolle*, Caucasus, Lenkoran, p. 555; *id.* l. c. *C. montenegrinum*, *lesinæ*, and *liliputanum*, id. Deutsche E. Z. xxv. pp. 214–216, pl. vi. figs. 17–19, Dalmatia, Herzegovina.

Silphidæ.

Czwalina, G. Beiträge zur Kenntniss der Gattung *Colon* und Beschreibungen neuer Asten. Deutsche E. Z. xxv. pp. 305–320.

Includes brief notes on several species. The genus is divided into two sections, in which the front tibiæ and tarsi are either simple or swollen. Several new varieties are noticed. The characters of *C. zebei*, *puncticolle*, *dentipes*, and allies, are specially discussed by Czwalina and Kraatz.

Necrophorus germanicus, red-spotted varieties (*bipunctatus* and *apicalis*) noticed ; Kraatz, Ent. Monatsbl. ii. pp. 116 & 117. *N. sibiricus*, Motsch., = *ruspator*, Er. ; Heyden, Deutsche E. Z. xxv. p. 102. *N. tomentosus*, Web., larva described: Schaupp, Bull. Brooklyn Soc. iv. pp. 37 & 38. *N. vestitinus*, pupa destroyed by parasites previously infesting the larva; *id. l. c.* p. 38.

Ptomascopus davidi, Fairm., = *plagiatus*, Mén. ; Bedel, Bull. Soc. Ent. Fr. (6) i. p. cii.

Silpha. Kiesenwetter objects to this genus being subdivided; Isis, 1878, p. 124. *S. opaca*, larva destructive to beetroot; Kessler, Ber. Ver. Nat. Cassel, xxviii. p. 30 ; *cf.* also Katter, Ent. Nachr. vii. p. 52.

Adelops and the allied genera discussed, with lists of species belonging to each; Schaufuss, Bull. Soc. Ent. Fr. (6) i. pp. xcvi.–xcviii.; *cf.* also Abeille de Perrin, *op. cit.* pp. cx. & cxi., and Schaufuss, pp. cxxxviii.–cxl., cxliv.–cxlvi.

Bathyscia erberi, Schauf., = *celatus*, Hampe, *pruinosa*, Schauf., = *narentina*, Mill., and *kerimi*, Fairm., = *tarsalis*, Kies.; Sédillot & Abeille de Perrin, Bull. Soc. Ent. Fr. (6) i. pp. cxi. & cxii.

Catops flavicornis, Thoms., recorded from Germany; Kraatz, Deutsche E. Z. xxv. p. 320.

Myrmecobius, see *Thorictidæ*.

New species :—

Pholeuon pluto, Reitter, Deutsche E. Z. xxv. p. 214, Croatia.

Necrophilus prolongatus, Sharp, Ent. M. M. xviii. p. 47, New Zealand.

Bathyscia filicornis, p. 113, *seeboldi*, p. 115, *cantabrica*, p. 118, *flaviobrigensis*, p. 121, *mazarredoi*, p. 123; Uhagon, An. Soc. Esp. x., Spain (Biscayan Provinces). *B.* (*Adelops*) *persica*, Astrabad, *B. tropica*, Spain, *damrii*, Sardinia, and *mialetensis*, Gard; Abeille de Perrin, Bull. Soc. Ent. Fr. (6) i. p. ix.

Adelops dorotkana, Herzegovina, and *lesinæ*, Lesina; Reitter, Deutsche E. Z. xxv. pp. 215 & 216. *A. insignis* and *paveli*, Frivaldsky, Term. füzetek, iv. pp. 181 & 183, Hungary. *A. destefanii*, Ragusa, Nat. Sicil. i. p. 6, pl. i. figs. 5 & 6, Sicily.

Ptomatophagus subtruncatus, Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 25, Siberia.

Colon myops, Caucasus, p. 308, *griseum*, France, Dalmatia, p. 310, *rufipes*, Spain, p. 314, *episternale*, Kassel, Thuringia, p. 315, *microps*, England, p. 318; Czwalina, Deutsche E. Z. xxv. *C. curvipes*, Mäklin, Ofv. Finsk. Soc. xxii. p. 84, and Sv. Ak. Handl. xviii. 4, p. 45, Siberia.

Anisotomidæ.

Hydnobius punctatissimus, Steph., var. *pallida*, from Aninskoi, noticed; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 25.

Anisotoma heydeni, sp. n., Ragusa, Nat. Sicil. i. p. 62, Sicily.

Cyrtusa castanescens, sp. n., Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. xxi., Corsica.

Scaphidiidæ.

Brachynopus, g. n., Broun, Man. N. Z. Col. p. 664. Allied to *Scaphisoma*; basal articulation of the posterior tarsus abbreviated, and third joint of antennæ with two spiniform bristles; type, *B. l*[illegible] sp. n., *l. c.*, New Zealand.

New species :—

Scaphidium nigro-maculatum, Reitter, Ent. Monatsbl. ii. p. 170, Ceylon.

Bæocera rufum, Broun, *l. c.* p. 665, New Zealand.

Scaphisoma actuosa [*-sum*], id. *l. c.* p. 664, New Zealand; *S. bifasciatum*, *gestroi*, p. 140, *albertisi*, p. 141: Reitter, MT. Münch. ent. Ver. v., Australia.

Toxidium oberthueri, id. *ibid.*, Abyssinia.

Histeridæ.

Marseul, S. A. de. Addition à l'énumeration des Histérides rapportés de l'Archipel Malais, de la Nouvelle Guinée, et de l'Australie boréale par O. Beccari et L. M. D'Albertis. Ann. Mus. Genov. xvi. pp. 149–160.

Includes several new species.

Idister, g. n., *id. l. c.* p. 154. Allied to *Platysoma* and *Hister*; type, *I. morphon*, sp. n., *id. ibid.*, Sumatra.

New species:—

Hololepta ferox, id. *l. c.* p. 149, Sumatra.

Platysoma pluviale and *sumatrense*, id. *l. c.* pp. 151 & 152, Sumatra.

Phelister discordans, id. *l. c.* p. 155, Sumatra.

Hister stercoriger and *singalanus*, Sumatra, pp. 156 & 157, *helluon[o]ides*, Abyssinia, and *zulu*, Caffraria, pp. 617 & 618, *id.* l. c. *H. miniatus*, Karsch, B. E. Z. xxv. p. 45, pl. ii. fig. 6, and in Rohlfs's Kufra, p. 372, Oasis of Kufra.

Epicrus biscissus, Marseul, *l. c.* p. 158, New Guinea.

Eretmotes palumboi, Ragusa, Nat. Sicil. i. p. 7, Sicily.

Tribalus fastigiatus, Marseul, *l. c.* p. 618, Abyssinia.

Saprinus lepidulus and *latipes*, Broun, Man. N. Z. Col. pp. 665 & 666, New Zealand.

Bacanius lotus, Marseul, *l. c.* p. 159, Java.

Abræus brunneus, Broun, *l. c.* p. 666, New Zealand.

Nitidulidæ.

Everts, E. Bijdrage tot de kennis der Nitidularien. Tijdschr. Ent. xxiv. pp. 9–60, pls. ii.–iv.

Tables of subfamilies, genera, and species are given, with synonymy, and notes on the characters, larvæ, &c., of most of the species. Five subfamilies are admitted, viz., *Brachypterini*, *Carpophilini*, *Nitidulini*, *Strongylini*, and *Ipini*. The plates represent structural details.

Cercus pedicularius, Linn. Dimorphism, Everts, *l. c.* p. 18.

Meligethes morosus, Eversm., recorded as new to Britain; Fowler, Ent. M. M. xviii. p. 112.

Rhizophagus. Characters of the genus discussed; it may be divided into three sections, of which *R. perforatus*, Fabr., and *parallelicollis*, Gyll, *R. bipustulatus*, Fabr., and *R. politus*, Hellw., may be regarded as typical. Everts, *l. c.* pp. xvii. & xviii.

p. 186.

Langelandia and species:—

pl. vii. fig. [illegible] Broun, Man. N. Z. Col. p. 667. Affinities doubtful;

Cor[illegible] sp. n., *l. c.* p. 668, New Zealand.

Bri[illegible] *l. c.* p. 668. Placed next to last; affinities not stated;

typ[illegible] *zandus*, sp. n., *l. c.* p. 669, New Zealand.

L[illegible]ngpeplus inauratus, p. 508, *affinis*, p. 509, *bidens*, p. 510, *vestitus*

and *metallescens*, p. 511, *varius*, p. 512, *guttatus*, p. 513, *sordidus*, p. 514, *striatus* and *obsoletus*, p. 515, *blackburni*, p. 516, Sharp, Tr. E. Soc. 1881, Hawaiian Islands.

Epurœa minuta, Mäklin, Œfv. Fin. Soc. xxii. p. 85, & Sv. Ak. Handl. (2) xviii. 4, p. 45, Siberia.

Prometopia rotundata, Reitter, Notes Leyd. Mus. iii. p. 75, Sumatra.

Ipomorpha nigro-fasciata, id. MT. Münch. ent. Ver. v. p. 140, Cayenne.

Trogositidæ.

Parallelodera, g. n., Fairmaire, Le Nat. iii. p. 340; Ann. Soc. Ent. Fr. (6) i. p. 255. Allied to *Airora* and *Alindria*; type, *P. quadraticollis*, sp. n., *ll. cc.* pp. 340 & 256, Viti.

Alindria sedilloti, sp. n., Léveillé, Bull. Soc. Ent. Fr. (6) i. p. lvi. Madagascar.

Trogosita patricioi, sp. n., Karsch, SB. Nat. Fr. 1881, p. 56, Guinea Islands.

Colydiidæ.

Corticus, Latr. (nec *Corticeus*, Piller & Mitt.), renamed *Horrimantus*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxiii.

Rhytidonotus squamulosus, Broun, figured by Waterhouse, Aid, i. pl. xlii.

Pathodermus, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 79. Allied to *Emmaglœus*; to include *P. libanicus*, Lebanon, *interruptus*, Zanzibar, p. 80, *rufo-squamus*, Queensland, New Guinea (?) *indicus*, India, *helophoroides*, Shanghai, p. 81, and *costulatus*, Cochin China, p. 82: spp. nn. Add *P. excisus*, sp. n., Ancey, Le Nat. iii. p. 509, Andaman Islands.

Ablabus crassus, sp. n., Broun, Man. N. Z. Col. p. 669, New Zealand.

Epistranus valens, sp. n., *id. l. c.* p. 670, New Zealand.

Ditoma latiuscula, sp. n., *id. l. c.* p. 255, Viti.

Bothrideres kuenowi and *succinicola*, Stein, B. E. Z. xxv. p. 221, Königsberg (in amber); *B. parallelus*, Gestro, Ann. Mus. Genov. xvi. p. 659, Bogos; *B. reitteri*, Ritsema, Notes Leyd. Mus. iii. p. 77, Sumatra: spp. nn.

Cucujidæ.

Grouvelle, Ann. Soc. Ent. Fr. (6) i. pl. iv., redescribes and figures the following known species: *Platamops decoratus*, Reitt., fig. 3, p. 90, *Læmophlœus macrognathus*, Reitt., figs. 6 & 6*a*, p. 92, *L. lucanoides*, Smith, fig. 7, *semiæneus*, Reitt., fig. 8, p. 93, and *Ino quadrin[illegible]*, Gorh., fig. 11, p. 95.

Prostomis atkinsoni and *corautus*, Waterh., and *laticep[illegible]* described; Fairmaire, *op. cit.* p. 257. [illegible]. Ceylon.

Notes on *Cucujidæ* observed in Japan; Lewis, Ent. M. M. pp. 198 & 199. [illegible]um.

Cucujus clavipes, Fabr.: note on habits and transformations; Wilson, Bull. Brooklyn Soc. i. p. 56.

New species:—

Prostomis pacificus, Fairmaire, Le Nat. iii. p. 340, and Ann. Soc. Ent. Fr. (6) i. p. 256, Viti Levu.

Cucujus coccinatus, Lewis, Ent. M. M. xvii. p. 198, Japan; *C. davidi*, Grouvelle, Ann. Soc. Ent. Fr. (6) i. p. 89, pl. iv. fig. 1, Moupin.

Ino picea, id. *l. c.* p. 95, pl. iv. fig. 10, Colombia.

Lyroplus metallescens, Fairmaire, *op. cit.* p. 254, Viti.

Platamus castaneus, Grouvelle, *l. c.* p. 89, pl. iv. fig. 2, Brazil.

Telephanus minutus, Jamaica, and *obscurus*, Caracas, *id. l. c.* p. 91, pl. iv. figs. 4 & 5.

Læmophlœus capito, id. *l. c.* p. 94, pl. iv. fig. 9, Mexico; *L. politus*, Fairmaire, *l. c.* p. 257, Viti; *L. parasitus*, Reitter, MT. Münch. ent. Ver. v. p. 139, Celebes.

Silvanus columbinus, Grouvelle, *l. c.* p. 96, pl. iv. fig. 12, Colombia.

Cryptophagidæ.

Ahasverus [sic], g. n., Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxvii. Allied to *Cryptophagus* and *Cathartus* [cf. Kraatz, B. E. Z. vi. p. 131]; type, *Silvanus advena*, Waltl; *Cathartus excisus*,' Reitt., probably also belongs to this genus.

Paramecosoma maculosa[*-sum*], sp. n., Broun, Man. N. Z. Col. p. 670, New Zealand.

Atomaria (*Anchicera*, Thoms.) *montenegrina*, sp. n., Reitter, Deutsche E. Z. xxv. p. 218, Montenegro.

Lathridiidæ.

Brisout de Barneville, H. Essai Monographique des espèces d'Europe et des confins de la Méditerranée du genre *Corticaria*. Ann. Soc. Ent. Fr. (6) i. pp. 375–422.

An elaborate monograph, with full descriptions, synonymy, &c., of 52 species, 2 new.

Reitter, E. Révision des *Latridiidæ* d'Europe, traduit de l'Allemand, accompagnés de généralités sur l'histoire, les mœurs, la distribution géographique, la bibliographie de cette tribu, avec addition des espèces extra européennes de l'Ancien Monde, par M. de Gozis. L'Ab. xviii. pp. 1–120.

Consists of a combined translation of Reitter's papers in S. E. Z. xxxvi. (1875), pp. 297–340, & 410–445, and in Verh. z.-b. Wien, xxx. [1880], accompanied by brief notes of the translator's.

Cartodere anatolica, Mannerh., redescribed; Reitter, Deutsche E. Z. xxv. p. 186. *C. pilifera*, Reitt., noticed; Ragusa, Nat. Sicil. i. p. 63.

Langelandia callosipennis, sp. n., Reitter, Deutsche E. Z. xxv. p. 217, pl. vii. fig. 4, Herzegovina.

Corticaria monticola, Pyrénées-Orientales, and *clairii*, Mentone, spp. nn., Brisout, Ann. Soc. Ent. Fr. (6) i. pp. 388 & 401.

Corticarina globipennis, sp. n., Reitter, MT. Münch. ent. Ver. v. p. 139, Auckland Islands.

Thorictidæ.

Myrmecobius, Luc. This genus should be placed in the *Silphidæ* near *Ptoma[to]phagus*, Ill. (*Catops*, auct.); Bedel, Bull. Soc. Ent. Fr. (6) i. p. ciii.

Apharia, g. n., Reitter, Verh. z.-b. Wien, xxxi. p. 87, note. Allied to *Myrmecobius* and *Oochrotus*; type, *A. melitophila*, sp. n., *l. c.* p. 88, note. Cayenne. It = *Scotocryptus*, Gir.; Bedel, Bull. Soc. Ent. Fr. (6) i. pp. clxiv. & clxv.

Thorictus trisulcatus, Algeria, p. 88, *punctithorax*, Abyssinia, *lederi*, Caspian, p. 90, *ciliatus*, Palestine, *rugulosus*, Algeria, *persicus*, North Persia, p. 91, *baudii*, Syria, Cyprus, p. 92, *tuberosus*, Palestine, *myrmecophilus*, Caspian, p. 93, *dilatipennis*, Syria, p. 94, Reitter, *l. c.*: spp. nn.

Myrmecobius pruinosus, id. *l. c.* p. 87, note, locality not stated.

Dermestidæ.

Reitter, E. Die aussereuropäischen Dermestiden meiner Sammlung. Mit 70 Diagnosen neuer Arten. Verh. Ver. Brünn, xix. pp. 28–60.

The following known genera and species are specially noticed: *Dermestes coarctatus*, Har., is distinct from *D. tessellatocollis*, Motsch.; *D. mannerheimi*, Lec., and ? *fasciatus*, Lec., = *caninus*, Germ., varr.; *D. mucoreus*, Lec., ? = *carnivorus*, Fabr., var.; *Attagenus*: tables of African species; *Trogoderma subfasciatum*, Chevr., = *Attagenus unifasciatus*, Fairm., = *A. cinnamomeus*, Rosh.; *A. redtenbacheri*, Peyr., = *Telopes dispar*, Redt.; *Æthriostoma undulata*, Motsch.; *Trogoderma ornatum*, Solsky (*nec* Say), renamed *solskii* (p. 38); *Trogoderma*, table of S. American species; *Cryptorrhopalum*, Guér., American and East Indian species tabulated: *Orphinus hæmorrhoidalis*, Motsch. (*nec* Lec.), renamed *motschulskii* (p. 55); *Anthrenus*, various species tabulated.

Anthrenus unaffected by naphthaline; Leprieur, Bull. Soc. Ent. Fr. (6) i. p. cxlix. *A. scrophulariæ* (Carpet beetle), noticed; Sandahl, Ent. Tidskr. ii. pp. 6, 7, & 57.

Anthrenops, Reitter, recharacterized by him; *Anthrenus leucogrammus*, Solsky, probably belongs to this genus. Verh. Ver. Brünn, xix. p. 59.

New species:—

Dermestes fasciventris [*fascii-* vel *fasciati-*], East Siberia, p. 28, *impressicollis*, South America, *fulvicollis*, Himalaya, p. 29; Reitter, *l. c.*

Attagenus capensis, *aurato-fasciatus*, *fulvicollis*, *flexicollis*, p. 31, *fasciato-punctatus*, *diversus*, *leopardinus*, South Africa, p. 32, *metallicus*, Abyssinia, p. 33, *simonis*, Syria, *cyphonoides*, Egypt, p. 34, *id. l. c.*

Telopes heydeni, Tangiers, and *breviusculus*, Cape, *id. l. c.* p. 35.

Æthriostoma sparsuta, id. *l. c.* p. 36, China, Himalaya.

Megatoma tenuifasciata, id. *ibid.*, Tasmania.

Hadrotoma clavata, id. *l. c.* p. 37, Brazil.

Thauma[to]glossa hilleri, Japan, and *concavifrons*, Tasmania (?), *id. l. c.* pp. 42 & 43.

Trogoderma mexicanum, Mexico, *bicinctum*, Antilles, p. 38, *schmorli*, *pectinicornis*, *subrotundatum*, Brazil, *subtile*, Chili, p. 40, *ruficollis*, *thoracicum*, Brazil, *funestum*, *humerale*, Cape, p. 41, and *irroratum*, Egypt, p. 42, *id.* l. c.; *T. dipicipenne*, id. Deutsche E. Z. xxv. p. 232, Australia.

Cryptorrhopalum rufipes, *globulum*, *puberulum*, *cribripenne*, p. 45, *bilimeki* and var. *brunneipenne*; *villosum*, *incanum*, Mexico, p. 46, *atro-pubescens*, Brazil, Bogota, *punctatissimum*, Ocana, *atripes*, Bogota, *sahlbergi*, p. 49, *atomarium*, *difficile*, Brazil, *splendidum*, Colombia, p. 50, *oberthueri*, Colombia, Brazil, *quinquepunctatum*, Bolivia, *sexsignatum*, p. 51, *sexpunctatum*, *imperiale*, Ega, *orbiculosum*, Bogota, p. 52, *centro-maculatum*, Brazil, *teffensis*[*-se*], Ega, *trogodermoides*, p. 53, *subtrifasciatum*, Brazil, *bimaculatum*, New Freiburg, *rufo-fasciatum*, Bogota, p. 54, *affine*, Celebes, *biflexum*, East Indies, p. 55, *confertum*, *variabile*, South Australia, and *erichsoni*, Tasmania, Melbourne, p. 56; *id.* Verh. Ver. Brünn, xix.

Anthrenus albo-stictus, *undatus*, Cape, p. 58, *simonis*, Syria, *maculifer*, East Indies, *crustaceus*, Syria, p. 59, *id.* l. c.; *A. incanus*, Frivaldsky, Term. füzetek, v. p. 28, Fiume.

Anthrenops subclaviger, Reitter, *l. c.* p. 59, Aden.

Trinodes mexicanus, id. *l. c.* p. 60, Mexico.

Byrrhidæ.

Cistela [*Byrrhus*] *pilula*, Linn., and *fasciata*, Fabr., varieties tabulated; Reitter, Verh. z.-b. Wien, xxxi. pp. 76-78. Several new varieties of *C. fasciata* are named *inornata*, *subornata*, *bella*, *complicans*, *fabricii*, *fuscula*, and *nivea*.—*C. nigro-sparsa*, Muls., = *kiesenwetteri*, Muls.; *id.* *l. c.* p. 75, note.

Byrrhus depilis, Graëlls, redescribed; Heyden, Deutsche E. Z. xxv. p. 244.

New species: —

Dendrodipnis grandis, Reitter, MT. Münch. ent. Ver. v. p. 140, Sumatra.

Curimus interstitialis, South Europe, p. 71, note, *erichsoni*, Silesia, *caucasicus*, Caucasus, p. 72, note, *id.* Verh. z.-b. Wien, xxxi.; *C. montenegrinus*, id. *l. c.* p. 73, note, Deutsche E. Z. xxv. p. 218, Montenegro.

Morychus nigricans and *rotundus*, Broun, Man. N. Z. Col. p. 671, New Zealand.

Limnichus picinus, id. *ibid.*, New Zealand; *L. subchalibæus*, Reitter Verh. z.-b. Wien, xxxi. p. 85, Lenkoran.

Chelonarium conspersum, id. Notes Leyd. Mus. iii. p. 73, Batavia.

Georyssidæ.

Georyssus nepos, sp. n., Fairmaire, R. Z. (3) vii. p. 182, Chiffa.

Parnidæ.

Friedenreich, C. W. Beitrag zur Kenntniss von Parnidenlarven S. E. Z. xlii. pp. 104–112.

An important anatomical paper, not admitting of abridgment

Psephenus darwini, Waterhouse, figured by him ; Aid, i. pl. xxvi.

Pachycephala, g. n., Broun, Man. N. Z. Col. p. 672. Allied to *Ancyronyx* ; type, *P. piceum*[*-cea*], sp. n., *l. c.*, New Zealand.

Parnus gracilis, sp. n., Karsch, B. E. Z. xxv. p. 45, & Rohlfs's Kufra, p. 373, Oasis of Kufra.

Dryops sericatus, sp. n., Waterhouse, Ann. N. H. (5) vii. p. 410, Peking.

Helichus elongatus, sp. n., Reitter, Notes Leyd. Mus. iii. p. 76, Sumatra.

Limnius intermedius, Sardinia, p. xi. *damrii*, Corsica, *sulcipennis*, Sardinia, p. xii., Fairmaire, Bull. Soc. Ent. Fr. (6) i. :, spp. nn.

Lucanidæ.

Gestro, R. Enumerazione dei Lucanidi raccolti nell' Archipelago Malese, e nella Papuasia dei G. Doria, O. Beccari, e L. M. D'Albertis. Ann. Mus. Genov. xvi. pp. 303–340.

68 species enumerated, including 14 new. The following known species are figured : — *Neolamprima adolphinæ*, Gestro, *Cyclommatus kaupi*, Deyr. (= *margaritæ*, Gestro), *Eurytrachelus ternatensis*, Thoms., and *concolor*, Blanch., *Gnaphaloryx sculptipennis* and *Ægus glaber*, Parry.

Hammond, A. The Anatomy of the Stag Beetle. Pop. Sci. Rev. (2) v. pp. 14–26, pl. ii.

Lucanus dama, Fabr., popularly described and figured ; W. Saunders, Canad. Ent. xiii. pp. 118 & 119, fig. 8.

Odontolabis burmeisteri, Hope, noticed ; Waterhouse, Ann. N. H. (5) vii. p. 457.

Cladognathus dorsalis, Er., various forms ; Semper, Natural Conditions of Existence, pp. 366–368, fig. 96.

Dorcus parallelus, Say, pupa described ; Schaupp, Bull. Brooklyn Soc. iv. p. 35.

Gnaphaloryx aper, Gestro, = *sculptipennis*, Parry ; Ritsema, Notes Leyd. Mus. iii. p. 82.

Ceratognathus irroratus. Larva and pupa described ; Broun, Tr. N. Z. Inst. xiii. pp. 230 & 231.

Passalus (?), larva infested by *Sphæria* (*Cordyceps*) ; McLachlan, P. E. Soc. 1881, pp. i. & ii. *P. cornutus* without elytra ; Hagen, Rep. E. Soc. Ont. 1880, p. 19.

New species :—

Rhyssonotus parallelus, Deyrolle, Ann. Soc. Ent. Fr. (6) i. p. 238, pl. v. fig. 3, Australia.

Hexarthrius mandibularis, id. *l. c.* p. 237, pl. v. fig. 2, Borneo.

Neolucanus muntjac, Gestro, Ann. Mus. Genov. xvi. p. 314, fig., Sarawak.

Cyclommatus elaphus, id. *l. c.* p. 309, fig., Sumatra.

Eurytrachelus ghilianii, Kei, p. 315, fig., *intermedius* (Deyr., MS.), New Guinea, p. 317, fig., *lansbergii*, Java, p. 320, fig., *coranus*, New Guinea, p. 321, fig. ; *id. l. c.*

Dorcus stewarti and *abditus*, Broun, Man. N. Z. Col. p. 673, New Zealand.

Gnaphaloryx aper, Gestro, *l. c.* p. 324, fig., New Guinea.

Ægus pusillus, Jobi, *minutus*, New Guinea, *id. l. c.* pp. 328 & 329, figs.

Alcionus alternatus, Fairmaire, Le Nat. iii. p. 340, Ponapé.

Lissotes desmaresti, pl. v. fig. 4, New Zealand, p. 239, *distinctus* and *basilaris*, Tasmania, p. 240, Deyrolle, l. c.; *L. helmsi*, Sharp, Ent. M. M. xviii. p. 49, New Zealand.

Figulus albertisi, *nitidulus*, p. 355, *papuanus*, Fly River, New Guinea, p. 336, *beccarii*, Sumatra, p. 338, Gestro, *l. c.*

Cardanus alfurus, id. *l. c.* p. 339, Andai, New Guinea.

Scarabæidæ.

Coprides.

Ateuchus tmolus, Fisch., discussed; Sharp, C. R. Ent. Belg. xxv. pp. xci. & xcii.

Gymnopleurus, habits, &c.; Lucas, Bull. Soc. Ent. Fr. (6) i. pp. lviii. & lix.

Canthon fractipes, Har., = *C. plicatipennis*, Blanch., Berg, S. E. Z. xlii. p. 54, Exped. Rio Negro, Zool. p. 99. *C. semicupreus*, Burm., = *lividus*, Blanch.; Harold, MT. Münch. ent. Ver. iv. p. 151.

Copris laticornis, Boh., ♀ described; Wallengren, Ent. Tidskr. ii. p. 20.

Onitis lama and *brahma*, Lansb., females described; Preudhomme de Borre, C. R. Ent. Belg. xxv. pp. xl. & xli. A list of species of *Onitis* in the Brussels Museum is added; *id. l. c.* pp. xli. & xlii.

Onthophagus tenuicornis, Klug, = *æruginosus*, Roth; *O. æneus*, Fabr., = *spinifex*, ♀, Fabr. (= *truncaticornis*, Herbst, *nec* Schall.); *O. deyrollii*, Raffr., = *dives*, Har.; *O. discoideus*, Ol., = *bituberculatus*, Ol., ♀; *O. exaratus*, Koll., = *chalybeus*, Klug; *O.* (*Copris*) *bicuspis*, Wiedem., is a *Caccobius*, probably *C. tortus*, Sharp: Harold, MT. Münch. ent. Ver. iv. pp. 154 & 155.

Stenosternus, g. n., Karsch, SB. nat. Fr. 1881, p. 56. Allied to *Eurysternus*; type, *S. costatus*, sp. n., *l. c.*, p. 57, Guinea Islands.

New species :—

Canthon diabolicus, Bahia, and *infernalis*, Brazil, Harold, MT. Münch. ent. Ver. iv. p. 150.

Deltochilum trisignatum, id. *ibid.*, Brazil.

Epirinus scrobiculatus, id. *l. c.* p. 152, Cape.

Coptorrhina forcipata, id. *l. c.* p. 149, Cape.

Clavicidium asperatum, id. *l. c.* v. p. 87, Brazil.

Synapsis trideus, Sharp, C. R. Ent. Belg. xxv. p. xcii., Assam.

Copris minator, Harold, *l. c.* iv. p. 152, South Africa. *C. magicus*, North India, and *spinator*, Nicobar Islands, *id. op. cit.* v. pp. 88 & 89. *C. pumilionis*, Wallengren, Ent. Tidskr. ii. p. 20, Transvaal.

Phanæus charon and *fovcolatus*, Harold, *op. cit.* iv. pp. 151 & 152, Guayaquil.

Onitis vischnu, Preudhomme de Borre, CR. ent. Belg. xxv. p. xxxix., India.

Onthophagus dedecor and *graphicus*, Wallengren, *l. c.* p. 21, Transvaal; *O. liopterus*, Harold, *l. c.* iv. p. 153, Zanzibar.

Oniticellus amplicollis, id. *l. c.* p. 155, Madagascar; *O. splendens*, Wallengren, *l. c.* p. 22, Transvaal.

Aphodiides.

Aphodius areatus, Helf., = *lepidul* *damrii*, Corsica, *su*- Helf., = *ornatulus*, Har., *A. bohemani*, Har., (= . Fr. (6) i. : sp.) , *nec* Muls.), = *guineensis*, Klug, *A. urostigma*, Har., *allidicornis*, Walk.; Harold, MT. Münch. ent. Ver. iv. p. .. *cus*, Leconte, description repeated; Bull. Brooklyn Soc. iv. p. . . *A. conspectus*, Creutz, occurs in Maine; Fernald, *op. cit.* i. p. 23.

Atanius figurator, Har., description reprinted, with that of *A. sculptilis*, Har.; *op. cit.* iv. p. 60.

Aphodius fusco-limbatus (Helf., MS.), Harold, MT. Münch. ent. Ver. iv. p. 155, Mesopotamia; *A. fasciger*, id. *op. cit.* v. p. 89, Darjeeling; *A. turkestanicus*, Heyden, Deutsche E. Z. xxv. p. 323, Turkistan; *A. palmetincolus*, Karsch, B. E. Z. xxv. p. 45, and Rohlfs's Kufra, p. 373, Oasis of Kufra; *A. pirazzolii*, Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. cxlv., Tunis: spp. nn.

Trogides.

Trox foveicollis, Har., = *insularis*, Chevr.; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. cxlv.

Trox nidicola, Bonnaire, Bull. Soc. Ent. Fr. (6) i. p. lxiii., Fontainebleau, (= *haroldi*, Fisch., *sec.* Kraatz & Bedel, *op. cit.* pp. lxxiii. & xcv.); *T. massalis*, Harold, MT. Münch. ent. Ver. iv. p. 156, Herero-Land: spp. nn.

Melolonthides.

HALDANE, R. C. All about Grub; including a paper on the Grub Pest in Ceylon: being the result of observations on the Cockchafers and their larvæ in connection with Coffee Planting. Colombo: 1881, 8vo, pp. 32, pls. iv., partly coloured.

A practical pamphlet. No scientific names are given; but the figures of *Melolonthidæ* appear to be recognizable.

Sericoides reichii, Guer., = *glacialis*, Fabr., and *Listronyx nigriceps*, Guér., = *Melolontha testacea*, Fabr.; Waterhouse, P. Z. S. 1881, pp. 81 & 82.

Myloxena vestita and *Pachrodema lucidum*, Burm., noticed and figured; Berg, Exped. Rio Negro, Zool. p. 100, pl. ii. figs. 13 & 14.

Lepidiota gracilipes, Sharp, structure described by him; Notes Leyd. Mus. iii. pp. 243 & 244.

Lachnosterna farcta, Lec., noticed and figured; Comstock, Rep. Dep. Agric. 1879, pp. 247 & 248, pl. v. fig. 5.

Trematodes pallasi, Fald. Note on sexes: it is probably not a European species; Kraatz, Deutsche E. Z. xxv. p. 80.

Rhizotrogus nebrodensis, Rag., = *Amphimallus logesi*, Muls.; Ragusa, Nat. Sicil. i. p. 64.

Polyphylla. Revision of species of the United States; 7 described, 1 new; *P. subvittata*, Lec., = *hammondi*, Lec. var. Horn, Tr. Am. Ent. Soc. ix. pp. 73–76.*

Melolontha albida found alive below the ground in November and December; Azam, Feuill. Nat. xi. p. 74. *M. vulgaris*: habits and times of appearance; Kessler, Ber. Ver. Cassel, xxviii. pp. 31–33. Ravages in Sweden from 1849–1879; P. von M., Ent. Tidskr. ii. pp. 51–53, 59 & 60. Dug up living in December; Katter, Ent. Nachr. vii. p. 20. With aborted fore-legs; Römer, Verh. siebenb. Ver. xxix. p. 108. *M. hippocastani*, var. from Mark Brandenburg described; Cornelius, Deutsche E. Z. xxv. p. 304.

Rhopea vitiensis, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 258.

New species :—

Dicheloplia crassa, Sharp, Notes Leyd. Mus. iii. p. 219, Sumatra.

Serica pertusa, Beyrut, p. 82, *modesta*, Jaffa, and *delicatula*, Egypt, p. 83, Fairmaire, Ann. Soc. Ent. Fr. (6) i.; *S. latipes*, id. Bull. S. E. F. (6) i. p. xxvi., Sardinia.

Homaloplia pauper, Wallengren, Ent. Tidskr. ii. p. 19, Transvaal.

Ablabera flavo-clypeata, id. *l. c.*, Transvaal.

Apogonia brevis, p. 220, *simplex*, *fulgida*, p. 221, *scutellaris*, p. 222, *setulosa*, p. 223, Sharp, *l. c.* Sumatra.

Schizonycha squamifera, Wallengren, *l. c.* p. 19, Transvaal.

Leucopholis cingulata, Sharp, *l. c.* p. 233, Sumatra.

Tricholepis vestita, id. *l. c.* p. 232, Sumatra.

Lachnosterna sumatrensis, p. 224, *pumila*, p. 225, *barbata*, p. 226, *gravida*, p. 227, *convexa*, *discedens*, p. 228, *marmorata*, p. 229, *miranda*, p. 231, *id. l. c.*, Sumatra.

Polyphylla gracilis, Horn, Tr. Am. Ent. Soc. ix. p. 75, Florida.

Melolontha (?) *furcicanda* [sic], Ancey, Le Nat. iii. p. 412, Ladak.

Pachydema abeillii, Jaffa, and *sinuatifrons*, Antilibanus, Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 84 & 85. *P. adusta*, Karsch, B. E. Z. xxv. p. 46, pl. ii. fig. 3, & Rohlfs's Kufra, p. 373, Oasis of Kufra. *P. puncticeps*, Waterhouse, P. Z. S. 1881, p. 471, Socotra.

Rutelides.

Anisoplia leucaspis, Stev., var from Nazareth described; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 86.

Phyllopertha ægyptiaca, Blanch., noticed; Dohrn, S. E. Z. xlii. p. 449. *P. massageta*, Solsky, redescribed; Kirsch, Ent. Monatsbl. ii. p. 164. *P. mesopotamica*, Blanch., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 86.

---

* With the exception of three papers on *Coleoptera* by Horn & Leconte, no portion of Tr. Am. Ent. Soc. ix. has been received in England in time to be included in the present Record.

Rhombonyx, Hope, cannot be separated from *Anomala*, even as a subgenus. *A. tingitana*, Blanch., = *velox*, var.; Preudhomme de Borre, C. R. Ent. Belg. xxv. pp. cxxxvi.–cxxxviii.

Anomala ænea, var. (?) or sp. n. (?), from South Europe, described; *id. l. c.* p. cxx.

Antichira splendida, Oliv. (*nec* Fabr.), renamed *olivieri*; *A. pantochloris*, Blanch., *tetradactyla*, Linn. (= *melanaria*, Blanch., = *tristis*, Burm., but perhaps not *tristis*, Cast.), *dichroa*, Mann. (= *tetradactyla*, Burm., *nec* Linn.), noticed: Waterhouse, Tr. E. Soc. 1881, pp. 537–539.

Chlorota lineata, Murr., referred to *Thyridium*; id. *l. c.* p. 550.

New species:—

Anisoplia gossypiata, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 86, Syria.

Phyllopertha xanthogastra, Harold, MT. Münch. ent. Ver. v. p. 90, Japan.

Anomala sordidula, p. 233, *rotundiceps*, p. 234, *breviceps*, p. 235, *fuscula*, p. 236, *chalcites* (Dej., MS.), p. 237, *flagellata* and *chalcescens*, p. 238; Sharp, Notes Loyd. Mus. iii. *A.* (*Spilota*?) *curtisi*, Waterhouse, Tr. E. Soc. 1881, p. 487, all from Sumatra.

Mimela debilis, Sharp, Notes Leyd. Mus. iii. p. 239, Sumatra.

Popilia foveolata, id. *l. c.* p. 240, Sumatra, Borneo.

Antichira modesta, Cuença, *sobrina*, Peru, p. 535, *læta*, Bahia, p. 536, *lævicollis*, Minas Geraes, p. 537, *aterrima* (Dej., MS.), Mexico, p. 538, *cribrata*, Monte Video, Chili?, *gagatina*, Rio Grande?, p. 539, *desmaresti*, Ecuador, New Granada, *polita*, New Granada, p. 540, *generosa*, Cayenne, *substriata*, Para, p. 541, *fulgida*, Peru?, p. 542, *sulcipennis*, p. 543, *pilosula*, Chiguinda, and *puberula*, New Granada, p. 544; Waterhouse, Tr. E. Soc. 1881.

Thyridium sommeri, Brazil, p. 545, *punctatum*, Venezuela, *sodale*, Ecuador, p. 546, *scutellatum*, Brazil?, p. 547, *cyanipes*, Colombia, p. 548, *punctatissimum*, Venezuela, p. 549, and *punctiventre*, Chiguinda, p. 550; *id. l. c.*

Chlorota ærea, *vitrina*, Ecuador, p. 551, *bidentata*, New Granada, p. 552, and *associata*, Chiguinda, p. 553; *id.* l. c. *C. diaspis*, Dohrn, S. E. Z. xlii. p. 447, Interior of Brazil.

Parastasia nigripennis and *sordida*, Sharp, *l. c.* p. 241, Rawas.

Dynastides.

Frédericq, L. Sur le sang des Insectes. Bull. Ac. Belg. (3) i. pp. 487–490.

The blood of *Oryctes nasicornis* is perfectly colourless, except when decomposing, and contains no substance analogous to hæmoglobine.

Cyclocephala parvula, Burm., noticed and figured; Berg, Exped. Rio Negro, Zool. p. 100, pl. ii. fig. 15.

Ligyrus rugiceps, Lec., life-history, &c.; Comstock, Report on Insects injurious to Sugar-cane (1881) pp. 3–8, fig.; *cf.* also *id.* Rep Dept. Agric. 1879, pp. 246 & 247, pl. v. fig. 4, 1880, pp. 236–240. *L. gibbosus*, De Geer, destructive to sunflowers; *id. l. c.* 1880, p. 274.

Anomocaulus fulvo-vestitus, Fairmaire, genus and species recharacterized by him; Ann. Soc. Ent. Fr. (6) i. p. 259.

Oryctes melanops, Burm., redescribed; *id. l. c.* p. 258.

Chalcosoma atlas, Er., and the small form *phidias*, Blainv., noticed and figured; Semper, Natural Conditions of Existence, pp. 367 & 368, fig. 97.

New genera and species:—

Melanhyphus, Fairmaire, Le Nat. iii. p. 389. Allied to *Oryctoderus*; type, *M. kleinschmidti*, sp. n., *l. c.* New Britain.

Brachysiderus, Waterhouse, Ann. N. H. (5) v. p. 409. Between *Antedon* and *Mitracephalus*, but with no horn on the thorax; type, *B. quadrimaculatus*, sp. n., *l. c.*; Aid, i. pl. xliii., Amazons.

Oryctoderus platygenioides, Fairmaire, *l. c.* p. 340, Duke of York Island.

Oronotus quadrituber, id. *l. c.*, Duke of York Island.

Astaborus antinorii, Gestro, Ann. Mus. Genov. xvi. p. 203, Shoa.

Trichogomphus semmelinki, Ritsema, Notes Leyd. Mus. iii. p. 158, Manipa and Ceram.

Cyphonistes camurus, Karsch, SB. nat. Fr. 1881, p. 57, Guinea Islands.

Cetoniides.

Kraatz, G. Ueber das männliche Begattungsglied der europäischen Cetoniden und seine Verwendbarkeit für deren scharfe specifische Unterscheidung. Deutsche E. Z. xxv. pp. 129–142.

The male organs of 28 species, illustrating various types of structure, are described and figured.

——. Genera nova Cetonidarum. Ent. Monatsbl. ii. pp. 17–32.

In addition to new genera, this paper includes diagnoses of several known African genera, with list of species.

Kraatz (*l. c.* pp. 31 & 32) makes the following synonymic notes on *Cetoniidæ*:—*Eudicella morgani*, White, = *gralli*, Buq., var.; *Schizorrhina gratiosa*, Blanch., = *obliquata*, Westw., but *eucnemis*, Burm., is distinct; *Anochilia marginicollis*, Westw., = *variabilis*, Burm., var. *lævigata*, Gory & Perch.; *Cetonia purpuriosata*, Mohn, = *scepsia*, Dohrn, var.; *C. papalis*, Mohn, ? = *bremii*, Schaum, *nec* Mohn; *C. ærata*, Er., = *submarmorea*, Burm.; *C. speculifera*, Swartz, is distinct, but *confuciusana*, Thoms., and *orientalis*, Gory, = *ærata*, varr.; *Pachnoda calceata*, Har., = *flaviventris*, Gory & Perch.; *P. perdix*, Har., is a *Rhabdotis*, *Oxythyrea amethystina*, Macl., is a good species, and = *dysenterica*, Boh., *nec* Macl.; *O. dysenterica*, Har. *nec* Boh., renamed *haroldi*; *Macroma sulcicollis* is not *scutellata*, Fabr.

The Mascarene genera of *Cetoniidæ* discussed, and in many cases recharacterized; *id.* Deutsche E. Z. xxv. pp. 65–79.

Kraatz criticises Thomson's new genera of *Cetoniidæ*, and states that *Platinocnema*, Thoms., = *Aphelorrhina*, Westw., and *Oranida* and *Isandula*, Thoms., = *Melinesthes* and *Smaragdesthes*, Kraatz, respectively; *l. c.* pp. 174–176.

Goliathus, Lam., *Fornasinius*, Bert., and *Goliathinus*, Thoms., discussed; Thomson, Ann. Soc. Ent. Fr. (6) i. pp. x. & xi.

Ceratorrhina bertolonii, Luc., variation discussed, and *C.* (*Dicranorrhina*)

oberthueri, Deyr., ♂ noticed; Dohrn, S. E. Z. xlii, pp. 83–86. *C. princeps*, Oberth., ♂, and *C. burkii*, Westw., var. *histrio*, from East Africa, described; Bates, Ent. M. M. xviii. pp. 156 & 157.

Aphelorrhina simillima, Westw. Waterhouse maintains that he has correctly identified this species; Ann. N. H. (5)'viii. pp. 362–364.

Neptunides polychrous, Thoms. (= *flavicollis*, Thoms.). Varieties discussed, comprising *purpurescens* and *abundans*, Thoms., and *lineatocollis*, and *marginicollis*, Kraatz, *l. c.* pp. 257–259.

Dicranorrhina oberthueri, Deyr. Varieties discussed; *id. l. c.* pp. 260 & 261.

Smaragdesthes mutica, Har., = *jucunda*, Germ., *nec* Hope; *id. l. c.* pp. 264 & 265.

Plæsiorrhina plana, Wiedem., var. *pygialis*, from Africa, noticed; *id.* Ent. Monatsbl. ii. p. 23.

Stethodesma strachani, Bainbr., discussed; Dohrn, *l. c.* pp. 89 & 90.

Euryomia velox popularly described and figured; W. Saunders, Canad. Ent. xiii. p. 1, fig. 1.

Eutelesmus simplex, Waterh., *Coptomia opalina*, Gory & Perch., and *Eupœcila eburneo-guttata*, Blanch., figured by Waterhouse, Aid, i. pls. xiii., xviii., & lix.

Anoplochilus, Burm., restricted to Burmeister's section, 1 A, and allied South African species; Kraatz, Deutsche E. Z. xxv. p. 264.

Tropi[do]nota and *Oxythyrea*. Species tabulated by an anonymous writer; Ent. Monatsbl. ii. pp. 63 & 64. A few notes on other *Cetoniidæ* are added:—*Epicometis lethierrii*, Reiche, = *squalida*, *Cetonia fatima* = *niveo-picta*, Fairm., *C. athalia*, Reiche, = *subpilosa*, *C. judith* differentiated from *angustata*.

Cetonia, Fabr. On the use of this generic name; Kraatz, *l. c.* pp. 127 & 128. Characters of Mulsant's subgenera reprinted; *id. l. c.* pp. 143 & 144.

Cetonia fieberi and *opaca*, and *C. cardui* and var. *opaca* discussed; Kraatz, Ent. Monatsbl. ii. pp. 57–62 & 104. *C. crassa*, *dohrni*, and *minula*, Harold, redescribed by him; MT. Münch. ent. Ver. iv. pp. 161–164. *C. speciosissima* noticed; Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. cxxxiv.

Pachnoda calceata is distinct from *flaviventris*, Gory & Perch.; Harold, *l. c.* p. 160.

Diplognatha incoides, Thoms., probably = *admixta*, Hope; Kraatz, *l. c.* p. 263.

New genera and species:—

Hegemus, Thomson, Bull. Soc. Ent. Fr. (6) i. p. xi. Allied to *Goliathinus*; type, *G. pluto*, Raffray.

Gnorimimelus, Kraatz, Ent. Monatsbl. ii. p. 18; type, *Ceratorrhina batesi*, Ruth.

Hæmatonotus, id. *l. c.* p. 20. Allied to *Heteroclita*; type, *H. fritschi*, sp. n., *l. c.*, South Africa; add *H. lugens*, sp. n., O. E. Janson, Cist. Ent. ii. p. 603, Lake Nyassa.

Pedinorrhina, Kraatz, *l. c.* p. 23. Subgenus of *Plæsiorrhina*; to include

P. swanziana, Schaum, *mediana*, Westw., *septa*, Har. (and var. *sellata*, from East Africa, noticed *l. c.*), and *subænea*, Har.

Melinesthes, id. *l. c.* p. 24 (= *Heterorrhina*, sect. 3, Schaum). To include *Genyodonta umbonata*, Gory, *picturata*, Har., *algoensis*, and var. *flavipennis*, Westw.; and *M. simillima*, sp. n., *l. c.* p. 25, South Africa.

Chondrorrhina, id. *l. c.* p. 26. Allied to *Plæsiorrhina* and *Melinesthes*; type, *Cetonia abbreviata*, Fabr. (var. *late-fasciata* from Guinea described, *l. c.*).

Dyspilophora, id. *l. c.* p. 27. Allied to *Melinesthes*; type, *Gnathocera trivittata*, Schaum (var. *nigricans* from Natal described, *l. c.*).

Taniesthes, id. *ibid.* Allied to last; type, *Heterorrhiza specularis*, Gerst.

Smaragdesthes, id. *l. c.* p. 28 (= *Coryphocera*, Burm., sect. n, *BB*, 6). To include *Heterorrhina alternata*, Klug, and allies; add *S. affinis* and *nigricollis*, spp. nn., *l. c.* p. 29, notes, Benin.

Scythropesthes, id. *l. c.* p. 29. Allied to *Genyodonta*; type, *G. bicolor*, Burm.

Stizopygora, id. Deutsche E. Z. xxv. p. 79. Allied to *Pygora*; type, *P. puncticollis*, Waterh.

Eumimela, id. *l. c.* p. 264. Allied to *Anoplochilus*; type, *E. pygialis*, sp. n., *l. c.* Himalaya.

Xeloma, id. *ibid.* (= *Anoplochilus*, sect. 1, n, Burm.).

Eumimimetica, id. *ibid.* (= *Anoplochilus*, sect. 2, Burm.); type, *A. terrosus*.

Sisyraphora, id. *ibid.* (= *Anoplochilus*, sect. 2, p. Burm.). To contain *S. tomentosus*, sp. n. (?), Cape, *cicatricollis*, Burm., and *seticollis*, Kraatz.

Goliathopsis, O. E. Janson, Cist. Ent. ii. p. 609. Allied to *Pilinurgus*, but resembling the *Goliathidæ* in the armature of the head. Type, *G. cervus*, sp. n., *l. c.* p. 610, pl. xi. figs. 4 & 5, Siam.

Paratrichius, id. *l. c.* p. 610. Allied to *Trichius* and *Trigonopeltastes*; type, *P. longicornis*, sp. n., *l. c.* p. 611, pl. xi. fig. 1, Jesso.

Goliathus (*Goliathinus*) *pluto*, Raffray, Ann. Soc. Ent. Fr. (6) i. p. 241, pl. v. fig. 1, Abyssinia.

Hypselogenia corrosa, Bates, Ent. M. M. xviii. p. 156, East Africa.

Mycteristes microphyllus, Wood-Mason, Ann. N. H. (5) vii. p. 411, pl. xvii. figs. A–C, Naga Hills.

Ceratorrhina euthalia, Bates, *l. c.* p. 156, East Africa.

Eccoptocnemis relucens, id. *l. c.* p. 157, East Africa.

Tmesorrhina simillima, Kraatz, Ent. Monatsbl. ii. p. 155, West Africa.

Heterorrhina conjux, Harold, MT. Münch. ent. Ver. iv. p. 157, Guinea; *H. gratiosa*, Ancey, Le Nat. iii. p. 509, Zanzibar; *H.* (*Anisorrhina*) *laevicauda*, *H.* (*A.*) *elongata*, and *H. tricolor*, Bates, *l. c.* p. 157, East Africa.

Plæsiorrhina undulata, id. *l. c.*, East Africa.

Gymnetis suilla and *ravida*, O. E. Janson, Cist. Ent. ii. p. 581, Venezuela.

Clinteria decora, id. *l. c.* p. 603, India.

Macronota nigricollis, id. *l. c.* p. 604, Assam; *M. anceps*, Waterhouse, Tr. E. Soc. 1881, p. 488, Sumatra.

Pyrrhopoda beryllina, O. E. Janson, *l. c.* p. 605, Madagascar.

Platedelosis pinguis, id. *l. c.* pl. xi. fig. 2, New Guinea.

Schizorrhina truncatipennis, Ritsema, Notes Leyd. Mus. iii. p. 1, Aru Islands.

Celidota parvula, O. E. Janson, *l. c.* p. 606, Madagascar.

Glycyphana pexata, Philippine Islands, p. 606, *subcincta*, Andaman Islands, p. 607, *forticula*, Japan, *rutilans*, India, *illusa* (= *Euryomia rufo-vittata*, Wall., *nec.* Guér.), Borneo, p. 608, *id. l. c.*

Euphoria acerba, *morosa*, Quito, p. 582, *precaria*, New Granada, p. 583, *punicea*, Ecuador, *avita*, p. 584, *limatula*, Guatemala, p. 585, *id. l. c.*

Anoplochilus scticollis, Kraatz, *l. c.* p. 154, Zanzibar.

Leucocelis cupricollis, Lake Nyassa, and *hildebrandti*, Zanzibar, *id. l. c.* pp. 153 & 154.

Protætia nox, O. E. Janson, *l. c.* p. 609, pl. xi. fig. 3, Philippine Islands.

Cetonia magica, Harold, *l. c.* p. 160, Külek; *C.* (*Pachnoda*) *prasina*, Karsch, SB. nat. Fr. 1881, p. 57, Guinea Islands.

Pachnoda massajæ, Gestro, Ann. Mus. Genov. xvi. p. 204, Shoa; *P. nigritarsis*, Harold, *l. c.* p. 158, Tropical Africa.

Trichoplus cordicollis, Waterhouse, Ann. N. H. (5) viii. p. 319, Zulu.

Myoderma rufipennis (Deyr. MS.), Gestro, *l. c.* p. 204, Shoa.

Buprestidæ.

Thomson, J. Revue du groupe des Psiloptérites. R. Z. (3) vii. pp. 161–177.

The genera are enumerated, with short characters, and the genus *Psiloptera* is divided into five sections: *Psiloptera*, Sol., type *attenuata*, Fabr.; *Damarsila*, Thoms., type *spissiformis*, Thoms.; *Œdisterna*, Luc., type *cuprea*, Linn.; and *Monosacra*, Thoms., type *lalandii*, Gory, *nec* Guér. A list of species in the author's collection is added, and several are described as new.

Table of Belgian *Buprestidæ*; Bergé, Bull. Soc. Dinant (1881?) (extract, 6 pp.).

Blepharum cæruleipes and *Melobasis cupro-ænea*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. pp. 264 & 266.

Euchroma gigantea, L., and *goliath*, Cast. & Gory, diagnosed and variation discussed; Sharp, Tr. E. Soc. 1881, pp. 289–295.

Paracupta. *Chalcophora helopioides*, Heer, *nec* Boisd., = *sulcata*, Saund.; *P. anomala*, Fairm., = *æneiventris*, Saund.; *Chrysodema louisa*, White, = *Chalcophora prasina*, Heer; *P. taciturna*, Saund., = *C. flaviventris*, Heer; *P. late-impressa*, *dilatipes*, and *kleinschmidti*, Fairm., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 260–264.

Cæculus insularis, Kies., noticed; Karsch, Ent. Monatsbl. ii. p. 143.

Buprestis (*Psiloptera*) *bioculata*, Oliv., noticed; Dohrn, S. E. Z. xlii. pp. 87 & 88.

Buprestis wallisi, Montr. (? = *Dicercomorpha cæruleipennis*, Fairm.), redescribed; Fairmaire, *l. c.* p. 265.

Lampra, Spin., monographed; 10 species noticed. *L. balcanica*, var.

major from Amasia described (p. 151); *Pœcilonata virgata*, Motsch., referred to the genus. Kraatz, *l. c.* pp. 145–152.

Buprestis (*Ancylochira*) *rustica*, Linn.; *B. hæmorrhoidalis*, Herbst (*punctata*, Fabr.), *B. flavo-maculata*, Fabr., *octo-punctata*, Linn., var. *magica*, Cast. & Gory, variation noticed, *B. ledereri*, Mars., *dalmatina*, Mannerh., and *tarsensis*, Mars., noticed from Greece; *B. hilaris*, Klug, var. *variegata*, Klug, noticed: *id. l. c.* pp. 133–142.

Melanophila legrandi, Muls., = *marmottani*, Fairm.; Bedel, Bull. Soc. Ent. Fr. (6) i. p. ciii. It is injurious to cedar in Algeria; Lamey, Nouv. et faits, ii. pp. 142 & 143.

Lasionota, Dej., = *Zemina*, Cast., = *Dactylonodes*, Chevr.; *D. tetrazona*, Chevr., = *Z. dorbignii*, *hirsuta*, and *brullæi*, Cast., = *D. quadrizonata*, Blanch., = *L. quadrifasciata*, Mannerh.: Berg, S. E. Z. xlii. pp. 55–58, & Exped. Rio Negro, Zool. pp. 100–102.

Stigmodera viridicincta, Waterh., and *sex-maculata*, Saund., variation noticed; Waterhouse, Ann. N. H. (5) vii. p. 464.

Chrysobothris dentipes, Germ., larvæ described; Packard, Ins. Inj. Trees, p. 12. *C. femorata*, Fabr., tranformations described; Fitch & Packard, *op. cit.* pp. 16–20, figs. 2 & 3.

Agrilus. Table of French species and descriptions of several new ones; Bauduer, Bull. Soc. Toulouse, xii. pp. 73–83.

Brachys æruginosa and *terminans*. Larva of the first figured, and of the second described; Packard, Ins. Inj. Trees, p. 130, fig. 60½.

New genera and species :—

Chalcoplia (Deyr., MS.), Thomson, R. Z. (3) vii. pp. 162 & 175. Allied to *Psiloptera*; third joint of antennæ long, prosternum transversely sulcate in front, unarmed: type, *P. serripennis*, Gory (redescribed, *l. c.* p. 176).

Damarsila, id. *l. c.* p. 163. Allied to *Lampetis*; prosternum bituberculate in front; type, *L. spissiformis*, Thoms.; add *D. hercules*, p. 170, *omphale*, *conturbata*, Zambesi, p. 171, *subumbrosa*, p. 172, *raffrayi*, Zanzibar, *transvaalensis*, Transvaal, p. 173, *suspecta*, *substriata*, Natal, p. 174, *gerstæckeri*, Mozambique, p. 175: spp. nn.

Monosacra, id. *l. c.* p. 163. Allied to *Œdisterna*; type, *Œ. lalandii*, Gory (*nec* Guér.).

Sternocera cambieri, Preudhomme de Borre, C. R. Ent. Belg. xxv. p. cii. pl. iv., Central Africa. *S. atro-virens*, Ancey, Le Nat. iii. p. 461, Uzagara, East Africa.

Catoxantha cuprascens, Waterhouse, Ann. N. H. (5) vii. p. 457, Travancore.

Chalcotænia vittata and *læta*, id. *l. c.* pp. 462 & 463, Queensland.

Paracupta tibialis (Saund., MS.), Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 262, Fiji.

Perotis longicollis, Kraatz, Ent. Monatsbl. ii. p. 142, Asia Minor.

Lampetis margaritacea, Cayenne, *eva*, Flores, p. 169, *costicella*, Zanzibar, p. 170, Thomson, R. Z. (3) vii.

Capnodis indica, id. *l. c.* p. 176, Almora.

Pœcilonota balcanica, Kirchsberg, Ent. Monatsbl. i. p. 29, Balkans. [Omitted from Zool. Rec. xiii.]

Anthaxia scorzoneræ, Thessaly, p. 129, *mascheli*, Caucasus, p. 130, *pinguis*, Parnes, *olympica*, Salonica (= *fuligidipennis*, Mars., *nec* Luc.) p. 131, and *hyrcana* (Kirsch, MS.), Astrabad, p. 132, Kiesenwetter, *op. cit.* ii.

Stigmodera macfarlani, Waterhouse, *l. c.* p. 463, Torres Straits.

Acmæodera pastoralis, Bogos, and *raffrayi*, Zanzibar, Gestro, Ann. Mus. Genov. xvi. pp. 659 & 660.

Sphenoptera libanica, Fairmaire, *l. c.* p. 87, Lebanon.

Chrysobothris regradata, Wallengren, Ent. Tidskr. ii. p. 16, Transvaal.

Amorphosoma diversicolor and *subindutum*, id. *ibid.*, Transvaal.

Discoderes pavo, Gestro, *l. c.* p. 660, Bogos.

Agrilus proximus, Lyons, p. 80, *baudii*, Trieste, Alps, p. 82, *reyi*, France, p. 83, Bauduer, Bull. Soc. Toulouse, xii.

Trixagidæ.

Lissomus francisci, sp. n., Karsch, SB. nat. Fr. 1881, p. 58, Guinea Islands.

Monommidæ.

Monomma mycotretoide, Aden, and *stenotarsoide*, Andaman Islands, Anccy, Le Nat. iii. pp. 397 & 413, spp. nn.

Eucnemidæ.

Melanus, g. n., Broun, Man. N. Z. Col. p. 676. Allied to *Talerax*; type, *M. sculptus*, sp. n., *l. c.* p. 677, New Zealand.

Neocharis osculans, sp. n., *id. l. c.* p. 674, New Zealand.

Talerax capax, p. 674, *niger*, *rusticus*, p. 675, and *foveatus*, p. 676, *id. l. c.*, New Zealand, spp. nn.

Protelater nigricans, sp. n., Sharp, Ent. M. M. xviii. p. 50, New Zealand.

Elateridæ.

Aphricus californicus, Lec., pl. ii. fig. 6, figured and redescribed; *Aplastus*, Lec., 6 species tabulated; *A. angusticollis*, Horn, figured, fig. 9, and *speratus* (fig. 8) and *optatus*, figs. 6 & 7, pl. i., ♀ ♀ described; *Anamesus convexicollis*, Lec., = *optatus*, ♀; *Plastocerus schaumi*, Lec., and varr. *frater*, Lec., and *macer*, Horn, pl. ii. figs. 1–5, *Euthisanius lautus*, Lec., figs. 1–3, and *pretiosus*, Lec., figs. 4 & 5, pl. ii., noticed and generally redescribed. Horn, Tr. Am. Ent. Soc. ix. pp. 76–81.

Lacon glirinus, *Anchastus major* and *tongaensis*, *Compshelus flavus* and *Photophorus jansoni*, Cand., and *Alaus costulicollis*, Fairm., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 267–271.

Alaolacon cyanipennis, Candèze, figured by Waterhouse, Aid. i. pl. lii.

Alaus gorgops and *oculatus* noticed; Bell & Leconte, Canad. Ent. xiii. pp. 59, 80 & 116. The latter popularly described and figured; W. Saunders, *op. cit.* pp. 117 & 118, fig. 7.

Chalcolepidius candezii, Dohrn, noticed by him ; S. E. Z. xlii. p. 446.

Semiotus caracassanus, Rojas, noticed from Chiriqui ; *id. ibid.*

Tetralobus bifoveolatus, Boh., noticed and figured ; Westwood, in Oates's Matabele Land, p. 361, pl. G, fig. 4.

Elater segetis and *obscurus*. Ravages in Sweden ; P. von M., Ent. Tidskr. ii. pp. 53 & 60.

Melanotus, Esch. *nec* Dej., must take the name of *Perimecus*, Steph. ; Des Gozis, Bull. Soc. Ent. Fr. (6) i. pp. cxxxv.

Corymbites (*Diacanthus*) *spretus*, Mannerh., noticed ; Mäklin, Sv. Ak. Handl. (2) xviii. p. 27.

Agriotes sordidus, Ill., var. *scutellatus*, from Malorca, described ; Schaufuss, Verh. z.-b. Wien, xxxi. p. 622.

Pleonomus, Mén. Generic characters discussed ; Kraatz, Deutsche E. Z. xxv. pp. 324 & 325.

New genera and species :—

Oxylasma, Broun, Man. N. Z. Col. p. 679. Placed after *Thoramus* ; types, *O. pannosum* and *tectum*, spp. nn., *l. c.* pp. 679 & 680, New Zealand.

Dioxypterus, g. n., Fairmaire, Le Nat. iii. p. 406 ; Ann. Soc. Ent. Fr. (6) i. p. 267. Allied to *Aphanobius* ; types, *D. nigro-transversus*, *flexuosus*, pp. 406 & 268, *guttulatus* and *vage-pictus*, pp. 406 & 269, spp. nn., *ll. cc.*, Fiji.

Agrypnus himerensis, Ragusa, Nat. Sicil. i. p. 8, pl. i. figs. 7 & 8, Sicily.

Lacon stricticollis, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 266, Fiji.

Agræus constrictus, Ritsema, Notes Leyd. Mus. iii. p. 29, Batavia.

Ctenicera controversa, Karsch, SB. nat. Fr. 1881, p. 58, Guinea Islands.

Algys bituberosus, Fairmaire, Le Nat. iii. p. 381, Duke of York Island.

Elater humeralis, Karsch, B. E. Z. xxv. p. 5, pl. i. fig. 7, Sandwich Islands.

Thoramus cervinus, p. 677, *angustus*, *parvulus*, p. 678, Broun, Man. N. Z. Col., New Zealand.

Cryptohypnus meinertzhageni, id. *l. c.* p. 680, New Zealand.

Cardiophorus margelanicus, Heyden, Deutsche E. Z. xxv. p. 325, Turkistan.

Athous cingulatus, Miller, Deutsche E. Z. xxv. p. 219, pl. vii. figs. 5 & 6, Cattaro.

Corymbites coruscus, Karsch, B. E. Z. xxv. p. 5, pl. i. fig. 6, Sandwich Islands.

Chrosis livens, *validus*, p. 681, *setigerus*, *brevicollis*, p. 682, *castaneus*, *certus*, *fulvipes*, p. 683, Broun, *l. c.* ; *C. violacea*, Sharp, Ent. M. M. xviii. p. 49, all from New Zealand.

Agriotes nitidicollis, Miller, *l. c.* p. 220, Buda.

Cebrionidæ.

The *Cebrionidæ* cannot be properly separated from the *Elateridæ* ; Horn, Tr. Am. Ent. Soc. ix. p. 85.

Anachilus is not truly distinct from *Cebrio* ; *C. bicolor*, Fabr., pl. ii. fig. 7 (of which *confusus* and *bicolor*, Lec., are synonyms) ; *C. mandibu-*

laris, Lec., *Scaptolenus lecontii*, Sallé, and *estriatus*, Lec., redescribed; Horn, *l. c.* pp. 82–85.

Genecerus cervinus, Walker, figured by Waterhouse, Aid, i. pl. lxxiii.

Cebrio estriatus, sp. n., Horn, *l. c.*, p. 83, Texas.

Scaptolenus ocreatus, sp. n., *id. l. c.* p. 84, Texas.

Rhipidoceridæ and Dascyllidæ.

The *Rhipidoceridæ* and *Dascyllidæ* cannot be considered to be distinct families. The following are the American species of the former group, which are tabulated and partly figured: *Zenoa picea*, Beauv. (= *brunnea*, Say, = *vulnerata*, Lec.), fig. 9. *Sandalus petrophyus*, Knoch, figs. 12 & 13, (= *fulvus*, Cast., = *proserpina*, Newm., = *brevicollis*, Mels.); *porosus*, Lec., *niger*, Knoch (= *rufipennis*, Latr., *rubidus*, Mels., = *knochi*, Guér., = *scabricollis*, Hald.), and *californicus*, Lec., figs. 10 & 11. *Æneus quadrimaculatus*, Horn, fig. 14, and *Brachypsectra fulva*, Lec., fig. 15, are also noticed. The genera *Psephenus* and *Lara* probably belong rather to the *Parnidæ* than to the *Dascyllidæ*. Horn, Tr. Am. Ent. Soc. ix. pp. 85–89, pl. ii.

Callirrhipis femorata and *costata*, Waterh., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 271 & 272.

Cyphon, sp. n. (?), from Jarzowo Selo, noticed; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 27.

Pherocladus, sp. n., Fairmaire, Le Nat. iii. p. 372, and Ann. Soc. Ent. Fr. (6) i. p. 273. Allied to *Ptilodactylus*; type, *P. dermestoides*, sp. n. *ibid.*, Fiji.

Prionocyphon ornatus, sp. n., Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i. p. 103.

Sacodes protectus, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 169, Nagasaki.

Telephoridæ.

Leconte, J. L. Synopsis of the *Lampyridæ* of the United States. Tr. Am. Ent. Soc. ix. pp. 15–72.

The *Lycidæ*, *Lampyridæ*, and *Telephoridæ* are regarded as 3 subfamilies of equal value, and are all included in the present paper. Many new genera and species are described. An appendix of bibliography and synonymy is added.

Lycides.

Cerceros pectinicornis, Kraatz, = *Lygistopterus flabellatus*, Motsch., and belongs to *Macrolycus*, Waterh., which has priority over *Cerceros*, Kraatz; Bourgeois, Bull. Soc. Ent. Fr. (6) i. pp. xlvi. & xlvii.

New genera and species:—

Rhyncheros, Leconte, Tr. Am. Ent. Soc. ix. p. 18. Allied to *Lycus* and *Plateros*; has a short distinct beak, and tubular thoracic spiracles. Type, *L. sanguinipennis*, Say.

Lopheros, id. *l. c.* p. 23. Allied to *Eros*, prothorax strongly carinate,

sides divided by an oblique ridge from the hind angles. Type, *Lycus fraternus*, Rand.

Calleros, Gorham, Biol. Centr. Amer. *Col.* iii. (2) p. 25. Allied to *Plateros*; to contain *Eros phœnicurus*, Kirsch, and *C. puniceus* (type) *rufo-brunneus*, *militaris*, and *sinanjœ*, spp. nn., *l. c.* p. 26, Guatemala.

Calolycus, id. *l. c.* p. 27. Allied to *Plateros*: prothorax expanded at sides, elytra oval; type, *C. calanticatus*, sp. n., *l. c.* pl. iv. fig. 3, Mexico.

Calodadon, id. *l. c.* Allied to *Plateros* and *Calopteron*; to contain *Calopt. lætum*, Kirsch, and *C. testaceum*, pl. ii. fig. 20, and *Calod. oculatum*, Guatemala and Nicaragua, p. 28, and *fusculum* and *pectinicornis*, Chontales, p. 29, spp. nn.

Lycostomus fulvellus, Leconte, *l. c.* p. 18, Colorado.

Calopteron retiferum and *tricarinatum*, id. *l. c.* p. 20, Arizona.

Cænia amplicornis, id. *l. c.* p. 22, Colorado.

Calochromus fervens, id. *l. c.* p. 28, Colorado.

Stadenus auberti, Bourgeois, Bull. Soc. Ent. Fr. (6) i. p. xxxvii., Gaboon.

Pyropterus himalejicus, id. *l. c.* p. cxliv., Sikkim.

Plateros patiens and *stramineus*, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 25, Guatemala.

Homalisus (*Phœopterus*, Costa) *nigricornis*, Reitter, Deutsche E. Z. xxv. p. 220, Dalmatia, Montenegro.

Lampyrides.

Leconte, J. L. On Lightning Bugs (*Lampyridæ*). P. Am. Ass. 1880, pp. 650–659.

The author summarizes the present classification, and our knowledge of the luminosity of the group, and suggests that spectroscopic, biological, and chemical investigations should be undertaken to determine the real character of the light.

Observations on fire-flies [*Lampyrides*?]; Pryer, Ent. M. M. xvii. pp. 244 & 245.

Gorham, Biol. Centr. Am. *Col.* iii. (2), figures and describes the following species of *Lampyrides* (chiefly his own): *Lamprocera picta*, fig. 1, *Hyas rhomboidea*, fig. 2, *angularis* (p. 30), *Cladodes plumosa*, fig. 21, *Phænolis laciniatus*, fig. 22, *Æthra despecta*, fig. 3, *Lucidota silphoides* and *apicicornis*, and *osculatii*, Guér. (p. 35), *bella*, fig. 4, *apicalis*, fig. 5, pl. iii., *atra*, Oliv. (= *laticornis*, Fabr., p. 37), *Photinus congruus*, Chevr., fig. 12 (p. 38), *perelegans*, pl. iii. fig. 12, p. 40, *cinctellus*, pl. iv. figs. 23 & 24, p. 42, *guatemalæ*, fig. 10, *lunicollis*, fig. 9, p. 44, *sanguinicollis*, fig. 8, *aurora*, fig. 7, p. 45, *perlucens*, fig. 11, pl. iii. p. 46, *Lucidota californica*, Gorh. (*nec* Mots.), renamed *Photinus sobrinus*, Dugès, MS., *P. coruscus*, L. (= *autumnalis*, Mels.), p. 49, *Pyrectomena angulata*, Say, pl. iv. fig. 19, p. 50, *striatella*, fig. 13, *Cratomorphus fuscipennis*, Mots. (= *latus*, Kirsch), p. 51, *Aspidosoma ægrotum*, fig. 16, *depictum*, fig. 17, pl. iii., *pulchellum*, fig. 15, p. 54, *ignitum*, L. (= *polyzona*, Chevr.), *bilineatum*, figs. 8 & 9, pl. iv., *costatum*, fig. 18, p. 55, *Photuris collaris*, fig. 15, *lucidicollis*, fig. 14, pl. iii. p. 58, *pennsylvanica*, De Geer (= *versicolor*, Fab. = *vittigera* and

lineaticollis, Mots.), p. 59, *fruticola*, Mots. (= *trivialis*, Boh.), p. 60, *mollis*, pl. iii. fig. 19, p. 61, *Belotus abdominalis*, Lec., pl. vi. fig. 8, p. 99.

Lampyridæ. Notes on luminosity; Austin & Martin, Rep. E. Soc. Ont. 1880, p. 17.

Extracts from Leconte's Synopsis of *Lampyridæ*; S. E. Z. xlii. pp. 492–494.

[*Lampyris*?] Notes on the Indian Glow-fly; Severn, Nature, xxiv. p. 165.

Lampyris noctiluca. Character of its phosphorescence; Enell, Ent. Tidskr. ii. pp. 101–103, 117 & 118.

Lamprohiza splendidula noticed; Dollfus, Feuill. Nat. xi. p. 152.

New genera and species:—

Tenaspis, Leconte, Tr. Am. Ent. Soc. ix. p. 33. Allied to *Hyas*; antennæ simple, light organs wanting; type, *Lycus angularis*, Gorh.

Drilolampadius, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 33. Allied to *Æthra*; antennæ 11-jointed, third to tenth joints with branches equal in length, and filamentary; types, *D. stolatus*, pl. iii. fig. 20, and *scutellaris*, spp. nn., *l. c.* Guatemala, &c.

Hyas lugubris and *semifusca*, Gorham, Biol. Centr. Am. *Col.* iii. (2) pp. 30 & 31, Guatemala.

Pleotomus davisi, Leconte, Tr. Am. Ent. Soc. ix. p. 37, Kentucky.

Phænolis nigricollis, Gorham, *l. c.* p. 32, Mexico.

Lucidota diaphanura, fig. 22, p. 36, *lugens*, Mexico, fig. 18, pl. iv. and *discolor*, Mexico, Central and South America, pl. iii. fig. 6, p. 37; *id. l. c.*

Pyropyga indicta, Leconte, *l. c.* p. 32, Michigan, California.

Photinus dimissus and *benignus*, id. *l. c.* p. 35, Texas; *P. meteoralis*, Guatemala, fig. 14, p. 38, *gliscens*, fig. 13, *nigridorsis*, fig. 17, p. 39, and *ovatus*, fig. 16, p. 40, *extensus*, fig. 11, *productus*, fig. 10, *attenuatus*, p. 41, *consanguineus*, Mexico, fig. 25, *simplex*, Mexico, Guatemala, p. 42, *reichii*, *sturmi*, fig. 21, p. 43, *salvini*, fig. 6, pl. iv. p. 44, *cordovæ*, p. 45, *albicauda*, *latiusculus*, Mexico, p. 46, *parvulus*, Guatemala, Mexico, p. 47, *picticollis*, Guatemala, p. 48, *ater* (Dugès, MS.), Mexico, p. 49: Gorham, *l. c.*

Pyrectomena vexillaria, id. *l. c.* p. 50, pl. iv. fig. 20, Mexico.

Cratomorphus picipennis, id. *l. c.* p. 52, pl. iv. fig. 7, Mexico, Guatemala.

Aspidosoma lepidum, id. *l. c.* p. 54, Mexico, Guatemala.

Lampyris (*Lampronetes*) *turkestanica*, Heyden, Deutsche E. Z. xxv. p. 326, Turkistan.

Megalophthalmus godmani, Gorham, *l. c.* p. 34, Guatemala.

Photuris fasciata, Guatemala, p. 56, *discicollis*, Mexico, Guatemala, pl. iv. fig. 26, *cyathigera*, Mexico, p. 57, *facialis*, Guatemala, p. 59, *lugubris*, Mexico, Guatemala, *simplex*, Costa Rica, p. 61, *scapularis*, Guatemala, p. 62; *id. l. c.*

Telephorides.

Chauliognathus, Hentz. Gorham, Biol. Centr. Am. *Col.* iii. (2), figures or specially notices the following known species:—*C. dimidiatus*, Waterh., fig. 3, *sodalis*, W., figs. 8 & 9, p. 69, *janus*, W., fig. 4, *togatus*, W., figs. 10 & 11, p. 71.

New genera and species :—

Zarhipis, Leconte, Tr. Am. Ent. Soc. ix. p. 39. Allied to *Phengodes*; to contain *P. integripennis*, Lec., and *Z. ruficollis* and *picicentris*, spp. nn., *l. c.*, California.

Cenophengus, id. *l. c.* p. 41. Allied to *Mastinocerus*, antennæ longer, &c.; type, *C. debilis*, sp. n., *l. c.*, California.

Euchleochrous, Fairmaire, Le Nat. iii. p. 381; Ann. Soc. Ent. Fr. (6) i. p. 274. Allied to *Tylocerus*; type, *E. semicyaneus*, spp. nn., *ll. cc.* pp. 382 & 275, Fiji.

Daiphron, Gorham, Biol. Centr. Am. *Col.* iii. (2) p. 66. Allied to *Chauliognathus*; to contain *D. lyciforme*, fig. 2, Guatemala, Nicaragua, p. 66, *ochraceum* and *crassicorne*, fig. 24, Guatemala, p. 67, and *proteum*, figs. 14–16, Mexico, Guatemala, p. 68, pl. v., spp. nn.

Discodon, id. *l. c.* p. 78. Allied to *Podabrus*; to contain the following new species:—*D. erosum*, Mexico, *plicatum*, Mexico, Guatemala, *incisum*, p. 79, *nigripes*, *carbonarium*, and *marginatum*, Guatemala, p. 80, *vitticolle*, Guatemala, Mexico, Costa Rica, *flavicolle*, *melancholicum*, Mexico, p. 81, *triste*, Mexico, Guatemala, Nicaragua, *normale*, pl. v. fig. 20, pl. vi. fig. 20, Mexico, Guatemala, p. 82, *perplexum*, Mexico, p. 83, *cleroides*, fig. 18, *photinoides*, fig. 19, Guatemala, p. 84, *dubium*, *luridum*, *lugubre*, Mexico, p. 85, *histrio*, fig. 22, Guatemala, *difficile*, p. 86, *bivittatum*, *oppositipunctum*, Mexico, *purpurascens*, fig. 23, Costa Rica, p. 87, *flaccidum*, Guatemala, p. 88, spp. nn.

Maronius, id. *l. c.* p. 100. Placed after *Belotus*; type, *M. dichrous*, sp. n., *l. c.* pl. vi. fig. 9, Mexico, Guatemala, Nicaragua.

Thinalmus, id. *l. c.* p. 101. Allied to *Malthinus*; antennæ in ♂ strongly pectinate, in ♀ serrate. Types, *T. pectinicornis*, pl. vi. fig. 13, and *centrolineatus*, both from Guatemala and Panama, spp. nn., *l. c.*

Plerhodius, id. *l. c.* p. 106. Allied to *Cenophengus*; to include *P. mandibularis* (type), Panama, and *ramosus*, pl. vi. fig. 12, Guatemala, p. 107, spp. nn.

Euryopa, id. *l. c.* p. 108. Differs from *Phengodes* by its shorter antennæ, &c. To contain *E. fusca* (type), Mexico, p. 108, *singularis*, pl. vi. fig. 4, *brunnea*, Guatemala, and *nigra*, Guatemala, Panama, p. 109, spp. nn.

Phengodes bimaculata, Chontales, pl. iii. fig. 23, p. 63, *fusca*, Costa Rica, and *nigricornis*, Mexico, p. 64, *bipennifera*, Mexico, Guatemala, pl. v. fig. 1, and *minor*, Guatemala, p. 65; Gorham, Biol. Centr. Am. *Col.* iii. (2); *P. frontalis*, Texas, *laticollis*, North Carolina, *sallei*, Louisiana, Leconte, Tr. Am. Ent. Soc. ix. p. 39.

Mastinocerus texanus, id. *l. c.* p. 40, Texas.

Chauliognathus rex, Mexico, Guatemala, p. 68, *nitidicollis*, Costa Rica, p. 69, *jucundus*, fig. 5, Guatemala, *tricolor*, fig. 6, Chontales, *tabulatus*, Costa Rica, Nicaragua, p. 70, *signatus* (Sturm, MS.), *nigro-cinctus*, fig. 12, *bilineatus*, fig. 13, Mexico, p. 72, *œdemeroides*, Mexico, Honduras, Nicaragua, Guatemala, *fuscescens*, Mexico, Guatemala, Nicaragua, p. 73, *exsanguis*, Guatemala, *lituratus*, Mexico, Nicaragua, *nigriceps*, Mexico, Honduras, Guatemala, p. 74, *apicalis*, *emaciatus*, Guatemala, fig. 17, *histrio* (Dej., MS.), Mexico, p. 75, *terminalis*, Costa Rica, Nicaragua, *collaris*, *aterrimus*, p. 76, *scapularis* (Sturm, MS.), *morio* (Sturm, MS.),

Mexico, *hastatus*, Guatemala, Mexico, fig. 7, p. 77, Gorham, *l. c.* pl. v.; *C. fasciatus*, Leconte, *l. c.* p. 44, Utah.

Podabrus nothoides, Massachusetts, Lake Superior, *quadratus*, Texas, *fissus*, Florida, p. 46, *binotatus*, California, *limbellus*, New Hampshire, p. 47, *xanthoderus*, California, *lutosus*, California, Nevada, &c., *extremus*, Hudson's Bay, p. 48, *bolteri*, California, *mellitus*, California, Nevada, p. 49, *id. l. c.*

Telephorus pusio, *walshi*, Illinois, p. 51, *nigritulus*, Hudson's Bay, Anticosti, *nanulus*, Detroit, p. 52, *ruficollis*, Colorado, *impar*, Texas, p. 53, *alticola*, Colorado, Wyoming, *ochropus*, California, p. 54, *ingenuus*, Nevada, *repandus*, Pennsylvania, Georgia, Texas, p. 55, *id.* l. c.; *T.* (*Discodon*?) *lampyroides*, pl. vi. fig. 15, Costa Rica, Guatemala, p. 89; *T. rugipennis*, *T.* (*Silis*?) *mimetus*, and *T. comptus*, Guatemala, p. 90, Gorham, *l. c.*

Silis lycoides, pl. v. fig. 21, Mexico, Guatemala, p. 91, *varians*, fig. 1, Mexico, Guatemala, p. 93, *præmorsa*, fig. 2, *nigrita*, *hæmatodes*, Guatemala, p. 93, *erythroderes*, Mexico, *croides*, fig. 6, Mexico, Guatemala, *basalis*, p. 94, *lineata*, *distorta*, Guatemala, p. 95, *dilacerata*, fig. 4, Mexico, Guatemala, Nicaragua, *albicincta*, fig. 5, Mexico, Costa Rica, Panama, p. 96, *rufifrons*, Guatemala, and *laticollis*, fig. 17, pl. vi., Mexico, p. 97, *id.* l. c.; *S. munita*, Arizona, Colorado, p. 56, *spathulata*, Illinois, *perforata*, Texas, p. 57, Leconte, *l. c.*

Ditemnus fossiger, id. *l. c.* p. 58, Texas, Arizona.

Belotus fuscus, Mexico, and *maculatus*, Panama, Gorham, *l. c.* p. 99.

Lobetus mirabilis, id. *l. c.* pl. vi. figs. 10 & 11, Mexico.

Trypherus forficulinus, id. *l. c.* p. 98, pl. vi. fig. 7, Guatemala.

Malthinus major, *championi*, Panama, p. 102, *laticeps*, pl. vi. fig. 14, Guatemala, *terminalis*, Panama, p. 103, *brevipennis*, *cruenticeps*, p. 104, and *flavipes*, Guatemala, p. 105, *id.* l. c.; *M. atripennis*, Leconte, *l. c.* p. 60, Texas.

Malthodes captiosus, Virginia, *rectus*, Virginia, Georgia, *curvatus*, Illinois, p. 61, *furcifer*, Colorado, *arcifer*, Maryland, *analis*, Middle States, *congruus*, Virginia, p. 62, *quadricollis*, Lake Superior, p. 63, *id.* l. c.; *M. pallipes*, Guatemala, and *sanguineicollis*, Panama, Gorham, *l. c.* p. 105.

Diurus compressicauda, Fairmaire, Le Nat. iii. p. 349, Ponapé.

Aclytia tumida and *piliventer*, Broun, Man. N. Z. Col. p. 684, New Zealand.

Melyrides.

Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i. pp. 104–128, notices the following known species: *Malachius lusitanicus*, Er., and *australis*, Rey, are distinct; *M. carinifrons*, and *parilis*, var. *calabrus*, Baudi; *Anthocomus bicinctus*, ♂, *Ebæus collaris*, Er., var. *princeps*, from Algeria, described; *E. baudueri*, Peyr., *nigricollis*, Küst., and *pedicularis*, Schrank; *E. eximius*, Peyr., ♂ described; *Antidipnis flavo-cinctus*, Muls., and var. *anthicinus*, Baudi; *Colotes maculatus*, Cast., and *hampii*, Redt., are probably distinct; *Troglops pluriarmatus*, Belou, is closely allied to *Psiloderes formicarius*, and the genus *Psiloderes* scarcely appears to be distinct from *Troglops*.

Attalus parietariæ, Er., discussed; Ragusa, Nat. Sicil. i. p. 64.

Dasytes ruficollis, Ulke, redescribed, Bull. Brooklyn Soc. iv. p. 41. *D. tibialis*, Muls. & Rey, *nec* Sol., renamed *reyanus*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxv.

Danacæa pallipes, Panz., noticed; Heyden, Deutsche E. Z. xxv. p. 245.

New species :—

Malachius dimorphus, Pyrénées Orientales, p. 105, *gethsemaniensis*, Gethsemane, p. 106, *peyroni*, Antilibanus, p. 108, and *bedeli*, Algeria, p. 110, *damascænus*, Damascus, p. 125, and *mossulensis*, Mesopotamia, p. 126, Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i.

Axinotarsus peninsularis, Barcelona, *insularis*, Ajaccio, *id. l. c.* pp. 112 & 113.

Attalus (*Antholinus*) *viduus*, id. *l. c.* p. 115, Caiffa.

Anthocomus cardinalis, id. *l. c.* p. 111, Syria.

Hypebæus vitticollis, Palestine, and *discifer*, Tiberias, *id. l. c.* pp. 117 & 118.

Psiloderes (?) *biguttatus*, id. *l. c.* p. 119, Tiberias.

Troglops orientalis, id. *l. c.* p. 121, Lebanon.

Cephalogonia gautardi, id. *l. c.* p. 123, Madeira.

Dasytes stewarti, Broun, Man. N. Z. Col. p. 684, New Zealand.

Cleridæ.

Clerus syriacus, Spin., and *carceli*, Chevr., variation noticed; Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i. p. 101. *C. lepidus*, Walk., figured by Waterhouse, Aid, i. p. lxxvi.

Lemidia oblique-fasciata and *Callimerus pulchellus*, Gorham, figured; *id. l. c.* pls. xiv. & xlv.

Spermodenops, g. n., Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i. p. 97. Allied to *Denops*; type, *S. mollipennis*, sp. n., *l. c.* p. 98, Palestine.

New species :—

Tillus rugulosus, Henschel & Dalla Torre, JB. Naturk. Œst. xi. p. 8, Upper Austria.

Clerus (*Trichodes*) *longissimus*, Damascus, p. 99, *angustifrons*, Tarsus, p. 100, *viridi-aureus*, Tiberias, p. 101, Abeille de Perrin, Ann. Soc. Ent. Fr. (6) i.

Trichodes gemma, Ancey, Le Nat. iii. p. 461, Uzagara, East Africa.

Ommadius lividipes, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 275, Fiji.

Tenerus frontalis, id. Le Nat. iii. p. 389, Duke of York Island.

Phymatophæa pictum, *dorsale*, p. 685, *viridans*, *testacea*, *atratum*, p. 686, Broun, Man. N. Z. Col., New Zealand.

Lymexylonidæ.

Gorham (Biol. Centr. Am. *Col.* iii. 2) discusses the *Lymexylonidæ*, in which he proposes to include the *Pterotini* and *Mastenocerini* of Leconte, p. 106. He redescribes and figures *Melitomma brasiliense*, Cast. (= *castaneum*, Murr.), fig. 3, p. 110, and *Atractocerus brasiliensis*, Serv. (= *dipterum* & *dipterorum*, Pert.), fig. 7, pl. vii. p. 112.

Lymexylon biguttatum, Schell., = *barbatum*, Panz.; *L.* (?) *liguricum*, Schell., apparently = *Zonites mutica*, Scriba; Heyden, Deutsche E. Z. xxv. p. 255.

Ptinidæ.

Priobium planum, Muls., *Anobium confusum*, Kraatz (= *denticolle*, Thoms.), *Ernobius tarsatus*, Kraatz (= *mollis*, Muls.), and *convexiusculus*, Muls., recorded as new to Germany; Kraatz, Deutsche E. Z. xxv. pp. 301–303.

Niptus hololeucus, Fald., noticed; Schilde, Ent. Nachr. vii. p. 115.

Dryophilus anobioides, Chevr., noticed; Régimbart, Bull. Soc. Ent. Fr. (6) i. p. cxix.

Ozognathus cornutus, Lec., noticed as infesting the gall of *Cynips quercûs-californicæ*, Bassett; Riley, Am. Nat. xv. pp. 402 & 403.

Amphibolus, Muls. & Rey., *nec* Klug, renamed *Claudius*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxl. [= *Oligomerus*, Redt., *sec.* G. & H. p. 1776].

Lasioderma læve, Ill. Life-history; Ritzema, Tijdschr. Ent. xxiv. pp. 115–124, pl. xiii.

Apate semihispida, Fairmaire, redescribed by him; R. Z. (3) vii. p. 191.

New genera and species:—

Exallophthalmus, Fairmaire, Le Nat. iii. p. 372, Ann. Soc. Ent. Fr. (6) i. p. 276. Allied to *Ptinus*; type, *E. quinque-guttatus*, sp. n., *ll. cc.*, Fiji.

Sphinditeles, Broun, Man. N. Z. Col. p. 687. *Anobiidæ*, a transitional form to the *Ptinidæ*; type, *S. atriventris*, sp. n., *l. c.* p. 687, New Zealand.

Xenocera, id. *l. c.* p. 688. Allied to *Anobium*; type, *X. pallens*, sp. n., *l. c.*; add *X. furcus*, *versuta*, *plagiata*, and *ambiguum*, p. 689, spp. nn., New Zealand. *Anobium notatum*, *granulatum*, and *sericeum*, Broun, also belong to this genus.

Capnodes [*Capnodis*, Esch. (Col.) 1829; *Capnodes*, Guér. (Lep.) 1852], id. *l. c.* p. 690. Intermediate between *Anobium* and *Dorcatoma*; type, *O. griseipilus*, sp. n. *l. c.*, New Zealand.

Xyletobius, Sharp, Tr. E. Soc. 1881, p. 517. Allied to *Xyletinus*; types, *X. marmoratus*, *nigrinus*, and *oculatus*, spp. nn., *l. c.* pp. 517–519, Hawaiian Islands.

Halcobius, id. *l. c.* p. 520. Allied to *Metholcus*; type, *H. granulatus*, sp. n., *ibid.*, also *H. glabricollis* and *major*, spp. nn., *l. c.* pp. 520 & 521, Maui.

Mirosternus, id. *l. c.* (*Dorcatomini*). To include *M. punctatus*, p. 522, *obscurus* and *muticus*, p. 523, *carinatus* and *glabripennis*, p. 524, *debilis* and *bicolor*, p. 525, spp. nn., *l. c.*, Hawaiian Islands.

Ptinus brevivittis, Reitter, Deutsche E. Z. xxv. p. 221, Herzegovina.

Niptus fuscus, Gradl, Ent. Nachr. vii. p. 306, Egerland.

Anobium undulatum, Broun, Man. N. Z. Col. p. 687, New Zealand.

Hadrobregmus thomsoni, Kraatz, Deutsche E. Z. xxv. p. 302, Germany

Tripopitys capucinus, Karsch, B. E. Z. xxv. p. 6, pl. i. fig. 8, Sandwich Islands.

Lasioderma bicolor, Schaufuss, Verh. z.-b. Wien, xxxi. p. 622, Minorca.
Dorcatoma lautum, Broun, *l. c.* p. 690, New Zealand.

Bostrychidæ.

Sinoxylon sexdentatum, Oliv., is distinct from *muricatum*, Fabr.; Dei, Bull. Ent. Ital. xiii. pp. 297–308. *S. declive*, Lec., injurious to wine-casks; Comstock, Rep. Dept. Agric. 1880, pp. 274 & 275.

Apate uncinata, Karsch, B. E. Z. xxv. p. 46, and Rohlfs's Kufra, p. 375, Oasis of Kufra; *A. nitidipennis*, Waterhouse, P. Z. S. 1881, p. 472, Socotra: spp. nn.

Synoxylon senegalense (Dej., MS., and var. *dentifrons*, Heyd., MS.), Karsch, B. E. Z. xxv. p. 42, note, and Rohlfs's Kufra, p. 374, North, South, and Central Africa; *S. truncatulum* and *subretusum*, Ancey, Le Nat. iii. p. 509, Senegambia: spp. nn.

Cioidæ.

Lyctus bicolor, Comolli, = *pubescens*, Panz.; *pubescens*, Duft., is distinct, and may be called *L. duftschmidti*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxv.

Trichapus, g. n., Friedenreich, S. E. Z. xlii. p. 328; tarsi 3-jointed types, *T. glaber* and *pubescens*, spp. nn., *l. c.* p. 329, South Brazil.

Ceracis compressicornis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 276, Viti Levu.

Tenebrionidæ.

Notes on Haag's collection of *Tenebrionidæ*; Kraatz, Ent. Monatsbl. ii. pp. 39 & 40.

Zophosides.

Zophosis sabæa, Baudi, Deutsche E. Z. xxv. p. 273, Arabia; *Z. æqualis*, Waterhouse, P. Z. S. 1881, p. 473, Socotra: spp. nn.

Erodiides.

Arthrodes. Fairmaire reprints the descriptions of the North African species described by himself and others; R. Z. (3) vii. pp. 183–187.

Arthrodes pinguis, Ancey, Le Nat. iii. p. 509, Aden; *A. impressifrons*, Baudi, Deutsche E. Z. xxv. p. 274, Arabia: spp. nn.

Histeromorphus plicatipennis, sp. n., Waterhouse, P. Z. S. 1881, p. 473, pl. xliii. fig. 1, Socotra.

Adesmiides.

Adesmia eburnea, Pascoe, figured by Waterhouse, Aid, i. pl. xix.

Adesmia austera, sp. n., Baudi, Deutsche E. Z. xxv. p. 275, Arabia.

Tentyriides.

Eusyntelia, g. n., Waterhouse, P. Z. S. 1881, p. 473. To precede *Tentyria*; types, *E. balfouri*, fig. 5, *ebenina*, p. 474, and *glabra*, fig. 6, pl. xliii. p. 475, spp. nn., Socotra.

New species :—

Tentyria kantaræ, East Kantara, *transversicollis*, Bu Saada, p. 187, *scuticollis* and *leptidea*, p. 188, Souf, Fairmaire, R. Z. (3) vii. ; *T. mesostenoides*, Baudi, Deutsche E. Z. xxv. p. 276, Arabia.

Mesostena gracillina [sic], Ancey, Le Nat. iii. p. 462, Uzagara, East Africa.

Mesostenopa carinata, Samahr, p. 660, *agilis*, Bogos, *arabica*, Aden, p. 661, Gestro, Ann. Mus. Genov. xvi.

Micipsa burtoni, Baudi, *l. c.* p. 277, Syria.

Scelosodis ustus, Fairmaire, *l. c.* p. 189, Mogador.

Epitragides.

Epitragus diremptus, sp. n., Karsch, B. E. Z. xxv. p. 6. pl. i. fig. 9, Sandwich Islands.

Adelostomatides.

Adelostoma meridionale, sp. n., Ancey, *l. c.* p. 468, Uzagara, East Africa (probably belongs to *Psaryphis*; id. Le Nat. iii. p. 485). *A. bicarinatum*, sp. n., Waterhouse, P. Z. S. 1881, p. 475, pl. xliii. fig. 6, Socotra.

Stenosides.

Stenosis costulata, Yemen, and *arabs*, Aden, spp. nn., Baudi, Deutsche E. Z. xxv. pp. 278 & 279.

Scaurides.

Enneacoides, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 277. Allied to *Enneacus*; much larger, antennæ short and thick, 2nd joint nearly obsolete, eyes small, tibiæ unarmed. Type, *E. vinculiger*, sp. n., *l. c.*, Fiji.

Scaurus vagecostatus, Batna, *planidorsis*, Jebel-Aurès, *id.* R. Z. (3) vii. pp. 189 & 190, spp. nn.

Blaptides.

Allard, E. Essai de Classification des Blapsides de l'ancien monde. 2e & 3e parties. Ann. Soc. Ent. Fr. (6) i. pp. 131–180, 493–526, figs. 16–84.

Includes *Blaps*, subgenera *Uroblaps* to *Platyblaps*, with descriptions and outline figures of every species.

Kraatz, G. Bemerkungen über typische Exemplare von Arten der Heteromeren-Gattung *Blaps* aus Fischer von Waldheim's Sammlung. Deutsche E. Z. xxv. pp. 53–60.

The following are the most important notes on Fischer's species :— *Dila lævicollis* is not a European species, but occurs in the Altai, in Dzungaria, and at Samarcand ; *Peltarium ovatum* = *Dineria confusa*, Mén., *Dila sulcata* = *Blaps pruinosa*, Fald., *Blaps songarica*, *longicollis*, and *confluens* = *confusa*, Mén. ; and *dahli*, Sol., and *pannonica*, Friv., are synonyms of the same species : *B. reflexicollis*, Fisch. (= *sinuaticollis*, Sol., = *dasmascena*, Kraatz) is distinct ; *Blaps miliaris* and *turcomana* are synonymous ; *variolosa* includes 2 species, *B. rugosa* and *reflexa*, Gebl. ; *Blaps deplanata*

and *muricata*, Mén., are sexes; *Blaps fischeri* and *sulcata* = *pruinosa*, Fald.; *B. dorsata* and *damascena* = *fatidica*, *coriacea* and *seriatimpunctata* are probably sexes; *amœna*, Fisch., = *nitida*, Stev.; *convexa* = *abbreviata*. Fischer's species are referred to their modern genera.

List of *Blaptides* of the Old World; Allard, Ent. Monatsbl. ii. pp. 71–74.

Prosodes. Criticisms on Allard's notes on the genus; Kraatz, Deutsche E. Z. xxv. pp. 61 & 62.

Eleodes gigantea and *dentipes*. Larvæ described and details figured; Gissler, Bull. Brooklyn Soc. i. p. 19, figs. 4 & 5; *cf.* also ii. p. 7.

New species:—

Blaps menetriesi, Kraatz, Deutsche E. Z. xxv. p. 56, Derbent. *B. tripolitanica*, Karsch, B. E. Z. xxv. p. 48, & Rohlfs's Kufra, p. 375, Oasis of Kufra.

Uroblaps spinosa, fig. 20, p. 135, *batesi*, fig. 23, p. 139, Mesopotamia, *tingitana*, fig. 24, p. 140, *antennalis*, fig. 25, p. 141, Morocco, *inflata* (Chevr., MS.), fig. 26, p. 143, Mogador, *heydeni*, fig. 27, p. 144, Morocco; Allard, Ann. Soc. Ent. Fr. (6) i.

Rhizoblaps pubescens, fig. 40, Bu-Saada, p. 162, *pinguis*, fig. 55, p. 179, Tangiers, *id. l. c.*

Blapisa juliæ, id. *l. c.* p. 505, fig. 65, Jerusalem, Egypt.

Platyblaps ocreata, id. *l. c.* p. 525, fig. 84, Algeria (?).

Prosodes minuta, Kraatz, Deutsche E. Z. xxv. p. 62, Vernoje.

Asidides.

Asida depressa. Sol., var. *crenata*, from the Balearic Islands, described; Schaufuss, Verh. z.-b. Wien, xxxi. p. 623.

Pimeliides.

Prionotheca coronata, Oliv. Longevity; Olivier, Bull. Soc. Ent. Fr. (6) i. p. lxxxii.

Pimelia maroccana, Fairm., = *cordata*, Kraatz; *spectabilis*, Haag, = *claudia*, Buq.; *asperata*, Sol., = *sericea*, Ol.; *sericea*, Sol., *nec* Ol., renamed *permixta*; Sénac, Bull. Soc. Ent. Fr. (6) i. pp. xix. & xx.

New genera and species:—

Mecopisthopus, Karsch, B. E. Z. xxv. p. 46. Allied to *Platyope*, but basal joint of hind tarsi very long; type, *M. rohlfsi*, sp. n., *l. c.* p. 47, pl. ii. figs. 4, 4*a*, & Rohlfs's Kufra, p. 377, Oasis of Kufra.

Storthocnemis, id. *l. c.* p. 47. Intermediate between *Platyope* and *Lasiostola*; type, *S. steckeri*, sp. n. *l. c.* p. 48, pl. ii. figs. 8, 8*a*, & *l. c.* p. 377, Oasis of Kufra.

Prionotheca ovalis. Ancey, Le Nat. iii. p. 397, Aden.

Thriptera murina, Baudi, Deutsche E. Z. xxv. p. 280, Arabia.

Pimelia tunisca, Fairmaire, R. Z. (3) vii. p. 191, Tunis. *P. variabilis* and *sordida*, Kraatz, Deutsche E. Z. xxv. p. 331, Turkistan.

Podhomala fausti (? = *serrata*, Fisch.), *id. l. c.* p. 332, Turkistan.

Molyrides.

Sepidium penicilligerum, sp. n., Karsch, B. E. Z. xxv. p. 49, pl. ii. figs. 2 & 2a, and Rohlfs's Kufra, p. 376, Oasis of Kufra.

Vieta gracilenta, Aden, p. 397, *erecticollis*, and *uncigera*, Uzagara, East Africa, p. 461, Ancey, Le Nat. iii. : spp. nn.

Coniontides.

Crypticus griseo-vestis, sp. n., Fairmaire, R. Z. (3) vii. p. 192, Biskra.

Pedinides.

Platyscelis minima, Motsch., noticed ; Mäklin, Sv. Ak. Handl. (2) xviii. (4) p. 27.

Pedinus. Kiesenwetter describes *P. ragusæ*, Baudi (= *vicinus*, Baudi), *longulus*, Rutenb., and several new species, and adds a table of the males in this genus ; Ent. Monatsbl. ii. pp. 65-70.

New species :—

Opatrinus josephi, Karsch, SB. nat. Fr. 1881, p. 58, Guinea Islands.

Selinus obsoletus and *parallelus*, Ancey, Le Nat. iii. p. 468, Uzagara, East Africa.

Dendarus calcaratus, Baudi, Deutsche E. Z. xxv. p. 281, Lebanon.

Pandarinus subopacus, id. *l. c.* p. 282, Antilibanus.

Pedinus ionicus, Ionian Islands p. 66, *taygetanus*, Taygetus, *olympicus*, Thessaly, p. 67, and *debilis*, Taygetus, p. 68, Kiesenwetter, Ent. Monatsbl. ii.

Cubirus obsoletus, Baudi, *l. c.* p. 281, Lebanon and Tiberias.

Opatrides.

Uzagaria, g. n., Ancey, Le Nat. iii. p. 509. Allied to *Opatrum* and *Pachypterus* ; type, *U. pubens*, sp. n., *l. c.*, Uzagara, East Africa.

New species :—

Adavius æthiopicus, Gestro, Ann. Mus. Genov. xvi. p. 662, Bogos.

Opatrum calcaripes, Karsch, SB. nat. Fr. 1881, p. 59, Guinea Islands.

O. costiferum, Waterhouse, P. Z. S. 1881, p. 476, pl. xliii. fig. 2, Socotra.

Opatroides judaicus, Baudi, Deutsche E. Z. xxv. p. 283, Tiberias.

Phylax balearicus, Schaufuss, Verh. z.-b. Wien, xxxi. p. 623, Balearic Islands.

Trachyscelides.

Bradymerus sublævicollis, Fairmaire, redescribed by him ; Ann. Soc. Ent. Fr. (6) i. p. 281.

Anemia convexa, g. n., Gestro, Ann. Mus. Genov. xvi. p. 662, Zanzibar.

Ulomides.

Latheticus oryzæ, Waterh., and *Toxicum grande*, Pasc., figured by Waterhouse ; Aid, i. pls. xv. & xxxiv.

Tribolium confusum and *ferrugineum* differentiated ; Olliff, Ent. xiv. p. 216.

Uloma multicornis, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 285.

Apithesis, g. n., Waterhouse, P. Z. S. 1881, p. 476. Allied to *Alphitobius*; type, *A. obesa*, sp. n., *l. c.* p. 477, pl. xliii. fig. 4, Socotra.

Uloma costæ, sp. n., Karsch, SB. nat. Fr. 1881, p. 59, Guinea Islands.

Toxicum umbrosum, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 165, Japan.

Helœides.

Helœus perroni, Boisd., and allies discussed; Dohrn, S. E. Z. xlii. pp. 313–315.

Helœus haagi, sp. n., *id. l. c.* p. 314, locality not stated.

Cossyphides.

Byzacnus picticollis, Pasc., variation noticed; Dohrn, S. E. Z. xlii. p. 315.

Cœlometopides.

Cœlocnemis magna, Lec.: habits in captivity; Gissler, Bull. Brooklyn Soc. ii. p. 7.

Derospharius, g. n., Westwood, in Oates's Matabele Land, p. 362. Allied to *Centronipus* and *Stenochia*; type, *D. anthracinus*, sp. n., *l. c.* pl. G, fig. 3, & pl. H, figs. 2, 2*a*–*c*.

Tenebrionides.

Notes on larvæ of *Tenebrionidæ*; Gissler, Bull. Brooklyn Soc. i. pp. 11, 18–20, & 85–88, pl.

Nyctobates barbata, Knoch: habits in captivity; *id. l. c.* ii. p. 8.

Catapiestus mediocris, Guér., is scarcely distinct from *piceus*, Perty; Dohrn, S. E. Z. xlii. pp. 315 & 316.

Zophophilus, g. n., Fairmaire, Le Nat. iii. p. 359. Allied to *Nyctobates*; type, *Z. curticornis*, sp. n., *l. c.* p. 359, Duke of York Island.

New species:—

Nyctobates levigatus, Gestro, Ann. Mus. Genov. xvi. p. 662, Zanzibar.

Derospharus rugiceps, id. *l. c.* p. 663, Zanzibar; *D. justi* and *marquesi*, Karsch, SB. nat. Fr. 1881, p. 59, Guinea Islands.

Menephilus conquinatus, id. *l. c.* p. 60, Guinea Islands.

Dilamus pictus, Baudi, Deutsche E. Z. xxv. p. 285, Cairo.

Boromorphus libanicus, id. *l. c.* p. 286, Lebanon.

Heterotarsides.

Phymatodes amœnus, Say: transformations described and figured; Packard, Ins. Inj. Trees, pp. 25–27, fig. 5.

Cnodalinides.

Aphyllocerus, g. n., Fairmaire, Le Nat. iii. p. 384, and Ann. Soc. Ent. Fr. (6) i. p. 282. Allied to *Tetraphyllus*; type, *A. decipiens*, sp. n., *ll. cc.* Fiji.

Helopides.

Læna clivinoides, Baudi. Varieties noticed by him; Deutsche E. Z. xxv. p. 290. Baudi also gives a comparative description of *L. ferruginea*, Küst. (*l. c.* p. 291).

Thesilea impressipennis and *versicolor*, Haag, redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 280.

Helops splendidulus, Schauf., = *Nalassus lapidicola*, Küst.; Reitter, Deutsche E. Z. xxv. p. 187.

Læna kaufmanni, Dalmatia, &c., p. 222, *krueperi*, Greece, and *hirtipes*, Lenkoran, p. 222, note, Reitter, Deutsche E. Z. xxv.; *L. heydeni*, Weise, Ent. Monatsbl. ii. p. 102, Balkan: spp. nn.

Chariotheca smaragdipunctata and *neomidina*, Fairmaire, Le Nat. iii. p. 373, and Ann. Soc. Ent. Fr. (6) i. pp. 278 & 279; *C. infima*, id. Ann. *l. c.* p. 279, Fiji: spp. nn.

Thesilea puncticeps, sp. n., *id. l. c.* p. 281, Fiji (?).

Omalois atticus, sp. n., Allard, Bull. Soc. Ent. Fr. (6) i. p. ciii., Attica.

Helops (*Odocnemis*) *valgus*, sp. n., Baudi, Deutsche E. Z. xxv. p. 291, Jerusalem.

Helopinides.

Helopinus psalidiformis, Ancey, Le Nat. iii. p. 397, & Baudi, Deutsche E. Z. xxv. p. 289, Aden; *H. elegans*, Baudi, *l. c.* p. 287, Assab, Abyssinia: spp. nn.

Amarygmides.

Rygmodus cyaneus, sp. n., Broun, Man. N. Z. Col. p. 659, New Zealand.

Strongyliides.

Bionesus cinereo-sparsus, Fairmaire, genus and species described by him; Ann. Soc. Ent. Fr. (6) i. p. 283.

Aspidosternum metallicum, F. (= *cyaneum*, Mäkl.), variation discussed; Dohrn, S. E. Z. xlii. pp. 88 & 89.

Strongylium tuberipenne, sp. n., Fairmaire, Le Nat. iii. p. 359, Duke of York Island.

Aspidosternum physopterum, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 164, Guinea.

Cistelidæ.

Anaxo rufo-janthina, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 284.

Cteniopus, Sol., nec *Ctenopus*, Fisch., renamed *Sarandonyx*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxiii.

Homophlus lucidus, Kirsch, ♂ described; Baudi, Deutsche E. Z. xxv. p. 294.

Allecula oronthea, sp. n., Baudi, Deutsche E. Z. xxv. p. 292, Lebanon.

Cistela syriaca, id. *l. c.* p. 293, Syria; *C. scioana*, Gestro, Ann. Mus. Genov. xvi. p. 204, Shoa: spp. nn.

MELANDRYIDÆ.

New species :—

Eustrophus bimaculatus, Gestro, Ann. Mus. Genov. xvi. p. 663, Zanzibar.

Lederia anatolica, Frivaldsky, Term. füzetek, iv. p. 262, and Reitter, Deutsche E. Z. xxv. p. 223, note, Constantinople, Brussa. *L. asturiensis*, Reitter, *l. c.* p. 232, Asturias.

Ctenoplectron maculatum and *costatum*, Broun, Man. N. Z. Col. p. 691, New Zealand.

Hallomenus scapulatus, Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. xii., Corsica.

LAGRIIDÆ.

Lagria dimidiata, Blanch., redescribed ; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 284.

ANTHICIDÆ.

Notoxus binotatus, Gebl., var. (?) *suturalis*, Mannerh., noticed ; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 27.

Anthicus quisquilius, Thoms., var. *syriacus*, described ; Baudi, Deutsche E. Z. xxv. p. 294.

Tomoderus dalmatinus, sp. n., Reitter, Deutsche E. Z. xxv. p. 224, Herzegovina, Montenegro.

Anthicus gebleri, Mäklin, Œfv. Fin. Soc. xxii. p. 85, and Sv. Ak. Handl. (2) xviii. 4, p. 46, Siberia ; *A. degener*, Lebanon, and *coarcticollis*, Beyrut, Baudi, Deutsche E. Z. xxv. pp. 294 & 295 ; spp. nn.

Cotes probus, sp. n., Broun, Man. N. Z. Col. p. 691, New Zealand.

MORDELLIDÆ.

Mordella : habits of larva ; V. T. Chambers, Canad. Ent. xiii. pp. 173–175. *M. dodoneæ*, Montr., redescribed ; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 286.

Apeosina, g. n., Broun, Man. N. Z. Col. p. 692. *Mordellidæ* (?) ; types, *A. stewarti* and *tener*, spp. nn., *l. c.* p. 693, New Zealand.

RHIPIDOPHORIDÆ.

Pelecotomoides fulvo-sericans, Fairmaire, redescribed by him ; Ann. Soc. Ent. Fr. (6) i. p. 285.

Emenadia gibbifera, sp. n., Abeille de Perrin, Bull. Soc. Toulouse, xiv. sp34, Barbary.

Idites zeschi, sp. n., Leconte, Bull. Buff. Soc. iv. p. 28, pl. i. figs. 3 em buffalo.

Cantharidæ.

Berg, C. Revision der argentinischen Arten der Gattung *Cantharis*. S. E. Z. xlii. pp. 301–309.

22 species enumerated, with full synonymy and occasional remarks; 2 new.

Burmeister, H. Die argentinischen Cantharideu. S. E. Z. xlii. pp. 20–35.

28 species described, belonging to the genera *Cantharis*, *Tetraonyx*, and *Spastica*; 7 new.

Magretti, P. Del prodotto di secrezione particolare di alcuni Meloidi: esame microscopico. Bull. scient. Pavia, i. Aprile, 1880.

Muñoz, G. y. Nuevas observaciones sobre costumbres y metamorphosis di algunos Vesicantos. An. Soc. Esp. x. Actas, pp. 55–64.

Relates to *Cantharis vesicatoria*, Linn., *Meloe turcica*, Rossi, *Coryna hillbergi*, Gyll., *Mylabris duodecim-punctata*, Ol., *geminata*, Fabr., and *quadripunctata*, Linn.

Meloe, sp. Transformations; Aurivillius, Ent. Tidskr. ii. pp. 7, 57 & 58.

Mylabris, Fabr., *nec* Geoffr., renamed *Megabris*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxiii.

Zonabris (*Mylabris*, olim). List of 14 species from Margelan, in Turkistan (some new); Heyden, Deutsche E. Z. xxv. pp. 327 & 328.

Cantharis. Burmeister (S. E. Z. xlii. pp. 21–31) gives the following synonymy of Argentine species: *Lytta steinheili*, Haag-Rut., = *C. viridipennis*, Burm.; *L. maculata*, Klug, = *C. vittigera*, Blanch.; *Causima luctuosa*, Dej., = *Lytta vidua*, Klug; *Epicauta conspersa*, Germ., = *L. adspersa*, Klug; *E. multipunctata*, Dej., var. *minor*, = *L. punctata*, Germ., = *C. germari*, Fisch., = *L. atomaria*, Germ.

Cantharis nuttalli, Say, *Epicauta corvina*, Lec., and *pennsylvanica*, Degeer, noticed, and the former figured; Comstock, Rep. Dept. Agric. 1879, pp. 251 & 252, pl. vi. fig. 3.

Lytta lugubris and *Epicauta wheeleri*, Ulke, redescribed; Bull. Brooklyn Soc. iv. p. 42. *L. vittigera*, Blanch., = *dispar*, Germ.; Berg, Exped. Rio Negro, Zool. p. 104.

Œnas, Latr., discussed, the males of the first division tabulated, and *Œ. afer*, Linn., *sericeus*, Ol., and *crassicornis*, Ill., redescribed; Abeille de Perrin, Bull. Soc. Toulouse, xiv. pp. 240–245.

Lydus algiricus, Linn., *pallidicollis*, Gyll., and *humeralis*, Gyll., var. *suturalis*, Reiche, redescribed; *id. l. c.* pp. 246–250.

Megatrachelus, Motsch. Abeille (improperly, as it appears) proposes to restrict this name to *politus*, Gebl.; *l. c.* p. 252.

Stenodera caucasica, Pall., var. *crocata*, from Tiberias described; *id. l. c.* p. 253.

Sitaris nitidicollis, Ab., is not distinct from *muralis*, Font.; *id. l. c.* p. 258.

Nemognatha chrysomelina, Fabr. Hagen disputes Müller's theory of the development of the proboscis; P. Bost. Soc. xx. pp. 429 & 430. Mus. Müller maintains his former opinions regarding the conclusions

drawn from the singular proboscis of this species, in reply to the strictures of Hagen; Kosmos, x. pp. 57-61, woodcuts.

Zonitides, g. n., Abeille de Perrin, Bull. Soc. Toulouse, xiv. p. 253. Allied to *Stenodera*; to include *Z. oculifer*, Syria, p. 253, *gibbicollis*, Taurus, p. 254, *terminata* (Reiche, MS.), Egypt, p. 255, *analis* (Reiche, MS.), Oran, *ruficollis*, Tiberias, p. 256, and *concolor*, Algeria, p. 257, spp. nn.; also *Zonitis abdominalis*, Cast., *paulinæ*, Muls. (variation noticed, p. 254), *6-maculata*, Ol., *5-maculata*, Suff., *bellieri*, Reiche, and *thoracica*, Cast.

Anancomœa, g. n., Karsch, B. E. Z. xxv. p. 12. Allied to *Danerces* (*Cantharidæ*), but has also affinities with *Nacerdes* and *Sessinia* (*Œdemeridæ*); type, *A. dentata*, sp. n., *l. c.* pl. i. fig. 18.

New species :—

Cerocoma syriaca, Abeille de Perrin, *l. c.* p. 235, Anti-Libanus, Palestine.

Coryna contaminata and *cauda-nigra*, id. *l. c.* pp. 236 & 237, Syria.

Zonabris (*Mylabris*) *staudingeri*, p. 328, *Z.* (*M.*) *magno-guttata*, Turkistan, and *Z.* (*Decatoma*) *kraatzi*, Persia, p. 329, Heyden, Deutsche E. Z. xxv.

Mylabris marseuli and *vittata*, Kirsch, Ent. Monatsbl. ii. p. 77, Hyrcania; *M. diffinis* (Reiche, MS.), Abeille de Perrin, *l. c.* p. 238, Algeria.

Tetraonyx propinquus, p. 31, *lampyroides*, *colon*, p. 33, Burmeister, S. E. Z. xlii., Argentine Republic.

Cantharis leucoloma, p. 22, *digramma*, p. 24, and *centralis*, p. 25, *id. l. c.*; *C. missionum* (cf. p. 28). and *clericalis*, Berg, *op. cit.* pp. 306 & 308, all from the Argentine Republic.

Lytta verrucicollis, Karsch, B. E. Z. xxv. p. 49, pl. ii. fig. 7, & Rohlfs's Kufra, p. 377, Oasis of Kufra.

Spastica sphærodera, Burmeister, *l. c.* p. 34, Buenos Aires.

Œnas fusicornis (= *afer*, Duv., *nec* Linn.), Algeria, p. 242, *hispanus*, Andalusia, p. 243, *cribricollis*, Jaffa, Anti-Libanus, &c., *tarsensis*, Tarsus, *brevicollis*, Nazareth, Tiberias, p. 244, *lævicollis*, Nazareth, *tenuicornis*, Syria, Asia Minor, p. 245, Abeille de Perrin, *l. c.*

Lydus tarsalis, Constantina, Lebanon, Tiberias, &c., *cerastes*, Constantina, Jericho, *tenuitarsis*, Algeria, Caucasus, Lebanon, Tiberias, p. 247, *sulcicollis*, Jaffa, Tiberias, p. 248, *brevicornis*, Nazareth, Tiberias, *decolor*, Anatolia, p. 249, *depilis*, Syria, p. 250, *gracilis*, Jerusalem, *cupratus*, Amasia, p. 251, *id. l. c.*

Zonitis bipunctata, pl. iii. fig. 5, and *nana*, Ragusa, Nat. Sicil. i. pp. 42 & 43, Sicily; *Z. spectabilis*, Kraatz, Deutsche E. Z. xxv. p. 326, Turkistan.

Sitaris acutipennis, Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. xliv., Catalonia.

ŒDEMERIDÆ.

SPILBAUER, L. Bestimmungs-Tabellen der europäischen Coleopteren. *Lvn. Œdemeridæ*. Verh. z.-b. Wien, xxxi. pp. 97–116.

emarg[illegible] the genera founded by Schmidt and others in this family

rest on very insufficient characters. The author describes one new genus and several new species: *Nacerdes surdea*, Schmidt, = ? *melanura*, Linn.; *N. viridipes*, Schmidt ?, = *Anoncodes meridionalis*, Costa. *N. adusta*, Panz.: the following are synonyms: *Œdechira flavipennis*, Motsch., *Œdemera paradoxa*, Fald., and ? *Anoncodes axillaris*, Mén. *Œdemera sericans*, Muls., var. *obscura* from the Caucasus described; *Œ. caucasica*, Kol., = *lateralis*, Schmidt; *Probosca* (*Nacerdes*) *fucata*, Fald., = ? *P. cinerea*, Motsch.

Xanthochroa italica, Chevr., amended description; Abeille de Perrin, Bull. Soc. Toulouse, xiv. p. 258.

Ananca lagenicollis, *incrassata*, Fairm., and *moorii*, Montr., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 286, 287 & 289.

New genera and species:—

Xanthochroina, Ganglbauer, Verh. z.-b. Wien, xxxi. p. 105. Allied to *Xanthochroa*; type, *X. auberti*, Abeille.

Ananca lignicolor, *subusta*, p. 287, and *apicata*, p. 288, Fairmaire, Ann. Soc. Ent. Fr. (6) i., Fiji.

Nacerdes austriaca, Ganglbauer, Verh. z.-b. Wien, xxxi. p. 103, Austria, Hungary; *N. carinata*, Karsch, B. E. Z. xxv. p. 50, pl. ii. fig. 9, & Rohlfs's Kufra, p. 378, Oasis of Kufra.

Danerces (?) *semipicea*, id. SB. nat. Fr. 1881, p. 60, Guinea Islands.

Lethonymus difformis, Frivaldszky, Term. füzetek, iv. p. 263, Brussa.

Ischnomera reitteri, Ganglbauer, *l. c.* p. 116, Caucasus.

Œdemera acutipalpis, Caramania, *pruinosa*, Beyrut, p. 259, *coarcticollis*, Jaffa, Tiberias, &c., p. 260, and *atriceps*, Tiberias, Nazareth, p. 261, Abeille de Perrin, Bull. Soc. Toulouse, xiv.; *Œ. brevipennis*, Ganglbauer, *l. c.* p. 108, note, Roumelia.

Aglycerida.

Proterhinus hystrix, p. 527, *dispar*, p. 528, *gracilis*, p. 529, *angularis*, and *punctipennis*, p. 530, and *validus*, p. 531, Sharp, Tr. E. Soc. 1881, Hawaiian Islands: spp. nn.

Curculionidæ.

Harrington, W. H. *Rhynchophora*—Weevils. Rep. E. Soc. Ont. 1880, pp. 49–57, figs. 31–43.

A popular article, with special reference to Canadian species.

Curculionideous larva feeding on the roots of lilies from Japan; McLachlan, P. E. Soc. 1881, p. xxxviii.

Brachyderides.

Aramigus fulleri. Food-plants; Comstock, Rep. Dep. Agric. 187[illegible] pp. 250 & 251.

Naupactus chordinus and *suffitus*, Boh., are sexes; Berg, Exped. [illegible]lus. Negro, Zool. p. 105. *N. stauropterus*, Germ., figured; Wat[illegible] Aid, i. pl. xxvii. [illegible]sions [illegible]

Polydrosus cedri, Mars., = *Scythropus cedri*, Chevr.; Bedel, Bull. Soc. Ent. Fr. (6) i. p. ciii.

Siderodactylus ornatus, Pasc., = *Naupactus longimanus*, Fabr.; Waterhouse, Ann. N. H. (5) viii. p. 435.

Eupholus. Ritsema enumerates the known species: *E. vilis*, Voll., is a *Rhinoscapha*; *aurifer*, Voll., = *petiti*, Guér.; *bandanus*, Voll., = *linnei*, Thoms., and *latreillii*, Kirsch, = *quinquefasciatus*, Chevr. Notes Leyd. Mus. iii. pp. 85–88.

Artipus floridanus, Horn, noticed and figured; Comstock, Rep. Dep. Agric. 1879, p. 207, pl. iii. fig. 3.

Epicærus imbricatus, Say. Habits and ravages, *id. l. c.* p. 249, pl. vi. fig. 2.

Cnemidothrix protensus, Fairmaire, genus and species redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 296.

Platyomus cultricollis, Germar, figured; Waterhouse, Aid, i. pl. xx.

New genera and species :—

Bornazon (= *Cneorrhinus*, Jek., *nec* Schönh.), Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxx.

Pactorrhinus, Ancey, Le Nat. iii. p. 485. Affinities uncertain; should perhaps follow *Sitones* and *Pandeletius*, but has a superficial resemblance to *Pachnæus*; type, *P. griescens*, sp. n., *l. c.* p. 485, Arizona.

Phanasora, Pascoe, Ann. N. H. (5) vii. p. 38. Differs from *Pandeletius*, &c., in the angular groove at the base of the rostrum and in all the femora being toothed beneath; type, *P. plumbea*, sp. n., *l. c.* p. 39, Bogota.

Emmeria, id. *l. c.* p. 42. Allied to *Eustales*; rostrum broad, as in *Scythus*, but shoulders not prominent; type, *E. marginata*, sp. n., *l. c.* p. 43, Para.

Blosyrus scopulifer and *murinus*, Ancey, Le Nat. iii. p. 485, Uzagara, East Africa.

Catoptes albatus and *cuspidatus*, Broun, Man. N. Z. Col. p. 694, New Zealand.

Strophosomus (*Neliocarus*) *huelvanus*, Spain, and *S.* (*N.*) *pellitus*, Andalusia, Kirsch, Ent. Monatsbl. ii. pp. 5 & 6.

Naupactus simplex, Brazil, *chloropleurus*, Bahia, p. 39, *serenus*, Parana, *imbutus*, Macas, p. 40, *sulphurifer*, Uruguay, *magicus*, Brazil, p. 41, Pascoe, Ann. N. H. (5) vii. *N. taniatulus*, Berg, S. E. Z. xlii. p. 61, and Exped. Rio Negro, Zool. 1881, p. 105, pl. ii. fig. 16, Buenos Aires, Patagonia.

Plectrophorus 4-*maculatus*, Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. xxxviii., Brazil.

Pandeletius naupactoides, Pascoe, *l. c.* p. 38, Brazil.

Anemerus cylindripennis, Ancey, *l. c.* p. 485, Uzagara, East Africa.

Enaptorrhinus granulatus, Pascoe, Cist. Ent. ii. p. 588, North China.

Piazomias vermiculosus, Waterhouse, P. Z. S. 1881, p. 478, Socotra.

Astycus flavo-vittatus, Pascoe, *l. c.* p. 588, India.

sp. *Eclycœlis auriventris* and *albicans*, Chevrolat, Ann. Ent. Belg. xxv. p. n. Zibar.

emargi

Stigmatotrachelus (?) *nobab*, Chevrolat, *ibid.*, Zanzibar.

Megalostylus expansus, Pascoe, Ann. N. H. (5) vii. p. 42, Mexico.

Rhinoscapha lagopyga, Fairmaire, Le Nat. iii. p. 348, Ann. Soc. Ent. Fr. (6) i. p. 289, Fiji; *R. bifasciata*, Chevrolat, Le Nat. iii. p. 494, Bull. Soc. Ent. Fr. (6) i. p. lxix., New Guinea.

Eupholus cyphoides, Pascoe, Cist. Ent. ii. p. 588, Aniteum.

Apocyrtus castaneus and *nigrans*, id. *l. c.* pp. 592 & 593, Philippine Islands; *A. contractus*, *margine-nodosus*, *spinipes*, Philippines, *efflorescens*, Singapore, *brevicollis*, *femoralis*, *longipes*, p. 363, *quadricinctus*, *tumoridorsum*, *lenis*, *opulentus*, Philippines, *glaberrimus*, Mindanao, p. 382, *graniferus*, *rugicollis*, *viridulus*, Philippines, p. 439; Chevrolat, Le Nat. iii.

Otiorrhynchides.

Elytrogonus griseus and *Sphærorrhinus villosulus*, Guér., and *Sphæropterus lineolatus*, Blanch., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 293–295.

Otiorrhynchus horridus, Stierlin, noticed; Reitter, Deutsche E. Z. xxv. p. 225. *O. nodosus*, Fabr. (*maurus*, Gyll.), varieties from North Norway described; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 14. *O. picipes*, &c., destructive to vines; Fairmaire, Bull. Soc. Ent. Fr. (6) i. pp. xlvii. & xlviii., lix. & lx.

Troglorrhynchus anophthalmus. Habits discussed; Joseph, B. E. Z. xxv. pp. 238 & 239.

Peritelus griseus, noticed; Lucas, Bull. Soc. Ent. Fr. (6) i. p. xxxix.

New genera and species :—

Apirocalus, Pascoe, Cist. Ent. ii. p. 590. Allied to *Elytrurus*; elytra not forming an angle at the sides, and not inflected at the apex so as to form a cavernous process; type, *A. cornutus*, sp. n., *l. c.* (cf. Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 290).

Diethicus, id. *l. c.* p. 594. Allied to *Ellimenistes*; rostrum broader, not compressed, antennæ longer, and scape not enlarged, or only at apex; types, *D. tumens*, Delagoa Bay, and *tumidiceps*, Natal; spp. nn. *l. c.*, pp. 594 & 595.

Piotypus, id. *l. c.* p. 595. Allied to *Sphrigodes*; scape curved, dilated towards the apex, and furnished with a minute tooth on the outside; type, *P. gravidus*, sp. n., *l. c.* p. 596, Grahamstown.

Pseudomeira, Stierlin, MT. schw. ent. Ges. vi. p. 160. Allied to *Meira* and *Parameira*; types, *P. nicæensis*, *clairi*, and *minuta*, spp. nn., *l. c.* pp. 191–193, Mentone.

Exorides, Pascoe, Ann. N. H. (5) vii. p. 43. *Otiorrhynchinæ*, but nearer affinities somewhat doubtful. Type, *E. carinatus*, sp. n., *l. c.* Macas.

Epipedosoma, Chevrolat, Ann. Ent. Belg. xxv. p. 86. *Otiorrhynchidæ*; type, *E. zanguebaricum*, sp. n., *l. c.* p. 87, Zanzibar.

Siteutes graniger and *cæruleatus*, Pascoe, Cist. Ent. ii. pp. 593 & 594, Yule Island.

Elytrurus rusticus and *subcittatus*, Pascoe, Cist. Ent. ii. p. 589, Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 291 & 292, Fiji; *E. horizontalis*, Fairmaire, *l. c.* p. 291, Fiji.

Elytrogonus obtusatus, id. *l. c.* p. 293, Fiji.

Sphærorhinus aberrans, id. *l. c.* p. 294, Tonga.

Sphæropterus seriegranatus, id. *l. c.* p. 295, Fiji.

Isomerinthus asper, *gramineus*, *decipiens*, Tondano, p. 591, and *scaposus*, Dorey, p. 592, Pascoe, *l. c.*

Otiorrhynchus sellæ, Monte Viso, p. 132, *lucæ*, Peleponnesus, p. 134, *ehlersi*, p. 135, *areolatus*, South Spain, p. 136, *johannis*, Asturias, p. 137, *validus*, Guadarrama, p. 139, *baudii*, Piedmont, p. 140, *acuminatus*, Greece, p. 159; Stierlin, MT. schw. ent. Ges. vi. *O.* (*Tournieria*) *miser*, Turkey, p. 3, *O. spartanus*, *excellens*, p. 4, and *O.* (*T.*) *laconicus*, Greece, p. 14; Kirsch, Ent. Monatsbl. ii.

Stomodes rotundicollis, Frivaldszky, Term. füzetek, iv. p. 264, Rhilo-Dagh.

Peritelus sphæroides (Creutz, MS.), Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 28, Krasnojarsk.

Sphingodes niger, Chevrolat, Ann. Ent. Belg. xxv. p. 87, Zanzibar.

Systates (?) *funicularis*, id. *ibid.*, Zanzibar.

Peribrotus bilineellus, id. *l. c.* p. 88, Zanzibar.

Phyllobius verruculatus, Karsch, SB. nat. Fr. 1881, p. 61, Guinea Islands.

Leptopides.

Alocorrhinus albo-lineatus, Schönh., and *squamulatus*, Blanch., = *albator*, Pall., and *virescens*, Jek., respectively; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. cxlvi.

Eutimus nobilis is quite white on first emerging from the pupa; E. Deyrolle, Bull. Soc. Ent. Fr. (6) i. p. lxviii.

Pseudoleptops, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 297. Allied to *Leptops*; type, *Otiorrhynchus nodulosus*, Blanch., (redescribed, *l. c.*).

Dacnirus, g. n., Pascoe, Ann. N. H. (5) vii. p. 300. Allied to *Cydianirus*, but with strongly mucronate anterior tibiæ. Type, *D. flexuosus*, sp. n., *l. c.* p. 301, Rio.

Rhigus vespertilio, sp. n., Pascoe, Ann. N. H. (5) vii. p. 299, Brazil.

Cydianirus ornatus, id. *l. c.* p. 300, Waterhouse, Aid, i. pl. lxxiv., Brazil.

Brachycerides.

Tænophthalmus, Desbr., recharacterized, Kirsch, Ent. Monatsbl. ii. p. 14.

Tænophthalmus crotchi, sp. n., *id. l. c.* p. 16, Caspian.

Rhyparosomatides.

Styphlus and *Orthochætes*. Tables of species; Stierlin, MT. schw. ent. Ges. vi. pp. 164 & 165.

Ariphron, g. n., Broun, Man. N. Z. Col. p. 695. Placed after *Phrynixus*, to include *A. sulcirostre*, *asper*, *costosa*, p. 696, *osculans*, *simplex*, and *striatum*, p. 697, spp. nn., *l. c.*, New Zealand.

Phrynixus facetus, sp. n., *id. l. c.* p. 695, New Zealand.

sp. *Pecyropa alba*, *varia*, p. 698, *discors*, p. 699, *id. l. c.*, New Zealand, [illegible]n.

emarg[illegible]

Styphlus syriacus, sp. n., Stierlin, MT. schw. ent. Ges. vi. p. 163, Caiffa.

Cylindrorrhinides.

Listroderes robustus, Waterh., = *L. costirostris*, Gyll; Berg, S. E. Z. xlii. p. 62, and Exped. Rio Negro, Zool. p. 106.

New genera and species:—

Asaphia, Broun, Man. N. Z. Col. p. 700. Allied to *Irenimus*, elytra oblong, abruptly broader than the thorax at the base, with obtuse, but not oblique, humeral angles. Types, *A. planum*[-*na*] and *angustula*, spp. nn., *l. c.* pp. 700 & 701, New Zealand.

Hygrochus, id. *l. c.* p. 702. Allied to *Empœotes*; type, *H. oscitans*, sp. n., *l. c.* p. 703, New Zealand.

Homodus, id. *l. c.* p. 703. Allied to last; type, *H. fumeus*, sp. n., *l. c.*, New Zealand.

Inophlœus rubidus and *nigellus*, id. *l. c.* pp. 699 & 700, New Zealand.

Empœotes apicalis, id. *l. c.* p. 701, New Zealand.

Lyperobius carinatus, id. *l. c.* p. 702, New Zealand.

Lithinides.

Rhytidophlœus oberthu[*e*]*ri*, sp. n., Chevrolat, Ann. Ent. Belg. xxv. p. 88, Zanzibar.

Molytides.

Anchonus planipennis, sp. n., Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. xxxii., Valparaiso.

Promecopides.

Coleocerus albidus, sp. n., Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. xxxviii., Bogota.

Eudius lineolatus, Brazil, and *albo-limbatus*, South America, *id. ibid.*, spp. nn.

Hyperides.

Alophus, sp. from the Chukch Peninsula figured; Nordenskiöld, Voyage of the 'Vega,' ii. p. 55.

Phytonomus punctatus, Fabr., imported into America from Europe, and injurious to clover; Riley, Am. Nat. xv. pp. 750 & 751, 912–914.

Pachyrrhynchides.

Pachyrrhynchus annulatus, Philippines, *centro-costatus*, Maldonado, *impressipennis*, *auro-guttatus*, p. 348, *ignipes*, p. 359, *luteo-guttatus*, Philippines, *lorquini*, Maldonado, *chlorites*, p. 360, *subcostatus*, Philippines, p. 439, Chevrolat, Le Nat. iii., spp. nn.

Diabathrariides.

Pachydon, g. n., Broun, Man. N. Z. Col. p. 705. Placed after *Geophilus* (Broun); type, *P. linearis*, sp. n., *l. c.*, New Zealand.

Geophilus politus, id. *l. c.* p. 704, New Zealand.

Cleonides.

Bothynoderes conicirostris, Gyll., *Conorrhynchus faldermanni*, Fabr., *Chromonotus confluens*, Fabr. (= *leucographus*, Fabr.), and *Trichocleonus leucophyllus*, Fisch., noticed from Margelan, Turkistan; Kraatz, Deutsche E. Z. xxv. p. 334.

Lixus biplicatus and *biforeatus*, spp. nn., Chevrolat, Ann. Ent. Belg. xxv. pp. 88 & 89, Zanzibar.

Hylobiides.

Pascoe, F. P. On the genus *Hilipus* and its Neotropical allies. Tr. E Soc. 1881, pp. 61–102, pls. i. & ii.

Includes general remarks, and the descriptions of many new species of *Hilipus*, and of several new genera now separated from it.

Hylobius pales, Herbst. Habits, &c.; Packard, Ins. Inj. Trees, p. 170.

Pissodes strobi, Packard. Transformations described and figured by him; *l. c.* pp. 185–188, fig. 80.

Orthorrhinus grano-sparsus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 314.

New genera and species :—

Hypnideus, Pascoe, Ann. N. H. (5) vii. p. 301. Allied to *Sternuchus*, but the depressed elytra do not rise above the level of the prothorax. Type, *H. circumdatus*, sp. n., *l. c.*, Para.

Syphorbus, id. Tr. E. Soc. 1881, p. 92. Allied to *Hilipus*; tibiæ bimucronate; mesothoracic epimera partially ascending. Type, *S. turgidus*, sp. n., *l. c.* p. 93, pl. ii. fig. 5, Cayenne.

Bytes, id. *l. c.* p. 94. Allied to *Hilipus*; eyes rounded; tibiæ bimucronate at the tips. Type, *B. sciureus*, sp. n., *l. c.*, Colombia.

Bactrius, id. *l. c.* p. 95. Allied to *Hilipus*; femora unarmed; tibiæ not mucronate, multidentate on the inside; front tibiæ curved. Type, *B. lophotoides*, sp. n., *l. c.* p. 95, pl. ii. fig. 9, Espiritu Santo.

Arniticus, id. *l. c.* p. 96. Allied to *Hilipus*; scrobes apical or subapical, rostrum a little dilated beneath in front; tibiæ submucronate, the mucro horizontal, and not curved. Type, *A. gladiator*, l. c. pl. i. fig. 8, Brazil; add *A. gibbosus*, Brazil, and *brevicollis*, Morro Velho, *l. c.* p. 97, spp. nn.

Chærius, id. *l. c.* p. 98. Allied to *Hilipus*; elytra smooth, the sides abruptly sloping; scrobes apical, commencing above the rostrum; tibiæ nearly straight, submucronate at the tip; the mucro horizontal, not curved. Type, *C. squalidus*, sp. n., *l. c.*, Colombia.

Plethes, id. *l. c.* p. 99. Allied to *Hilipus*, but femora unarmed. Types, *P. albo-lineatus*, pl. ii. fig. 6, and *verrucosus*, spp. nn., *l. c.* pp. 99 & 100, Colombia.

Acallestes, id. *l. c.* p. 100. Allied to *Hilipus*; scutellum absent; elytra rounded on each side at the base; tibiæ bimucronate. Type, *A. talpa*, sp. n., *l. c.* p. 100, pl. ii. fig. 8, Colombia.

Irenarchus, id. *l. c.* p. 101. Allied to *Hilipus*; but propectus deeply emarginate. Type, *H. fossilis*, Thoms.

Styphlus, Pascoe, *ibid.* Allied to *Hilipus*; femora incrassate, not Caiffa. rovided with a small tooth; tibiæ straight, compressed. Type, *C atipennis*, Blanch.

ilipus medullosus, Parana, pl. i. fig. 6, p. 64, *mirus*, Colombia, p. 65, *mmodus*, Macas, *aulicus*, Brazil, p. 66, *mysticus*, Sarayacu, pl. i. fig. 5, p. 67, *collectus*, Chontales, *pœcilus*, Chanchamajo, p. 68, *nudipennis*, Macas, *posticus*, Sarayacu, p. 69, *respiciens*, Chanchamajo, *vestitus*, Macas, pl. i. fig. 7, p. 70, *empiricus*, Chontales, p. 71, *insidiosus*, Morro Velho, *decoru*. Amazons, Sarayacu, p. 72, *circulatus*, Ucayali, pl. ii. fig. 2, *hipporhinoid* Colombia, p. 73, *contumax*, Chamicuros, pl. i. fig. 3, p. 74, *spectator*, Cayenne, pl. ii. fig. 1, p. 75, *suspensus*, Ega, *tetanicus*, Cayenne, p. 76, *aspredo*, Brazil, *intensus*, Colombia, p. 77, *grammicus*, Ega, Ucayali, p. 78, *cratosomoides*, Cayenne, *severus*, p. 79, *diversus*, *austerus*, Parana, p. 80, *obesulus*, Rio Janeiro, *caliginosus*, Cayenne, p. 81, *vappa*, Sarayacu, pl. ii. fig. 4, p. 82, *scabrosus*, Colombia, *indutus*, Macas, pl. ii. fig. 3, p. 83, *depictus*, Sarayacu, pl. i. fig. 1, p. 84, *catenatus*, Macas, pl. i. fig. 4, *galeotes*, Sarayacu, p. 85, *monitor*, Ucayali, p. 86, *stellio*, Pará, *exustus*, Colombia, p. 87, *expletus*, Chamicuros, *molestus*, Amazons, p. 88, *cynicus*, p. 89, *occultus*, Chontales, *prionurus*, Colombia, pl. i. fig. 2, p. 90, *miliaris*, p. 91, and *paradoxus*, Cayenne, p. 92; *id. l. c.*

Erirrhinides.

Bagous binodulus. Habits; Lancelevée, Feuill. Nat. xi. p. 73.

Smicronyx cyaneus, Gyll. Note on transformations; Bargagli, Bull. Ent. Ital. Resoconti, 1881, pp. 20 & 21.

Ochetina, g. n., Pascoe, Ann. N. H. (5) vii. p. 302. Allied to *Bagous*; but rostrum long and slender, and propectus entire. Type, *O. uniformis*, sp. n., *l. c.*, Ega (?).

New species :—

Erirrhinus creperus, *simulans*, *sexmaculatus*, p. 706, *dolosus*, *fascialis*, p. 707, *crucigerus*, *anchoralis*, *gracilirostris*, p. 708, *stramineus*, *nocens*, p. 709, *acceptus*, *femoralis*, and *concolor*, p. 710, Broun, Man. N. Z. Col., New Zealand.

Dorytomus septentrionalis, Mäklin, Œfv. Finsk. Soc. xxii. p. 86, and Sv. Ak. Handl. (2) xviii. 4, p. 46, Siberia; *D. lateralis*, *sudus*, p. 711, and *ochraceus*, p. 712, Broun, *l. c.*, New Zealand.

Praolepra albo-picta, p. 712, *rufescens*, *varia*, *asperirostre*[*-tris*], p. 713, *pallidum*[*-da*], *castanea*, p. 714, *vestita*, p. 715, *id. l. c.*, New Zealand.

Eugnomus maculosus, *nubilans*, p. 715, *fasciatus*, *cyaneus*, p. 716, *id. l. c.* New Zealand.

Stephanorrhynchus tuberosus and *fatuus*, id. *l. c.* pp. 717 & 718, New Zealand.

Cylades.

Cylas formicarius, Oliv., noticed and figured; Comstock, Rep. Dept. Agric. 1879, pp. 249 & 250, pl. vi. fig. 1.

Apionides.

Apion genistæ, Kirb., = *astragali*, Herbst; *astragali*, Payk., may be called *saculare*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxv.

Apion desbrochersii, sp. n., Kirsch, Ent. Monatsbl. ii. p. 13, Andalusia.

Cybebides.

Cybebus gibbipennis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 289, Tenasserim Levu.

Attelabides.

Apoderus tenuissimus, Philippine Islands, and [illegible] Laos, Pascoe, Cist. Ent. ii. pp. 596 & 597 (the former figured [illegible] louse, Aid, i. pl. xxviii.); *A. flavo-tinctus*, Ancey, Le Nat. iii. Uzagara, East Africa: spp. nn.

Attelabus pustula, sp. n., *id. ibid.*, Uzagara.

Rhinomacerides.

Rhynchites, Herbst, must take the name of *Rhinomacer*, Geoffr., and *Rhinomacer*, Fabr. (*nec* Geoffr.), is renamed *Cimberis*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. pp. cxii. & cxiii.

Rhynchites bacchus. Habits and transformations noticed; Schmidt, Göbel, Ent. Nachr. vii. pp. 130–132. Distribution; Lentz, *op. cit.* p. 187.

Auletes major, sp. n., Pascoe, Cist. Ent. ii. p. 597, Andaman Islands.

Mesoptiliides.

Nyscetes rufipes, sp. n., Broun, Man. N. Z. Col. p. 718, New Zealand.

Scolopterides.

Scolopterus æneo-rufus, sp. n., Broun, Man. N. Z. Col. p. 718, New Zealand.

Otidocephalides.

Magdalis olyra, Herbst, noticed and supposed mine figured; Packard, Ins. Inj. Trees, pp. 28 & 29, fig. 7.

Magdalis tridentatus, sp. n., Gradl, Ent. Nachr. vii. p. 302, Egerland.

Balaninides.

Balaninus caryotrypes, Boh. Larva noticed and figured; Packard, Ins. Inj. Trees, pp. 93 & 94, fig. 41.

Anthonomides.

Anthonomus gracilipes, Desbr., *nec* Boh., renamed *leptopus*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxv.

Tychiides.

Pachytychius bedeli, sp. n., Chevrolat, Bull. Soc Ent. Fr. (6) i. p. cxii., Algeria.

Cionides.

Cionus. Réaumur's account of the cocoon; Osborne, Sci. Goss. xvii. p. 276.

Cionus wittii, sp. n., Kirsch, Ent. Monatsbl. ii. p. 8, Jaffa.

Gymnetrides.

Gymnetron incanus, Andalusia, and *niloticus*, Egypt, Kirsch, Ent. Monatsbl. ii. p. 7, spp. nn.

Alcidides.

Alcides convexus and *excavatus*, Oliv., are distinct; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. lxxiii. *A. dentipes*, Oliv., noticed; *id.* Ann. Ent. Belg. xxv. p. 90. *A. rufipennis*, Montr., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 312.

Alcides late-fasciatus, p. 89, *orientalis*, *erythropterus*, *wahlbergi* (Boh., MS.), *tetragrammus*, p. 90, *simus*, p. 91, Chevrolat, Ann. Ent. Belg. xxv., Zanzibar; *A. pentastictus*, Somerset, Australia; p. 372, *humerosus* and *rubripennis*, p. 461, and *intermedius*, p. 485, Uzagara, East Africa, Ancey, Le Nat. iii.: spp. nn.

Haplonychides.

Physarchus pyramidalis, Pasc., and *conspicillatus*, Fairm., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 313.

Metatyges hocquardi, sp. n., Chevrolat, Ann. Ent. Belg. xxv. p. 89, Zanzibar.

Northopides.

Acicnemis variegatus, Fairm., and var. *albo-guttatus*, Chevr., *A. apicalis* and *maculicornis*, Chevr., *crassiusculus* and *biconifer*, Fairm., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 298–301.

Camarotus bruchoides, St. João del Rey, and *atteluboides*, pl. ii. fig. 1, Brazil, Karsch, B. E. Z. xxv. p. 51, spp. nn.

Cholides.

Cholus hæmatostictus, Pascoe, figured by Waterhouse, Aid, i. pl. xxxv.

Archarias carinatus, Chevrolat (nec *Cholus carinatus*, Guér.), renamed by him *frontalis*; Le Nat. iii. p. 467.

Lobaspis, g. n., Chevrolat, Le Nat. iii. p. 467. To include *Cholus squamosus*, Boh., *biskel* and *sulphuratus*, Fabr. (small species, with the prothoracic lobe slightly projecting, and covering the scutellum). Add *L. argentulus*, Colombia, p. 467, and *molitor*, Brazil, p. 468, spp. nn.

New species :—

Cholus consors, Brazil, p. 467, *albiventris*, Costa Rica, *catoleucus*, Brazil, *pallidus*, Colombia, *transversalis*, Venezuela, p. 482, *brunnirostris*, Colombia, *conspicillatus*, *superciliosus*, Upper Amazons, *obsoletus*, locality not stated, *columbus*, Venezuela, p. 483, Chevrolat, l. c.; *C. brasiliensis*, Pt. *niveus*, *ornatus*, p. lxxiii., *calcatus*, Brazil, *lacordairii*, Mexico, p.

id. Bull. Soc. Ent. Fr. (6) i. *C. luctuosus* and *mœstus*, Pascoe, Ann. N. H. (5) vii. pp. 44 & 45, Sarayacu.

Archarias multicostatus, Chiquitos, *rœlofsi*, Cayenne; Chevrolat, Le Nat. iii. p. 467; *A. cylindrirostris*, Amazons, p. xxi., *atripes*, Brazil, and *granifer*, Colombia, pp. xxvi. & xxvii., *id.* Bull. Soc. Ent. Fr. (6) i.

Dionychus conciliatus, Pascoe, Ann. N. H. (5) vii. p. 303, Brazil; *D.*? (*Ardoleucus*) *marginicollis*, Chevrolat, *l. c.* p. xx., Brazil.

Callinotus anormis, id. *ibid.*, Brazil.

Amphyorrhynchus flexuosus, id. *l. c.* p. xxvi., Brazil.

Cryptorrhynchides.

Blepiarda lophata, Pasc., *Trichogonus unipencillus*, *Mecistocerus ocellolineatus*, and *Cyanobolus atomosparsus*, Fairm., redescribed by Fairmaire; Ann. Soc. Ent. Fr. (6) i. pp. 308–311.

Cryptorrhynchus parochus, Say. Note on larva and pupa; Schaupp, Bull. Brooklyn Soc. iv. p. 35.

New genera and species :—

Edesius, Pascoe, Ann. N. H. (5) vii. p. 305. Allied to *Conotrachelus*; type, *E. obesus*, sp. n. *l. c.*, Para.

Tetracyphus, Chevrolat, Ann. Ent. Belg. xxv. p. 91. Not characterized; allied to *Desmidophorus*; type, *T. odontomus*, sp. n. *l. c.*, Zanzibar.

Trichosomus, id. *l. c.*, note [*Trichosomus*, Swains. (*Pisc.*), 1839; *-ma*, Rud. (*Verm.*), 1819, Ramb. (*Lep.*), 1832, Swains. (*Pisc.*), 1839; *Trichiosoma*, Leach (*Hym.*), 1817]. Allied to *Desmidophorus*; types, *D. senex*, Schœnh., and *fascicularis*, Oliv.

Pantoxystus, Pascoe, Cist. Ent. ii. p. 600. Allied to *Cleogonus*; type, *C. rubricollis*, Boh.; add *P. rubripennis*, Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. lxix., New Guinea.

Dipaltosternus, Fairmaire, Le Nat. iii. p. 389, Ann. Soc. Ent. Fr. (6) i. p. 304. Allied to *Psepholax*; type, *D. insidiator*, sp. n. *ll. cc.*, Fiji.

Heteromolius, id. Le Nat. iii. p. 389, Ann. Soc. Ent. Fr. (6) i. p. 302. Allied to *Strongylopterus*; type, *H. hylesinoides*, sp. n., *ll. cc.* pp. 389 & 303; add *H. tricostatus*, sp. n., Ann. p. 304: both from Fiji.

Pseudomolius, id. Le Nat. iii. p. 421, and Ann. Soc. Ent. Fr. (6) i. p. 305. Allied to last; type, *P. crassicornis*, sp. n., *ll. cc.* pp. 421 & 306, Ovalau.

Thylacosternus, id. Ann. Soc. Ent. Fr. (6) i. p. 306. Allied to *Anaballus*; type, *T. bigibbosus*, sp. n., *l. c.* p. 307, Viti-Levu.

Pteroporus, id. *l. c.* p. 307. Allied to *Poropterus*; type, *P. subtruncatus*, sp. n., *l. c.* p. 308, Ovalau.

Barisses, Pascoe, Ann. N. H. (5) vii. p. 306. Allied to *Pseudomus*; type, *B. rufipennis*, sp. n., *l. c.*, Parana.

Microbothrus, Fairmaire, *l. c.* p. 301. Allied to *Bothrobathys*; mesosternum simply concave, and open at the extremity, ocular lobes very prominent, covering half the eyes, femora not claviform. Type, *M. squamituber*, sp. n., *l. c.* p. 302, Tonga, Ovalau.

Coptomerus, Chevrolat, *l. c.* p. lxix. *Gasterocercides*; type, *C. nigri-*
p. x[illegible], sp. n., *l. c.*, Somerset, Australia.

Idastes, Pascoe, Cist. Ent. ii. p. 598. Allied to *Protopalus*; tibiæ flexuous. Type, *I. elevatus*, sp. n., *l. c.* p. 599, New Hebrides.

Ectopsis, Broun, Man. N. Z. Col. p. 719; type, *E. ferrugalis*, sp. n., *l. c.*, New Zealand.

Pachypeza, id. *l. c.* p. 729. Allied to *Paromilia* (?), but with unarmed femora; type, *P. sanguinea*, sp. n., *l. c.* p. 730, New Zealand.

Ectatorrhinus godeffroyi, Fairmaire, Le Nat. iii. p. 389, Duke of York Island.

Conotrachelus eximius, Pascoe, Ann. N. H. (5) vii. p. 303, Sarayacu, Macas.

Cyphorrhynchus rugosus, Ega, and *scapulatus*, Para, *id. l. c.* p. 304.

Cleogonus rubripennis, Chevrolat, Le Nat. iii. p. 495, New Guinea.

Ocladius setipes, Ancey, *op. cit.* p. 372, Aden.

Camptorrhinus sanguinolentus, Chevrolat, Ann. Ent. Belg. xxv. p. 91, Zanzibar.

Poropterus python and *lemur*, Pascoe, Cist. Ent. ii. pp. 599 & 600, Port Bowen.

Imaliodes pusillus, Karsch, B. E. Z. xxv. p. 10, pl. i. fig. 15, Marshall Islands.

Acalles ovatellus, *cordipennis*, p. 720, *leviculus*, *cristatus*, *rudis*, p. 721, *dorsalis*, *volens*, p. 722, *horridus*, *rubricus*, p. 723, *spurcus*, *mundus*, p. 724, *canescens*, *arctus*, and *vafrum*, p. 725, Broun, Man. N. Z. Col., New Zealand.

Dolichoscelis setosus, *villosus*, *denotans*, p. 726, *latus*, *crinitus*, p. 727, *exiguus*, p. 728, *id. l. c.*, New Zealand.

Sympedius curtus, id. *l. c.* p. 728, New Zealand.

Tychanus lacrymosus, id. *l. c.* p. 729, New Zealand.

Analcis fasciatus, Ega (?) *striatus*, Minas Geraes, Pascoe, Ann. N. H. (5) vii. pp. 306 & 307.

Torneuma sicula, Ragusa, Nat. Sicil. i. p. 43, pl. iii. fig. 6, Palermo.

Rhyncodes squamosus, Broun, *l. c.* p. 730, New Zealand.

Cyamobolus greeffi, Karsch, SB. nat. Fr. 1881, p. 61, Guinea Islands.

Gasterocercus nigro-æneus, Chevrolat, Le Nat. iii. p. 495, Somerset, Australia.

Cryptorrhynchus brandti, Harold, MT. Münch. ent. Ver. iv. p. 165, Peking.

Ampagia rude-squamea, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 312, Viti-Levu.

Zygopides.

Copturus eximius, Pascoe, figured by Waterhouse; Aid, i. pl. lxxv.

Chirozetes insignis, sp. n., Pascoe, Cist. Ent. ii. p. 600, Labuan.

Metialma africana, sp. n., Gestro, Ann. Mus. Genov. xvi. p. 664, Zanzibar.

Panoptes convexus, sp. n., Karsch, SB. nat. Fr. 1881, p. 61, Guinea Islands.

Sympiezopus albo-lineatus, sp. n., Chevrolat, Ann. Ent. Belg. xxv. p. 92, Zanzibar.

Pyropides.

Pyropus pusillus, sp. n., Pascoe, Ann. N. H. (5) vii. p. 307, Jamaica.

Pterocolides.

Micror[r]*hinus*, g. n., Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. xxxiii. Allied to *Pterocotus* [sic]; type, *M. striatus*, sp. n., *l. c.*, Argentine Republic.

Ceuthorrhynchides.

Cœliodes inæqualis, Say. Eggs described; Riley, Index to Reports, p. 54.

Ceuthorrhynchus longirostris, Hautes-Pyrénées, and *leprieuri*, Bône, Brisout de Barneville, Ann. Soc. Ent. Fr. (6) i. pp. 129 & 130, spp. nn.

Baridiides.

Baridius crinipes, *limbatus*, Bris., *schwarzenbergi*, Hochh., and *albomaculatus* and *nivalis*, Bris., redescribed; Kirsch, Ent. Monatsbl. ii. pp. 8–12.

Trigonopterus semi-cribosus, *anthrax*, *æneo-niveus* and *merophysioides*, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. pp. 314 & 315.

Baridius egyptus, sp. n., Kirsch, *l. c.* p. 13, Upper Egypt.

Diorycalus punctatellus, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 317, Viti (genus recharacterized, p. 516).

Trigonopterus cribrellicollis, id. *l. c.* p. 316, Samoa.

Madarides.

Pseudocholus holocyaneus, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 317.

Calandrides.

Phascecorynus zamiæ, Gyll., = *Curculio variegatus* and *varius*, Fabr.; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. viii.

Sphenophorus. Several species injurious to corn in North America, especially *S. robustus*, Horn, which actually breeds in it; Riley, Am. Nat. xv. pp. 915 & 916 [*cf.* also Comstock, Rep. Dep. Agric. 1879, pp. 248 & 249 (habits of *S. zeæ*, Walsh, described), and 1880, pp. 272 & 273]. *S. circumscriptus*, Gemm., = *cinctus*, Montr.), redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 318.

Calandra oryzæ, Linn. Ravages in the United States; Comstock, *l. c.* 1880, p. 273.

Liocalandra, g. n., Chevrolat, Ann. Ent. Belg. xxv. p. 92. Allied to *Calandra*; type, *L. nuda*, sp. n., *l. c.*, Zanzibar.

Protocerius purpuratus, sp. n., Dohrn, S. E. Z. xlii. p. 447, Sarawak.

Barystethus semitomentosus, New Caledonia, and *hemiscotus*, Lizard Island; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. viii.: spp. nn.

Sphenophorus sulcipes, sp. n., Karsch, B. E. Z. xxv. p. 11, pl. i. fig. 16, Marshall Islands.

Ithaura nitida, sp. n., Pascoe, Ann. N. H. (5) vii. p. 308, Parana.

Cossonides.

Cotaster uncatus, Friv. (= *pilosus*, Motsch.), is from the shores of the Adriatic, and not from South Russia; Bedel, Bull. Soc. Ent. Fr. (6) i. p. ciii.

Macroscytalus, g. n., Broun, Man. N. Z. Col. p. 736. Placed after *Pentarthrum*; to include *P. remotum*, Sharp, *æneopiceum* and *badium*, Broun, and *M. laticollis* and *russulus*, spp. nn., *l. c.* p. 737, New Zealand.

New species :—

Pentarthrum sculpturata[*-tum*], p. 731, *reductum*, *confinis*[*-ne*], p. 732, *punctirostre*, *asperella*[*-lum*], *auricoma*[*-mum*], p. 733, *rugirostre*, *ruficorne*, p. 734, *glabrum*, *conicolle*, p. 735, *castum*, p. 736, Broun, *l. c.* New Zealand.

Oodemas olindæ, *infernum*, p. 199, and *substrictum*, p. 200, Blackburn, Ent. M. M. xvii., Hawaiian Islands.

Anotheorus ignavus, id. *l. c.* p. 201, Maui.

Raymondia salpingoides, Kraatz, Deutsche E. Z. xxv. p. 226, pl. vii. fig. 7, Dalmatia.

Phlœophagosoma rugipenne and *abdominale*, Broun, *l. c.*, New Zealand.

Rhyncolus opacus, Karsch, B. E. Z. xxv. p. 7, pl. i. fig. 10, Sandwich Islands.

Scolytidæ.

Lindemann, K. Neue Beiträge zur Kenntniss der Borkenkäfer Russlands. Deutsche E. Z. xxv. pp. 232–238.

Notes on the habits of *Tomicus typographus*, *Dryocœtes autographus*, *alni*, *coryli*, and *aceris*, and on the specific characters of *Tomicus chalcographus* and *xylographus*.

Packard (Ins. Inj. Trees) notices the transformations, &c., of the following North American species : *Xyleborus xylographus*, Say, pp. 163–166, *X. cælatus*, Zimm., p. 175, *Tomicus calligraphus*, Germ. (figs. 74 & 75, galleries), *cœcographus*, Lec., and *pini*, Say (fig. 76, larva and pupa), pp. 166–170, *Pityophthorus puberulus*, Lec. (fig. 77, gallery), and *materiarius*, Fitch, pp. 170–175, *Hylurgus terebrans*, Oliv., pp. 175 & 176, *Carphoborus bifurcus*, Eichh. (fig. 79, mine), p. 179, *Xyloterus*, various species, pp. 229–231, *Crypturgus atomus*, Lec., pp. 231 & 232, *Phlœosinus dentatus*, Say (fig. 94, galleries), pp. 244 & 245, and *Pityophthorus*, various species pp. 260 & 261.

Hylurgus piniperda noticed ; Girard, Bull. Soc. Ent. Fr. (6) i. p. xxxix.

Phlœophthorus rhododactylus, Marsh., and *Carphoborus pilosus*, Ratz. Habits; Lindemann, Ent. Monatsbl. ii. pp. 161–163.

Monarthrum fasciatum and *Tomicus monographus* destructive to wine-casks ; Comstock, Rep. Dep. Agric. 1880, pp. 274 & 275.

Xyleborus saxeseni noticed ; Lamey, Nouv. et faits, ii. pp. 142 & 143.

Thamnurgus kaltenbachi, Bach. Habits and transformations ; Buddeberg, JB. nass. Ver. xxxiii. & xxxiv. pp. 394–402, plate and woodcut.

Scolytus. Lindemann discusses the range, habits, and enemies of the 6 Russian species, viz., *S. multistriatus*, Marsh, *intricatus*, *pruni*, and *rugu-*

losus, Ratz, *ratzeburgi*, Jans., and *destructor*, Ol.; Deutsche E. Z. xxv. pp. 171–173.

Platypus gerstæckeri, Chap., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 468.

Stenopus, Broun, g. n., Man. N. Z. Col. p. 739. *Scolytidæ*, but with some resemblance to the *Cossonidæ*; type, *S. rufo-piceus*, sp. n., *l. c.*, New Zealand.

Homarus, id. *l. c.* p. 740. Placed after *Stenopus*; type, *H. mundulus*, sp. n., *l. c.*, New Zealand.

Dendrotrupes, id. *l. c.* p. 741. Placed after *Homarus*; types, *D. vestitus* and *costiceps*, spp. nn., *l. c.*, New Zealand.

Hylurgus micklitzi, sp. n., Wachtl, Deutsche E. Z. xxv. p. 227, pl. vi. fig. 28, Dalmatia (elytron of *H. ligniperda* figured for comparison, fig. 23).

Tomicus asper, sp. n., Broun, *l. c.* p. 742, New Zealand.

Brenthidæ.

Eubactrus semiæneus and *Bolbogaster ctenostomoides*, Lac., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 461 & 464.

Lasiorrhynchus barbicornis. Transformations and habits described; Broun, Tr. N. Z. Inst. xiii. pp. 228–230.

New genera and species:—

Bothrior[r]hinus, Fairmaire, Le Nat. iii. p. 421. Allied to *Amorphocephalus*; type, *B. costulipennis*, sp. n., *l. c.*, Duke of York Island.

Anomobrenthus, id. *l. c.*, p. 349, Ann. Soc. Ent. Fr. (6) i. p. 484. Allied to *Ectocemus*; type, *A. hamatirostris*, sp. n., *ll. cc.* pp. 349 & 465, Fiji.

Cerobates viticnsis, Fairmaire, Le Nat. iii. p. 422, and Ann. Soc. Ent. Fr. (6) i. p. 463, Fiji, *australasiæ*, id. *l. c.* p. 463, Australia.

Ectocemus spinipennis, id. Le Nat. iii. p. 349, Duke of York Island.

Eutrachelus sumatrensis, Waterhouse, Tr. E. Soc. 1881, p. 489, Sumatra.

Ceocephalus georgii, Karsch, SB. nat. Fr. 1881, p. 61, Guinea Islands.

Schizotrachelus schmeltzii, Fairmaire, *l. c.* p. 421, Duke of York Island.

Eubactrus spissicornis, id. *l. c.* p. 373, Duke of York Island, and *fuscojanthinus*, Fiji, *id. l. c.*, Ann. Soc. Ent. Fr. (6) i. p. 461; *E. metallicollis*, id. Le Nat. iii. p. 421, Ann. Soc. Ent. Fr. (6) i. p. 462, Fiji.

Ithystenus nigro-sulcatus, id. Le Nat. iii. p. 421, and Ann. Soc. Ent. Fr. (6) i. p. 462, Fiji.

Anth[ot]ribidæ.

Ceramby[cir]rhynchus schœnherri, Montr., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 465.

Lyriba [illegible] *arsus scabrosus*, Fabr. Larva feeding on *Coccus*; Lichtenstein, [illegible] Ent. Fr. (6) i. p. lxxv.

[illegible] p. 44; = *Eppis*, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 467. Allied to *Eurhidea*; type, *R. cristiferus*, sp. n., *l. c.*, Fiji.

Rawasia diardi, Roelofs, Notes Leyd. Mus. iii. p. 161, West Java.

Anthribus picipictus, p. 742, *nigrescens*, and *torulosus*, p. 743, Broun, Man. N. Z. Col., New Zealand, spp. nn.

Bruchidæ.

Bruchus. Habits, distribution, &c., discussed, with special reference to *B. pisi* and its transformations; Cornelius, CB. Ver. Rheinl. xxxviii. pp. 151–157.

Bruchus, Linn., = *Mylabris*, Geoffr., which has the priority [Zool. Rec. x. p. 321 : Ed.] ; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxiii.

Pachymerus, Latr., *nec* St. Farg. & Serv., renamed *Adromisus*; id. *ibid.*

Caryoborus arthriticus, Fabr., noticed ; C. Dury, Canad. Ent. xiii. p. 20.

Bruchus hamatus, sp. n., Miller, Deutsche E. Z. xxv. p. 228, Lesina.

Cerambycidæ.

Ganglbauer, L. Bestimmungs-Tabellen der europäischen Coleopteren. vii. *Cerambycidæ.* Verh. z.-b. Wien, xxxi. pp. 681–758, pl. xxii.

Extends to the genus *Parandra*. The plate illustrates various details of larvæ and perfect insects.

On collecting Longicorns ; Azam, Feuill. Nat. xii. p. 11.

Prionides.

Parandra striatifrons, Fairm., *Xixuthrus heros*, Heer, and var. *terribilis*, Thoms., *Olethrius scabripennis*, Thoms., *Opheltes cariosicollis*, Fairm., and *Cacodacnus hebridanus*, Thoms., redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. pp. 468–471.

Prionus insularis, Motsch., with only one antenna; Schönfeldt, Ent. Nachr. vii. p. 121.

Remphan hopii, Waterh., noticed ; Dohrn, S. E. Z. xlii. pp. 312 & 313.

Macrotoma absurdum, Newm., belongs to *Remphan* ; id. *l. c.* p. 313.

Mallodon arabicus, Buq., var. from Socotra noticed and figured ; Waterhouse, P. Z. S. 1881, p. 478, pl. xliii. fig. 7.

Orthosoma brunneum, De Geer : transformations described and imago figured ; Packard, Ins. Inj. Trees, pp. 160 & 161, fig. 72.

New genera and species :—

Logæus, Waterhouse, Ann. N. H. (5) vii. p. 458. Allied to *Priotyrannus* ; type, *L. subopacus*, sp. n., *l. c.*, Travancore.

Halycidocrius, Berg, S. E. Z. xlii. p. 62, and Exped. Rio Negro, Zool. p. 106. Intermediate between *Rhipidocerus*, Westw., and *Microplophorus*, Blanch. ; type, *H. philippii*, sp. n., *ll. cc.* pp. 62 & 107, Patagonia.

Cacoscelis (?) *latus*, C. O. Waterhouse, Tr. E. Soc. 1881, p. 427, South Africa.

Macrotoma æneipennis, id. *l. c.* p. 428, South-East India ; *M[illegible]dulis*, Karsch, SB. nat. Fr. 1881, p. 62, Guinea Islands.

Ægosoma reflexum, id. B. E. Z. xxv. p. 7, pl. i. fig. 11, Sandwic[h] to wine-

Æ. bicoloripes, Ritsema, Notes Leyd. Mus. iii. p. 151, Sumatra & 143.

Philus aubæi, Reitter, Verh. z.-b. Wien, xxxi. p. 519, Corsica.

Cerambycides.

Packard (Ins. Inj. Trees) notices the following North American

species : *Clytus colonus* (transformations) pp. 27 & 28 ; *Dularius brevilineus*, Say, p. 60, fig. 19 ; *Arhopalus fulminans*, Fabr., pp. 90 & 91, fig. 40 ; *Asemum mœstum*, Hald., pp. 157 & 158, fig. 70 ; *Criocephalus agrestis*, Kirby, pp. 158 & 159, fig. 71 ; *Callidium antennatum*, Newm., pp. 159, 160, & 246 ; and *Rhagium lineatum*, Say (winter cell of larva), p. 163.

Scleroderma larva parasitic on larvæ of *Oxypleurus nodieri*, Muls. ; Saunders & André, P. E. Soc. 1881, pp. xxxiii., xl. & xli.

Epania pusio and *Earinis picta*, Pascoe, figured by Waterhouse, Aid, i. pls. lxxvii. & lxxviii.

Cerambyx cerdo, *mirbecki*, *miles*, and *velutinus* : habits, &c. ; Mayet, Bull. Soc. Ent. Fr. (6) i. pp. clxii.-clxiv. *C. heros* : tenacity of life ; Chambolle, Feuill. Nat. xi. p. 139.

Criodion feisthameli, Buq., = *suturale*, Gory ; Dohrn, S. E. Z. xlii. pp. 316 & 317.

Hesperophanes cinereus, Villers : ravages ; Girard, Bull. Soc. Ent. Fr. (6) i. p. xxvii. *H. nebulosus*, Oliv., and *Hylotrupes bajulus*, Linn : the larvæ are scarcely distinguishable ; *id. l. c.* p. cxxviii.

Chlorida festiva, Linn. : recorded from the West African island, São Thomé ; Karsch, SB. nat. Fr. 1881, p. 55.

Ceresium guttaticolle, Fairm., = *simplex*, Fabr. ; *C. olidum*, Fairmaire, redescribed by him : Ann. Soc. Ent. Fr. (6) i. p. 472.

Obrium oblongo-guttulum, Fairmaire, redescribed by him ; *id. l. c.* p. 474.

Rhagium. Notes on various species ; Preudhomme de Borre, CR. Ent. Belg. xxv. pp. cxlix.-cli. *R. inquisitor* lifting 547 times its own weight in its jaws ; W. W. Fowler, Ent. M. M. xviii. pp. 18 & 19.

Leptura rufa, Brullé, and *oblongo-maculatus*, Buq. The varieties of these species discussed and differentiated ; *silbermanni* and *nigro-picta*, Fairm., = *rufa* ; and *rufa*, Küst. & Fairm. (*nec* Brullé, *nec* Kraatz), = *oblongo-maculatus* : Heyden, Deutsche E. Z. xxv. pp. 249–253. *L. martialis*, Dohrn, = *Trachyderes sanguinolentus*, Burm. ; Dohrn, *l. c.* p. 446. *L. quadripustulata*, Fabr., = *quadrifasciata*, Linn., and is not a Swedish but a Siberian species ; Lampa, Ent. Tidskr. ii. pp. 173, 174 & 176.

Necydalis ulmi. Collecting, &c. ; Feuill. Nat. xi. pp. 150 & 151.

Molorchus. Species tabulated ; Abeille de Perrin, Nouv. et faits, ii. p. 133.

Callimus. Species tabulated and redescribed ; *id. l. c.* pp. 134 & 135, 137 & 139.

Callidium (*Semanotus*) *rusticum*, Fabr., recorded from America ; Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. civ.

Clytus duponti, Muls., = *cinereus*, Lap. & Gory, = *sterni*, Kraatz, and is omitted distinct from *figuratus*, Scop., = *plebeius*, Fabr., the former species American as well as European : *id. l. c.* pp. civ. & cv. *C. lignatilis*, = *agricola* gitivus, and *decolor*, Thieme, respectively = *pulcher*, Blessig, Et. Ent. p. 44 ; = *sida* l., var., and *cuneipennis*, Kraatz ; Kraatz, Deutsche E. Z. xxv. p. 356. *C. speciosus*, *pictus*, and *robiniæ* noticed, and the first figured ; Rogers, Rep. E. Soc. Ont. 1880, pp. 31–34, fig. 13.

Glycobius speciosus, Say. Habits described and imago figured ; Packard, Ins. Inj. Trees, pp. 103–105, fig. 45.

Xylotrechus convergens. Habits of larva; Myers, Am. Nat. xv. p. 151.

Crossidius intermedius, Ulke, redescribed; Bull. Brooklyn Soc. iv. p. 42.

Vesperus strepens. Habits, &c.; Azam & Chanay, Feuill. Nat. xi. pp. 11, 21 & 22.

New genera and species :—

Plectogaster, C. O. Waterhouse, Tr. E. Soc. 1881, p. 429. Allied to *Megacælus*; type, *M. pectinicornis*, Bates (figured by Waterhouse, Aid, i. p. lx.), Cameroons, and *P. thoracica*, Waterh., Mamboio, Usagara Mountains, spp. nn., *l. c.* p. 430.

Cyrtoclytus, Ganglbauer, Verh. z.-b. Wien, xxxi. p. 736. Allied to *Clytus*, scutellum triangular, and wing-cases with a hook on both sides of it. Type, *Clytus capra*, Germ.

Esamus lineicollis and *quinquelineatus*, Chevrolat, Bull. Soc. Ent. Fr. (6) i. p. lxxxviii., Himalaya.

Œme gracilis, Leconte, Bull. Buff. Soc. iv. p. 27, pl. i. fig. 2, California.

Elaphidion imbelle, id. *l. c.* fig. 1, California.

Ceresium grandipenne, p. 472, *impuncticolle*, *gracilipes*, p. 473, *angustulum*, p. 474, Fairmaire, Ann. Soc. Ent. Fr. (6) i., Fiji.

Aprosictusbi lineatus (Voll., MS.), Ritsema, Notes Leyd. Mus. iii. p. 145, Waigiou.

Rhagium pygmæum, Ganglbauer, Verh. z.-b. Wien, xxxi. p. 718, Caucasus.

Cartodera pumila, id. *l. c.* p. 710, Caucasus.

Molorchus hircus, Abeille de Perrin, Nouv. et faits, ii. p. 133, Antilibanus.

Callimus narcissus and *adonis*, id. *l. c.* pp. 138 & 139, Tarsus, &c.

Pachyteria rugosicollis, p. 31, *punticollis*, Java, p. 33, *affinis*, locality unknown, p. 35, *parallela*, Java (?), p. 36, *scheepmakeri*, Java, p. 38, Ritsema, Notes Leyd. Mus. iii. (*P. puncticollis* = *javana*, Bates, *id. l. c.* p. 83); *P. huegeli*, Distant, Ann. N. H. (5) vii. p. 298, and Waterhouse, Aid, i. pl. xxxvi., Java.

Callichroma holubi, Dohrn, S. E. Z. xlii. p. 90, Zambesi; *C. testaceipennis*, Ritsema, *l. c.* p. 153, Sumatra.

Philematium greeffi, Karsch, SB. nat. Fr. 1881, p. 62, Guinea Islands.

Rhopalopus lederi, Ganglbauer, *l. c.* p. 747, Caucasus.

Anaglyptus reitteri and *raddii*, id. *l. c.* p. 737, Caucasus.

Clytus asellus, Margelan, p. 99, *lignatorum*, *fugitivus*, p. 100, *decolor*, Amor, p. 101, Thieme, B. E. Z. xxv.

Clytarlus finschi, Harold, MT. Münch. ent. Ver. iv. p. 166, and Karsch, B. E. Z. xxv. p. 8, pl. i. fig. 13, and *pulvillatus*, Karsch, *l. c.* p. 9, pl. i. fig. 14, Sandwich Islands; *C. pennatus* and *fragilis*, Sharp, T[illegible] to wine[illegible] Soc. 1881, pp. 532 & 534, Hawaiian Islands.

Lamiides. & 143.

Bates, H. W. Biologia Centrali-Americana (cf. *Insecta*: General Subject, sub Godman & Salvin). *Coleoptera*, v. pp. 153–224, pls. xii.–xv.

Extends from *Trichalphus* (g. n. *Acanthocerini*) to *Lucidola*. The fol-

lowing known species (chiefly Bates's) are figured or specially noticed :— *Mecotetarsus antennatus* (= *Eutessus asper*, Lec.), fig. 14, *Alcidion privatum*, Pasc., fig. 10, *brachiale*, fig. 13, *Lophopæum saronotum*, fig. 12, *barbiscapum*, fig. 11, pl. xii., *Cosmotoma rubella*, pl. xiii. fig. 8, *Oxineus arietinus*, fig. 1, *Anisopodus phalangodes*, Er., fig. 6, *hamaticollis*, figs. 4 & 5, *scriptipennis*, figs. 3 & 7, *argus*, fig. 2, pl. xii., *Lepturges inflatus*, fig. 3, *festivus*, fig. 4, pl. xiii., *gratiosus*, pl. xii. fig. 20, *navicularis*, pl. xiii. fig. 5, *Dectes mexicanus*, Thoms., fig. 6, p. 174, *Probatius mexicanus*, fig. 7, *Baryssinus bilineatus*, fig. 1, *Œdopeza pogonocheroides*, Serv., fig. 14, *guttigera*, fig. 13 (*guttifera* on plate), *Trypanidius mexicanus*, Thoms., fig. 11, *rubripes*, fig. 10, *melancholicus*, Serv. (= *geminus*, Pasc.), fig. 12, pl. xiii. *Chætanes setiger*, pl. xii. fig. 8, *Atrypanius conspersus*, Germ., fig. 9, *punctatellus*, fig. 15, *Nyssodrys deleta*, fig. 16, *leucopyga*, fig. 18, pl. xiii. *lætifica*, pl. xii. fig. 19, *calligramma*, pl. xii. fig. 17, pl. xiii. fig. 2, *polygramma*, fig. 17, *Hylettus cænobita*, Er., fig. 19, *Astynomus mucoreus*, fig. 20, pl. xiii., *setiger*, fig. 7, *vexillaris*, fig. 6, pl. xiv., *Olenosus serrimanus*, pl. x. figs. 13 & 14, *Carphina arcifera*, pl. xiv. fig. 8, *Synchyzopus geometricus*, pl. xiv. fig. 9, *Priscilla hypsiomoides*, Thoms. (= *dioptica*, Bates), pl. xiv. fig. 10, *Colobothea ramosa*, fig. 12, *chontalensis*, fig. 11, *hebraica*, fig. 13, *unilineata*, fig. 14, *dispersa*, fig. 15, *distincta*, fig. 16, *bitincta*, fig. 17, *Carneades superba*, fig. 18, *princeps*, fig. 20, pl. xiv., *Eumathes cupreseens*, fig. 17, *Cymatonycha castanea*, fig. 13, *Callia fulvo-cincta*, fig. 19, *Phœa saperda*, Newm. (= *Lamprocleptes entomologorum*, Thoms.), p. 195, *vitticollis*, fig. 7, *lineola*, Bates (= *miniata*, Pasc.), *mirabilis*, fig. 6, *Tetraopes varicornis*, Cast. (= *undecimpunctatus*, Thoms.), *umbonatus*, Lec., fig. 18, *Antodice cretata*, fig. 8, *Amillarus apicalis*, Thoms. (= *erythroderus*, Chevr., = *mutabilis*, Bates), fig. 14, *Eulachnesia smaragdina*, fig. 11, *Phœbe albaria*, fig. 3, *Amphionycha bifasciata*, fig. 4, *princeps*, fig. 2, *Isomerida subdilatata*, fig. 9, *lineata* (= *albicollis*), *picticornis*, fig. 10, *Hemilophus prolixus*, fig. 20, pl. xv.

——. Notes on Longicorn *Coleoptera*. Revision of the *Ærenicides* and *Amphionychides* of Tropical America. Ann. N. H. (5) viii. pp. 142–152, 196–204, 290–306.

Chiefly consists of new genera and species, but the characters of several known genera mentioned are also discussed. A list of all genera and species described since 1873 is appended.

Monohammus confusor, Kirby. Habits and transformations described by various authors; Packard, Ins. inj. Trees, pp. 152–156, figs. 68 & 69.

Eunithera viduata, Pasc., = *Celosterna umbrosa*, Thoms.; Ritsema, Notes Leyd. Mus. iii. p. 83.

Eryibasis princeps, Pascoe, figured by Waterhouse, Aid, i. pl. xliv.

Batocera gacriodes ebeninus, Voll., = *Batocera roylii*, Hope, and *M. guttatus*, Ritsema, l. c. p. 44; = *Batocera octomaculata*, Thoms., *nec* Fabr.; Ritsema, *l. c.* p. 10.

Etesida hecphora, Thoms., redescribed; Harold, MT. Münch. ent. Ver. iv. p. 166.

Hypaphesis punctata, Thomson. Genus and species redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 475.

Oopsis, Fairm. Fairmaire notices or redescribes the following known

species : *O. semigranosus, granicornis, striatellus*, Fairm., *nutator*, Fabr., *variivestis, brunneo-caudatus, lateripictus*, and *fusco-apicatus*, Fairm.; *l. c.* pp. 475–480.

Pogonocherus mixtus, Hald. Habits, Caulfield, Canad. Ent. xiii. p. 60.

Cyclopeplus cyaneus, Thomson, figured by Waterhouse, *l. c.* pl. lxi.

Agapanthia irrorata, Fabr., and *pubiventris*, Muls., redescribed; Chevrolat, Bull. Soc. Ent. Fr. (6) i. pp. xcv. & xcvi.

Saperda cretata feeds on apple; Osborn, Am. Nat. xv. p. 244. *S. tridentata*, Oliv.: larva and imago described and figured; Packard, *l. c.* pp. 58 & 59, fig. 17.

The genera *Momisis* and *Bacchisa* of Pascoe are sexes of the same species; Lansberge & Ritsema, *l. c.* p. 83.

Phytœcia cirtana, Luc., belongs to *Conizonia*, Fairm.; Bedel, Bull. Soc. Ent. Fr. (6) i. p. ciii.

Bates (Biol. Centr. Am. *Col.* v.) proposes the following new groups:—

Tetraopini (= *Phytœciides vrais*, groupe ii., Lac.), p. 195.

Phytœciini (= *Phytœciides vrais*, *Amphionychides*, and *Ærenicides*, Lac.), p. 202.

New genera and species :—

Dolichoprosopus, Ritsema, Notes Leyd. Mus. iii. p. 149. Allied to *Nemophas* and *Iothocera*; type, *D. maculatus*, sp. n., Halmaheira.

Rosenbergia, id. *l. c.* p. 11. Allied to *Batocera* and *Apriona*; types, *R. mandibularis*, p. 11, and *vetusta*, p. 13, spp. nn., Dorey.

Pattalinus, Bates, Biol. Centr. Am. *Col.* v. p. 165. Allied to *Lagochirus, Cœnopœus*, and *Amniscus*; type, *P. charis* and *cultus*, spp. nn., *l. c.*, Mexico.

Hexagona, id. *l. c.* p. 157. Allied to *Alcidion*, &c.; type, *H. armata*, sp. n., *l. c.* p. 149, pl. xii. fig. 15, Costa Rica.

Catharesthes, id. *l. c.* p. 158. Allied to *Alcidion*, but with a superficial resemblance to *Acanthoderes*; type, *C. elegans*, sp. n., *l. c.*, Guatemala.

Leptocometes, id. *l. c.* p. 161. Differs from *Anisopodus* by the thoracic tubercles and long hairy elytra; type, *L. hispidus*, sp. n., *l. c.*, Mexico.

Trichalphus, id. *l. c.* p. 153. Allied to *Leptostylus* (?); type, *T. pilosus*, sp. n., *l. c.*, Guatemala.

Eleothinus, id. *l. c.* p. 154. Allied to *Leptostylus* and *Liopus*; types, *E. abstrusus*, p. 154, *longulus* and *comus*, p. 155, spp. nn., Guatemala.

Alphinellus, id. *l. c.* p. 153. Prosternum and anterior coxæ as in *Liopus* and *Lepturges*; body convex, oblong, thorax gibbous (sometimes with lateral spines, as in *Dectes*), elytra marked with short elevated lines, arranged in rows; scape nearly as in *Alphus*. Types, *A. gibbicollis*, p. 153, *minimus* and *subcornutus*, p. 154, spp. nn., Guatemala.

Idephrynus, id. *l. c.* p. 160. Allied to *Leptostylus* and *Lophoporus*; type, *I. scaber*, sp. n., *l. c.*, Mexico.

Carphontes, id. *l. c.* p. 171. Allied to *Lepturges*, but with wide mesosternum, and short hind tarsi; type, *C. posticalis*, sp. n., *l. c.* p. 172, Guatemala.

Sympagus, id. *l. c.* p. 172. Differs from *Lepturges* by its wide pro- and metasterna; type, *L. lætabilis*, Bates (figured, pl. xii. fig. 18).

Phrissolaus, id. *l. c.* p. 172. Allied to *Lepturges*; antennæ and elytra bristly; terminal segment of abdomen lengthened into a sheath for ovipositor in ♀; type, *P. inspersus*, sp. n., *l. c.*, Chontales.

Sympleurotis, id. *l. c.* p. 185. Allied to *Colobothea*, &c., in form, but not in markings; type, *S. rudis*, sp. n., *l. c.*, Mexico, Guatemala.

Asemolea, id. *l. c.* p. 194. Allied to *Drycothea*, but with unarmed thorax; types, *A. setosa*, Guatemala, and *crassicornis*, Mexico, spp. nn., *l. c.*

Cephalodina, id. *l. c.* p. 212. Allied to *Amphionycha*; types, *A. capito*, Bates, and *crassiceps*, sp. n., *l. c.* p. 213, pl. xv. fig. 5, Guatemala.

Alampyris, id. *l. c.* p. 218. Placed after *Amphionycha*; appearance of *Photinus*. To contain *A. fuliginea, curta, nigra*, p. 219, *mimetica, marginella*, and *quadricollis*, Mexico, and *photinoides*, Guatemala, p. 220, spp. nn.; also *Pannychis melanophiloides*, Thoms.

Aphilesthes, id. Ann. N. H. (5) viii. p. 145. Allied to *Ærenica*; type, *A. rustica*, sp. n., *l. c.*, Merida, Venezuela.

Apagomera, id. *l. c.* p. 146. Allied to *Erana* and *Essostrutha*; type, *Saperda triangularis*, Germ. Add *A. suturella* and *azurescens*, spp. nn., *l. c.* p. 147, Brazil.

Sphallonycha, id. *l. c.* p. 149. Allied to *Pretilia*, but elytra carinated; type, *Amphionycha roseicollis*, Bates.

Tetanola, id. *l. c.* p. 151. Allied to *Amphionycha*, elytra acuminate and lateral carina extended as an obtuse ridge; type, *T. polita*, sp. n., *l. c.* Ecuador.

Ochromima, id. *ibid.* Allied to *Amphionycha*, but a very aberrant form; type, *A. megalopoides*, Bates.

Chrysaperda, id. *l. c.* p. 152. An aberrant form of *Amphionycha*; type, *C. metallica*, sp. n., *l. c.*, Ecuador, Peru.

Sphingnotus yorkensis, Fairmaire, Le Nat. iii. p. 359, Duke of York Island.

Echthistatus binodosus, Waterhouse, Tr. E. Soc. 1881, p. 431, Tokei.

Dorcadion perrini, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 88, Antilibanus; *D. turkestanicum*, Kraatz, Deutsche E. Z. xxv. p. 335, Turkistan.

Morimus inæqualis, Southern India, and *plagiatus*, Travancore, Waterhouse, Ann. N. H. (5) vii. p. 459.

Anhammus aberrans, Ritsema, Notes Leyd. Mus. iii. p. 146, Borneo.

Nemophas rosenbergi (Voll., MS.), *id. l. c.* p. 148, Celebes.

Monohammus peregrinus, Gradl, Ent. Nachr. vii. p. 301, Egerland; *M. grandis*, Waterhouse, Tr. E. Soc. 1881, p. 431, Japan; *M. versteegi*, Ritsema, *l. c.* p. 155, Sumatra.

Melanauster medenbachi, id. *l. c.* p. 39, locality unknown.

Idiopsius apicalis, id. *l. c.* p. 5, Java.

Egacriodes forbesi, Waterhouse, Ann. N. H. (5) vii. p. 408, Sumatra.

Palernotomis variabilis, Quedenfeldt, B. E. Z. xxv. p. 289, Angola.

Pinacostera mechowi, id. *ibid.*, Angola.

Pœmenesperus dobræi, Waterhouse, *l. c.* p. 408, Gaboon.

Eutænia elegans, id. *l. c.* p. 460, Travancore.

Gnathœnia albo-maculata, Quedenfeldt, *l. c.* p. 289, Quango, West Africa.

Cymatura mechowi and *bizonata*, id. *ibid.*, Angola.

Olenecamptus lacteo-guttatus, Fairmaire, Le Nat. iii. p. 359, Ruk, Carolina.

Xiphotheata luctifera, id. *ibid.*, Duke of York Island.

Praonetha moensi, Ritsema, *l. c.* p. 15, Java.

Stasilea curvicornis, Karsch, B. E. Z. xxv. p. 8, pl. i. fig. 12, Honolulu.

Menyllus xyalopus, id. *l. c.* p. 11, pl. i. fig. 17, Marshall Islands.

Oopsis griseo-caudatus, p. 480, *dorsatus* and *discedens*, p. 481, Fairmaire, Ann. Soc. Ent. Fr. (6) i., Fiji.

Aleidion eulophum, Mexico, British Honduras, Guatemala, pl. xiv. fig. 3, *furciferum*, p. 156, and *scutellatum*, Guatemala, p. 157, Bates, Biol. Centr. Am. *Col.* v.

Ozineus torquatus, id. *l. c.* p. 162, Guatemala.

Anisopodus mexicanus, Mexico, Guatemala, p. 162, *xylinus*, Costa Rica, p. 163, *pardalis*, Mexico, and *callistus*, Guatemala, p. 164, *id. l. c.*

Dectes spinicornis, id. *l. c.* p. 174, Mexico.

Lepturges macilentus, Mexico, p. 166, *sejunctimacula*, Guatemala, p. 167, *janus*, Mexico, *sordidus*, Guatemala, *clerulus*, pl. xiv. fig. 5, Guatemala, *multinotatus*, Guatemala, Nicaragua, p. 168, *fasciatus*, *laticollis*, Guatemala, *tumidicollis*, Guatemala, Nicaragua, p. 169, *raficollis* (= *unilineatus* ♀, *nec* ♂, Bates), *mixtus* (= *musculus*, pt., Bates), Nicaragua, *stigmaticus*, Guatemala, p. 170, *id. l. c.*

Oxathres pictulus, id. *l. c.* p. 175, pl. xiv. fig. 1, Guatemala.

Œdopeza incerta, id. *l. c.* p. 176, pl. xii. fig. 9, Chontales.

Nyssodrys pulverea, Mexico, *circumscripta*, pl. xii. fig. 16, Chontales, p. 180, *longula*, Costa Rica, p. 181, *id. l. c.*

Astynomus picticauda, Guatemala, *nigro-punctatus*, Mexico, Guatemala, *tenebrosus*, p. 183, and *decorus*, Guatemala, p. 184, *id. l. c.*

Carterina pygmæa (= *cincticornis*, var., Bates), *id. l. c.* p. 186, Chontales.

Exocentrus acutispina, Fairmaire, *l. c.* p. 482, Fiji.

Synchyzopus cancellatus, Bolivia, *lætus*, Ecuador, p. 275, *polystigma*, New Granada, and *duplex*, Brazil, p. 276, Bates, Ent. M. M. xvii.

Colobothea guatemalena, Guatemala, *regularis*, Mexico, p. 188, and *parcens*, Mexico, Guatemala, p. 189, *id.* Biol. Centr. Am. *Col.* v.

Carneades hemileuca, id. *l. c.* p. 190, pl. xiv. fig. 19, Costa Rica; *C. nodicornis*, Ecuador, New Granada, *personata* and *reticulata*, New Granada, *id.* Ent. M. M. xvii. p. 277.

Drycothea stictica, *testaceipes*, p. 193, *cribrata*, p. 194, *id. l. c.*, Guatemala.

Sparna platyptera, id. Ent. M. M. xvii. p. 276, Paraná, Brazil.

Apechthes championi, Bates, Biol. Centr. Am. *Col.* v. p. 191, Guatemala.

Agapanthia granulosa, Oran, and *nicæensis*, Nice, Chevrolat, Bull. 43. Ent. Fr. (6) i. pp. xcv. & xcvi. (The latter possibly = *cynaræ*, Gerh. & Muls.; Bedel & Chevrolat, *op. cit.* pp. cv. & cvii.)

Bacchisa nigriventris, Ritsema, *l. c.* p. 7, Sumbawa (= *Momisis ægrota*, Pasc., *sec.* Ritsema & Lansberge, *l. c.* p. 83).

Oberea quinquepunctata, Bates, *l. c.* p. 202, Mexico.

Mecas senescens, *rubripes*, *ambigenus*, Mexico, p. 203, *laminata*, Mexico, Guatemala, *obereoides*, pl. xv. fig. 16, *laticeps*, *mexicana*, Mexico, p. 204, *id. l. c.*

Phœa lateralis, Mexico, Guatemala, *nigripennis*, Guatemala, p. 196, *flavo-vittata*, Mexico, Guatemala, Honduras, *macilenta*, Mexico, *phthisica*, Guatemala, p. 197, *scapularis*, *rubella*, Guatemala, *hœgii*, Mexico, p. 198, *nigro-maculata*, Yucatan, *tricolor*, Mexico, Guatemala, *maxima*, Mexico, p. 199, *id. l. c.*

Tetraopes comes, Guatemala, p. 200, *thoreyi*, and *subfasciatus*, Mexico, p. 201, *id. l. c.*

Pannychis ducalis and *callicerus*, id. *l. c.* pp. 205 & 206, Mexico.

Calocosmus janus and *semimarginatus*, id. Ann. N. H. (5) viii. p. 151, Cuba.

Amphionycha charis, Ecuador, *albiventris*, Venezuela, p. 197, *leucodryas*, New Granada, *tribalteata*, Peru, *læta*, New Granada, Venezuela, Peru, p. 198, *spilota*, Brazil, *sexlineata*, Rio Janeiro, *theaphia*, Ecuador, p. 199, *dilaticeps*, New Granada, *dimidiata*, New Granada, *bisellata*, Ecuador, p. 200, *suturata*, Brazil, *pubicornis*, Lower Amazons, *postilenata*, Rio Janeiro, p. 201, *rectilinea*, Minas Geraes, *longipennis*, Ecuador, *fenestrata*, Rio Janeiro, p. 202, *fuscipennis*, Bolivia, Peru, *fulvicornis*, Rio Janeiro, *discicollis*, Ecuador, p. 203, *rubra*, Rio Janeiro, *urocosmia*, New Granada, p. 204, *callizona*, Honduras, Guatemala, *pluricostata*, Guatemala, *obesa*, Mexico, Guatemala, p. 217, *globicollis*, Mexico, *fraudatrix*, Nicaragua, p. 218, *id. l. c.*

Isomerida fimbriata, p. 290, *plumosa*, *picticollis*, p. 291, *vittipennis*, *longicornis*, p. 292, *id. l. c.*, Brazil.

Hemilophus infuscatus, p. 292, *leucogramma*, *unicolor*, Brazil, *smithi*, Lower Amazons, p. 293, *cayennensis*, Cayenne, *duplicatus*, New Granada, p. 294, *id.* l. c.; *H. longulus*, Mexico, and *varians*, Mexico, Guatemala, *id.* Biol. Centr. Am. *Col.* v. p. 222.

Tyrinthia xanthe, Chontales, and *lycinella*, Costa Rica, *id. l. c.* p. 223; *T. macilenta*, *longiscapus*, p. 294, *reversa*, *xanthotænia*, p. 295, Rio Janeiro, *obtusa*, p. 295, New Granada, *id.* Ann. N. H. (5) viii.

Malacoscylus albens, South Brazil, *iodinus*, Ecuador, *auricomus*, Chanchamoyo, p. 296, *cinctulus*, Bolivia, *gratiosus*, Ecuador, *gonostigma*, Rio Janeiro, p. 297, *id.* l. c.; *M. humilis*, id. Biol. Centr. Am. *Col.* v. p. 223, Mexico.

Themistonoe exilis, id. Ann. N. H. (5) viii. p. 298, Bolivia.

Lycidola expansa, id. *ibid.*, New Granada.

Essostrutha fimbriolata, Mexico, p. 210, *cinnabarina*, p. 211, Guatemala, and *rufinotata*, p. 212, pl. xv. fig. 18, Mexico, *id.* Biol. Centr. Am. *Col.* v.

Xerrhicera championi, pl. xv. fig. 12, *longifrons*, p. 214, Guatemala, *cristi-*, p. 44*is*, p. 214, Mexico, *cinereola*, p. 215, Guatemala, *id. l. c.*

Ethœbe mexicana, Mexico, *luteola*, Guatemala, *id. l. c.* p. 215.

Eurenica hirsuta, id. *l. c.* p. 206, Guatemala; *E. spissicornis*, p. 145, *leucippe*, Paraná, *porosa*, Venezuela, p. 146, *id.* Ann. N. H. (5) viii.

Antodice juncea, id. *l. c.* p. 145, Brazil; *A. nympha*, id. Biol. Centr. Am. *Col.* v. p. 207, Mexico, Guatemala.

Eulachnesia cobaltina, New Granada, *calliste*, Peru, p. 148, *æquatoria* and *viridipennis*, p. 149, Ecuador, Bates, Ann. N. H. (5) viii.

Alampyris planipennis, id. *l. c.* p. 150, South Brazil.

Erana pectoralis, p. 208, Mexico, Guatemala, *leuconoe*, Nicaragua, Panama, *florula*, Guatemala, *dispar*, Mexico, Guatemala, *suavissima*, Guatemala, *univittata*, Mexico, p. 209, p. 210, *fulvcola*, Guatemala, *id.* Biol. Centr. Am. *Col.* v.

Hybolasius vegetus and *fasciatus*, Broun, Man. N. Z. Col. p. 744, New Zealand.

Chrysomelidæ.

Jacoby, M. Biologia Centrali-Americana (cf. *Insecta*, General Subject, sub Godman & Salvin). *Coleoptera*, vi. (1) pp. 73–144, pls. iv.–vli.

Extends from *Pachybrachys* to *Colaspis*. The following known species are figured or specially noticed :—*Pachybrachys melanostictus*, Suffr., *reticulatus*, Fabr. (= *jucundus*, Dej.), pl. iv. fig. 10, p. 73, *Diaspis paradoxa*, Lac., pl. v. fig. 2, p. 74, *mœstifica* and *memnonia*, Lac., p. 75, *Chlamys amœna*, Lac., pl. v. fig. 4, *pavonina*, Lac., pl. ii. fig. 23, *cinerea*, Lac., *sextuberculata*, Jac., pl. ii. fig. 24, p. 76, *episcopalis*, Lac., pl. v. fig. 3, p. 77, *maculipes*, Chevr., pl. v. fig. 10, p. 78, *tragulus*, Lac., pl. iv. fig. 22, p. 80, *luteola*, Germ., pl. v. fig. 13, p. 81, *stigmula*, Lac., pl. ii. fig. 25, *ferrugata*, Lac., pl. v. fig. 5, and *gnatho*, Lac., p. 82, *stictica*, Lac., pl. v. fig. 1, p. 83, *gysseleni*, Koll., *hypocrita*, Lac., pl. iv. fig. 21, p. 84, *mixta*, Lac., *pardalis*, Lac., pl. iv. fig.25, p. 88, *Lamprosoma hypochryseum*, Baly, fig. 17, *chapuisi*, Jac., fig. 21, *insigne*, Lac., fig. 18, *opulentum*, Lac., fig. 23, *refulgens*, Lac., fig. 22, *splendidum*, Lac., fig. 16, *pediculus*, Lac., fig. 24, pl. v., *Chrysodina ignita*, Lef., fig. 7, p. 106, *corrusca*, Lef., fig. 2, p. 107, *cupriceps*, Lef. (= *instabilis*, Jac.), figs. 3 & 4, p. 109, *Phædra maxima*, Lef., fig. 5, *dives*, Lef., fig. 6, p. 112, *Noda cretifera*, fig. 10, p. 114, *atra*, fig. 11, pl. vi. p. 119, *Spintherophyta cephalotes*, Lef., pl. vii. figs. 1 & 2, p. 122, *Metaxyonycha tridentata*, Jac., fig. 12, *crucifera*, Marsh. (= *chevrolati*, Dej.), p. 129, *Primodera amasia*, Marsh. (= *wagneri*, Har.), fig. 14, pl. vi. p. 130, *Promecosoma abdominale*, Lef., figs. 1 & 2, *dispar*, *scutellare*, *nobilitatum*, *cinctipenne*, *sallæi*, *dugesi*, *inflatum*, *dilatatum*, *fervidum*, *lugens* and *lepidum*, Lef., figs. 3–12, pl. viii., *Colaspis gemmingeri*, Har., fig. 15, p. 137, *hypochlora*, Lef., fig. 18, *prasina*, Lef., figs. 16 & 20, p. 138, *suturalis*, Lef., fig. 19, pl. vi. p. 143.

Sagrides.

Mecynodera madagascariensis, Heyd. Amended description ; Deben, S. E. Z. xlii. pp. 448 & 449.

Donaciides.

Donacia phellandrii, Sahlb., and *angustata*, Kunze, = *dentata*, var. ; *brevicornis*, Ahr., and *rustica*, Kunze, are good species ; *lacordairii*, Perr., = *discolor*, Panz. ; *sericea* and allies belong to the genus *Plateumaris* ; Weise, Ent. Monatsbl. ii. p. 158.

Criocerides.

Preudhomme de Borre, A. Liste des Criocérides recueillies au Brésil par feu C. Van Volxem, suivie de la description de douze nouvelles espèces Américaines de cette tribu. Ann. Ent. Belg. xxv. pp. 74–84.

Lema erichsoni, Thoms., *nec* Suffr., renamed *L. septentrionis*; *L. gallæciana*, Heyd., = *lichenis*, var.; *duftschmidti*, Redt., = *melanopa*, var. *atrata*, Waltl; *cyanipennis*, Duft., = *rufo-cyanea*, Suffr.; *Crioceris alpina*, Redt., = *tibialis*, Villa; *dahli*, Lac., and *decorata*, Mor., = *paracenthesis*, Linn.; *campestris*, Fabr., *nec* Linn., = *asparagi*, Linn., var.; *campestris*, auctt., from Corsica, renamed *macilenta*; *Labidostomis leithneri*, Redt., = *tridentata*, Linn.; *tridentata*, Redt., = *cyanicornis*, Germ.; *steveni*, Lac., = *propinqua*, Fald., ♀; *senicula*, Kraatz, is distinct from *metallica*, Lef. Weise, Ent. Monatsbl. ii. p. 158.

Crioceris. Kraatz gives the following synonymy of European species: —*C. rusticus*, Linn. (♂ = *pachymerus*, Muls.; *polonicus* and *coriaceus*, Motsch., are varr.); *epibata*, Schiödte, ? = *ferus*, Kraatz; *C. agrestis*, Kirby, from Hudson's Bay, is distinct: Deutsche E. Z. xxv. pp. 63 & 64. *C. asparagi*, Linn.: life-history and remedies; Comstock, Rep. Dep. Agric. 1879, pp. 216–218, pl. iii. fig. 4. *C. merdigera*, Linn.: transformations, &c., noticed; Lucas, Bull. Soc. Ent. Fr. (6) i. pp. xcviii. & cxxvi.

Lema flavipes destructive to pupæ of *Saturnia pyri*; Chambolle, Feuill. Nat. xi. p. 91.

Lema chapuisi, Mexico, p. 75, *villei*, Ecuador, p. 76, *cubana*, Cuba, p. 77, *dimidiaticornis*, Mexico, *paraguayensis*, Paraguay, p. 78, *ferrum-equinum*, America, p. 79, *volxemi*, Brazil, p. 80, *atripes*, Bahia, *latemaculata*, Brazil, p. 81, *dugesi*, Guanascuato, *surinamensis*, Surinam, p. 82, Preudhomme de Borre, Ann. Ent. Belg. xxv., spp. nn.

Crioceris rugicollis, sp. n., *id. l. c.* p. 83, Guatemala.

Chlamydides.

Exema dispar. Transformations described and figured, and compared with those of *Minturnia dimidiata*; Dugés, Ann. Ent. Belg. xxv. pp. 5–7.

Chlamys sallæi, Mexico, pl. iv. fig. 23, *gerstæckeri*, Costa Rica, p. 77, *insularis*, Mexico, pl. v. fig. 12, p. 78, *frontalis*, Guatemala, p. 79, *pilatii*, Mexico, pl. v. fig. 8, p. 81, *fulvicollis*, Mexico, pl. v. fig. 6, p. 83, *clarki*, pl. v. fig. 7, *fasciaticollis*, p. 85, *kraatzi*, pl. v. fig. 11, *bipunctatus*, Mexico, pl. iv. fig. 24, p. 86, *maculicollis*, Guatemala, pl. v. fig. 9, p. 87; Jacoby, Biol. Centr. Am. *Col.* vi. (1), spp. nn.

Exema complicata, sp. n., *id. l. c.* p. 89, Honduras, Guatemala.

Cryptocephalides.

Cryptocephalus flavipes, varr. *nigrescens* and *kowarzi*, from Egerland, described; Gradl, Ent. Nachr. vii. p. 307. *C. sericeus*, Linn., and *C. lusitanicus*, Suffr., differentiated; Weise, Ent. Monatsbl. ii. p. 75. *C. lusitanicus*, Suffr., varieties noticed; Heyden, Deutsche E. Z. xxv. p. 246.

Calaphodius compactus, sp. n., Sharp, Ent. M. M. xviii. p. 50, New Zealand.

Cryptocephalus mechowi, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 167, Malange.

Lamprosomatides.

Lamprosoma sallæi, fig. 14, Mexico, p. 91, *magicum*, Costa Rica, Panama, p. 92, *nigripenne*, Guatemala, *chlorizans*, fig. 20, Mexico, p. 93, *panamense*, Panama, p. 94, *bifasciatum*, fig. 19, *elongatum*, Mexico, p. 95, *laticolle*, Costa Rica, p. 97, *prosternale*, Chontales, *lacordairii*, Mexico, p. 98, *nigritarse*, Mexico, p. 99, *salvini*, Guatemala, p. 101, *championi*, *balii*, fig. 15, Mexico, *tibiale*, p. 102, *separatum*, Guatemala, *minutum*, Honduras, Guatemala, p. 103, *godmani*, *modestum*, Guatemala, *hirta*, Mexico, p. 104; Jacoby, Biol. Centr. Am. Col. vi. (1) pl. v.: spp. nn.

Eumolpides.

BALY, J. S. Descriptions of uncharacterized species of *Eumolpidæ*, with notices of some previously observed Insects belonging to the same family. Tr. E. Soc. 1881, pp. 491-506.

Corynodes mouhoti, *Dorrmorrhytis ornatipinna*, and *Callisina mouhoti*, Baly, are omitted from Gemminger's Catalogue; *id. l. c.* p. 506.

Metaxyonycha eximia, Marsh., and *salvini*, Jac. (MS. ?), redescribed; *id. l. c.* pp. 492 & 493.

Dematochroma (= *Thasycles*, Chap.) *picea*, Baly, ♀ noticed; *id. l. c.* p. 502.

Damelia marshalli, Clark, redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 482.

Fidia murina, Crotch, = *viticida*, Walsh; Riley, Index to Reports, p. 53.

Rhyparida luteola, *punctatissima*, *subæneicollis*, and *trapezicollis*, Fairmaire, redescribed by him; *l. c.* pp. 483 & 484.

Colasposoma barbatum, Har., = *sellatum*, Baly, and *C. varians*, Baly, = *instabile*, Har.; Jacoby, P. Z. S. 1881, p. 446.

Adoxus vitis. Generative organs described: all the specimens examined were parthenogenetic females, or else (as some incomplete observations appear to indicate) hermaphrodites. Jobert, C. R. cxiii. pp. 975-977.

Eurydemus insignis, Chap., redescribed; Fairmaire, *l. c.* p. 482.

New genera and species:—

Euphrytus, Jacoby, Biol. Centr. Am. *Col.* vi. (1) p. 124. Allied to *Chalcophana* and *Coytiera*; antennæ thickened, femora dilated, prosternum truncate. Types, *E. æneus*, pl. vii. fig. 25, *simplex*, *opacicollis*, fig. 18, p. 125, and *fulvicollis*, fig. 19, pl. viii. p. 126, spp. nn., Mexico.

Beltia, id. *l. c.* p. 128. Allied to *Sterneurus*; type, *B. nicaraguensis*, sp. n., *l. c.* pl. viii. fig. 25, Nicaragua.

Vitibia, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 485. Allied to *Anepichroma*, *Chrysopida*, and *Pyropida*; type, *V. rufo-violacea*, sp. n., *l. c.* *Rhyparidâ formosa*, Baly, redescribed, *l. c.*, may also belong to this genus.

Auranius, Jacoby, P. Z. S. 1881, p. 447. Allied to *Corynodes*; but lateral margin dentate, and thorax very convex. Type, *A. robustus*, sp. n., *l. c.*, Brazil.

Chrysodina flavipes, Guatemala, p. 106, *ornata*, Mexico, *championi*, Guatemala, p. 107, *ornaticollis*, *pubescens*, pl. vi. fig. 7, p. 108, *purpureicollis*, Mexico, *marginicollis*, p. 109, *minuta*, Guatemala, *hagii*, Mexico, p. 110, Jacoby, Biol. Centr. Am. *Col.* vi. (1).

Chalcoplacis fulvipes, Guatemala, and *jansoni*, Chontales, *id. l. c.* p. 111.

Lamprosphærus apicalis, Honduras, Guatemala, and *minutus*, Guatemala, *id. l. c.* pp. 112 & 113; *L. gigas*, Peru, *subcostatus*, Bogota, *id.* P. Z. S. 1881, p. 439.

Spintherophyta hybrida, Guatemala, and *guatemalensis*, Guatemala, Costa Rica, *id.* Biol. Centr. Am. *Col.* vi. (1) pp. 122 & 123.

Coytiera fulvipes and *rugipennis*, id. *l. c.* pp. 126 & 127, pl. viii. figs. 15 & 16, Mexico.

Phædra buckleyi, id. P. Z. S. 1881, p. 439, Ecuador.

Noda irazuensis, Costa Rica, *lateralis*, Mexico, Guatemala, p. 115, *opaca*, pl. vi. fig. 8, *thoracica*, p. 116, *subcylindrica*, p. 117, *tarsata*, p. 118, *igneicollis*, p. 119, *cribellata*, *distincta*, *curtula*, fig. 9, pl. vi. p. 120, *dispersa*, Mexico, *bicallosa*, Guatemala, *lævicollis*, Mexico, p. 121, *id.* Biol. Centr. Am. *Col.* vi. (1); *N. unicostata*, id. P. Z. S. 1881, p. 440, Amazons.

Agbalus quadriplagiatus and *mexicanus*, id. Biol. Centr. Am. *Col.* vi. (1) p. 124, Mexico.

Metaxyonycha gigas, New Freiburg, p. 491, *pulchella*, Brazil, p. 493, *pretiosa*, Ecuador, p. 494, *batesi*, Upper Amazons, p. 495, *octosignata*, Amazons, p. 496, *tarsata*, Parana, *distincta*, St. Paulo, p. 497, and *retifera*, Parana, p. 498, Baly, Tr. E. Soc. 1881. *M. godmani*, Jacoby, *l. c.* p. 130, pl. vi. fig. 13, Guatemala.

Prionodera salvini, Costa Rica, Guatemala, *hirtipennis*, Guatemala, *id. l. c.* p. 131, pl. viii. figs. 20 & 21.

Coluspis splendida, pl. vi. fig 17, Costa Rica, Panama, *chontalensis*, Chontales, p. 136, *championi*, Mexico, Guatemala, p. 137, *bifasciata*, Panama, p. 139, *mexicana*, Mexico, *submetallica*, pl. vii. fig. 7, Honduras, Guatemala, Panama, p. 140, *belti*, pl. vi. fig. 21, Chontales, p. 141, *subcostatus*, Panama, p. 142, *melancholica*, Mexico, Guatemala, Panama, *balyi*, Guatemala, p. 143, *laticollis*, pl. vii. fig. 6, Mexico, Guatemala, Nicaragua, p. 144, *id. l. c.*

Promecosoma viride, id. *l. c.* p. 135, pl. viii. fig. 14, Mexico.

Chalcophana opulenta, Bogota, *mexicana*, Mexico, p. 499, *eximia*, Ecuador, p. 500, *jacobii*, Peru, and *binotata*, Ecuador, p. 501, Baly, *l. c.*

Callisina indica, id. *l. c.* p. 503, India (?).

Aulexis elongatus, Jacoby, P. Z. S. 1881, p. 440, Java.

Eubrachys apicalis, id. *l. c.* p. 446, Cameroons.

Colasposoma gibbicolle, Zanzibar, *apicale*, Transvaal, p. 441, *tarsale*, Africa, *longipes*, p. 442, *melancholicum*, Transvaal, *variabile*, Zanzibar, p. 443, *antennale*, South Africa, *ornaticolle*, Cochin China, p. 444, *ornatum*, *id.* p. 445, *robustum*, Nilgherries, p. 446, *id. l. c.*

Euryope pulchella, Cape of Good Hope, *nigrita*, Port Natal, Zululand, Baly, *l. c.* pp. 504 & 505.

Colaspidea grandis, Frivaldszky, Term. füzetek, iv. p. 264, Bithynia.

Corynodes limbatus, Baly, *l. c.* p. 505, Gaboon.

Colaspoides amazona, Jacoby, *l. c.* p. 448, Amazons.

Chrysomelides.

Kraatz, G. Die Unterscheidung der Oreinen-Arten nach den männlichen Geschlechtsorganen, angeregt durch J. S. Baly. Ent. Monatsbl. ii. pp. 33–38.

A critical examination of Baly's conclusions respecting 10 species.

Weise, J. Die Verschiedenheiten des Forceps der Orina-Arten besprochen. *Op. cit.* pp. 97–102.

18 species noticed.

List of *Chrysomelidæ* of the neighbourhood of New York; Schmelter, Bull. Brooklyn Soc. i. p. 55.

Chrysomelidæ observed upon *Salix discolor*, Muhl., and *S. petiolaris*, var. *gracilis*, Andrus; Webster, *op. cit.* iii. p. 79.

Chrysomela heeri, Herr.-Schäff., = *vernalis*, Brull.; *Phyllodecta cavifrons*, Thoms., = *laticollis*, Suffr.; *P. pumila*, Reiche, = *Prasocuris suffriani*, Küst.; *Prasocuris aucta*, Fabr., var., = ? *glabra*, Herbst, and is distinct from *Chrysomela cgena*, Gyll., which = *Phædon cochleariæ*, Fabr.; *Gastroidea alpina*, Gebl., is a Siberian species; the reputed specimens from Monte Rosa belong to *viridula*, Deg. Weise, Ent. Monatsbl. ii. p. 102.

Gastrophysa raphani. Remarks on its parthenogenesis: McLachlan, P. E. Soc. 1881, p. xxvii. Ravages at Paris: Girard, Bull. Soc. Ent. Fr. (6) i. pp. lxiv. & lxv.

Phædon. British species discussed and differentiated; Fowler, Ent. xiv. pp. 293–295. *P. betulæ*: habits and ravages; Fryer & others, Ent. xiv. pp. 44, 45, 187, 188, 236 & 237. *P. bonariensis*, Boh.: variation noticed; Berg, S. E. Z. xlii. pp. 64 & 65, & Exped. Rio Negro, Zool. p. 108.

Prasocuris hannoverana, Fabr., var. *degenerata* from Novaya Zemlya, described; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 16.

Lina tremulæ. Meigenia bisignata and *Phora*, sp. (?) are parasitic on the larva; Bugnion, Bull. Soc. Vaud. (2) xvii. pp. 17–31, pls. i. & ii.

Melasoma lapponicum. New varieties from Egerland described; Gradl, Ent. Nachr. vii. pp. 303–306. *M. populi*, Linn., noticed; Robinson, Rep. Dulwich Soc. iv. p. 41.

Chrysomela americana, Linn.: found in Greece among old buildings on mountains, and called, "Beetles of the Prophet Elias"; Heldreich, SB. nat. Fr. 1881, pp. 125–127. *C. scalaris*, Lec.: transformations described; Packard, Ins. Inj. Trees, pp. 126 & 127. *C. septentrionalis*, Ménétr. (?): varieties from Waigatsch described; Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 16.

Leptinotarsa behrensi, Har.: description reprinted; Bull. Brooklyn Soc. iv. p. 59.

Chrysomela (*Doryphora*) *decemlineata*, noticed; Brackel-Welda, Nat. Mex. v. Riv. Cient. pp. 13–15. In Devonshire; Ent. M. M. xvii. p. 235, and P. E. S. 1881, p. iv. Feeds on *Datura*; Grote, Rep. E. Soc. Ont. 1880, p. 18. Increase of its enemies; Comstock, Rep. Dep. Agric. 1879, p. 245. Noticed (with *C. juncta*), Dury, Canad. Ent. xiii. p. 20.

Doryphora porosa and *costata*, Jacoby, figured by Waterhouse; Aid, i. pls. liv. & lxii.

Phytodecta pallida, Linn., and *5-punctata*, Fabr., differentiated; Weise, *l. c.* p. 76.

Acanthodon, g. n., *id. ibid.* Allied to *Phytodecta*; type, *P. lineata* Géné.

Phædon inauratus, (Mannerh.), sp. n., Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 29, Siberia.

Chrysomela dilacerata, sp. n., Ancey, Le Nat. iii. p. 485, Usagara, East Africa.

Halticides.

Leeseerg, A. F. A. Bijdrage tot de kennis der inlaandsche Halticiden. Tijdschr. Ent. xxiv. pp. 169–208, pl. xvi.

Includes tables of genera, and tables and descriptions of the Dutch species of *Psylliodes*, *Dibolia*, *Chætocnema*, *Batophila*, and *Aphthona*. The species figured are *Psylliodes chrysocephala*, Linn., *affinis*, Payk., *Dibolia occultans*, Koch, *Chætocnema concinna*, Marsh., *mannerheimi*, Gyll., *Batophila rubi*, Koch, *Aphthona cyparissiæ*, Koch, *A.* (*Phyllotreta*) *nodicornis*, Marsh., and *A.* (*P.*) *ochripes*, Cast.

Crepidodera smaragdina, Foudr., from Scotland recorded as new to Britain; Sharp, Scot. Nat. vi. p. 92. *C. chloris*, Foudr.: ravages at Paris; Girard, Bull. Soc. Ent. Fr. (6) i. pp. lxiv. & lxv.

Chalcoides, Foudr., *nec* Motsch., renamed *Foudrasia*; Des Gozis, Bull. Soc. Ent. Fr. (6) i. p. cxxxiv.

Ligrus, Motsch., nec *Lygrus*, Schönh,, renamed *Nancredis*; id. *l. c.* p. cxl.

Graptodera (*Haltica*) *chalybea*, Ill.: life-history; Comstock, Rep. Dep. Agric. 1879, pp. 213–216, pl. iii. figs. 1 & 2.

Lactica specularis and *xanthochroa*, Har.: descriptions reprinted; Bull. Brooklyn Soc. iv. pp. 59 & 60.

Febra funesta, Clark, redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 489.

Œdionychis. Harold (B. E. Z. xxv. pp. 119–154) tabulates and afterwards describes 47 species, many new. *Œ. zygogrammica*, Har., = *zebrata*, Ill., var.; *Œ. umbratica*, Oliv., var. *evanescens* (Chevr., MS.), described; *Œ. porosa*, Baly, = *variolosa*, Har.; *Œ. crassa*, Baly, = *sanguinipes*, Har.; *Œ. septem-maculata*, Jac., = *propugnaculum*, Ill., and *Œ. quinquemaculata*, Jac., = *dissepta*, Er.: Harold, MT. Münch. ent. Ver. iv. p. 169.

Dibolia ærea, Mels. Larva described; Comstock, Rep. Agric. Dep. 1879, p. 248.

Psylliodes milleri, Kutsch., = *Crepidodera corpulenta*, Kutsch.; Kraatz, Deutsche E. Z. xxv. p. 104.

New species :—

Notozona clarki, Baly, Tr. E. Soc. 1881, p. 56, Bahia.

Podagrica madagassa, id. *l. c.* p. 58, Madagascar.

Crepidodera madacassa, id. *ibid.*, Madagascar.

Disonycha interlineata, Berg, S. E. Z. xlii. p. 65, Exped. Rio Negro, Zool. p. 109, pl. iv. fig. 18, Patagonia.

Febra semi-aurantiaca and *varioloidea*, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 490, Ovalau.

Blepharida guttulata, Angola, p. 52, *ornata*, Transvaal, p. 53, *xanthospilota*, China, and *nigripennis*, Malacca, p. 54, Baly, *l. c.*

Eutheca malayana, id. *l. c.* p. 55, Macassar.

Asphæra oblecta, Amazons, and *inclusa*, Venezuela, *id. l. c.* pp. 56 & 57.

Œdionychis cassidoides, Brazil, p. 125, *quadrilineata* (Sturm, MS.), Mexico, p. 126, *taniolata*, p. 127, *livida*, Brazil, p. 128, *familiaris*, *virgata*, Mexico, p. 130, *separata*, Brazil, *bergi*, Monte Video, Buenos Aires, p. 131, *circumvaga* (Chevr., MS.), p. 132, *rubeola*, Brazil, p. 134, *haagi*, Corrientes, p. 135, *scytha*, p. 136, *patricia*, p. 137, *quærula*, Brazil, p. 138, *fenestrata*, New Granada, Ubaqué, *vestita*, p. 139, *desmogrammica*, Brazil, p. 140, *horni*, Texas, p. 142, *ferrugata*, Bahia, p. 144, *selloi*, p. 145, *mendax*, Brazil, *burmeisteri*, Corrientes, p. 147, *alternans*, Brazil, p. 149, *patruelis*, Brazil, p. 153, Harold, B. E. Z. xxv. *Œ. sejuncta*, Brazil, *auguralis*, and *ornamentalis*, Ecuador, pp. 167–169, *id.* MT. Münch. ent. Ver. iv. *Œ. mathematica*, Minas Geraes, *defecta*, Colombia, p. 91, 27-*maculata*, Buenos Aires, p. 92, *id. l. c.* v.

Galerucidæ.

Diabrotica soror, Lec., and *trivittata*, Mann, noticed; Comstock, Rep. Dep. Agric. 1879, p 246.

Luperus, sp. destructive to sunflowers; *id. l. c.* 1880, p. 274.

Pachytoma, Clark. Table of species; Karsch, B. E. Z. xxv. p. 225.

Galeruca xanthomelana. Ravages on elm in America; Lockwood, Am. Nat. xv. pp. 242-245.

New genera and species:—

Malacotheria, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 486. Differs from *Aulacophora* by its almost entire epipleura, and its closed cotyloid cavities; types, *M. funerea*, *strigiscutata*, p. 487, and *lateritia*, p. 488, spp. nn., *l. c.*, Fiji.

Neocharis, Jacoby, P. Z. S. 1881, p. 448. Allied to *Doridea* and *Platyxantha*, but with the third joint of the antennæ greatly dilated (in the male only?); type, *N. fulvicollis*, sp. n., *l. c.*, Java.

Metrioidea, Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 489. Allied to *Dorydea* and *Palpoxena*; type, *M. signatipennis*, sp. n., *l. c.*, Fiji.

Oides costata, Lake Nyassa, and *antennalis*, Queensland, Baly, Tr. E. Soc. 1881, pp. 51 & 52.

Chthoneis marginicollis, Jacoby, P. Z. S. 1881, p. 449, Peru.

Pachytoma maculicollis, p. 225, *dives* (Bohem., MS.), Natal, and *clavicornis* (Har., MS.), Dondo, p. 226, Karsch, B. E. Z. xxv.

Adimonia costipennis, Kirsch, Ent. Monatsbl. ii. p. 164, Krasnowodsk.

Hispides.

Waterhouse, C. O. On the Coleopterous Insects belonging to the family *Hispidæ* collected by Buckley in Ecuador. P. Z. S. 1881, pp. 260–269, pl. xxx.

36 species are enumerated. In addition to those described as new, the

following are specially noticed: *Cephalolia pulchella*, *Alurnus batesi*, and *saundersi*, Baly, *cassideus*, Westw., *perplexus* (fig. 14) and *Arescus histrio*, Baly, *Odontota*, sp. n. (?), and *Stethispa bonvouloiri*, Baly (fig. 20).

Promecotheca cæruleipennis, Fairmaire, redescribed by him; Ann. Soc. Ent. Fr. (6) i. p. 486.

New species:—

Prosopodonta scutellaris, Waterhouse, P. Z. S. 1881, p. 260, pl. xxx. fig. 19, Ecuador.

Cephalolia alternans, fig. 5, *ornata*, fig. 6, p. 261, *læta*, fig. 9, *antennata*, fig. 7, p. 262, *felix*, fig. 8, *angusticollis*, fig. 4, p. 263, *id. l. c.* pl. xxx., Ecuador.

Homal[oh]ispa cribripennis and *collaris*, id. *l. c.* p. 264, pl. xxx. figs. 1 & 2, Ecuador.

Alurnus mutabilis, id. *l. c.* p. 265, pl. xxx. fig. 3, Ecuador

Arescus pulcher, figs. 11 & 12, and *æmulus*, fig. 13, *id. l. c.* p. 266, pl. xxx., Ecuador.

Uroplata rugata, *deplanata*, and *bispinosa*, id. *l. c.* p. 267, pl. xxx. figs. 15 & 17, Ecuador.

Odontota annulipes, id. *l. c.* p. 268, pl. xxx. fig. 18, Ecuador.

Metaxycera quadriguttata, id. *l. c.* pl. xxx. fig. 21, Ecuador.

Cephalodonta lycoides, id. *l. c.* p. 269, pl. xxx. fig. 10, Chiquinda.

Estigmena cribicollis, id. Ann. N. H. (5) vii. p. 461, Travancore.

Cassidides.

Wagener, B. Cassididæ. MT. Münch. ent. Ver. v. pp. 17–85.

Includes descriptions of many new species, and tables of species of the following genera: *Hopleonota*, *Prioptera*, *Tauroma*, *Batonota*, *Porphyraspis*, *Himatidium*, *Calliaspis*, *Spilophora*, *Calyptocephala*, *Omoplata*, *Hybosa*, *Mesomphalia*.

Dolichotoma gloriosa, Baly, figured by Waterhouse; Aid, i. pl. liii.

Physonota quinquepunctata, Walsh & Riley, = *unipunctata*, Say; Riley, Index to Reports, p. 53.

Eggs of *Cassida nigripes*, Oliv., and *bivittata*, Say, and *Coptocycla guttata*, Oliv., described; *id. l. c.* pp. 53 & 54.

New species:—

Hoplionota circumdata, East Indies, *obscura*, Celebes, p. 17, *undulata*, Mindanao, *modesta*, East Indies, p. 18, *vittata*, Bohol, *biramosa*, Philippines, p. 19, *rufa*, Malacca, p. 20, Wagener, MT. Münch. ent. Ver. v.

Himatidium nigrum, id. *l. c.* p. 25, Ecuador.

Calliaspis punctata, id. *ibid.*, Bahia.

Prioptera pallida, Malacca, p. 25, *multiplagiata*, Andaman Islands, *latissima*, Philippines, *immaculata*, Bohol, Philippines, p. 26, *id. l. c.*

Tauroma azurea, Venezuela, and *cuprea*, Colombia, Venezuela, *id. l. c.* pp. 30 & 31.

Mesomphalia annulosa, *alta*, Brazil, p. 34, *cordata*, Peru, *retusa*, Brazil, p. 35, *chapuisi*, *modesta*, Ecuador, p. 36, *cuprea*, Paraguay, *fenestrata*, Cayenne, p. 37, *subopaca*, Peru, *serricornis*, Ecuador, p. 38, *thoracica*,

Brazil, *rufo-cincta*, New Friburg, p. 39, *collocata*, Colombia, *retis*, Brazil, *parva*, Ecuador, p. 40, Wagener, *l. c.*

Batonota rufo-marginata, Brazil, *rugosa*, St. Domingo, p. 41, *minima*, Paraguay, *fasciata*, Brazil, p. 42, *margine-vittata*, Ega, p. 43, *sexplagiata*, Nicaragua, p. 44, *id. l. c.*

Aspidomorpha late-ramosa, *flavo-dorsata*, New Guinea, p. 48, *septem-costata*, Rockhampton, *olivacea*, Himalaya, p. 49, *id. l. c.*

Cassida reticulata, Buenos Aires, *deflexa*, Minas Geraes, *id. l. c.* p. 50.

Coptocycla nigro-punctata, id. *l. c.* p. 51, Central America.

Ischyrosonyx hospes, Dohrn, S. E. Z. xlii. p. 311, Transvaal.

Languriidæ.

Languria mozardi, Fabr.: transformations described and figured; Comstock, Rep. Dep. Agric. 1879, pp. 199 & 200, pl. i. fig. 6.

Erotylidæ.

Pselaphacus nicaraguæ, Crotch, figured by Waterhouse; Aid, i. pl. lxxii.

Triplax elongata, Lac., = *rustica*, Linn. (immature); Mayet, Bull. Soc. Ent. Fr. (6) i. p. clxv.

Helota ocellata, and *semifalca*, Ritsema, Notes Leyd. Mus. iii. pp. 79 & 80, Java; *H. cerco-punctata*, Lewis, Ent. M. M. xvii. p. 255, Japan: spp. nn.

Triplax tergestana, sp. n., Reitter, Deutsche E. Z. xxv. p. 229, Trieste.

Aulacochilus bedeli, sp. n., Harold, MT. Münch. ent. Ver. iv. p. 170, Nikko.

Endomychidæ.

Alexia pubescens and *pilosissima*, Frivaldszky, Term. füzetek, iv. pp. 265 & 266, Brussa.

Coccinellidæ.

Weise, J. Nachträge zu den Bestimmungs-tabellen ii. der Coccinelliden. Deutsche E. Z. xxv. pp. 165 & 166.

Includes short notes on 10 species. The following apparently new varieties are noticed: *Hippodamia* 13-*maculata*, var. *incomta*, *Anisosticta* 19-*punctata*, varr. *athesis* and *tiesenhauseni*, *Coccinella* 10-*punctata*, var. *recurva*, *Micraspis* 16-*punctata*, var. *flavidula*.

Adonia variegata, Goeze, *Adalia* 11-*notata*, Schneid., and *Halyzia conglobata*, Linn. Several new varieties of each described; Sajó, Ent. Nachr. vii. pp. 213 & 214.

Hippodamia maculata, De Geer, not European; Riley, Index to Reports, p. 52. *H. punctulata*, Leconte: recorded from the Tonga Islands, and redescribed; Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 491.

Coccinella decempunctata, Linn., var. *weisii*, described; Sajó, Ent. Monatsbl. ii. p. 160. *C. septempunctata*: anatomy noticed; Nachr. Ges. Mosc. xxxiii. pp. 81 & 82. *C. septempunctata* and *quinquepunctata*: larvæ

noticed; Hagens, Ent. Nachr. vii. p. 172. *C. septempunctata*: var. described; Gradl, *op. cit.* p. 392. *C. 11-punctata*: varieties described; Tariel, Feuill. Nat. xi. p. 103.

Halyzia conglobata, Linn., varr. *parumpunctata*, *pannonica*, *frivaldszkii* and *leopardina*, described; Sajó, *l. c.* p. 159. *H. japonica*, Thoms., and varieties discussed, including varr. nn. *ancora*, *tristis*, and *lewisi*; Weise, Ent. Monatsbl. ii. pp. 118 & 119.

Chilomenes polynesiæ, Crotch, description copied; Fairmaire, *l. c.* p. 491.

Epilaena montrouzieri, Fauv., and *ureillii*, Montr., redescribed; *id. l. c.* p. 492.

Scymnus argutus, Muls., recorded from Derbent and redescribed; Weise, Deutsche E. Z. xxv. p. 166.

Coelophora atro-lineata, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) i. p. 491, Fiji, New Caledonia.

HYMENOPTERA.

BY

W. F. KIRBY, M.E.S., &c.

THE GENERAL SUBJECT.

ANDRÉ, E. Species des Hyménoptères d'Europe et d'Algérie. 8me—11me Fasc. (i. pp. 301–596, 37*–70*, pls. xxi.–xxiii.; ii. pp. 48, pls. i.–iv.).

The first volume includes the *Tenthredinidæ*, from *Blennocampa* to the end, and the *Cephidæ* and *Siricidæ*; and the second, by Ernest André, contains the commencement of the Introduction to the *Formicidæ*, comprising general anatomical and physiological details, transformations, habits, nidification, &c

BIGNELL, G. C. Contributions towards the Fauna of Plymouth: *Hymenoptera, Ichneumonidæ*, Part i. Rep. Tr. Plym. Inst. vii. pp. 508–512.

Includes the names of several species new to Britain.

BRONGNIART, C. J. E. See *Insecta*, General Subject.

CAMERON, P. Notes on *Hymenoptera*, with descriptions of new species. Tr. E. Soc. 1881, pp. 555–577.

Includes species from Britain, Spain, and the Sandwich Islands.

DEWITZ, H Hymenopteren von Porto Rico. B. E. Z. xxv. pp. 197–208, pl. v.

List of species, with occasional observations; 12 are described as new.

GRIBODO, G. Spedizione Italiana nell' Africa Equatoriale. Resultati Zoologici. Imenotteri. Ann. Mus. Genov. xvi. pp. 226–269.

Includes notices of 28 known species, those previously diagnosed by the author in Ann. Mus. Genov. xiv. being redescribed in full.

——. Escursione in Calabria 1877–78. Imenotteri. Bull. Ent. Ital. xiii. pp. 43–74, 145–168.

Includes occasional notes, besides descriptions of a few new species.

JUST, B. Anatomie und Physiologie der Hymenopteren, mit besonderer Berücksichtigung der bekanntesten Formen. JB. niederösterr. Landes-Realgymnasiums, xvii. pp. 3–36.

KIRBY, W. F. A list of the *Hymenoptera* of New Zealand. Tr. E. Soc. 1881, pp. 35–50.

81 species enumerated, 5 new. The descriptions of several species described by Fabricius and Walker are copied.

MACLOSKIE, G. See *Insecta*, General Subject.

MAGRETTI, P. Sugli Imenotteri della Lombardia. Memoria I. Bull. Ent. Ital. xiii. pp. 3–42, 89–123, 213–273.

Includes a synonymic list of 174 species, with notes on localities, &c.

MARQUET, —. Aperçu des Insectes Hyménoptères qui habitent le midi de la France. Notes supplémentaires. Bull. Soc. Toulouse, xiii. pp. 129–190.

Includes a number of short notes; a few species described are possibly new. The *Braconidæ*, *Chalcididæ*, and *Proctotrypidæ* are omitted.

MOCSÁRY, A. A Magyar Fauna masnejii darazsai (*Heterogynidæ* Faunæ Hungaricæ). Budapest: 1881, 8vo, pp. 95, 2 pls.

[Not seen by the Recorder.]

PACKARD, A. S. Descriptions of some new Ichneumon Parasites of North American Butterflies. P. Bost. Soc. xxi. pp. 18–38.

Several known genera and species are noticed or recharacterized, in addition to new ones.

PROVANCHER, [L'ABBÉ]. Faune Canadienne. Les Insectes—Hyménoptères. Nat. Canad. xii. pp. 193-207, 225–241, 257–269, 291–304, 321–333, 353–362, woodcuts.

Includes *Braconidæ*, from *Eurinus* to *Capelus*, and *Cynipidæ*, *Proctotrypidæ*, *Chalcididæ*, *Chrysididæ*, *Formicidæ*, and *Mutillidæ* (*Methoca*), with occasional figures of neuration.

RADOSZKOVSKY, O. Hyménoptères d'Angola. J. Sci. Lisb. viii. pp. 197–221.

[Not seen by the Recorder.]

ROGENHOFER, A., & DALLA TORRE, K. W. v. Die Hymenopteren in J. A. Scopoli's Entomologia Carniolica, und auf den dazugehörigen Tafeln. Verh. z.-b. Wien, xxxi. pp. 593–604.

The nature of this paper is explained by its title. It consists of brief synonymic notes, too numerous to be repeated here.

SAUNDERS, E. Notes on the Entomology of Portugal. vi. *Hymenoptera Aculeata*. Collected by A. E. Eaton in 1880. Ent. M. M. xviii. pp. 165–171.

A few new species are described. Pages 169–171 fall into 1882, and their contents will not be included in the present Record.

——. Notes on the hairs of *Hymenoptera*. Ent. M. M. xvii. pp. 201 & 202, figs. 1–3.

The character of simple or branching hairs is maintained even in the hairs between the facets of the eyes in hairy-eyed species. The sharp hairs on the hind tibiæ of *Andrena*, and on the front tibiæ of *Bombus*, are probably cleaning instruments. The scale-like hairs on *Colioxys* and *Andrena* are not true scales.

SCHØYEN, W. M. Bemerkninger til. H. Siebke's Enumeratio Insectorum Norvegicorum. Fasc. v. Pars. 1. (*Hymenoptera Phytophaga*, et *Aculeata*.) Forh. Selsk. Chr. 1880, No. 10, pp. 15.

Notes on localities of British *Heterogyna* and *Fossores*. C. W. Dale, Ent. M. M. xvii. p. 236.

Aculeate *Hymenoptera* in 1881. Bridgman & Perkins, Ent. xiv. p. 238.

Captures of *Hymenoptera* in Dorsetshire; Pickard Cambridge, Ent. xiv. p. 137. Near Worcester in 1880; Fletcher, Ent. M. M. xvii. p. 212. At Hayling Island and Bournemouth; Saunders, *op. cit.* xviii. pp. 113 & 115.

Captures of *Hymenoptera* in Germany; Preudhomme de Borre, CR. Ent. Belg. xxv. pp. xxii.–xxiv.

Additions to the *Hymenoptera* of Hamburg; Beuthin, Verh. Ver. Hamb. iv. pp. 239–241.

Captures of *Hymenoptera* (chiefly *Bombi*) in Switzerland in 1880; Frey-Gessner, MT. schw. ent. Ges. vi. pp. 105–118.

List of the genera of *Hymenoptera* described between 1869–1879; Dalla Torre, Ent. Nachr. vii. pp. 330–344.

List of hymenopterous parasites on *Lepidoptera*, with notices of hosts; Fitch, Ent. xiv. pp. 138–143.

Hymenopterous parasites infesting *Gyrinus natator*; Parfitt & Hellius, Ent. M. M. xviii. pp. 78, 88, & 89, and Rep. Devon. Ass. xiii. p. 261.

APIDÆ.

MÜLLER, H. Über die angebliche Afterlosigkeit der Bienenlarven. Zool. Anz. iv. pp. 530 & 531.

The larva of *Dasypoda hirtipes* discharges no excrement till it is full grown; when it ceases to feed, it discharges the undigested remains of its food, and lies torpid without spinning up till next summer. In the young larva, the anus only exists as a transverse closed line, unconnected

with any intestine ; and it only becomes fully developed when the larva ceases to feed.

RITSEMA, C. Tweede Supplement op de Naamlijst der Nederlandsche *Hymenoptera Anthophila*. Tijdschr. Ent. xxiv. pp. cxxiii.-cxxviii.

Raises the list of Dutch Bees to 30 genera and 230 species.

List of *Hymenoptera Anthophila* observed at Hermannstadt in 1879 and 1880. Henrich, Verh. MT. Hermannst. xxx. pp. 179-182, xxxi. pp. 68 & 69.

Bees destroyed or narcotised by the honey of *Eucalyptus*, &c. ; Girard & Senneville, Bull. Soc. Ent. Fr. (6) i. pp. xc. & xci., cv. & cvi.

On the Pollen-collecting Bees of Great Britain ; E. Saunders, P. Holmesdale Club, 1879–80, pp. 49–52.

Eucera spectabilis, Mocs., = *tomentosa*, Dours, *concinna*, Grib., = *cinerea*, Lep., *amplitarsis*, Mocs., = *perezi*, Mocs., *echii*, Mocs., = *dubia*, Sich, = ? *robusta*, Baer ; *Megachile ursula*, Gerst., and *curvicrus*, Thoms., = *albiventris*, Schenck, *imbecilla*, Gerst., = *pacifica*, Panz. ; *M.* (*Chalicodoma*) *hungarica*, Mocs., = *syraensis*, Rad., and *Cœlioxys diplotœnia*, Först., = *argentea*, Lep. The following doubted species are good : *Macropis labiata*, Panz., *fulcipes*, Fabr., *Halictus morbillosus*, Kriechb., and *Anthidium strigatum* and *contractum*, Latr. Mocsáry, Ent. Nachr. vii. pp. 19 & 20.

Andrenides.

Colletes picistigma, Thoms., recorded as new to Britain ; S. S. Saunders, Ent. M. M. xviii. p. 161.

Halictus elegans, Lep., *major*, Nyl. (?), and *interruptus*, Panz. (?), described ; Gribodo, Bull. Ent. Ital. xiii. pp. 151–155. *H. morbillosus*, Kriechb., briefly recharacterized ; Magretti, *op. cit.* p. 237.

Andrena lapponica and *fasciata*, noticed ; E. Saunders, Ent. M. M. xviii. pp. 42 & 43. *A. trichopus*, White, = *Dasycolletes metallicus*, Smith ; Kirby, Tr. E. Soc. 1881, p. 37.

Dasypoda. Table of Central European species ; Dalla Torre & Rudow, Ent. Nachr. vii. pp. 13, 80–83. *D. hirtipes* is noted as = *farfariseyna*, Panz. (p. 83). *D. hirtipes*, *plumipes* and *argentata*, Fabr., redescribed ; Stein, Ent. Nachr. vii. pp. 108–114. *D. villipes*, Lep., and *plumipes*, Panz., differentiated ; *id. l. c.* p. 114.

Dasypoda eatoni, E. Saunders, Ent. M. M. xviii. p. 168, Portugal ; *D. spectabilis* (? = *plumipes*, Panz.) and *aurata* (? = *pyrotricha*, Blanch.), Rudow, Ent. Nachr. vii. pp. 81 & 82, Germany ; *D. rhododactyla*, Dalla Torre, *l. c.* p. 11, Brentonico (the last perhaps = *argentata*, Fabr. ; Stein, *l. c.* p. 114) : spp. nn.

Apides.

CHESHIRE, F. R. Physiology and Anatomy of the Honey Bee, and its relations to flowering plants. London : 1881, 2 pls., fol. and text.

COOK, A. J. Foreign Honey Bees. Psyche, iii. pp. 197 & 198.

Relates to Cyprian, Syrian, and Indian Bees, and the attempts of Messrs. Jones & Benton to introduce them into Europe and America.

[Cook, A. J.] The Relation of Apiculture to Science. Am. Nat. xv. pp. 195–203.

A brief summary of the principal observations which have been made relative to the mode of life of bees, with notes on their enemies, and general hints on management.

Fischer, J. G. Ueber die Eierlage der Bienenkönigin und die Theorie von Dziernon. Verh. Ver. Hamb. iv. pp. 181–191.

The writer disputes the assertions of Perez.

Grassi, B. Saggio di una monografia delle Api d'Italia (*Api siciliane*). Milano: 1881.

Hallɔ'n, A. P. Ett och annat om Biskölseln. Kort framställning af det vigtigaste för en nöjsam och vinstgifvande biafvel efter Dziernous method, med rörliga skott och tillämpad på flera olika kupkonstruktioner samt vanliga halmkupor. Stockholm: 1880, 8vo, 2 pls.

Keller, A. de. Elenchus Librorum de Apium Cultura: Bibliografia Universale di Apicoltura. Milano: 1881, 12mo, pp. iii. & 224.

Larssen, P. A. Lidt af biernes naturhistorie tilligemed en kortfatted anvisning til biavl for begyndende birögtere. Met ferord af H. Rasch. Christiania: 1880, 8vo, pp. 88, pl. and woodcuts.

Lubbock, [Sir] J. On the Colours of Flowers as an Attraction to Bees. Ent. xiv. pp. 282–285.

The author's experiments lead him to the conclusion that Bees prefer blue flowers to those of any other colour.

Mülln, R. Das Leben und der rationelle Zucht der Honigbiene. Wien: 1880, 8vo, pp. 277, woodcuts.

Morawitz, F. Die russischen *Bombus*-Arten in der Sammlung der Kaiserliche Academie der Wissenschaften. Bull. Pétersb. xxvii. pp. 213–265; Mél. Biol. xi. pp. 69–144.

37 species enumerated, and in most cases redescribed.

Spaulding, J. The Bee's Tongue, and Glands connected with it. Am. Nat. xv. pp. 113–119, woodcuts.

There is a spiral duct from the glands of the head and thorax, meeting the tube from the ligula, and discharging its contents through the same opening into the mouth. It is suggested that these glands may be modifications of the spinning organs of the larva.

Vogel, F. W. Die Honigbiene und die Vermehrung der Bienenvölker nach der Gesetze der Wahlsucht. Strassburg: 1880, 8vo, woodcuts.

Gribodo (Ann. Mus. Genov. xvi. pp. 229–238) notices the following known *Apidæ* from Shoa:—*Apis unicolor*, Latr. (which is distinct from *adansoni*, Latr.), *Anthophora acraensis*, Fabr., *Xylocopa caffra* and *gutuans*, Linn., *olivacea*, Fabr., *flavo-rufa*, De Geer, and *inconstans*, Smith; *Tachytes antinorii*, Grib. (redescribed), *cognata* and *ianthoptera*, Smith, Nachr. vii. *ys scioensis*, Grib. (redescribed).

Megachile centuncularis noticed; Le Nat. iii. p. 390.

Eucera concinna, Grib., redescribed: Magretti, Bull. Ent Ital. xiii. pp. 255 & 256.

Xylocopa æstuans, Linn., recorded from Socotra; Kirby, P. Z. S. 1881, p. 649. *X. inconstans*, Smith, noticed; Girard, J. Sci. Lisb. viii. p. 226, and Capello & Ivens, De Benguellaás Terras de Iácca, ii. p. 365.

Bombus. Variation discussed; Schmiedeknecht, CB. des Irmischia, 1881, No. 10, Ent. Nachr. vii. pp. 321–323. *Bombi* lying under trees disabled by birds, *Oecypus*, &c.; Nature, xxiv. pp. 335, 357 & 358. Captured by flowers of *Cypripedium acaule*; Kellicott, Bull. Buff. Soc. iv. p. 31. *B. ligusticus*, Spin. (= *scutellatus*, Jur., = ? *argillaceus*, Scop.), is a local dimorphic ♀ of *B. ruderatus*, Fabr.; Dalla Torre, Zool. Anz. iv. pp. 335–337. *B. pratorum* and *muscorum* appropriating wrens' nests; Stein, B. E. Z. xxv. p. 223. *B. soroensis*, Fabr., noticed: S. S. Saunders, Ent. M. M. xviii. pp. 160 & 161.

Trigona mirim [sic]. Habits, economy, and intelligence; F. Müller, Kosmos, x. pp. 138–140.

Apis mellifica. Honeycomb constructed on an unsheltered wall; Eaton, P. E. Soc. 1881, p. xxxi. Royal jelly supposed to contribute to the fecundation of the queen bee; E. Kirby & Robinson, Am. Bee Journ. March, 1881, Bull. Apic. Suisse romande, May, 1881, p. 134, Bull. Soc. Vaud. (2) xvii. p. xlix. Note on variation and odour; Lucas, Bull. Soc. Ent. Fr. (6) i. p. lxx. If the wings of the queen-bee are clipped, only drones are produced; bees will not touch sound but only damaged fruit: McCook, Rep. E. Soc. Ont. 1880, p. 16. Old exhausted bees said to commit suicide by voluntarily casting themselves out of the hives; Luby, P. R. Dubl. Soc. (2) ii. pp. 600–608.

New species:—

Panurgus cavannæ, Gribodo, Bull. Ent. Ital. xiii. p. 161, Calabria; *P. proximus*, E. Saunders, Ent. M. M. xviii. p. 168, figs. A & B, Portugal.

Cœlioxys spinosa, Dewitz, B. E. Z. xxv. p. 197, pl. v. figs. 1 & 1 A–C, Porto Rico.

Crocisa pantalon, id. *l. c.* p. 198, pl. v. figs. 2 & 2 A–E, Porto Rico.

Eucera confusa (Kriechb., MS.), Gribodo, *l. c.* p. 164, Calabria.

Bombus tilingi, Kamtschatka, p. 217 (p. 75), *incertus* (? = *tunicatus*, Smith, ? = *niveatus*, Kriechb., and ? = *montanus*, pt., Radoszk.), Caucasus, p. 229 (p. 92), *schrenckii*, Amur, p. 250 (p. 123), *uralensis* (= *rufescens*, Eversm., *nec* Lep., and = *elegans*, pt., Radoszk.), Ural, p. 262 (p. 141), Morawitz, Bull. Pétersb. xxvii. (Mél. biol. xi.).

Vespidæ.

Dahm, O. E. L. Några Iakttagelser rörande Gettingar. Ent. Tidskr. ii. pp. 97–100, & 115–117.

Wasps do not pair during flight, but on a level surface. Special attention is called to various points relating to their habits, which attempts of further investigation.

Gribodo (Ann. Mus. Genov. xvi. pp. 238–241), notices the following species from Shoa: *Polistes marginalis*, Fabr., *Belenogaster meneliki*, Grib. (redescribed), *Synagris pentameria*, Smith, *rueppeliana*, Sauss., and *Eumenes tinctor*, Christ.

Rhynchium atratum, Fabr.: variation; Dewitz, B. E. Z. xxv. p. 200.

Polistes gallica and varieties noticed; Magretti, Bull. Ent. Ital. xiii. pp. 215–217.

Odynerus pictus. Note on nest and larvæ; Bignell, Ent. xiv. pp. 188 & 189.

Vespa. Table of German species; Schmiedeknecht, Ent. Nachr. vii. pp. 313–318. Scarcity of wasps in 1881, noted by various writers in Sci. Goss. xvii. Singular nest; King, *op. cit.* pp. 190 & 191. Their irregular appearance in Kirkcudbrightshire; Service, Ent. xiv. pp. 238 & 239. Wasps and their prey; Brownell, Nature, xxiv. pp. 484 & 485. *V. crabro*: rapid construction of nest; R. S. Saunders, Ent. xiv. pp. 189 & 190. *V. vulgaris*: appropriating a wren's nest; Stein, B. E. Z. xxv. p. 224.

Belenogaster saussurii, sp. n., Kirby, P. Z. S. 1881, p. 649, Socotra.

Polybia argentina, sp. n., Berg, S. E. Z. xlii. p. 68, and Exped. Rio Negro, Zool. p. 111, pl. ii. fig. 19, Patagonia. *Zethus* (*Didymogastra*) *pamparum*, sp. n., *id. ll. cc.* pp. 69 & 112, pl. ii. fig. 20, Patagonia.

Odynerus (*Lionotus*) *calabricus*, Gribodo, Bull. Ent. Ital. xiii. p. 148, Calabria; *O.* (*Pachyodynerus*) *nigriculus*, Berg, *ll. cc.* pp. 70 & 112, Mendoza: spp. nn.

Crabronidæ.

Pompilus zelleri, Dahlb., = *Sphex aterrima*, Rossi; *P. venustus*, Wesm., = *Larra 4-maculata*, Spin.; *Priocnemis bipunctatus*, and *variegatus*, Fabr., = *Sphex versicolor*, Scop.; *Pompilus tripunctatus*, Spin., noticed: *Ceropales histrio*, Fabr., = *Evania albicincta*, Rossi. *Sapyga pacca*, Fabr.: the following are synonyms: *Scolia* 4-, 5-, & 6-*guttata*, *Hellus* 6-*punctatus*, Fabr., and *Sphex tricolor*, Schrank, *Thyreopus lactarius*, Chevr., = *alpinus*, Imhoff, and *Oxybelus mandibularis*, Dahlb., = *variegatus*, Wesm.: but the former name was probably intended to cover several species; Kohl, Ent. Nachr. vii. pp. 53–56.

Bembex dalmatina, Kriechb., = *bidentata*, Van der Lind; *Cerceris modesta*, Smith, = *Philanthus rubidus*, Jur.; *Pompilus sesquialterus*, F. de Waldh., = *aterrimus*, Rossi; *P. fasciatus*, Eversm., = *Ferreda ursus*, Fabr., and *Priocnemis nigriventris*, Costa, = *Pompilus graellsi*, Guér.: *id. l. c.* p. 239, note.

Dalla Torre translates Fabre's descriptions of *Cerceris antoniæ & julii*, *Bembex julii*, and *Ammophila julii*; op. *cit.* pp. 152–156.

Pompilides.

Pompilus ursus, Fabr., = *coccineus*, Fabr.; *P. luctuosus*, Mocs., = *cingulatus*, Rossi; *Ammophila limbata*, Kriechb., = *dives*, Brullé, and *Tachytes argentata*, Brullé, = *Andrena etrusca*, Rossi: Mocsáry, Ent. Nachr. vii. pp. 18 & 19.

Gribodo (Ann. Mus. Genov. xvi. pp. 244-249) notices *Pompilus vespiformis*, Klug, and *viaticus*, Linn., and redescribes his *Cyphononyx abyssinica* (♀ = *flavicornis*, Dahlb., pt., *nec* Fabr.), and *Agenia personata*.

Pompilus, sp. said to be bred from *Grapta interrogationis*, described; Packard, P. Bost. Soc. xxi. p. 38. *P. cinctinnus*, Dahlb., noticed; Gribodo, Bull. Ent. Ital. xiii. p. 73. *P. hæmatopus*, Lep., redescribed; Kohl, Ent. Nachr. vii. pp. 92–94.

Priocnemis abdominalis, Dahlb., redescribed; *id. l. c.* pp. 239–242. *P. maculipennis*, Smith, = *fugax*, Fabr.; Kirby, Tr. E. Soc. 1881, p. 39.

Pepsis heros, Dahlb.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 203.

New species :—

Salius major, Marquet, Bull. Soc. Toulouse, xiii. p. 171, Vias.

Ferreola nigra, id. *l. c.* p. 172, Genoa.

Pompilus villosus, id. *l. c.* p. 174, South France; *P. dallatorreanus*, Kohl, Ent. Nachr. vii. p. 93, Tirol; *P. cressoni*, Dewitz, B. E. Z. xxv. p. 203, pl. v. fig. 6, Porto Rico.

Priocnemis consobrinus and *binotatus*, Marquet, *l. c.* pp. 175 & 176, South France; *P. wakefieldi*, Kirby, Tr. E. Soc. 1881, p. 39, New Zealand.

Mygnimia extranea, id. P. Z. S. 1881, p. 649, Socotra.

Sphegides.

Patton, W. H. Some characters useful in the study of the *Sphecidæ*. P. Bost. Soc. xx. pp. 378–385.

Relates to the structural characters of various North American species of *Pelopœus*, *Chalybion*, *Chlorion*, *Isodontia*, *Sphex*, *Harpactopus*, and *Priononyx*.

Gribodo (Ann. Mus. Genov. xvi. pp. 241–244) redescribes his *Chlorion funereum* and *scioense*, and notices *Pelopœus spirifex*, Linn., all from Shoa.

Pelopœus ægyptius, Linn., recorded from Socotra; Kirby, P. Z. S. 1881, p. 650.

Sphex. Kohl redescribes *S. fuscata*, *subfuscata*, *fera*, *confinis*, and *bicolor* of Dahlbom; Ent. Nachr. vii. pp. 27–31, & 37–40.

Isodontia, g. n., Patton, P. Bost. Soc. xx. p. 380. Placed after *Chlorion*; to include *Sphex philadelphica*, Lep. (type, *apicalis*, Smith), *tibialis*, Lep., *elegans*, and *nigella*, Smith, *azteca*, Sauss., and *costipennis*, Spin.

Ammophila abeillii and *lanuginosa*, Marquet, Bull. Soc. Toulouse, xiii. p. 177, South France; *A. egregia*, Mocsáry, Ent. Nachr. vii. p. 327, Beyrut: spp. nn.

Sphex syriaca, sp. n., *id. l. c.* p. 328, Beyrut.

Larrides.

Patton, W. H. List of the North American *Larradæ*. P. Bost. Soc. xx. pp. 385–397.

Includes table of genera; list of species; occasional remarks on characters, synonymy and habits; and descriptions of a few new species.

The following are the most important observations: *Morphota*, Smith, probably = *Lyroda*, Say; *Larra* should date from Latreille (1802), with *ichneumoniformis*, Fabr. (= *xanthema*, Rossi) as its type; *Larra distincta*, Smith, variation and structure noticed; *Tachytes*, Panz., probably needs subdivision; its habits are noticed.

Larra acuta, sp. n., Patton, P. Bost. Soc. xx. p. 390, Connecticut.

Tachytes crassus, *mandibularis*, and *harpax*, id. *l. c.* pp. 393–395, Connecticut; *T. costæ*, De Stefani, Nat. Sicil. i. p. 42, pl. iii. fig. 4, Sciacca; *T. frey-gessneri*, Kohl, Ent. Nachr. vii p. 242, Sicily, Syria: spp. nn.

Bembicides.

Bembecinus erberi, sp. n., Mocsáry, Ent. Nachr. vii. p. 329, Corfu, Epirus.

Nyssonides.

Hoplisus lævigatus, Kohl, ♀ described by him; Ent. Nachr. vii. p. 90.

Stizus continuus, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 181, South France.

Lestiphorus semistriatus, Schmiedeknecht, sp. n., Ent. Nachr. vii. p. 286, Thuringia.

Crabronides.

Patton, W. H. Notes on the *Philanthinæ*. P. Bost. Soc. xx. pp. 397–405.

The writer describes the structure of the clypeus and its side lobes, which form a portion of the clypeus itself, and do not belong to the epicranium, as asserted by Packard. These lobes are provided with a fringe of hairs on the apical margin in the males of the *Philanthinæ*, which may be called the moustache. The mandibles, coxæ, and neuration, &c., of *Cerceris* and allies are described, and the differences between *Cerceris* and *Eucerceris* pointed out.

Crabro crœsus, Lep.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 200.

Cerceris compar, Cress.: structural characters, and both sexes described; Patton, P. Bost. Soc. xx. pp. 404 & 405.

Philanthus abdelkader, Luc. Preys on bees: it is probably a local form of *P. triangulum*, Fabr.; Girard, Bull. Soc. Ent. Fr. (6) i. p. cxxviii. [See also *op. cit.* (5) x. pp. cxxxvii & cxxxviii.; entry misplaced in Zool. Rec. xvii.] *P. leylingi*, Dahlb.: characters discussed; Gribodo, Ann. Mus. Genov. xvi. pp. 250 & 251.

Aphilanthops, g. n., Patton, P. Bost. Soc. xx. p. 401. Allied to *Nectarinia*; type, *Philanthus frigidus*, Smith (redescribed, *l. c.*). *P. laticinctus* and *albo-pilosus*, Cress., probably also belong to this genus.

Crabro polynesialis, Cameron, Tr. E. Soc. 1881, p. 562, Hawaii; *C. mayeri*, Dewitz, B. E. Z. xxv. p. 201, pl. v. figs. 4 & 4*a*–*b*, Porto Rico: spp. nn.

Oxybelus affinis, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 185, South France.

Gribodo (Ann. Mus. Genov. xvi. pp. 244-249) notices *Pompilus vespiformis*, Klug, and *viaticus*, Linn., and redescribes his *Cyphonomyx abyssinica* (? = *flavicornis*, Dahlb., pt., *nec* Fabr.), and *Agenia personata*.

Pompilus, sp. said to be bred from *Grapta interrogationis*, described; Packard, P. Bost. Soc. xxi. p. 38. *P. concinnus*, Dahlb., noticed; Gribodo, Bull. Ent. Ital. xiii. p. 73. *P. hæmatopus*, Lep., redescribed; Kohl, Ent. Nachr. vii. pp. 92–94.

Priocnemis abdominalis, Dahlb., redescribed; *id. l. c.* pp. 239–242. *P. maculipennis*, Smith, = *fugax*, Fabr.; Kirby, Tr. E. Soc. 1881, p. 39.

Pepsis heros, Dahlb.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 203.

New species:—

Salius major, Marquet, Bull. Soc. Toulouse, xiii. p. 171, Vias.

Ferreola nigra, id. *l. c.* p. 172, Genoa.

Pompilus villosus, id. *l. c.* p. 174, South France; *P. dallatorreanus*, Kohl, Ent. Nachr. vii. p. 93, Tirol; *P. cressoni*, Dewitz, B. E. Z. xxv. p. 203, pl. v. fig. 6, Porto Rico.

Priocnemis consobrinus and *binotatus*, Marquet, *l. c.* pp. 175 & 176, South France; *P. wakefieldi*, Kirby, Tr. E. Soc. 1881, p. 39, New Zealand.

Mygnimia extranea, id. P. Z. S. 1881, p. 649, Socotra.

Sphegides.

Patton, W. H. Some characters useful in the study of the *Sphecidæ*. P. Bost. Soc. xx. pp. 378–385.

Relates to the structural characters of various North American species of *Pelopœus*, *Chalybion*, *Chlorion*, *Isodontia*, *Sphex*, *Harpactopus*, and *Prionomyx*.

Gribodo (Ann. Mus. Genov. xvi. pp. 241–244) redescribes his *Chlorion funereum* and *scioense*, and notices *Pelopœus spirifex*, Linn., all from Shoa.

Pelopœus ægyptius, Linn., recorded from Socotra; Kirby, P. Z. S. 1881, p. 650.

Sphex. Kohl redescribes *S. fuscata*, *subfuscata*, *fera*, *confinis*, and *bicolor* of Dahlbom; Ent. Nachr. vii. pp. 27–31, & 37–40.

Isodontia, g. n., Patton, P. Bost. Soc. xx. p. 380. Placed after *Chlorion*; to include *Sphex philadelphica*, Lep. (type, *apicalis*, Smith), *tibialis*, Lep., *elegans*, and *nigella*, Smith, *azteca*, Sauss., and *costipennis*, Spin.

Ammophila abeillii and *lanuginosa*, Marquet, Bull. Soc. Toulouse, xiii. p. 177, South France; *A. egregia*, Mocsáry, Ent. Nachr. vii. p. 327, Beyrut: spp. nn.

Sphex syriaca, sp. n., *id. l. c.* p. 328, Beyrut.

Larrides.

Patton, W. H. List of the North American *Larradæ*. P. Bost. Soc. xx. pp. 385–397.

Includes table of genera; list of species; occasional remarks on characters, synonymy and habits; and descriptions of a few new species.

The following are the most important observations: *Morphota*, Smith, probably = *Lyroda*, Say; *Larra* should date from Latreille (1802), with *ichneumoniformis*, Fabr. (= *xanthema*, Rossi) as its type; *Larra distincta*, Smith, variation and structure noticed; *Tachytes*, Panz., probably needs subdivision; its habits are noticed.

Larra acuta, sp. n., Patton, P. Bost. Soc. xx. p. 390, Connecticut.

Tachytes crassus, mandibularis, and *harpax*, id. *l. c.* pp. 393–395, Connecticut; *T. costæ*, De Stefani, Nat. Sicil. i. p. 42, pl. iii. fig. 4, Sciacca; *T. frey-gessneri*, Kohl, Ent. Nachr. vii. p. 242, Sicily, Syria: spp. nn.

Bembicides.

Bembecinus erberi, sp. n., Mocsáry, Ent. Nachr. vii. p. 329, Corfu, Epirus.

Nyssonides.

Hoplisus lævigatus, Kohl, ♀ described by him; Ent. Nachr. vii. p. 90.

Stizus continuus, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 181, South France.

Lestiphorus semistriatus, Schmiedeknecht, sp. n., Ent. Nachr. vii. p. 286, Thuringia.

Crabronides.

Patton, W. H. Notes on the *Philanthinæ*. P. Bost. Soc. xx. pp. 397–405.

The writer describes the structure of the clypeus and its side lobes, which form a portion of the clypeus itself, and do not belong to the epicranium, as asserted by Packard. These lobes are provided with a fringe of hairs on the apical margin in the males of the *Philanthinæ*, which may be called the moustache. The mandibles, coxæ, and neuration, &c., of *Cerceris* and allies are described, and the differences between *Cerceris* and *Eucerceris* pointed out.

Crabro cræsus, Lep.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 200.

Cerceris compar, Cress.: structural characters, and both sexes described; Patton, P. Bost. Soc. xx. pp. 404 & 405.

Philanthus abdelkader, Luc. Preys on bees: it is probably a local form of *P. triangulum*, Fabr.; Girard, Bull. Soc. Ent. Fr. (6) i. p. cxxviii. [See also *op. cit.* (5) x. pp. cxxxvii & cxxxviii.; entry misplaced in Zool. Rec. xvii.] *P. loeflingi*, Dahlb.: characters discussed; Gribodo, Ann. Mus. Genov. xvi. pp. 250 & 251.

Aphilanthops, g. n., Patton, P. Bost. Soc. xx. p. 401. Allied to *Nectarinia*; type, *Philanthus frigidus*, Smith (redescribed, *l. c.*). *P. laticinctus* and *albo-pilosus*, Cress., probably also belong to this genus.

Crabro polynesialis, Cameron, Tr. E. Soc. 1881, p. 562, Hawaii; *C. mayeri*, Dewitz, B. E. Z. xxv. p. 201, pl. v. figs. 4 & 4*a–b*, Porto Rico: spp. nn.

Oxybelus affinis, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 185, South France.

Gribodo (Ann. Mus. Genov. xvi. pp. 244-249) notices *Pompilus vespiformis*, Klug, and *viaticus*, Linn., and redescribes his *Cyphononyx abyssinica* (? = *flavicornis*, Dahlb., pt., *nec* Fabr.), and *Agenia personata*.

Pompilus, sp. said to be bred from *Grapta interrogationis*, described; Packard, P. Bost. Soc. xxi. p. 38. *P. concinnus*, Dahlb., noticed; Gribodo, Bull. Ent. Ital. xiii. p. 73. *P. hæmatopus*, Lep., redescribed; Kohl, Ent. Nachr. vii. pp. 92–94.

Priocnemis abdominalis, Dahlb., redescribed; *id. l. c.* pp. 239–242. *P. maculipennis*, Smith, = *fugax*, Fabr.; Kirby, Tr. E. Soc. 1881, p. 39.

Pepsis heros, Dahlb.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 203.

New species:—

Salius major, Marquet, Bull. Soc. Toulouse, xiii. p. 171, Vias.

Ferreola nigra, id. *l. c.* p. 172, Genoa.

Pompilus villosus, id. *l. c.* p. 174, South France; *P. dallatorreanus*, Kohl, Ent. Nachr. vii. p. 93, Tirol; *P. cressoni*, Dewitz, B. E. Z. xxv. p. 203, pl. v. fig. 6, Porto Rico.

Priocnemis consobrinus and *binotatus*, Marquet, *l. c.* pp. 175 & 176, South France; *P. wakefieldi*, Kirby, Tr. E. Soc. 1881, p. 39, New Zealand.

Mygnimia extranea, id. P. Z. S. 1881, p. 649, Socotra.

Sphegides.

PATTON, W. H. Some characters useful in the study of the *Sphecidæ*. P. Bost. Soc. xx. pp. 378–385.

Relates to the structural characters of various North American species of *Pelopœus*, *Chalybion*, *Chlorion*, *Isodontia*, *Sphex*, *Harpactopus*, and *Priononyx*.

Gribodo (Ann. Mus. Genov. xvi. pp. 241–244) redescribes his *Chlorion funereum* and *scioense*, and notices *Pelopœus spirifex*, Linn., all from Shoa.

Pelopœus ægyptius, Linn., recorded from Socotra; Kirby, P. Z. S. 1881, p. 650.

Sphex. Kohl redescribes *S. fuscata*, *subfuscata*, *fera*, *confinis*, and *bicolor* of Dahlbom; Ent. Nachr. vii. pp. 27–31, & 37–40.

Isodontia, g. n., Patton, P. Bost. Soc. xx. p. 380. Placed after *Chlorion*; to include *Sphex philadelphica*, Lep. (type, *apicalis*, Smith), *tibialis*, Lep., *elegans*, and *nigella*, Smith, *azteca*, Sauss., and *costipennis*, Spin.

Ammophila abeillii and *lanuginosa*, Marquet, Bull. Soc. Toulouse, xiii. p. 177, South France; *A. egregia*, Mocsáry, Ent. Nachr. vii. p. 327, Beyrut: spp. nn.

Sphex syriaca, sp. n., *id. l. c.* p. 328, Beyrut.

Larrides.

PATTON, W. H. List of the North American *Larradæ*. P. Bost. Soc. xx. pp. 385–397.

Includes table of genera; list of species; occasional remarks on characters, synonymy and habits; and descriptions of a few new species.

The following are the most important observations: *Morphota*, Smith, probably = *Lyroda*, Say; *Larra* should date from Latreille (1802), with *ichneumoniformis*, Fabr. (= *xanthema*, Rossi) as its type; *Larra distincta*, Smith, variation and structure noticed; *Tachytes*, Panz., probably needs subdivision; its habits are noticed.

Larra acuta, sp. n., Patton, P. Bost. Soc. xx. p. 390, Connecticut.

Tachytes crassus, *mandibularis*, and *harpax*, id. *l. c.* pp. 393–395, Connecticut; *T. costæ*, De Stefani, Nat. Sicil. i. p. 42, pl. iii. fig. 4, Sciacca; *T. frey-gessneri*, Kohl, Ent. Nachr. vii. p. 242, Sicily, Syria: spp. nn.

Bembicides.

Bembecinus erberi, sp. n., Mocsáry, Ent. Nachr. vii. p. 329, Corfu, Epirus.

Nyssonides.

Hoplisus lævigatus, Kohl, ♀ described by him; Ent. Nachr. vii. p. 90.

Stizus continuus, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 181, South France.

Lestiphorus semistriatus, Schmiedeknecht, sp. n., Ent. Nachr. vii. p. 286, Thuringia.

Crabronides.

Patton, W. H. Notes on the *Philanthinæ*. P. Bost. Soc. xx. pp. 397–405.

The writer describes the structure of the clypeus and its side lobes, which form a portion of the clypeus itself, and do not belong to the epicranium, as asserted by Packard. These lobes are provided with a fringe of hairs on the apical margin in the males of the *Philanthinæ*, which may be called the moustache. The mandibles, coxæ, and neuration, &c., of *Cerceris* and allies are described, and the differences between *Cerceris* and *Eucerceris* pointed out.

Crabro crœsus, Lep.: var. from Porto Rico noticed; Dewitz, B. E. Z. xxv. p. 200.

Cerceris compar, Cress.: structural characters, and both sexes described; Patton, P. Bost. Soc. xx. pp. 404 & 405.

Philanthus abdelkader, Luc. Preys on bees: it is probably a local form of *P. triangulum*, Fabr.; Girard, Bull. Soc. Ent. Fr. (6) i. p. cxxviii. [See also *op. cit.* (5) x. pp. cxxxvii & cxxxviii.; entry misplaced in Zool. Rec. xvii.] *P. loeflingi*, Dahlb.: characters discussed; Gribodo, Ann. Mus. Genov. xvi. pp. 250 & 251.

Aphilanthops, g. n., Patton, P. Bost. Soc. xx. p. 401. Allied to *Nectarinia*; type, *Philanthus frigidus*, Smith (redescribed, *l. c.*). *P. laticinctus* and *albo-pilosus*, Cress., probably also belong to this genus.

Crabro polynesialis, Cameron, Tr. E. Soc. 1881, p. 562, Hawaii; *C. mayeri*, Dewitz, B. E. Z. xxv. p. 201, pl. v. figs. 4 & 4*a–b*, Porto Rico: spp. nn.

Oxybelus affinis, sp. n., Marquet, Bull. Soc. Toulouse, xiii. p. 185, South France.

Crossocerus festivus, Marquet, *l. c.* p. 188, South France.

Cerceris euphorbiæ, id. *l. c.* p. 190, Tarbes; *C. mandibularis*, Patton, P. Bost. Soc. xx. p. 403, Connecticut; *C. krugi*, Dewitz, *l. c.* p. 200, pl. v. fig. 3, Porto Rico: spp. nn.

Trachypus gerstaeckeri, sp. n., *id. l. c.* p. 202, pl. v. fig. 5, Porto Rico.

Scoliides.

Scolia atrata, Fabr., provisions its nest in Porto Rico with a large grasshopper, which it disables with its sting. Dewitz & Krug, B. E. Z. xxv. p. 204.

Discolia ruficornis, Fabr., recorded from Shoa; Gribodo, Ann. Mus. Genov. xvi. p. 249.

Tiphia femorata and *morio*, Fabr., *ruficornis*, Klug, and *minuta*, V. der Lind., differentiated: *id.* Bull. Ent. Ital. xiii. pp. 124–131.

Dyscolesthes, g. n., Westwood, Tr. E. Soc. 1881, p. 387. Affinities uncertain (*Scoliidæ* ?); type, *D. canus*, sp. n., *l. c.* p. 388, pl. xvi., Chili.

Thynnidæ.

Thynnus picinus, sp. n., Westwood, Tr. E. Soc. 1881, p. 133, pl. vii. fig. 5, Brazil.

Mutillidæ.

Methoca californica, California, and *hæmorrhoidalis*, Caffraria, Westwood, Tr. E. Soc. 1881, pp. 133 & 134, pl. vii. figs. 1 & 2: spp. nn.

Formicidæ.

André, E. Catalogue raisonné des Formicides provenant du Voyage en Orient de M. Abeille de Perrin. Ann. Soc. Ent. Fr. (6) i. pp. 52–78, pl. iii.

45 species enumerated; the following known species being discussed in more or less detail: *Camponotus sylvaticus* and *lateralis*, Oliv., *Myrmecocystus viaticus*, Fabr., fig. 4, *albicans*, Roger, fig. 5, *cursor*, Fonsc., *Prenolepis longicornis*, Latr. (♂ described), *vividula*, Nyl., *Acantholepis frauenfeldi*, Mayr, and var. *syriaca*, fig. 8, *Monomorium venustum*, Smith, figs. 16–18, *Tetramorium cæspitum*, Linn., *Leptothorax nigrita*, and *rottenbergi*, Emery, *Aphænogaster barbara*, Linn., var. *rugosa*, *A. pallida*, Nyl., *rufo-testacea*, Först., *splendida*, and *dentigera*, Roger, and *Phidole sinaitica*, Mayr.

Bethune, C. J. S. Ants. Rep. E. Soc. Ont. 1880, pp. 76–89, figs. 67–74.

Relates to structure, nests, habits, &c. Includes an account of a battle between red (*Formica sanguinea*), and black ants, by Mrs. Treat (extracted from Harper's New Monthly Magazine).

Forel, A. Die Ameisen der Antille St. Thomas. MT. Münch. ent. Ver. v. pp. 1–16.

13 species discussed, all remarkably small. 3 other species from the island are only mentioned by name.

Lubbock, [Sir] J. On the Anatomy of Ants. Tr. L. Soc. (2) ii. pp. 141–154, pls. xi. & xii.

Chiefly consists of observations on the muscles of the head and thorax of *Lasius flavus*, and its appendages. The author agrees with Ratzeburg's view that the fifth segment of the larva forms the hinder part of the thorax of the imago. The thorax of ants possesses three pairs of spiracles, and four ganglia, the last minute; while the internal chitinous appendages clearly divide the thorax into four portions. The principal divisions of the pupa are as follow:—(1) Prothorax: The normal endo-skeleton of the thorax of insects consists of seven principal processes, four springing from the back—the phragma, prophragma, mesophragma, and metaphragma; and three from the sternum—the profurca, mesofurca, and postfurca. In the worker ants, the four superior processes are not developed, but the other three are very important, giving attachment to various muscles; these processes are then described. (2) Muscles of the head: these are described; they are less complex than in *Coleoptera*; but one muscle seems hitherto undescribed, which rises from the anterior surface of the pronotum by several discharging bands, and, passing backwards and downwards, is attached to the upper part of the antefurca. (3) Front legs and their muscles: these are more numerous than in *Melolontha*, and differently arranged. (4) Remarks on the tibial organs: the trachea is twice expanded in the tibia of ants, and a small branch rises from the upper sac, falling into the main trachea just above the lower sac; and where the upper sac contracts, is a conical striated organ at the back of the leg. This arrangement resembles that found in some *Orthoptera*, which has been conjectured to be an organ of hearing. (5) Other organs of the prothorax: Spiracles, œsophagus, &c., noticed. (6) Mesothorax and middle legs: principal muscles noticed. (7) Posterior portion of thorax: muscles and their attachment described; the thorax of the male and female ants is very unlike that of the workers, by the changes and additions contingent on the presence of wings. The muscles of flight are very large in the winged ants, but are fewer and more simple than in other insects; consisting mainly of four only, two elevators and two depressors, which are therefore the same for both the wings.

——. Observations on Ants, Bees, and Wasps, Part viii. J. L. S. xv. pp. 362–387 (woodcuts) (*cf.* also Nature, xxiv. pp. 142 & 143; Ent. xiv. pp. 161–163; Zool. 3, v. pp. 340–342; Kosmos, ix. pp. 384–386).

Relates entirely to ants (except a mite described as parasitic on *Lasius flavus*), treating of their sense of sight and direction, production of queens, affection and kindness, and longevity. They are affected by the ultra-violet rays of the spectrum; are less guided by sight in finding their way than vertebrate animals; they appear to be able to produce

either a queen or a worker from a given egg; show kindness to a sick companion; and live to the age of at least seven or eight years.

[Lubbock, (Sir) J.] Observations on Bees, Ants, and Wasps. Nature, xxiii. pp. 255–258.

Relates to ants, and treats of power of communication, recognition of relations, workers breeding, hearing, treatment of *Aphides*, &c.

McCook, H. C. The Honey Ants of the Garden of the Gods. P. Ac. Philad. 1881, pp. 17–77, pls. i.–x.

Relates to *Myrmecocystus melliger* var. n. *hortus-deorum*, McCook (described, p. 75, from Colorado). The separate chapters relate to geographical distribution; ant-honey, which is gathered by night from a *Cynips* gall on scrub-oak; interior architecture of nests; queen life; economy of the honey-bearers; anatomy of the alimentary canal; parasites, literature, and description. The honey is contained in an expansion of the crop which fills the abdomen, the organs of which are in a natural state (neither ruptured nor re-absorbed), but displaced by pressure.

Catalogue of ants collected at Cairo, Aden, Assab, and neighbouring places; Emery, Ann. Mus. Genov. xvi. pp. 525–535. The following known species are specially noticed:—*Camponotus sylvaticus*, Oliv., var., *Myrmecocystus viaticus*, Fabr., var. *albicans*, Rog., *Leptothorax exilis*, Emery, *Monomorium*, species from Africa, Mediterranean, and Red Sea tabulated; *M. subopacum*, var. *mediterraneum*, Mayr., *Aphænogaster pallida*, Nyl., var. *subterraneoides*, from Zante, and *Phidole rugaticeps*, Em., var. *arabs*, from Tes.

Emery (Ann. Mus. Genov. xvi. pp. 270–273) records the following known species from Shoa:—*Platythyrea cribrinodis*, Gerst., *Aphænogaster barbara*, Fabr., *Phidole punctulata* and *Typhlopone brevinodosa*, Mayr, and *Anomma burmeisteri*, Shuck. The various forms of the last species are described, and two outlines of the heads of workers are given.

Ants mimicked by Spiders, which live associated with them, and are not easily distinguished from them; Semper, Natural Conditions of Existence, p. 391, fig. 104 (Spiders).

Sound produced by Ants in Sumatra and Assam; Forbes & Peal, Nature, xxiv. pp. 101, 102 & 484.

An excellent edible oil procured from Ants by the negroes of Central Africa (Ndóruma); Junker, Geogr. MT. xxvii. p. 153.

Mischief caused by Ants in Arizona; Rusby, Am. Nat. xv. pp. 573 & 574.

Lychnis viscaria a trap for Ants; J. H. Stone, Nature, xxv. pp. 151 & 152.

Camponotus herculeanus. Aspen destroyed by this Ant; Bertholet, Bull. Soc. Vaud. (2) xvii. pp. xxv. & xxvi. *C. inflatus*, Lubbock (Australian honey-ant), noticed; Nature, xxiii. p. 258.

Lasius niatus, Nyl., recorded as new to Britain; Fitch & Bignell, P. E. Soc 1881, pp. xxvii. & xxviii., and Ent. p. 262.

Tapinoma, sp. from Sicilian amber described and figured; Cornalia, Atti Acc. Rom., Trans. (3) v. pp. 81–83, fig. 2.

Atta, sp. A new leaf-cutting Ant observed in New Jersey, which con-

structs a comb like that of the hive-bee: habits, architecture, &c., noticed; Morris, Am. Nat. xv. pp. 100–102.

Myrmica ruginodis. An *Acarus* (*Hypopus*) noticed as parasitic on this Ant; Parfitt, Ent. M. M. xviii. p. 43.

New genera and species:—

Oxyopomyrmex, g. n., André, Ann. Soc. Ent. Fr. (6) i. p. 72. Allied to *Aphænogaster*; antennæ 11-jointed, pronotum less rounded; second node of the petiole twice as large as the first; eyes large, placed obliquely, close to the articulation of the mandibles. Type, *O. oculatus*, sp. n., *l. c.* p. 73, pl. iii. figs. 1–3, Jaffa.

Alaopone, g. n., Emery, Ann. Mus. Genov. xvi. p. 274. Allied to *Anomma*; type, *A. antinorii*, sp. n., *l. c.* p. 275, woodcuts, Shoa; add *A. oberthueri*, sp. n., *l. c.* p. 274, note, woodcuts, Calcutta.

Camponotus foreli, Emery, Ann. Mus. Genov. xvi. p. 526, note, Algeria; *C. libanicus*, André, Ann. Soc. Ent. Fr. (6) i. p. 54, pl. iii. figs. 14 & 15, Lebanon.

Myrmecocystus altisquamis, id. *l. c.* p. 56, pl. iii. figs. 6 & 7, Anti-libanus.

Formica pallitarsis and *mellea*, Provancher, Nat. Canad. xii. pp. 355 & 356, Canada.

Ponera abeillii, André, Bull. Soc. Ent. Fr. (6) i. p. xlviii. Ajaccio.

Myrmica incompleta, Provancher, *l. c.* p. 359, Canada.

Monomorium abeilli and *clavicorne*, pl. iii. fig. 9, *id.* Ann. Soc. Ent. Fr. (6) i. pp. 67 & 68, Jaffa; *M. abeillii*, Jaffa, p. 351, note, *niloticum*, Cairo, and *luteum*, Aden, p. 533, Emery, *l. c.*

Cardiocondyla emerii, Forel, MT. Münch. ent. Ver. v. pp. 5 & 6, André, *l. c.* p. 69, Jaffa, St. Thomas.

Tetramorium doriæ, Emery, *l. c.* p. 530, Assab.

Aphænogaster blanci, Marseilles, and *crocea*, Algeria, André, Bull. Soc. Ent. Fr. (6) i. pp. xlviii. & xlix.

Solenopsis steinheili and *corticalis*, Forel, *l. c.* pp. 11 & 13, St. Thomas.

Cremastogaster steinheili, id. *l. c.* p. 15, St. Thomas; *C. chiarinii*, Emery, *l. c.* p. 271, Shoa.

Chrysididæ.

Lamprecht, H. Die Goldwespen Deutschlands. Zerbst: 1881, 4to, pp. 26, plate.

[Not seen by the Recorder.]

Cleptes æreus and *Chrysis cingulicornis*, *sybarita*, and *comta*, Först., are good species; Mocsáry, Ent. Nachr., vii. p. 20.

Homalus nanus, Saunders, figured by Waterhouse, Aid. i. pl. xxii.

Holopyga ovata, var. *ignicollis*, and *Hedychrum minutum*, var. *homœopathicum*, from France, described; Abeille de Perrin, Bull. Soc. Toulouse, xiii. p. 157.

Chrysis. Table of French species; *id. l. c.* pp. 157–163. *C. bidentata*, Linn., var. *fenestrata*, from Toulouse, is noticed, p. 159. *C. sciocusis*, Gribodo, redescribed by him; Ann. Mus. Genov. xvi. pp 251–253, woodcuts of apical segments.

New species :—

Homalus nitidulus and *minutus*, Abeille de Perrin, Bull. Soc. Toulouse, xiii. p. 156, France.

Holopyga semi-ignita, id. *l. c.* p. 157, France.

Hedychrum longicolle and *gratiosum*, id. *ibid.*, France.

Chrysis virgo (= *assimilis*, Spin.), p. 158, *dominula*, p. 159, *pustulosa*, *subsinuata*, *mulsanti*, p. 160, *igniventris*, *chevrieri*, p. 161, *purpurifrons*, *angustifrons*, *lais*, *phryne*, *fugax*, p. 162, *schousboei*, *spinifer*, *gribodoi*, p. 163, *id. l. c.*, France. *C. aurichalcea*, Provancher, Nat. Canad. xii. p. 300, Canada.

Elampus spinosus, p. 302, *cyanescens*, *purpurascens*, p. 303, *marginatus*, p. 304, *id. l. c.*, Canada.

Cleptes americana, id. *l. c.* p. 304, Canada.

Ichneumonidæ.

Bridgman, J. B. Some additions to Mr. Marshall's Catalogue of British *Ichneumonidæ*. Tr. E. Soc. 1881, pp. 143–167, pl. viii.

A large number of species are added to the British list, some new. The more important observations will be noticed in their places, but the synonymic notes are too numerous to be quoted in full.

Parfitt, E. The Fauna of Devon. Order, *Hymenoptera* ; Family, *Ichneumonidæ* ; Section, *Pupivora*. Tr. Devon. Ass. xiii. pp. 241–292.

Two new species are described, and many are recorded as new to Britain. A general Introduction is prefixed. The most important observations on food, habits, cocoons, &c., are referred to in their places, but many others will be found in the paper itself.

Ichneumonides.

Bridgman, J. B., & Fitch, E. A. Introductory Papers on *Ichneumonidæ*. Ent. xiv. pp. 58–61, 77–82, 109–112, 129–132, 205–209.

Tables of genera and species from *Limerodes* to *Apaleticus*.

Kriechbaumer, J., & Tischbein, —. Bemerkungen zu Holmgren's Enumeratio Ichneumonidum, exhibens species in alpibus Tiroliæ captus. i. Ber. Ver. Innsbrück, xi. pp. 1–10.

40 species noticed : *Ichneumon inquilinus* and *helleri*, probably = *rufinus* ; *I. stramentorius*, ♂ does not belong to that species ; *I. oblongatus*, ♂ var., Tischb., is a distinct species ; *I. luteipes* = *indiscretus*, var. ; *I. emancipatus*, one specimen = *gracilicornis*, Wesm. ; *I. redimitus* = *albosignatus*, Wesm., var. ? ; *Amblyteles notatorius* = *auratorius*, Wesm. ; *A. melanocastanus* = *gressorius*, Grav., var. 1.

Tischbein, —. Zusätze und Bemerkungen zu der Uebersicht der europäischen Arten des Genus *Ichneumon*, Grav. S. E. Z. xlii. pp. 166–186.

The following known species are noticed : *Ichneumon perfidus*, Tischb., *faunus*, Grav., var. ?, *Amblyteles litigiosus*, Wesm., *celsiæ*, Tischb., *uniguttatus*, Grav., and *diasemæ*, Tischb.

Ichneumon q-albatus, Kriechb., ♀ described, pp. 51 & 52; *mordax*, supposed ♂, pp. 83–86; *patruelis*, Holmgr. (?), discussed, pp. 99–103; *I. cerebrosus*, Wesm., redescribed; it is quite distinct from *tuberculipes*, Wesm., pp. 57–60; *I. cumerus*, Wesm., ♂ described and ♀ noticed, pp. 117–120; Kriechbaumer, CR. Ver. Regensb. xxxiv. *I. medialis*, *luteipes*, and *deletus*, Wesm., males described; *id.* Ent. Nachr. vii. pp. 133–137. *I. molorchi*, parasitic on *Necydalis ulmi*; Fouill. Nat. xi. pp. 150 & 151. *I. rufiventris*, Cress., infesting *Pyrameis cardui*; C. E. Henstis, Canad. Ent. xiii. pp. 143 & 144.

Amblyteles flavicinctus, Desv., amended description; Bridgman, Tr. E. Soc. 1881, p. 144. *A. litigiosus*, Wesm., ♂ described; Kriechbaumer, Ent. Nachr. vii. pp. 1–6. *A. celsiæ*, Tischb., ? = *nonagriæ*, Holmgr.; Brischke, Ent. Nachr. vii. p. 216.

Trogus exesorius, Brullé, redescribed; Packard, P. Bost. Soc. xxi. p. 21.

Platylabus orbitalis, Grav., variety noticed; Parfitt, Tr. Devon. Ass. xiii. p. 255. *P. massaiæ*, Gribodo, redescribed by him; Ann. Mus. Genov. xvi. p. 254.

Phæogenes ater, Cress., parasitic on *Ægeria syringæ*; French, Papilio, i. p. 106.

Octatomus, g. n., Tischbein, S. E. Z. xlii. p. 186. Placed after *Amblyteles*; type, *O. tricolor*, sp. n., *l. c.*, Danzig (= *Exephanes femoralis*, Brischke; Brischke, Ent. Nachr. vi. p. 216).

New species :—

Exephanes variegator, p. 166, *rufo-niger*, Birkenfeld, p. 167, *subnudus*, Thuringia, *macilentus*, Tirol, p. 168, and *nigrifemur*, Eutin, p. 169, Tischbein, S. E. Z. xlii.

Ichneumon castanicauda, Switzerland, *specularis*, Eutin, p. 170, *cœlareator*, p. 171, *adulator*, Switzerland, *dissimulator*, Eutin, p. 172, *gemmatus*, Switzerland, *malignus*, p. 173, *brevicornis*, Birkenfeld, p. 174, *criticus*, South Germany, *quadrilineatus*, Eutin, p. 175, *ramiformis*, *opacus*, Birkenfeld, p. 176, *improbus*, Eutin, p. 177, *adscendens*, Hungary, *lætus*, Birkenfeld, p. 178, *hostificus*, Thuringia, p. 179, *nigro-castaneus*, p. 180, and *spiracularis*, Birkenfeld, p. 181, *id.* l. c. *I. hunteræ* (from *Pyrameis huntera*), and *I. tharotis* (from *Melitæa tharos*), Packard, P. Bost. Soc. xxi. pp. 22–24, United States. *I. huttoni*, Kirby, Tr. E. Soc. 1881, p. 44, New Zealand.

Amblyteles adsentator, Botzen, and *albo-striatus*, Birkenfeld; Tischbein, *l. c.* pp. 184 & 185.

Herpestomus striatus, Bridgman, Tr. E. Soc. 1881, p. 145, pl. viii. figs. 1 & 2, Norwich.

Dicælotus cameroni, id. *l. c.* p. 146, pl. viii. fig. 3, Norwich.

Phæogenes similis and *formosus*, id. *l. c.* pp. 148 & 149, pl. viii. figs. 4 & 5, England.

Cryptides.

Phygadeuon fumator, Grav., *aberrans*, and *probus*, Tasch., noticed, and the first figured; Bridgman, Tr. E. Soc. 1881, pp. 151 & 152, pl. viii. figs. 6–8.

Cryptus tricolor and *obscurus*, Grav. Food noticed, and pupa-case of the latter described; Parfitt, Tr. Devon. Ass. xiii. p. 258.

Hemiteles tenerrimus, Grav., mass of cocoons mentioned, and *H. areator*, Panz., variety described; *id. l. c.* pp. 261 & 263. *H. melanarius*, Grav. (parasitic on *Vanessa c-album*), redescribed; Holmgren & Zetterlund, Ent. Tidskr. ii. pp. 48–50, 58 & 59.

Agrothereutes batavus, Voll., recorded as new to Britain; Bloomfield, Ent. M. M. xvii. p. 258.

Pezomachus distinctus (Billups, P. E. Soc. 1881, p. ii.), *geochares*, and *xylochophilus*, Först. (*id. l. c.* p. xxii.), and *micrurus*, Först., recorded as new to Britain; Pickard Cambridge, Ent. xiv. p. 137.

Brachycyrtus, g. n., Kriechbaumer, CB. Ver. Regensb. xxxiv. p. 161. Allied to *Hemiteles*; type, *B. armatus*, sp. n., *l. c.* p. 163, Munich.

New species :—

Phygadeuon tarsatus, Bridgman, Tr. E. Soc. 1881, p. 150, pl. viii. fig. 9 & 9*a*, Arran.

Cryptus antennatus, id. *l. c.* p. 153, pl. viii. figs. 10 & 10*a*, Norwich. *C. gallarum*, Rudow, Ent. Nachr. vii. p. 79. Parasitic on *Nematus viminalis*, Linn.

Hemiteles gallarum, id. *l. c.*, parasitic on *Nematus viminalis*, Linn. *H. gyrini*, Parfitt, Rep. Devon. Ass. xiii. p. 261, and Ent. M. M. xviii. p. 79 (bred by J. Hellins from pupa of *Gyrinus natator*; cf. Ent. M. M. xviii. pp. 88 & 89), Exeter.

Aptesis nordenskiœldi and *palanderi*, Holmgren, Nov. Spec. Ins. pp. 15 & 16, Novaya Zemlya.

Ophionides.

Osprynchotus flavipes, Brullé (♂ & var. ♀), and *Paniscus capensis*, Holmgr., noticed; Gribodo, Ann. Mus. Genov. xvi. p. 260.

Limneria albida, Gmel., cocoon described, and *tristis*, variety described; Parfitt, Tr. Devon. Ass. xiii. pp. 268 & 269. *L. littoralis*, Holmgr., recorded as new to Britain; Billups, P. E. Soc. 1881, p. xxii. *L. mœsta*, Grav., redescribed; Bridgman, Tr. E. Soc. 1881, p. 158.

Exetastes osculatorius, Fabr., variation described; Parfitt, *l. c.* p. 272.

New species :—

Ophion skelloni and *insularis*, Kirby, Tr. E. Soc. 1881, p. 46, New Zealand. *O. tityri*, Packard, P. Post. Soc. xxi. p. 19, United States (bred from *Eudamus tityrus*).

Campoplex pieridicola, id. *l. c.* p. 20, United States (bred from *Pieris rapæ*).

Limneria fitchi, fig. 13, *barretti*, fig. 14, and *monticolana*; Bridgman, Tr. E. Soc. 1881, pp. 157–159, pl. viii., Britain.

Cremastus retiniæ, Cresson, Rep. Dep. Agric. 1879, p. 238, New York.

Mesochorus aciculatus, Bridgman, *l. c.* p. 162, pl. viii. fig. 11, Plymouth.

Tryphonides.

Mesoleptus ventralis, Curt., cocoon, and *Polyblastus hilaris*, Holmgr., pupa-case described; Parfitt, Rep. Devon. Ass. xiii. pp. 274 & 276.

Monoblastus femoralis, Holmgr., recorded as new to Britain; Billups, P. E. Soc. 1881, p. xxii.

Mesolius rufilabris, Zett., recorded as new to Britain; E. A. Butler, Ent. M. M. xvii. p. 236.

Dicksonia, g. n., Holmgren, Nov. spec. Ins. p. 11. Allied to *Mesolius*; type, *D. arctica*, sp. n., *l. c.* p. 12, Novaya Zemlya.

Chorinæus flavipes, sp. n., Bridgman, Tr. E. Soc. 1881, p. 165, pl. viii. fig. 15, Norwich.

Perilissus vollenhoveni, sp. n., Gribodo, Bull. Ent. Ital. xiii. p. 58, Calabria.

Mesolius bignelli, Bridgman, *l. c.* p. 163, pl. viii. fig. 12, Plymouth; *M. brachyacanthus*, Parfitt, Ent. M. M. xviii. p. 78, and Tr. Devon. Ass. xiii. p. 275, Exeter; *M. bovii*, Holmgren, Nov. spec. Ins. p. 13, Novaya Zemlya: spp. nn.

Tryphon cerberus, sp. n., Dewitz, B. E. Z. xxv. p. 207, pl. v. fig. 11, Porto Rico.

Pimplides.

Pimpla diluta, Ratz., and *Lissonota leucogona*, Grav., noticed; Bridgman, Tr. E. Soc. 1881, pp. 166 & 167. *P.* (?) *antinorii* and *P. mahalensis*, Gribodo, redescribed by him; Ann. Mus. Genov. xvi. pp. 256 & 258. *P. instigator* parasitic on *Bombyx neustria*; Van Segvelt, Feuill. Nat. xii. p. 11.

Acrodactyla degener, Hal.: habits and cocoon noticed; Parfitt, Tr. Devon Ass. xiii. p. 281. Parasitic on spiders; Pickard Cambridge, P. Z. S. 1881, p. 259.

Lissonota linearis, Grav., and *anomala*, Holmgr. (Billups, P. E. S. 1881, p. xxii.), and *L. leucozona*, Grav. (Bloomfield, Ent. M. M. xvii. p. 258), recorded as new to Britain.

Sibiriakoffia, g. n., Holmgren, Nov. spec. Ins. p. 13. Allied to *Lissonota*; type, *S. arctica*, sp. n., *l. c.* p. 14, Novaya Zemlya.

New species:—

Coleocentrus ruficornis, p. 309, *maximus*, *scutellaris*, p. 310, Rudow, Ent. Nachr. vii., Thuringia.

Ephialtes ruficollis and *atratus*, id. *l. c.* p. 309, Thuringia; *E. comstocki*, Cresson, Rep. Dep. Agric. 1879, p. 235, New York; *E. cressoni*, Dewitz, B. E. Z. xxv. p. 205, pl. v. fig. 9, Porto Rico.

Pimpla amœna, p. 310, *lativentris*, *nematorum*, p. 311, Rudow, *l. c.* Thuringia; *P. nubecularia*, Dewitz, *l. c.* p. 206, pl. v. fig. 10, Porto Rico.

Polysphincta albipes, Cresson, *l. c.* p. 208, Florida.

Meniscus fumipennis and *minutus*, Rudow, Ent. Nachr. vii. pp. 311 & 312, Thuringia.

Braconidæ.

Bracon urinator, Fabr. (?), and *Rogas gasterator*, Jur. (?), varr. or spp. nn. noticed; Gribodo, Bull. Ent. Ital. xiii. pp. 62 & 63.

Gribodo (Ann. Mus. Genov. xvi. pp. 260-263) redescribes his *Bracon*

martinii, and notices *B. laminator*, Fabr., and *Gastrotheca furcata*, Guér., all from Shoa.

Rhogas reticulator, *circumscriptus*, *geniculator*, Nees, and *bicolor*, Spin.: habits, cocoons, &c., described; Parfitt, Tr. Devon. Ass. xiii. pp. 284 & 285.

Apanteles. 49 species described, including several new; Reinhard, Deutsche E. Z. xxv. pp. 33-52. The following synonymy occurs: *A. glomeratus*, Linn. (= *reconditus*, Nees, and *cratægi*, Ratz.); *brevicornis*, Wesm. (= *placidus*, Hal., = *fuliginosus*, Ratz., p., = ? *præpotens*, Hal., *difficilis*, Nees (= *vestalis*, Hal., = *insidens* and *melanoscelus*, Ratz.); *ruficornis*, Wesm. (*nec* Nees), is renamed *A. lictorius* (p. 37); *fasciatus*, Nees (= *equestris*, Hal.), *hoplites*, Ratz. (= *lavigatus*, Ratz.), *lactipennis*, Ratz. (*nec* Hal.), renamed *ultor* (p. 38); *xanthostigma*, Hal. (= *ochrostigma*, Wesm.), *emarginatus*, Nees (= *hilaris*, Hal.), *obscurus*, Nees (= *arenarius*, Hal.), *albipennis*, Nees (= *lacteipennis*, Hal.), *impurus*, Nees (= *candidatus*, Hal.), *longicauda*, Wesm. (= *terebrator*, Ratz.), *bicolor*, Nees (= *circumscriptus*, Nees, = *exiguus*, Hal., = *ardeæ-pennellus*, Bouché, = *lividipes*, Wesm.), *callidus*, Hal. (= *majalis*, Wesm.), *lateralis*, Hal. (= *rufilabris*, Ratz.); *vitripennis*, Hal. (= *fuleriger*, Wesm., = *flavilabris*, Ratz.); *fulvipes*, Hal. (= *glomeratus*, Nees, and *nemorum*, Ratz.). *A. falcatus*, Nees: habits and cocoons noticed; Parfitt, *l. c.* p. 286.

Microgaster difficilis. Habits and cocoon noticed; Parfitt, *l. c.* p. 288. *Microgaster*, sp. infesting *Pieris brassicæ* noticed; Joseph, JB. schles. Ges. lviii. pp. 113 & 114.

Cœlinius niger, Nees: noticed as destructive to *Chlorops tæniopus*; Parfitt, *l. c.* p. 291.

New genera and species:—

Trichesia, Provancher, Nat. Canad. xii. p. 203. Placed after *Alysia*; type, *T. auripes*, sp. n., *l. c.* fig. 30 (fore-wing), Canada.

Arotropus, id. *l. c.* p. 205, figs. 32 & 33. Placed after *Aphidius*; type, *A. binodosus*, sp. n., *l. c.* p. 206, Canada.

Copelus, id. *l. c.* p. 206, figs. 34 & 35. Placed next to *Arotropus*; type, *C. paradoxus*, sp. n., *l. c.* p. 207, Canada.

Sigalphus canadensis, id. *l. c.* p. 197 (fig. 25, fore-wing), Canada.

Chelonus basicinctus, p. 198, *fissus*, *carinatus*, p. 199, *nanus*, p. 200, *id. l. c.*, Canada; *C. carinatus*, Cameron, Tr. E. Soc. 1881, p. 559, Oahu.

Monolexis (?) *palliatus*, id. *l. c.* p. 560, Honolulu.

Rhytidogaster quebecensis, Provancher, *id. l. c.* (fig. 28, fore-wing), Canada.

Phanerotoma fasciata, id. *l. c.* p. 200 (fig. 27, fore-wing), Canada.

Apanteles vanessæ, Vienna, Stuttgart, p. 33, *scabriculus*, Vienna, p. 38, *sucrus*, Stuttgart, p. 39, *nanus*, Dresden (?), p. 41, *vipion*, France, Germany, *longipalpis*, p. 44, *lineatus*, p. 45, *corvinus*, *merula*, Dresden (?), p. 46, *fraternus*, Vienna, p. 47, *pallipes*, Vienna, Danzig, p. 48, *rubens*, Dresden, p. 51, Reinhard, Deutsche E. Z. xxv.

Microgaster carinata (bred from *Pyrameis atalanta*), p. 25, *pieridis*

(from *Pieris rapæ*), p. 26, *atalantæ* (from *P. atalanta*), *carduicola* (from *P. cardui*), p. 27, *limenitidis* (Riley, MS., from *Limenitis disippus*), and *lunatus* (from *Papilio asterias*), p. 28; Packard, P. Bost. Soc. xxi., United States. *M. cinctus* and *clavatus* (fig. 24, fore-wing), Provancher, *l. c.* p. 196, Canada.

Aphidius canadensis, id. *l. c.* p. 204, fig. 31 (fore-wing), Canada.

Trioxys testaceipes, Florida, and *picens* [sic], Virginia, Cresson, Rep. Dep. Agric. 1879, pp. 208 & 260.

Alysia caudata, *lucens* (fig. 29, fore-wing), p. 202, *nigriceps*, p. 203, Provancher, *l. c.* Canada.

Evaniidæ.

Abeille de Perrin, E. Essai de classification des espèces françaises du genre *Fœnus*, Fabr. Bull. Soc. Toulouse, xiii. pp. 260–279.

Consists of general remarks, separate tables of males and females, and descriptions of species (some new). A list of 21 described species is appended: *Fœnus nigripes*, Tourn., var. *annulatus*, from South France is described, p. 276.

Evania lævigata, Linn., noticed from Shoa, and *Megischus antinorii*, Grib., redescribed; Gribodo, Ann. Mus. Genov. xvi. pp. 264–266.

Evania ruficaput, sp. n., Dewitz, B. E. Z. xxv. p. 205, pl. v. fig. 7, Porto Rico.

Hyptia rufipectus, sp. n., *id. ibid.* fig. 8, Porto Rico.

Fœnus diversipes, South France, *obliteratus*, South France, Austria, p. 272, *rugulosus*, *variolosus*, Marseilles, pp. 149 & 275, *undulatus*, South France, p. 276, *mariæ*, Var, p. 279, Abeille de Perrin, Bull. Soc. Toulouse, xiii., spp. nn.

Chalcididæ.

Howard, L. O. Report on the Parasites of the *Coccidæ* in the Collection of this Department [of Agriculture]. Comstock's Rep. Dep. Agric. 1880, pt. iii. pp. 350–371.

Relates to *Chalcididæ* and *Proctotrypidæ*. The author notices the following known North American *Chalcididæ*:—*Aphelinus mytilaspidis*, Le Baron, pl. xxiii. fig. 1, p. 354, *mali*, Hald. (p. 356); *Aphelinus aspidioticola*, Ashm., should be referred to the *Mymarinæ*; *Coccophagus lecanii*, Fitch, p. 357, *Rhopus* (= *Acerophagus*) *coccois*, Smith, pl. xxiv. fig. 2, p. 161; *Signiphora flavo-palliatus*, Ashm., is one of the *Mymarinæ*, and *Trichogramma flavus* and *Stenomesius aphidicola*, Ashm., do not belong to the genera to which they have been referred.

André (Ann. Soc. Ent. Fr. 6, i. pp. 332–338) discusses the genera allied to *Chalcis*, of which he gives the following synonymy:—*Chalcis*, Fabr. (= *Brachymeria*, Westw., *Phasgnonophora*, Westw., Sich., and *Conura*, Spin., Sich., pt.); *Smicra*, Spin. (= *Conura*, Spin., Sich., pt.); *Halticella*, Spin. (= *Euchalcis*, Duf., and *Allocera*, Sich.). The structure of several species is also discussed, and details of *Chalcis pectinicornis*, Latr., and *minuta*, Linn., are figured (pl. ix. figs. 4–6).

Chalcis, sp. parasitic on *Mantis religiosa* noticed; Xambeu, Bull. Soc. Ent. Fr. (6) i. pp. cxiii. & cxiv. *C. gallica*, Sich. (= *Phasgonophora conica*, ♀, Sich.), ♂ described, and sexes and details figured; André, *l. c.* pp. 338–340, pls. ix. figs. 1, 3, & 7. *C. minuta*, Linn. (?), parasitic on *Sarcophaga lineata*; S. S. Saunders, P. E. Soc. 1881, p. xxiv.

Euchalcis dargelasi, Latr. (?), noticed; Gribodo, Bull. Ent. Ital. xiii. p. 67.

Halticella osmicida, Saunders, figured by Waterhouse, Aid, i. pl. xl. *H. venusta*, Duf., ♀ noticed and figured, with details; André, *l. c.* p. 340, pl. ix. fig. 2.

Isosoma (*Eurytoma*). Russian species discussed; Portchinsky, St. Petersburg: 1881, 8vo, pp. 36.

Eurytoma hordei, Walsh. Transformations, ravages, and parasites described; Lindeman, Bull. Mosc. lv. 2, pp. 127–136, 378–385, figs. 1–3. Its galls are infested by species of *Euryscapus*, *Entedon*, and *Pteromalus*.

Decatoma signata, Nees, mentioned as parasitic on *Aphilothrix*; Wachtl, MT. forstl. Versuchswesen Österr. ii. [1879].

Syntomaspis druparum, Boh., noticed; Schlechtendal, JB. Ver. Zwickau, 1879, p. 29.

Copidosoma truncatellum, Dalm., infesting larva of *Zeuzera æsculi* in vast numbers; Fitch, P. E. Soc. 1881, p. xxi.

Encyrtus montinus, Packard (bred from *Chionobas semidea*), redescribed by him; P. Bost. Soc. xxi. p. 31.

Euryscapus, sp. parasitic on *Eurytoma hordei* described; Lindeman, Bull. Mosc. lv. 2, p. 381.

Antigaster, Walsh, is not distinct from *Eupelmus*, Dalm.; Howard & Riley, Canad. Ent. xiii. pp. 31–33, fig. 3 (antennæ), p. 114.

Eriophilus (or *Agonioneurus*) *mali*, Hald., noticed and figured; Comstock, Rep. Dep. Agric. 1879, p. 259, pl. vi. fig. 6. Belongs to *Aphelinus*; Howard, *l. c.* p. 356, note.

Sciatheras trichotus, Ratz., redescribed by Westwood as *Chætospila elegans*, is quite distinct from *Cerocephala formiciformis*, Westw., with which it has been confounded by Förster; Fitch, Ent. xiv. pp. 21 & 22.

Spalangia hirta, Hal., recorded from Honolulu, but probably introduced; Cameron, Tr. E. Soc. 1881, p. 562.

Pteromalus. 2 species parasitic on *Eurytoma hordei* [and *Lasioptera* (*Cecidomyia*) *cerealis*] described; Lindeman, *l. c.* pp. 384 & 389. *P. puparum*: numbers bred from pupæ of *Pieris*, smaller in proportion to the greater number bred from a single pupa; Reichenau, Ent. Nachr. vii. p. 51. Redescribed from *P. rapæ*; Packard, P. Bost. Soc. xxi. p. 30.

Diplolepis puparum, Fabr. Habits; Joseph, JB. schles. Ges. lviii. pp. 113 & 114.

Euplectrus comstocki, Howard (parasitic on cotton-worm). Life-history; Schwarz, Am. Nat. xv. pp. 61–63.

Eulophus semideæ, Packard (bred from *Chionobas semidea*), redescribed by him, *l. c.* p. 35.

Entedon. 2 species, parasitic on *Eurytoma hordei*, described; Lindeman, *l. c.* p. 383.

Trichogramma minutum, Riley, recharacterized; Packard, *l. c.* p. 37.

Tomocera, g. n., Howard, Rep. Dep. Agric. 1880, p. 368. Allied to *Pirene*; maxillary palpi 2-jointed, marginal vein short; abdomen ovate, slightly pedunculate, &c. Type, *T. californica*, sp. n., *l. c.* pl. xxiv. figs. 3 & 4, California.

New species :—

Smicra gigantea, Day, Canad. Ent. xiii. p. 90, Florida; *S. picta* and *flavescens*, André, Ann. Soc. Ent. Fr. (6) i. pp. 341 & 343, Cayenne.

Chalcis polynesialis, Cameron, Tr. E. Soc. 1881, p. 561, Honolulu.

Callimome fago-pirum, Provancher, Nat. Canad. xii. p. 291, Canada.

Eurytoma albinervis, Lindeman, Bull. Mosc. lv. 2, pp. 385 & 131–133, fig. 4, Russia; *E. funebris*, Howard, Rep. Dep. Agric. 1879, p. 196, Washington; *E. vagabunda*, Ashmead, Canad. Ent. xiii. p. 134, Florida.

Monodontomerus virid[*i*]*æneus*, Provancher, Nat. Canad. xii. p. 290, Canada.

Decatoma basilaris, id. *l. c.*, Canada; *D. flava*, p. 134, *querci*, *lanæ*, p. 135, *phellos*, *foliatæ*, and *batatoides*, p. 136, *id. l. c.*, Florida.

Eucharis gibbosa, Provancher, *l. c.* p. 292, Canada.

Paphagus rugosus, id. *l. c.* p. 293, Canada.

Semiotellus fasciatus, *melanicrus*, p. 294, *fuscipes*, *oblongus*, *cupræus*, *minimus*, p. 295, *suborbicularis*, p. 296, *id. l. c.*, Canada.

Chiloneurus albicornis, Howard, *l. c.* 1880, p. 363, pl. i. fig. 4, Washington.

Comys bicolor, pl. xxiii. fig. 3, Columbia, and *fusca*, Alabama, *id. l. c.* pp. 362 & 363.

Encyrtus artaceæ, Florida, p. 252, *flavus*, pl. xxiii. figs. 7 & 8, California, *inquisitor*, pl. xxiv. fig. 1, Florida, p. 367, *id.* l. c. *E. turni*, Packard, P. Bost. Soc. xxi. p. 32 (bred from *Papilio turnus*), United States.

Aphelinus diaspidis, Florida, California, *abnormis*, Columbia, p. 355, *fuscipennis*, California, Florida, Columbia, and *pulchellus*, Columbia, p. 356, Howard, *l. c.*

Coccophagus immaculatus, Columbia, p. 358, *fuscipes*, Florida, *cognatus*, pl. xxiii. fig. 2, *fraternus*, Columbia, *ater*, Ithaca, N. Y., p. 359, and *varicornis*, Columbia, p. 360, *id. l. c.*

Aphycus eruptor, pl. xxiii. fig. 5, Florida, North Virginia, p. 364, *flavus*, Florida, and *pulvinariæ*, Iowa, p. 365, *id. l. c.*

Blastothrix adjutabilis, pl. xxiii. fig. 6, Florida, North Virginia, p. 366, *incerta*, Florida, and *longipennis*, Columbia, p. 366, *id. l. c.*

Spalangia (?) *syrphi*, Ashmead, *l. c.* p. 171, Florida.

Pteromalus pieridis, p. 296, *acutus*, *nigricornis*, p. 297, Provancher, *l. c.*, Canada; *P. calandræ*, Howard, *l. c.* p. 273, Texas; *P. 4-maculatus*, Ashmead, *l. c.* p. 171, Florida.

Eulophus vesubiellæ, Millière, Mém. Soc. Cannes, vii. (Lépidoptérologie, iii.) p. 14, pl. iv. figs. 5–7, parasitic on *Psyche vesubiella*, Mill. *E. theclæ* and *saundersi* (both bred from *Thecla calanus*), Packard, *l. c.* p. 34, United States; *E. ramosus*, Provancher, *l. c.* p. 297, Canada.

Entedon antiopæ (bred from *Vanessa antiopa*), Packard, *l. c.* p. 36, United States; *E. diastatæ*, Howard, *l. c.* p. 246, Washington.

Astichus minutus, id. *l. c.* p. 369, Columbia.

Gyrolasia flavimedia, Howard, *l. c.* pl. xxiv. fig. 5, California.

Geniocerus lasiopteræ, Lindeman, Bull. Mosc. lv. 2, p. 387, parasitic on *Lasioptera* (*Cecidomyia*) *cerealis*.

Trichogramma minutissimum, Packard, P. Bost. Soc. xxi. p. 37 (bred from *Papilio turnus*), United States.

Proctotrypidæ.

Saunders, [Sir] S. S. On the habits and affinities of the Hymenopterous genus *Scleroderma*, with descriptions of new species. Tr. E. Soc. 1881, pp. 109–116.

These insects prove to be parasitic, chiefly on other Hymenopterous larvæ, and should probably be referred to the *Proctotrypidæ*. The ♀ is generally without wings or ocelli, but some unusually well-developed examples possess both.

Westwood, J. O. Observations on the Hymenopterous genus *Scleroderma*, Klug, and some allied groups. Tr. E. Soc. 1881, pp. 117–140, pls. iv.–vii.

The structural characters are discussed, special attention being called to the 13-jointed antennæ, and a list of species described since the author's monograph published in Tr. E. Soc. ii. is added; *S. bicolor*, Smith, is redescribed and figured, p. 121, pl. v. figs. 1 & 1*a–e*. The following known genera and species are also discussed, and several new species described: *Cephalonomia formiciformis*, Westw. (= *Holopedina polypori*, Fœrst.), p. 126, pl. vi. figs. 1–3; *C.* (?) *fuscicornis*, Westw., p. 128, pl. vi. fig. 7; *Apenesia modesta*, Smith, p. 131, pl. vii. figs. 4 & 4*a–c*; *A. parasitica*, Smith, p. 132; *Pristocera contracta*, Westw., probably = *atra*, Klug, ♀, p. 132; *Methoca*, known species redescribed, pp. 134–138.

Polynema natans, Lubb. (parasitic on eggs of dragon-flies), noticed; Bostock, Nature, xxiv. pp. 356 & 357.

Scleroderma domesticum, Westw. Larva feeding on a Longicorn larva (*Oxypleurus nodieri*, Muls.); Saunders & André, P. E. Soc. 1881, pp. xxxiii. xl. & xli.

Undetermined species of *Mymarinæ* from Sicilian amber, noticed and figured; Cornalia, Atti Acc. Rom. (3) v. pp. 80–83, fig. 1.

Platygaster, sp., parasitic on *Lasioptera* (*Cecidomyia*) *cerealis*, described; Lindeman, Bull. Mosc. lv. 2, p. 388. *P.*, sp. infesting pupa of Hessian fly; Warneck, Bull. Mosc. lvi. 1, Séances, pp. 17 & 18. *P. error*, Fitch, noticed; Comstock, Ann. Rep. Dep. Agric. 1879, pp. 196 & 197.

Sierola, g. n., Cameron, Tr. E. Soc. 1881, p. 556. Allied to *Gonioxus*, but differs from all the known genera of *Bethyloinæ* in having the radial cellule completely closed, and in the presence of a small oval cellule uniting the humeral cellules; type, *S. testaceipes*, sp. n., *l. c.*, Sandwich Islands.

New species:—

Apenesia chontalica, Westwood, Tr. E. Soc. 1881, p. 131, pl. vii. figs. 3 & 3*a–d*, Chontales.

Galesus quebecensis, Provancher, Nat. Canad. xii. p. 260, Canada.
Basalys ruficornis, id. *l. c.* p. 261, Canada.
Aneurynchus spinosus, id. *l. c.* p. 262, Canada.
Spilomicrus longicornis, id. *ibid.*, Canada.
Proctotrypes meridionalis, Gribodo, Bull. Ent. Ital. xiii. p. 70, Calabria; *P. rufigaster* and *flavipes* (*pallipes* in table), Provancher, *l. c.* pp. 263 & 264, Canada.
Dethylus prolongatus, id. *l. c.* p. 265, Canada.
Isobrachium hispanicum, Cameron, Tr. E. Soc. 1881, p. 555, Spain.
Psilloma caudata, id. *l. c.* p. 557, Spain.
Megaspilus punctulatus, Ayrshire, and *mullensis*, Ben More, Island of Mull, *id. l. c.* pp. 557 & 558.
Scleroderma ephippium, pl. iv. figs. 1–11, p. 114, *gracilis*[*-le*], p. 115, *concinna*[*-num*], Epirus, p. 116, and *polynesialis*[*-le*], Maui, p. 116, S. S. Saunders, Tr. E. Soc. 1881; *S. wollastoni*, St. Helena, fig. 2, p. 122, *vigilans*, figs. 3 & 4, *thwaitesiana*[*-num*], Ceylon, *soror*, Mexico, fig. 5, p. 123, *fonscolombii*, fig. 6, Provence, *linearis*[*-re*], Albania, fig. 7, p. 124, Westwood, *l. c.* pl. v.
Cephalonomia (?) *peregrina*, Ceylon, figs. 5 & 6, and *C.* (?) *cursor*, Albania, figs. 8 & 8*a–e*, id. *l. c.* pp. 127 & 129, pl. iv.
Anaphes gracilis, Howard, Rep. Dep. Agric. 1880, p. 370, pl. xxiv. fig. 6, Columbia.
Cosmocoma elegans, id. *l. c.* p. 371, pl. xxiv. fig. 7, California.

Cynipidæ.

Adler, H. Über den Generationswechsel der Eichen-Gallwespen. Z. wiss. Zool. xxxv. pp. 151–246, pls. x.–xii.

The writer publishes his experiments on 23 species of *Cynipidæ*, giving full descriptions and particulars of their life-history and alternation of generations. Most of these exhibit differences in the sexual and asexual broods (which appear at different seasons), hitherto considered generic. Several forms are described as new, and will, for convenience of reference, be here also treated as new species. The 23 species noticed are as follows, the alternate brood being added in the second column.

I. Neuroterus group.

1. *N. lenticularis*, Ol., = *Spathogaster baccarum*, Linn.
2. *N. læviusculus*, Schenk, = *S. albipes*, Schenck.
3. *N. numismatis*, Ol., = *S. vesicatrix*, Schindl.
4. *N. fumipennis*, Hart., = *S. tricolor*, Hart.

II. Aphilothrix group.

5. *A. radicis*, Fabr., = *Andricus noduli*, Hart.
6. *A. sieboldi*, Hart., = *And. testaceipes*, Hart.
7. *A. cordicis*, L., = *And. gemmatus*, Adl.
8. *A. globuli*, Hart., = *And. inflator*, Hart.
9. *A. collaris*, Hart., = *And. curvator*, Hart.
10. *A. fecundatrix*, Hart., = *And. pilosus*, Adl.

11. *A. callidoma*, Hart., = *And. cirratus*, Adl.
12. *A. malpighii*, Adl., = *And. nudus*, Adl.
13. *A. autumnalis*, Hart., = *And. ramuli*, Linn.

III. Dryophanta group.

14. *D. scutellaris*, Hart., = *Spathegaster taschenbergi*, Schlecht.
15. *D. longiventris*, Hart., = *S. similis*, Adl.
16. *D. divisa*, Adl., = *S. verrucosus*, Schlecht.

IV. Biorrhiza group.

17. *B. aptera*, Fabr., = *Teras terminalis*, Fabr.
18. *B. renum*, Hart., = *Trigonaspis crustalis*, Hart.
19. *Neuroterus ostreus*, Hart., ? = *Spathogaster aprilinus*, Gir.

Parthenogenetic species, not exhibiting alternation of generations.

20. *Aphilothrix seminationis*, Gir.
21. *A. marginalis*, Schlecht.
22. *A. quadrilineatus*, Hart.
23. *A. albo-punctata*, Schlecht.

The article consists of an historical introduction (chap. i.); the descriptions of species already referred to (chap. ii.); a chapter on the formation of galls (chap. iii.); and another giving full anatomical details respecting the structure of the ovipositor, and the process of oviposition (chap. iv.). The latter is summed up as follows: (1.) The tunnel is bored, first by passing the ovipositor under the scaly covering at the base, and then driving it to the centre of the axis of the bud. (2.) The egg passes from the ovary to the base of the ovipositor; its stalk is grasped between the bristles of the latter, and the egg is pushed down to the ovipositor. (3.) The tip of the ovipositor is withdrawn from the channel, into which the egg passes, when it is pushed forward by the ovipositor, till it reaches the extremity. Chapters v. & vi. contain a comparison of the alternate generations of the *Cynipidæ* according to their structure; a discussion on the relations which the sexual and asexual forms bear to each other, and general concluding remarks. The first two plates are coloured, and represent galls and gallflies; the third represents details of the ovipositor and eggs.

Abstracts or notices of Adler's observations have appeared in Ent. M. M. xvii. pp. 258 & 259; Ann. N. H. (5) viii. pp. 281–288; Biol. Centralbl. i. pp. 168–175; CR. Ent. Belg. xxv. pp. xciii.–xcv., cxlvi.–cxlix. & clvii.; Feuill. Nat. xi. pp. 93–95; Arch. Zool. ix. pp. xvii.–xxii., &c.

[Adler, H.] Les Cynipides. 1ière partie. Introduction. La Génération Alternante chez les Cynipides. Traduit et annoté par J. Lichtenstein, suivi de la classification des Cynipides d'après G. Mayr. Montpellier & Paris: 1881, 8vo, pp. xiv. & 141, pls. iii.

A translation of the foregoing work, preceded by an introduction, in which Lichtenstein draws a parallel between the phenomena of alternate generation in the *Cynipidæ* and *Aphididæ*.

Mayr, G. Die Genera der gallenbewohnenden Cynipiden. Wien : 1881, 8vo, 38 pp, woodcuts. (Separatabdruck aus dem 20sten Jahresberichte der Communal Oberrealschule in I. Bezirk.)

29 genera, many new, are described in detail, tables of females and males being prefixed. A few new species are also described in notes. The following known genera are noticed : *Pediaspis*, Tischb. (= *Bathyaspis* Först.), *Rhodites*, Hart. (= *Hololexis*, Hart.), *Phanacis*, Först., *Aulax*, Hart. (= *Isocolus*, *Eubothrus*, and *Liposthenes*, Först.), *Xestophanes*, Först., *Periclistus*, Först., *Ceroptres*, Hart., *Synergus*, Hart., *Sapholytus*, Först., *Synophrus*, Hart., *Diastrophus*, Hart., *Amphibolips*, Reinh., *Andricus*, Hart. (= *Callirrhytis* and *Aphilotrix*, Först.), *Cynips*, L., *Trigonaspis*, Hart. (= *Biorrhiza*, pt. Westw.), *Biorrhiza*, Westw. (= *Apophyllus* and *Teras*, Hart., and *Dryoterus*, Först.), *Dryocosmus*, Gir. (= *Eutropha*, Först.) ; *Dryophanta*, Först. (= *Liodora*, sp.), and *Neuroterus*, Hart. (= *Spathogaster*, Hart., *Ameristus*, Först., and *Manderstjernia*, Rad.).

Remarks on *Cynipidæ* ; Bassett & Riley, Rep. E. Soc. Ont. p. 17.

Notes on Oak-galls in the Quercetum of the Royal Botanic Garden, Kew ; R. A. Rolfe, Ent. xiv. pp. 54–58.

On Caprification and Fig-Insects ; S. S. Saunders, P. Holmesdale Club, 1879–80, pp. 45–49, and P. E. Soc. 1881, pp. xxxiii.–xxxv.

Cynips psenes and *sycomori*, Linn. Types discussed ; with remarks on allied species. *Blastophaga sycomori*, Westw., = *ficus*, Linn., and *Sycophaga crassipes*, Westw., = *sycomori*, Linn. ; Waterhouse and Saunders, P. E. Soc. 1881, pp. xli.–xlv. [*Cf.* also Saunders, *l. c.* pp. xxxiii.–xxxv., and Cohn, JB. schles. Ges. liii. pp. 189 & 190.]

Aphilothrix laricis, Hart., figs. 2, 2D, and *mayri*, Wachtl, figs. 3, 3C, discussed and galls figured ; *Synergus melanopus*, Hart., and *Decatoma signata*, Nees, are parasites on *Aphilothrix* ; *Cynips corruptrix*, Schlecht., figs. 5, 5C, and *amblycera*, Gir., figs. 6, 6C, differentiated : Wachtl, MT. forstl-Versuchswesen Österr. ii. pp. 91–98, pl. ii.

Cynips, sp. Gall from *Quercus pubescens* noticed ; Fairmaire, Bull. Soc. Ent. Fr. (6) i. p. clix. *C. kollari* : *Coniopteryx tineiformis*, Curt., and *Cemiostoma wailesella*, Staint., bred from the galls ; Fletcher, Ent. xiv. p. 21. *C. quercus-californica*, Bassett (*vide infrà*), is one of the largest galls of North America ; it is always infested by *Ozognathus* (*Anobium*) *cornutus*, Lec. ; Riley, Am. Nat. xv. pp. 402 & 403.

Andricus ramuli, Linn. *Grapholitha corticana*, Hübn., bred from its gall ; Six, Tijdschr. Ent. xxiv. pp. 7 & 8.

Aulax scorzoneræ, Gir., lives in galls growing on water-mint in ditches on the Island of Sylt. The frequent submersion of the galls does not interfere with the development of the perfect insect. Joseph, JB. schles. Ges. lviii. p. 114.

New genera and species :—

Eschatocerus, Mayr, Gen. Cynip. p. 13. Type, *E. acaciæ*, sp. n., *l. c.* p. 14, woodcut (fore-wing), Uruguay.

Belenocnema, id. *l. c.* p. 16. Type, *B. treatæ*, sp. n., *l. c.* p. 17, note, woodcut (fore-wing), Florida.

Timaspis, Mayr, *l. c.* p. 18. Type, *T. lampsanæ*, Karsch.
Rhoophilus, id. *l. c.* p. 22. Type, *R. lævi*, sp. n., *l. c.* p. 23, note, Cape.
Aphelonyx, id. *l. c.* p. 29. Type, *A. cerricola*, Gir.
Acraspis, id. *ibid.* Types, *A. pezomachoides*, Ost.-Sack., and *erinacei*, Walsh.
Chilaspis, id. *l. c.* p. 32. Type, *C. nitida*, Gir.
Plagiotrochus, id. *ibid.* Types, *P. coccifera* and *ilicis*, Licht.
Loxaulus, id. *l. c.* p. 33. Type, *L. mammula*, Bass.
Holeaspis, id. *l. c.* p. 35. To include *H. globulus*, Fitch, and *duricoria* and *rugosa*, Bass.

Andricus gemmatus (= *Aphilothrix corticis*, Linn.), pl. x. fig. 7*a* (galls), p. 174. *Andr. pilosus* (= *Aph. fecundatrix*, Hart.), pl. xi. fig. 10*a* (galls), p. 180. *Andr. cirratus* (= *Aph. callidoma*, Hart.), pl. xi. fig. 11*a* (galls), p. 182; *Andr. nudus* (= *Aph. malpighii*, Adl.), pl. xi. fig. 12*a* (galls), p. 183; Adler, Z. wiss. Zool. xxxv., Germany.
Aphilothrix malpighii, id. *l. c.* p. 188, pl. xi. fig. 12 (galls), Germany; *A. seckendorffi*, Wachtl, MT. forstl-Versuchswesen Österr. ii. [1879], p. 93, pl. ii. figs. 4 & 4t (galls), Austria.
Spathogaster similis, Adler, *l. c.* p. 189, pl. xi. fig. 15*a* (galls), Germany (= *Dryophanta longiventris*, Hart.).
Diastrophus similis, Bassett, Canad. Ent. xiii. p. 95, Long Island.
Cynips quercus-californica, p. 51, *q.-agrifoliæ*, p. 53, *q.-suttoni*, California, p. 54, *q.-nubila*, Arizona, p. 56, *q.-pomiformis*, California, p. 74, *q.-ficula*, Georgia, p. 75, *q.-mammula*, United States, p. 76, *q.-utricula*, Connecticut, p. 78, *tenuicornis*, p. 92, *bella*, Arizona, p. 93, *minuta*, p. 96, *vesicula*, United States, p. 97, *pattoni*, Connecticut, p. 98, *polita*, p. 99, *rugosa*, p. 100, *cicatricula*, *capsula*, p. 101, *affinis*, p. 103, *gemula*, p. 104, *nigra*, United States, p. 105, *ignota*, Massachusetts, p. 106, *papula*, p. 107, *noxiosa*, p. 108, *corrugis*, United States, p. 109, *cinerosa*, Texas, p. 110, *floccosa*, Ohio, p. 111, and *coxi*, Arizona, p. 112, Bassett, l. c.; *C. q.-rileyi*, id. Am. Nat. xv. p. 149, Ohio; *C.* (*Andricus*) *gibbosa* (fig. 37, fore-wing), and *C.* (*Neuroterus*) *crassitelus*, Provancher, Nat. Canad. xii. pp. 232 & 233, Canada.
Dryophanta pubescentis (? = form of *D. folii*, L.), Mayr., Gen. Cynip. p. 36, note, Nassau.
Eucœla subcompressa, Provancher, *l. c.* p. 237, Canada.
Cleidotoma maculipennis and *cupulifera* (fig. 39, forewing), *id. l. c.* pp. 237 & 238, Canada.
Ægilips aciculatus, id. *l. c.* p. 239, Canada.

Siricidæ.

Xiphydria flavo-picta, Smith, = *Derecyrta deceptus*, Smith, ♀; Kirby, Tr. E. Soc. 1881, p. 49.
Sirex fuscicornis, Fabr., redescribed, with remarks on habits; Brauns, Ent. Nachr. vii. pp. 74–78.
Sirex sah, Persia, and *vates*, North China, Mocsáry, Term. füzetek, v. p. 36, spp. nn.

TENTHREDINIDÆ.

ANDRÉ, E. Catalogue raisonné des Tenthrédines recueillies en Syrie et en Palestine en 1880, par E. Abeille de Perrin. Ann. Soc. Ent. Fr. (6) i. pp. 345–362.

50 *Tenthredinidæ* and *Cephidæ* enumerated.

Notes on *Tenthredinidæ* near York ; Wilson, Ent. xiv. pp. 88–91.

Cameron & Fletcher record the occurrence of parthenogenesis in a considerable number of British *Tenthredinidæ* ; Ent. M. M. xvii. pp. 127, 180, 271 & 272.

Directions for examining the saws in the *Tenthredinidæ* ; Cameron, Tr. E. Soc. 1881, pp. 576 & 577.

Allantus rufo-cingulatus, Tischb., = *dispar*, Klug ; *A. xanthorius*, Kriechb., = *dahli*, Klug ; *Macrophya superba*, Tischb., = *erythropus*, Brullé ; *M. ratzeburgi*, Tischb., and *histrionica*, Voll., *postica*, Brullé, *Tenthredo flavicornis*, Eversm., and *eversmanni*, Ball., = *fulva*, Klug ; *T. spectabilis*, Mosc., = *sibiricus*, Kriechb. ; and *Cephus orientalis*, Tischb., = *parreysi*, Spin. Mocsáry, Ent. Nachr. vii. p. 18.

Tenthredo colon, Klug, and *Selandria candidata*, Fall. (= *repanda*, Klug). Life-histories by Vollenhoven ; translated by J. W. May, Ent. xiv. pp. 30–35, 105–108.

Hemichroa alni, *rufa* (♂ recorded), *Fenusa hortulana* and *Phyllotoma ochropoda* noticed ; Fletcher, Ent. M. M. xviii. pp. 126 & 127.

Emphytus patellatus and *calceatus*, *Taxonus agilis*, Klug, and *Phyllæcus giraudi*, Perr. (= *Macrocephus ulmariæ*, Schlecht.). Transformations discussed ; Schlechtendal, JB. Ver. Zwickau, 1879, pp. 21–28.

Garbodo (Ann. Mus. Genov. xvi. pp. 256–258) redescribes his *Athalia vollenhoveni*, *scioensis*, and *fumosa*, and *Hylotoma massaiæ*.

Abia fulgens (André) noticed ; Marquet, Bull. Soc. Toulouse, xiii. p. 131.

Praia taczanowskii and *Hylotoma sanguinicollis*, André, redescribed by him ; Spec. Hym. i. pp. 572 & 574. For the latter, *cf.* also Ann. Soc. Ent. Fr. (6) i. p. 349.

Inculia, Cam. Palpi in this and allied genera noticed ; Cameron, Tr. E. Soc. 1881, p. 563.

Hylotoma rosæ. Young larvæ devoured by larvæ of *Hemerobius* ; Lucas, Bull. Soc. Ent. Fr. (6) i. p. xxxi. Parthenogenesis ; Ent. Nachr. vii. pp. 288–294. Variety ; André, Ann. Soc. Ent. Fr. (6) i. p. 349. *H. interstialis*, Cameron, figured by Waterhouse, Aid, i. pl. lxxxi.

Lophyrus abietis, Harr. Larva described ; Packard, Ins. Inj. Trees, pp. 236, 255 & 257. *L. pini-rigida*, Nort., redescribed, it is largely destroyed by the Red Cross-bill ; *id. l. c.* pp. 399 & 400.

Nematus gallarum, Hart. (= *viminalis*, Linn.), and *vallisnierii*, Hart. : notes on galls and parasites ; Rudow, Ent. Nachr. vii. pp. 78 & 79. *N. erichsoni*, Hart., recorded as new to North America ; Hagen, Canad. Ent. xiii. p. 37. *N.* (*Crœsus*) *septentrionalis*, Linn., larva destructive to hazel ; Fitch, Ent. xiv. pp. 188 & 216.

Diphadnus fuscicornis, Hart., discussed, it is very similar to *Nematus*

appendiculatus, Hart., with which *peletieri*, André (= *pallipes*, Lep.), is synonymous; Stein, Ent. Nachr. vii. pp. 63–65.

Blennocampa melanopygia, Costa. Habits and transformations described; Failla Tedaldi, Nat. Sicil. i. pp. 57–62, and André, Ann. Soc. Ent. (6) i. pp. 444–448, pl. xiii. No. 2.

Selandria vollenhoveni, Gribodo, redescribed by him; Bull. Ent. Ital. xiii. p. 50.

Phyllotoma aceris, Kalt. Transformations: Ritsema, Tijdschr. Ent. xxiv. pp. xvi. & xvii.

Emphytus togatus, Panz., = *succinctus*, Klug, and is quite distinct from *togata*, Fabr. (= *neglectus*, Zadd., = *cingulatus*, Lep.); Cameron, Tr. E. Soc. 1881, pp. 564 & 565. *E. succinctus*, var. *steini*, from Thuringia, described; Schmiedeknecht, Ent. Nachr. vii. p. 215.

Dolerus gessneri, André, new to Britain, recorded from Scotland; Cameron, Tr. E. Soc. 1881, p. 574. *D. palustris*, Kluz: larva feeding on *Equisetum limosum*; Fitch, P. E. Soc. 1881, p. xxii., and described, *id.* Ent. xiv. pp. 163 & 164. *D. arvensis*, Say, = *unicolor*, Beauv., ♀; Riley, Am. Nat. xv. p. 574.

Allantus viduus, Rossi. Variety from Syria described; André, Ann. Soc. Ent. Fr. (6) i. p. 355.

Tenthredopsis, Costa. Cameron enumerates and tabulates 21 British species, and describes several as new; Tr. E. Soc. 1881, pp. 566–576. *T. dorsatus*, Spin., noticed; *l. c.* p. 573. *T. nassata* with a supernumerary antenna of three joints rising from the right antenna; Jacobs, CR. Ent. Belg. xxv. pp. xcvi. & xcvii. fig.

Cephus and allied genera tabulated; Gradl, Ent. Nachr. vii. pp. 295 & 296. *C. leskii*, Lep. (?), noticed; Gribodo, Bull. Ent. Ital. xiii. p. 53.

New genera and species:—

Nematoneura, André, Spec. Hym. i. p. 576. Head, thorax, and legs as in *Schizocera* (♀); fore-wings with one radial appendiculate cell, and four cubital cells, the second receiving both recurrent nervures; lanceolate cell contracted. Type, *N. violaceipennis*, sp. n., *l. c.* p. 577, Caucasus.

Parastatis, Kirby, Ent. M. M. xviii. p. 107. Allied to *Tenthredo*; antennæ 8-jointed, joints 5–8, forming a club gradually tapering at each end; type, *P. indica*, sp. n., *l. c.*, Waterhouse, Aid, i. pl. lxviii., India.

Cephosoma, Gradl, Ent. Nachr. vii. p. 294. Allied to *Macrocephus*; type, *C. syringæ*, sp. n., *l. c.* p. 296, Egerland.

Schizoceras zaddachi, Dewitz, B. E. Z. xxv. p. 207, pl. v. figs. 12 & 12a, Porto Rico [= *krugi*, Cress.].

Amasis similis, Mocsáry, Term. füzetek, iv. p. 267, and André, Ann. Soc. Ent. Fr. (6) i. p. 346, Beyrut.

Hylotoma versicolor, André, Ann. Soc. Ent. Fr. (6) i. p. 438, Tashkend; *H. proxima*, id. *l. c.* p. 347; *H. syriaca* (cf. also André, *l. c.* p. 349) and *scita* (cf. André, *l. c.* p. 348), Mocsáry, Term. füzetek, iv. p. 267; *H. flavo-mixta* and *proxima* (l. c. p. 47), André, Spec. Hym. i. pp. 574 & 576, Syria.

Monoctenus andrai, Mocsáry, Term. füzetek, iv. p. 267, Brussa (? = *juniperi*, Linn.; André, Ann. Soc. Ent. Fr. 6, i. p. 350).

Nematus scoticus, Cameron, Tr. E. Soc. 1881, p. 563, Braemar ; *N. smaragdinus* and *nebulosus*, Stein, Ent. Nachr. vii. pp. 60 & 62, Chodau ; *N. superbus*, Gradl, *op. cit.* p. 299, Egerland ; *N. similaris*, Norton, Comstock's Rep. Dep. Agric. 1879, p. 224, pl. iv. fig. 1, United States.

Dineura grandis, André, Ann. Soc. Ent. Fr. (6) i. p. 437, East Siberia.

Blennocampa lugens, p. 583, *strigata*, Beyrut, *scutellaris*, South France, p. 584, and *coronata*, Marseilles, p. 585, André, Spec. Hym. i. (*B. strigata* and *lugens*, cf. also Ann. Soc. Ent. Fr. 6, i. pp. 352 & 353) ; *B. sanguinicollis*, Mocsáry, Term. füzetek, iv. p. 268, Budapest.

Monophadnus japonicus, id. *ibid.*, Nagasaki.

Holopyga imperialis, Gradl, *l. c.* p. 300, Egerland.

Monostegia antipoda, Kirby, Tr. E. Soc. 1881, p. 50, New Zealand.

Phyllotoma nigrescens, Gradl, *l. c.* p. 298, Egerland.

Emphytus tegulatus (Ann. Soc. Ent. Fr. 6, i. p. 351), Beyrut, and *barbarus*, Algeria, André, Spec. Hym. i. pp. 578 & 580 ; *E. albisternus*, id. Ann. Soc. Ent. Fr. (6) i. p. 439, Amur ; *E. zonarius*, Persia, and *ruficrus* (= *nigritarsis*, Brullé, ♂, *sec.* André, *l. c.* p. 351), Beyrut, Mocsáry, Term. füzetek, iv. p. 268.

Strongylogaster viridis, Schmiedeknecht, Ent. Nachr. vii. pp. 214 & 228, Thuringia.

Dolerus tinctipennis, *megapterus*, p. 574, and *intermedius*, p. 575, Cameron, Tr. E. Soc. 1881, Britain. *D. scoticus*, id. Ent. M. M. xvii. p. 206, Braemar. *D. rufipes*, Gradl, *l. c.* p. 297, Egerland. *D. hispanicus*, Mocsáry, *l. c.* v. p. 29, and André, Spec. Hym. i. p. 580, Granada. *D. fulvinotus*, id. Ann. Soc. Ent. Fr. (6) i. p. 439, Tashkend.

Sciapteryx nigriventris, id. *l. c.* p. 441, Tashkend ; *S. levantina*, id. Spec. Hym. i. p. 419, Syria.

Allantus violaceus, South Russia, Caucasus, p. 373, *rufo-niger*, Algeria, p. 374, *semirufus*, p. 375, *hispanicus*, *varicarpus*, Spain, p. 378, *ornatus*, p. 382, *pubescens*, Caucasus, p. 383, *syriacus*, Algeria, Syria, Caucasus, p. 386, *trivittatus*, Caucasus, p. 392, *caspius*, Astrakhan, p. 400, *analis*, p. 403, and *ouralensis*, Siberia, p. 405, *id. l. c.* *A. pictus*, *nazareensis*, *abeillii*, *calcaratus*, pp. 592–595, Syria, *id. l. c.*, and Ann. Soc. Ent. Fr. (6) i. pp. 355–357. *A. persicus*, Teheran, and *tuberculatus*, Tashkend, *id. l. c.* pp. 440 & 441. *A. fulviventris*, Malaga, *sabariensis*, Hungary, p. 269, *similis*, Persia, p. 270, *caucasicus*, Caucasus, *obesus*, Bulgaria, *albiventris*, Caucasus, p. 271, Mocsáry, *op. cit.* iv.

Macrophya brunnipes, *tristis*, Siberia, p. 349, *caucasica*, p. 357, *limbata*, Caucasus, p. 360, *dibowskii*, Siberia, p. 361, *radoszkowskii*, p. 365, *nebulosa*, Caucasus, p. 369, *rubripes*, Greece, p. 590, André, Spec. Hym. i. *M. ottomana*, Amasia, p. 29, *tricoloripes*, Granada, *albimacula*, p. 30, *cognata*, Hungary, p. 31, *consobrina*, Syria, *marginata*, Dalmatia, p. 32, *tenella*, *tibialis*, Hungary, p. 33, *lineata*, Syria, p. 34, Mocsáry, *op. cit.* v. *M. consobrina* and *lineata*, redescribed by André, Ann. Soc. Ent. Fr. (6) i. pp. 353 & 354.

Lachyprotasis formosa, Schmiedeknecht, *l. c.* p. 214, Thuringia ; *P. albicincta*, Cameron, Tr. E. Soc. 1881, p. 565, Himalayas.

Synarema bimaculosa, Marquet, Bull. Soc. Toulouse, xiii. p. 137, North France.

Perineura fulvitarsis, South France, p. 418, *lusitanica*, Portugal, p. 424, *moscovita*, Moscow, p. 430, André, Spec. Hym. i.

Tenthredopsis nigro-notatus, p. 556, *nigricollis* (= *scutellaris*, Lep., *nec* Fabr.), *flavo-maculatus*, p. 567, *picticeps*, *lividicentris*, p. 568, *albo-maculatus*, *nigriceps*, p. 569, *saundersi*, *dorsivittatus*, p. 570, and *inornatus*, p. 571, Cameron, *l. c.*, Britain.

Tenthredo amœna (Duf.), Marquet, *l. c.* p. 139, Toulouse. *T. rudowi*, Germany, and *vestita*, Caucasus; André, Spec. Hym. i. pp. 446 & 596. *T. picticornis*, Dobrudsha, *balkana*, Bulgaria, p. 272, *basimacula*, Dalmatia, p. 273, *propinqua*, Syria, *pœcilopus*, Austria, *fallax*, Caucasus, p. 274, Mocsáry, *l. c.* iv.

Tarpa orientalis, Brussa, p. 34, *turcica*, Asia Minor, p. 35, *gratiosa*, Granada, p. 36, *id.* l. c.; *T. caucasica*, Caucasus, and *mocsarii*, Hungary, *id. l. c.* pp. 479 & 481; *T. lamellata*, id. Ann. Soc. Ent. Fr. (6) i. p. 442, Tashkend.

Lyda iridescens, id. *ibid.*, East Siberia.

Cephus fœrsteri, France, Germany, Algeria, p. 526, *infuscatus*, France, p. 530, *libanensis*, Nazareth, p. 544, *nigritarsis*, Tiberias, p. 545, *nigricarpus*, Syria, p. 546, *id.* Spec. Hym. i.

Phyllœcus eburneus, Finland, and *algiricus*, Algeria, *id. l. c.* i. pp. 528 & 542.

LEPIDOPTERA.

BY

W. F. Kirby, M.E.S., &c.

The General Subject.

Ballard, J. P. Insect Lives. How to rear and preserve Butterflies, Moths, &c. Cincinnati: 1880, 12mo, woodcuts.

Breitenbach, W. Beiträge zur Kenntniss des Baues der Schmetterlings Rüssel. Jen. Z. Nat. xv. pp. 151–214, pls. iv.–vi.

A very elaborate paper, including an historical introduction; remarks on the phylogenetic origin of the proboscis of *Lepidoptera*; the transverse striation of the upper surface; the structure of the extremity (the "sapborer," "saftbohrer") in various species; its functions and development; its internal structure; the junction of the two halves; the mechanism of suction, and a list of the most important publications on the subject.

CATTIE, J. S. Beiträge zur Kenntniss der Chorda supra-spinalis der *Lepidoptera* und des centralen, peripherischen und sympathischen Nervensystems der Raupen. Z. wiss. Zool. xxxv. pp. 304–320, pl. xii.

The writer's researches have been directed to the ventral cord and sympathetic nervous system of *Acherontia atropos*, and to the central, peripheral, and sympathetic nervous systems of the larvæ of *Acherontia atropos*, *Sphinx ligustri*, *Harpyia vinula*, and *Cossus ligniperda*. He sums up his principal results as follows:—(1) In *Acherontia*, the vagus-system is composed only of the frontal ganglion and the nervus recurrens. (2) In the larvæ examined, the tracheæ permeate the small lateral sympathetic ganglia of the head, but are never connected with the nerves of the antennæ. (3) The sympathetic nervous system in larvæ is a connected whole. The median nerves, which always rise from a ganglion, are invariably connected immediately with the succeeding ganglion. (4) In the thoracic masses, it is the transverse lateral nerves, and in the abdominal ganglia two slender nervous threads, which form this connection. (5) No ganglia are formed at the points where the median nerves branch.

CRÜGER, C. Ueber exotische Lepidopteren (1877). Verh. Ver. Hamb. iv. pp. 192–198.

Notes on collections of *Lepidoptera* received at Hamburg.

DEWITZ, H. See *Insecta*, General Subject.

DORFMEISTER, G. Ueber den Einfluss der Temperatur bei der Erzeugung der Schmetterlingsvarietäten. MT. Ver. Steirm. 1879, pp. 3–8.

Experiments on *Vanessa atalanta*, *urticæ*, and *levana*, *Arctia villica*, &c.

EDWARDS, W. H. On the length of life of Butterflies. Canad. Ent. xiii. pp. 205–210, and Am. Nat. xv. pp. 868 & 869.

The popular opinion that Butterflies only live a few weeks in the perfect state (except in the case of hibernating species) appears to be in the main correct.

——. On the number of molts of Butterflies, with some history of the Moth *Callosamia promethea*. Psyche, iii. pp. 159–161, 171–174.

The larvæ of Butterflies are constant in the number of moults; and the regular number is four, except in cases of hibernation, and three is a very rare exception. In *C. promethea*, however, the number appears to vary according to the latitude or locality.

GOOSSENS, T. Des Chenilles urticantes, et quelques considérations sur l'utilité des œufs pour la classification. Ann. Soc. Ent. Fr. (6) i. pp. 231–236.

The larvæ of several species of *Liparis* are provided with retractile warts, placed on the ninth and tenth segments, and consisting of a number of small elevations pierced by one or several holes. These discharge a secretion which dries up into a highly irritating dust. In *Cnethocampa* (which the writer refers to the *Notodontidæ*), these glands are less visible, but more numerous, extending over the greater part of the back of the

larva. The observations on the eggs of *Lepidoptera*, which conclude the paper, are merely general, relating to their probable value in classification.

LINTNER, J. A. On the Life-duration of the *Heterocera* (Moths). Canad. Ent. xiii. pp. 217–220.

The average duration of life in the perfect state is about three weeks in the *Noctuidæ*; and it is probably shorter, as a rule, in the *Phalænidæ*, and much shorter in the *Attacidæ*.

MABILLE, P. Notice nécrologique sur A. Guénée. Ann. Soc. Ent. Fr. (6) i. pp. 5–12.

Includes a list of his publications.

MAURICE, C. Des Larves aquatiques dans les différents groupes de Lépidoptères. Bull. Sci. Nord. (2) iv. pp. 115–120.

Relates to *Hydrocampa*, *Cataclysta*, *Parapoynx*, *Palustra*, and *Philampelus*.

MELDOLA, R. The developmental characters of the larvæ of the *Noctuæ* as determining the position of that group. Tr. Epp. Forest, ii. pp. 19–28.

Referring the *Psychidæ* to the *Tineina*, the writer proposes the following classification of the *Noctuæ* and allied groups :—

Bombycidæ (including *Endromidæ* and *Saturniidæ*).
Drepanulidæ.
Pseudo-Bombyces.
Noctuæ.
Trifidæ.
Quadrifidæ.
Geometræ.
Deltoides, &c.

He proposes to place the *Cochliopodidæ* between the *Hepialidæ* and *Nolidæ*.

——. See also WEISMANN.

OBERTHÜR, C. Études d'Entomologie. Faunes Entomologiques. Descriptions d'insectes nouveaux ou peu connus. v. Faune des Lépidoptères de l'île Askold. 1ière partie (Oct., 1880), pp. 88, pls. ix.

297 species of *Macrolepidoptera* enumerated, many new. A critical analysis is given by Butler in Ann. N. H. (5) vii. pp. 228–237. Keferstein gives a list of the species enumerated by Oberthür in S. E. Z. xlii. pp. 381–384.)

——. Études d'Entomologie, &c. 6me Livr. Juillet, 1881, pp. 115, pls. xx. i. Lépidoptères de Chine ; ii. Lépidoptères d'Amérique, & Appendix ; iii. Lépidoptères d'Algérie ; iv. Le genre *Ecpantheria*.

As the author declares his intention of ignoring all descriptions unaccompanied by a good figure, it is to be feared that he has frequently described old species as new.

SCHILDE, J. Noch einige Worte über die Verbreitung der Heteroceren in den Tropen. S. E. Z. xlii. pp. 425–432.

The writer maintains that *Microlepidoptera* are comparatively much less numerous in the Tropics than in temperate climates.

SCUDDER, S. H. Butterflies, their structure, habits, and life-histories, with special reference to American forms; being an application of the Doctrine of Descent to the study of Butterflies. With an Appendix of practical instructions. New York: 1881, 8vo, pp. viii., 322; 200 woodcuts.

The book is divided as follows:—STRUCTURE: Egg; Caterpillar, Chrysalis, Butterfly; Internal Organs of Caterpillars; Transformations of Internal Organs during Growth. LIFE AND RELATIONSHIP: Habits, Seasonal Changes and Histories, Colouring of Butterflies, Diversity of the Sexes in Colouring and Structure, Origin and Development of Ornamentation; Ancestry and Classification; Geographical Distribution; The Colonization of New England. APPENDIX: Instructions for Collecting, Rearing, Preserving, and Stuffing; Systematic List of Butterflies; List of Food-plants of Caterpillars of American Butterflies.

An exceedingly important work, giving a compendium of what is known on the subjects of which it treats, with many illustrations and observations of the author's own. Among these may be noted, the suggestion that the larva eats the egg-shell, lest its presence should be a sign-post to enemies; the notice of the mandible-cases of the pupa; the remarks on the rudimentary eyes in the pupa, and that every chrysalis living through the winter has its head protected by angular prominences; also on the number and position of the spiracles and on dimorphism; the statement that no European Butterfly has more broods than the corresponding American species; the proposal of the name "androconia" for male scales, which are questioned as scent-organs; the observations on formation of ocellate spots, the primeval type of butterfly, and the relationship of families, &c. (For reviews, *cf.* Nature, xxv. pp. 5 & 5, and Am. Nat. xv. pp. 885–887.)

——. Fragments of the coarser anatomy of Diurnal *Lepidoptera*. Psyche, iii. pp. 263–275.

Relates to *Danais plexippus* (larva and pupa), *Polygonia c-album* (larva), *Aglais urticæ* (larva and pupa), and *Hamadryas io* (larva).

WEBB, S. The Phenomena connected with the Emergence of *Lepidoptera* from the Chrysalis. P. Holmesdale Club, 1879–80, pp. 7–17.

WEISMANN, A. Studies in the Theory of Descent. Translated and edited, with notes, by R. Meldola, with notes and additions by the author. Part ii. On the Origin of the Markings of Caterpillars, and on Phyletic Parallelism in Metamorphic Species. London: 1881, 8vo, pp. 555, pls. vi.

Chiefly relates to the larvæ of *Sphingidæ*. The original work is noticed in Zool. Rec. xiv. *Ins.* pp. 119 & 120; the new matter consists chiefly of additional or subsequent observations, many of which are of great interest and importance. The most important original observations (except those of a special character, which will be noticed in their place) are: On the dimorphism or trimorphism of many Butterflies, which has apparently originated through polymorphism from ordinary variability (pp. 250 & 251); on green caterpillars and chlorophyll (pp. 310 & 311); on the origin of dorsal and subdorsal lines in larvæ (pp. 374 & 375, 529–551);

and the ontogeny of larvæ of *Noctuæ* (pp. 520 & 521). F. Müller's paper on *Acræa* and the Maracuja Butterflies is translated (pp. 536–545).

Europe.

GRAEFFE, E. Vergleichung der Papilioniden Fauna der Hochalpen mit derjenigen des Hohen Nordens. Z. Deutsche Öst-Alpenver., 1880, pp. 69–80.

[Not seen by the Recorder.]

LANG, H. C. The Butterflies of Europe, illustrated and described. London: 1881, roy. 8vo. Parts i.–vi. pp. 1–128, pls. i.–xxxii.

A serial work, including descriptions and coloured figures of all the species occurring within the geographical limits of Europe, and also of their larvæ, as far as possible. Most of the allied Palæarctic and even Nearctic forms are referred to, and, in most cases, briefly described, thus rendering the work one of great completeness.

Parts 35–46 of W. F. Kirby's "European Butterflies and Moths," and Parts 23 (No. 2) and 2 parts, No. 24, of S. L. Mosley's "Illustrations of European Butterflies," have appeared within the year.

British Isles.

WHITE, F. B. Some Thoughts on the Distribution of the British Butterflies. Ent. xiv. pp. 265–277.

The writer analyzes the present distribution of the species, and endeavours to account for it in accordance with received geological theories.

WEIR, J. J. Further notes on the *Macro-Lepidoptera* of the Shetland Isles. Ent. xiv. pp. 278–281.

13 species added, raising the list to 38. Notes on the variations observed are also given.

——. Notes on the *Lepidoptera* of the Outer Hebrides. *L. c.* pp. 218–223.

58 species noticed. The fauna bears no resemblance to that of Shetland, and the prevailing colour is grey, especially among the *Geometræ*, thus assimilating with the gneiss rocks. Two well-marked varieties of known species were taken, in addition to a supposed new *Eupithecia*. (*Cf.* also Meek, Ent. xiv. p. 184.)

S. L. Mosley has published Parts ix. and x. of his "Illustrations of Varieties of British *Lepidoptera*," representing varieties of *Smerinthus tiliæ*, *Arctia mendica*, *lubricipeda*, *urticæ*, and *menthastri*, *Vanessa urticæ*, *Polyommatus phlæas*, *Hesperia malvæ*, *sylvanus*, *comma*, and *linea*.

Protective colouring of British Butterflies; J. Innes Rogers & W. C. Ley, Nature, xxiii. pp. 435 & 436, 458.

List of *Lepidoptera* reared in 1880; Machin, Ent. xiv. p. 44. Reared from larvæ collected in the Essex Marshes; *id. l. c* p. 69.

Notes on *Lepidoptera* in 1880; Anderson, Ent. xiv. pp. 182–184.

Scarcity of *Lepidoptera* in Scotland in 1881; Arnold, Sci. Goss. xvii. pp. 242 & 242.

Butterflies of the Perth district (20 species noticed); Ellison, P. Perthshire Soc. i. pp. 5–7.

Catalogue of *Macro-Lepidoptera* of Bristol (*Noctuæ* excepted); Hudd, P. Bristol Soc. ii. pp. 149–174, 383–407.

Cidaria russata, *Vanessa urticæ*, and *Scopula ferrugalis* observed in Pembrokeshire in the first week in December, 1880; Barrett, Ent. M. M. xvii. p. 187.

Captures at Taywell, Argyleshire; Salway, Ent. xiv. pp. 13–16. At Barnwell Wold; Porritt, Ent. M. M. xviii. pp. 38 & 39. Deal; Tugwell, Ent. xiv. pp. 214 & 215. North Devon; Porritt & South, Ent. xiv. pp. 154–156, 202–205. Llandudno; Porritt, Ent. xiv. pp. 215 & 216. New Forest; Piffard, Carrington, South, & Fletcher, Sci. Goss. xvii. pp. 200 & 201, figs. 112–116, Ent. xiv. pp. 112–114, 199–201, Ent. M. M. xvii. pp. 169–171. Norfolk; Wheeler & Barrett, Tr. Norw. Soc. iii. pp. 262–265, Ent. M. M. xviii. pp. 110 & 111. Pembrokeshire; Barrett, Ent. M. M. xviii. p. 70. Roxburghshire; Elliot, Ent. M. M. xvii. pp. 257 & 258. Wicken Fen; Meek, Ent. xiv. pp. 185 & 186. Yorkshire; Barrett, *l. c.* p. 68.

Scandinavia, Denmark, and Livonia.

Haas, A. B. Tillæg til Fortegnelse over de i Danmark levende *Lepidoptera*. Nat. Tidsk. (3) xiii. pp. 169–228.

Additions to former lists, including one new *Tinea*, and a tabular comparison of the Danish Lepidopterous Fauna with that of some of the adjacent countries. 696 *Macro-* and 737 *Micro-Lepidoptera* are now recorded as inhabiting Denmark.

Schøyen, W. M. Nye Bidrag til Kundskaben om det arktiske Norges Lepidopterfauna. Tromsø Mus. Aarsh. iv. pp. 71–100.

New localities for polar insects, with occasional notes.

Notes on various Swedish *Lepidoptera* (*Sphinges* and *Bombyces*); Thesenius, Ent. Tidskr. ii. pp. 104–108 & 118.

Notes on Livonian *Lepidoptera*; Sintenis & Zander, SB. Ges. Dorp. v. pp. 289, 290, 316–332.

France and Belgium.

Berce, E. Faune Entomologique Française. Descriptions de tous les Papillons qui se trouvent en France, indiquant l'époque de l'éclosion de chaque espèce, les localités qu'elle fréquente, la plante qui nourrit la chenille, le moment ou il convient de la chasser. VI. Hétérocères: Deltoides, Pyralites. Paris: 1878 [?], 12mo, pp. iv. & 397, pls. & E 1–9.

Includes the *Crambidæ* as well as the *Pyralidæ*, and additions and corrections to previous volumes. Many of the rarest species recently described by Millière and others are here redescribed and figured by T. Deyrolle; but no actually new species are described.

Laubus, J. F. Faune lépidoptérologique de l'Arrondissement de St. Quentin. Fasc. 2, pp. 41–108. St. Quentin: 1881, 8vo.

Millière, P. Lépidoptérologie, 7 fascicules. Cannes: 1881, 8vo. Portrait i. (from Mém. Soc. Cannes, 1875), pp. 16, pls. ii.; ii. (from

Ann. Ent. Belg. xx.) pp. 14 and plate; iii. (from Mém. Soc. Cannes, vii. 1878) pp. 24, pls. iii. & iv.; iv. (from Ann. Soc. L. Lyon, xxv.) pp. 14, plate; v.–vii. (from Mém. Soc. Cannes, 1879–81) pp. 31, 20, & 22, pls. v.–x.

Fasc. ii. & iv. have already been noticed in Zool. Rec.; the contents of the remainder will be given from the reprints here mentioned, as the Recorder has not been able to consult the original papers.

Calendar of larvæ for June; De Lafitole, Le Nat. iii. p. 411.

Additions to the *Lepidoptera* of the Lower Seine; Lhotte and others, Bull. Soc. Rouen (2) xv. pp. 117–132, xvi. pp. 137–156.

Parts 118–125 of Dubois's Lépidoptères de la Belgique have appeared in 1881.

Captures of *Lepidoptera* in Belgium; Lallemand, CR. Ent. Belg. xxv. pp. x.–xii.

De Graaf, H. W., & Snellen, P. C. T. Microlepidoptera nieuw voor de Fauna van Nederland. Laatste Verfolg. Tijdschr. Ent. xxiv. pp. 109–114.

Additions to former lists.

Germany.

Fuchs, A. Microlepidopteren des Rheingaues. S. E. Z. xlii. pp. 451–470.

Includes notices of more or less importance on the following known species:—*Margarodes unionalis*, Hübn., *Crambus pratellus*, Clerck, var. *alfacarellus*, Staud., *Teras quercinana*, Zell., *Tortrix bifasciana*, Hübn., *Penthina lucivagana*, Zell., and var. *rupestrana*, Dup., *Grapholitha fuchsiana*, Rössl., *Steganoptycha neglectana*, Dup., *rufimitrana*, Herr.-Schäff., *Lampronia luzella*, Hübn., *Nemophora pilella*, W. V., *Tichobia verhuellella*, Staint., *Acrolepia granitella*, Treitschke, *Hyponomeuta stanniella*, Thunb., *Bryotropha decrepitella*, Herr.-Schäff., and var. *lutescens*, Const., *Lita kiningerella*, Herr.-Schäff., *leucomelanella*, Zell., *Psecaphora* (*Chrysoclista*) *schranckella*, Hübn., *Butalis fallacella*, Schleich., *schneideri*, Zell., *tabidella*, Herr.-Schäff., and var. *ericetella*, Snell., *Augasma* (*Asychna*) *æratellum*, Zell., *Coleophora badiipennella*, Dup., *linosyridella*, Fuchs (= *troglodytella*, Dup.), *dianthi*, Herr.-Schäff., and *asteris*, Mühl.

Hering, —. Die Pommerschen Rhopaloceren, Sphingiden, Bombyciden, und Noctuinen. S. E. Z. xlii. pp. 133–140, 147–154, 333–367.

Includes notes on the more remarkable species, by Hering & Schulz.

Rössler, A. Die Schuppenflügler (Lepidopteren) des kgl. Regierungsbezirks Wiesbaden und ihre Entwicklungsgeschichte. JB. nass. Ver. xxxiii. & xxxiv. pp. 1–393.

2221 species enumerated.

Sorhagen, L. Aus meinem entomologischen Tagebuche. B. E. Z. xxv. pp. 17–40.

Includes short notes on 41 *Lepidoptera*, chiefly *Tortrices* and *Tineæ*.

STANGE, G. Lepidopterologische Bemerkungen. S. E. Z. xlii. pp. 113–118.

Unimportant notes on 15 species.

SCHMIDT, F. Uebersicht der in Mecklenburg beobachteten Makrolepidopteren. Arch. Ver. Mecklenb. xxxiii. pp. 1–198.

Compare also List of *Macro-Lepidoptera* of Mecklenburg (795 species out of 1436 occurring in Germany and Switzerland); *id. op. cit.* xxxiv. pp. i.–xxviii. The remarks on each species are lengthy, but chiefly of local interest.

Supplementary list of *Lepidoptera* of Berlin; Pfützner, B. E. Z. xxv. p. 298.

List of *Lepidoptera* in the collection of the Natural History Society of Fulda (those found in the district being indicated); Bauer, Ber. Ver. Naturk. Fulda, vi. pp. 15–28.

Additions, corrections, and notes to the list of *Lepidoptera* of Osnabrück; JB. Osnabrück Ver. iv. pp. 39–45.

On the appearance of *Vanessa cardui*, *Plusia gamma*, *Colias edusa*, and other *Lepidoptera*, in the summer of 1879; Speier, Ent. Nachr. vii. pp. 145–152, 157–162.

Captures in the Island of Borkum; König, Abh. Ver. Brem. vii. pp. 129–132. In the Bavarian Fichtelgebirge; Ent. Nachr. vii. pp. 274–277. At Kissingen; Maassen, S. E. Z. xlii. pp. 94–96.

Austria and Switzerland.

FREY, H. Nachträge zur Lepidopteren Fauna der Schweiz. MT. schw. ent. Ges. vi. pp. 143–147.

Supplementary notes to Frey's work, including descriptions of 2 new *Tineina*.

HELLER, C. Die alpinen Lepidopteren Tirols. Ber. Ver. Innsbrück, xi. pp. 60–162.

A local list (1130 species) chiefly interesting as a contribution to Geophical Distribution.

HÖFNER, G. Die Schmetterlinge des Lavantthales und der beiden Alpen, "Kur- und Saualpe." Fortsetzung & i. Nachtrag. JB. Mus. Karnten, xiii. pp. 113–147, xiv. pp. 259–266.

Includes *Micro-Lepidoptera*, and a supplement to the *Macro-Lepidoptera*.

KILLIAS, E. Beiträge zu einem Verzeichnisse der Insectenfauna Graubündens. ii. Verzeichniss der Bündner Lepidopteren. JB. Ges. Graub. xxiii. & xxiv. pp. 1–224.

835 *Macro-* and 1535 *Micro-Lepidoptera* enumerated. A table of their vertical elevation is added.

[illegible]LER, J. Die Schmetterlinge des Tauferer Thales, ein Beitrag zur Lepidopterenkunde von Tirol. Progr. Ober-Realschule in Innsbrück, 1879–80.

Captures in the Canton de Vaud; Rubattel, Feuill. Nat. xi. pp. 74 & p. 5. In the Valais; Jordan, Ent. M. M. xvii. pp. 267–270.

Additions to the *Lepidoptera* of the Stilfser Joch ; Wocke, JB. schles. Ges. lviii. pp. 198–205.

Italy and Sicily.

Fiori, A. Contribuzione allo studio dei Lepidotteri del Modenese e del Reggiano. Bull. ent. Ital. xiii. pp. 132–144.

Includes *Geometridæ*, and additions to earlier groups.

Captures of *Lepidoptera* in Sicily, during May, 1881 ; Gianelli, Nat. Sicil. i. pp. 33–36.

Portugal.

Staudinger, O. Notes on the Entomology of Portugal. III. *Lepidoptera.* Ent. M. M. xvii. pp. 181–184.

A list of 44 *Rhopalocera* and 26 *Heterocera* (chiefly *Geometridæ*) collected by A. E. Eaton.

Ragonot, E. L. Notes on the Entomology of Portugal. IV. *Lepidoptera* (continued), *Micro-Lepidoptera* (except *Tineina*) collected by A. E. Eaton in 1880, with descriptions of new species. *Tom. cit.* pp. 229–233.

Turkey.

Notes on *Lepidoptera* observed in the neighbourhood of Gallipoli in 1878 ; G. F. Mathew, Ent. M. M. xviii. pp. 10–13, 29–32, & 92–100.

Asia.

Biggs, L. C. Butterflies in Malaya. Monthly Packet, ii. pp. 186–192.

A popular article.

Butler, A. G. Illustrations of typical specimens of *Lepidoptera Heterocera* in the Collection of the British Museum. Part v. London : 1881, pp. xii.–74, pls. lxxviii.–c.

Includes Indian *Sphinges* and *Bombyces*.

——. On a collection of *Lepidoptera* from Western India, Beloochistan, and Afghanistan. P. Z. S. 1881, pp. 602–624.

103 species enumerated, collected by C. Swinhoe. A few species are described as new ; the remarks on known species chiefly relate to localities and dates of appearance.

——. On Butterflies from Japan, with which are incorporated notes, and descriptions of new species by M. Fenton. *L. c.* pp. 846–856.

Includes a list of 74 species observed in Hokkaido (Yesso), in July and August ; the remarks on known species are unimportant, except that *Chrysophanus phlæas* and *Gonepteryx rhamni* have been erroneously reputed Japanese.

——. Descriptions of new Genera and Species of Heterocerous *Lepidoptera* from Japan. Tr. E. Soc. 1881, pp. 1-23, 171-200, 401–426, 579–600.

CHRISTOPH, H. Neue Lepidopteren des Amurgebietes. Bull. Mosc. lv. 2, pp. 33–121; lvi. 1, pp. 1–80.

111 new species (*Geometridæ* to *Tortricidæ*), chiefly from Vladivostok, are described. A short account of the character of the country, vegetation, &c., is prefixed.

ELWES, H. J. On the Butterflies of Amurland, North China, and Japan. P. Z. S. 1881, pp. 856–916.

Includes list of publications, geographical remarks, analysis of the distribution of species, table of geographical distribution of butterflies in North-eastern Asia, and short observations (too numerous to be noticed in detail), on a great number of species.

FENTON, M. See BUTLER, A. G.

GRAESER, L. Beitrag zur Kenntniss der Schmetterlingsfauna von Wladiwostok. Verh. Ver. Hamb. iv. pp. 199–209.

210 species enumerated, of which 140 belong to the strictly European fauna.

MOORE, F. The *Lepidoptera* of Ceylon. Parts ii.–iv. pp. xii. 41–190, pls. xxix.–lxxi.

Completes the first volume, and the Butterflies.

STAUDINGER, O. Beitrag zur Lepidopteren-Fauna Central-Asiens. S. E. Z. xlii. pp. 253–300 & 393–424.

A list of the species obtained by J. Haberhauer and his son, in various localities. The portion published in 1881 extends to the genus *Agrotis*.

WOOD-MASON, J., & NICÉVILLE, L. DE. Second List of Rhopalocerous *Lepidoptera* from Fort Blair, Andaman Islands; with descriptions of, and Notes on, new and little-known Species and Varieties. P. A. S. B. 1881, pp. 142 & 143; J. A. S. B. l. pt. 2, pp. 243–262, pl. xiv.

133 species mentioned.

Elwes criticises Butler's writings on *Colias* and other Butterflies; and remarks on the localities of East Indian Butterflies. Ann. N. H. (5) vii. pp. 464–469.

East Indian Butterflies attacked by the larvæ of *Diptera*; Rössler, S. E. Z. xlii. pp. 189 & 190.

Notes on collecting *Lepidoptera* in the Western Caucasus; Christoph, S. E. Z. xlii. pp. 157–166.

Captures of *Lepidoptera* at Tiflis, &c.; *id.* Bull. Mosc. lv. 2, pp. 398–402.

118 Butterflies enumerated from Nikko; Butler, Ann. N. H. (5) vii. pp. 132 & 133.

Notes on British Butterflies in Japan; Lewis, Ent. M. M. xvii. pp. 209 & 210.

List of Butt[illegible] Sikkim in October, 1880, with notes on habits &c.; Do- [illegible] S. B. l. pt. 2, pp. 49–60.

List of Butt[illegible] from Travancore; Wood-Mason, *tom. cit.* p. 86.

List of Diurnal *Lepidoptera* inhabiting the Nicobar Islands (64 species, some new); Wood-Mason & De Nicéville, J. A. S. B. l. pp. 224–238.

List of 231 Butterflies of Sumatra; Henley Grose Smith, in Bock's "Head Hunters of Borneo," App. v. (pp. 336 & 337).

Africa and Socotra.

Aurivillius, C. Om en Samling Fjärilar från Gaboon. Ent. Tidskr. ii. pp. 38–47.

Includes lists of *Rhopalocera*, *Sphingidæ* and *Zygænidæ*, with notes on variation, &c., and descriptions of a few new genera and species.

Butler, A. G. On the *Lepidoptera* collected in Socotra by J. B. Balfour. P. Z. S. 1881, pp. 175–180, pl. xviii.

13 species enumerated, 7 new.

Dewitz, H. Afrikanische Nachtschmetterlinge. Verh. L.-C. Ak. xlii. pp. 63–91, pls. ii. & iii.

Includes descriptions of new African species, chiefly from Chinchoxo and the Cape. A list of the known species obtained in the former locality is also added.

Gooch, W. D. Notes on the *Lepidoptera* of Natal. Ent. xiv. pp. 1–7, & 35–40.

Notes on habits and transformations of Butterflies: *Acræidæ* to *Hesperiidæ*. (See also on collecting Butterflies in Natal, *id. l. c.* pp. 61–66, 100–105, & 124–129.)

Walsingham [Lord]. On the *Tortricidæ*, *Tineidæ*, and *Pterophoridæ* of South Africa. Tr. E. Soc. 1881, pp. 219–288, pls. x.–xiii.

Includes a complete list of described species, with synonymic notes, &c., and descriptions of many new genera and species.

Caterpillars in South Africa; Oates's "Matabele Land," p. 96.

North America.

Butler, A. G. Notes on some North American *Lepidoptera*. Papilio, i. pp. 103–106, 128–132, 168–171, & 220–223.

Relates to various *Sphingidæ*, *Bombyces*, *Noctuæ*, and *Geometridæ*.

——. An account of the Sphinges and Bombyces collected by Lord Walsingham in North America, during the years 1871–72. Ann. N. H. (5) viii. pp. 306–318.

Notes on 36 species, some new, chiefly from California and Oregon.

Lintner, J. A. *Lepidoptera* of the Adirondack Region. Albany: 1880, 8vo, 26 pp.

Weir, J. J. Notes on the *Lepidoptera Rhopalocera* of Hudson's Bay. Ent. xiv. pp. 97–100.

17 species: 10 genera noticed; all the genera but 1 British; 3 British species, 8 closely allied to British species; 4 have European al- represents an American type of an European genus, and 1 is of American genus.

Lepid. v. 91–426,

Synoptic tables of the North American species of the following genera are given in Bull. Brooklyn Soc. i.–iv., with occasional woodcuts: *Papilio, Parnassius, Pieris, Anthocharis, Callidryas, Cricogonia, Colias, Nathalis, Terias, Heliconius, Danais, Colænis, Agraulis, Argynnis, Euptoieta, Melitæa.*

Check List of North American *Macro-Lepidoptera*; Bull. Brooklyn Soc. iv., App. pp. iv. 25. 3204 species are enumerated to the end of the *Geometridæ*.

Notices of Butterflies from Gosse's "Canadian Naturalist," and "Letters from Alabama"; Scudder, Psyche, iii. pp. 245–247.

Short notes on various American *Lepidoptera*; Riley, Am. Nat. xv. pp. 751 & 752. (from Bull. U. S. Ent. Comm. vi.)

List of Butterflies found at Potsdam, New York; Canad. Ent. xiii p. 40.

Pinus insignis, Dougl., covered with butterflies in California; Buch, Am. Nat. xv. p. 572.

South America.

Butler, A. G. List of Butterflies collected in Chili by T. Edmonds. Tr. E. Soc. 1881, pp. 449–486, pl. xxi.

70 species enumerated, many new. Remarks by Butler and Edmonds are appended to most of the species.

Capronnier, J. B. Note sur les époques d'apparition des Lépidoptères diurnes de l'Amérique du Sud. Ann. Ent. Belg. xxv. pp. 94–105.

105 species noticed, 2 new. Remarks on the localities of the species are added; CR. Ent. Belg. xxv. pp. cxxiv. & cxxv.

Kirby, W. F. Notes on new or interesting species of *Papilionidæ* and *Pieridæ*, collected by C. Buckley in Eastern Ecuador. Tr. E. Soc. 1881, pp. 351–358.

23 species noticed, 6 new.

Godman, F. Ducane, & Salvin, O. Biologia Centrali-Americana (*cf. Insecta*, General Subject), *Rhopalocera*, pp. 89–168, pls. ix.–xviii. Extends from *Euptychia* to *Colænis*.

Gundlach, J. An Annotated Catalogue of the Diurnal *Lepidoptera* of the Island of Cuba. (Based on Kirby's Synonymic Catalogue). Papilio, i. pp. 111–125.

Contains a number of short synonymic notes, and observations on doubtful Cuban species.

Möschler, H. B. Beiträge zur Schmetterlings-Fauna von Surinam. iv. Verh. z.-b. Wien, xxxi. pp. 393–442, pls. xvii. & xviii.

Includes *Geometridæ* and *Pyralidæ* (many new).

Butterflies on the Rio Maués (a tributory of the Amazons); Ent. Nachr. vii. pp. 49 & 50.

Australasia.

habit.

List on 3 Lepidopterous galls in Australia (*Tortrix*, sp. *Pyralis ægusa*- p. 86. and the third undetermined); Meyrick, Ent. M. M. xvii. p. 185.

P. Buller (Tr. N. Z. Inst. xiii. pp. 237-239) remarks on the habits of the following New Zealand species [under English names!] : The Bronze-wing Moth (*Plusia eriosoma*), the Magpie Moth (*Nyctemera annulata*), the Dwarf Magpie Moth, the Rare Tiger Moth (*Fidonia* (?) *crephosata*), the Common Tiger Moth, and the Common Grass Moth.

Guide to Nature-printing Butterflies and Moths [Anon.] ; containing specimens illustrative of the process. London : 1880, 8vo.

Caterpillars stopping a train in New Zealand ; Colonies and India, quoted in Ent. xiv. p. 118.

List of Butterflies of the New Hebrides ; Schmeltz, Verh. Ver. Hamb. iv. pp. 85–89.

Miscellaneous Observations.

Analysis of the Hewitson Collection of Diurnal *Lepidoptera* ; Crüger, B. E. Z. xxv. pp. 105–118.

Entomology at the Westminster Aquarium (*Lepidoptera*) ; South & Carrington, Ent. xiv. pp. 234–236 & 264.

Exhibitions of *Lepidoptera* at the Haggerstone Entomological Society ; Carrington, Ent. xiv. pp. 262–264.

W. F. Kirby has published one instalment of his "Introductory Papers on *Lepidoptera* ; *Nymphalidæ—Nymphalinæ*" (continued) ; Ent. xiv. pp. 174–176.

General scarcity of Lepidopterous larvæ in the tropics, contrasted with their abundance in new clearings ; Pryer, Ent. M. M. xvii. pp. 243 & 244.

On the distribution of *Heterocera* in the Tropics ; Petersen, S. E. Z. xlii. pp. 245-252.

Melanism in *Melitæa phœbe, Argynnis selene, dia, aglaia, Erebia ligea, Lasiocampa*, var. *lobulina*, and *Harpyia bifida* ; albinism in *Polyommatus virgaureæ, Melitæa dictynna, Argynnis euphrosyne, hecate*, and *Epinephile janira* ; Naacke, JB. schles. Ges lviii. pp. 196 & 197.

On the relations between food and variation in *Lepidoptera* ; Ralfe & others, Ent. xiv. pp. 204, 260 & 261.

Short notes on the broods of *Saturnia pavonia* (*carpini*, W.V.), *Lycæna argiolus, Dasychira pudibunda, Papilio machaon*, and the common species of *Vanessa* ; Reichenau, Ent. Nachr. vii. pp. 323–326.

Hibernation of *Lepidoptera* in caves ; Trouessart, Feuill. Nat. xi. p. 127. [*Cf.* also Olivier, *tom. cit.* pp. 165 & 166.]

Lepidoptera infested by mites ; Haller, MT. schw. ent. Ges. vi. pp. 152–154.

List of Hymenopterous parasites on *Lepidoptera*, with notices of hosts ; Fitch, Ent. xiv. pp. 138–143.

Moths attracted by the electric light ; Mera & others, Ent. xiv. pp. 140, 141, & 182.

Forcing pupæ ; Pritchard, Ent. xiv. pp. 86 & 87.

Hints on the rearing of *Lepidoptera* ; Hulst, Bull. Brooklyn Soc. ii. pp. 63–73.

Lepidopterous larvæ devoured by the larvæ of *Hemerobius*; Constant, Bull. Soc. Ent. Fr. (6) i. pp. xxi.–xxiii.

On killing larvæ, required for preserving, with cyanide; Von Kirschberg, Ent. Monatsbl. ii. p. 64.

On collecting eggs of *Lepidoptera*; Hulst, Bull. Brooklyn Soc. iv. pp. 13 & 14.

On pinning and setting *Lepidoptera*; Martini, Ent. Nachr. vii. p. 144.

Earwigs injurious to *Lepidoptera* on the setting-board; Dobson, Ent. xiv. p. 240.

Papilionidæ.

The following known species are redescribed and generally figured, often with transformations, by Moore (Lep. Ceyl. i.): *Pathysa antiphates*, Cram., pl. lxiii. figs. 1 & 1*a*, *nomius*, pl. lxii. fig. 2, p. 142, *Zetides telephus*, Feld., pl. lxiii. fig. 3, p. 144, *doson*, Feld., pl. lxi. fig. 3, *agamemnon*, Linn., pl. lxiii. figs. 2 & 2*a*, p. 145, *Orpheides erithonius*, Cram., pl. lxi. figs. 2*a*, *b*, p. 147, *Laertias romulus*, Cram., pl. lix. figs. 1*a–c*, p. 150, *Menelaides hector*, Linn., fig. 2, *iophon*, Gray, fig. 1, pl. lviii. p. 153, *Ornithoptera darsius*, Gray, pl. lv. figs. 1*a*, *b*, p. 155.

Ornithoptera pompius, Cram., *Papilio mayo*, Atk. (♀ = *charicles*, Hew.), *rhodifer*, Butl, ♀, *clytia*, Linn., var. *flavo-limbatus* (figured, pl. xiv. figs. 1 & 2), *læstrygonum*, Wood-Mason, and *prexaspes*, Feld., ♀, from the Andaman Islands, discussed; Wood-Mason & Nicéville, J. A. S. B. l. pt. 2, pp. 252–254.

Papilio enterpinus, Salv. & Godm., ♀ noticed; *P. lacydes*, Hew. (= *P. erithalion*, ab. *equestris*, Oberth.) supposed ♂ described; *P. chinsiades*, Westw., *drucii*, Butl., *cutora*, Gray, *xeniades*, Hew., and *isidorus*, Doubl., variation noticed: Kirby, Tr. E. Soc. 1881, pp. 351–354.

Calinaga buddha, Moore, discussed and figured by Oberthür; *C. davidis*, Oberth., is hardly distinct; the genus appears to be intermediate between *Leuconea* and *Parnassius*: Études d'Ent. vi. pp. 11 & 12, pl. viii fig. 6.

Parnassius intermedius, Mén., *clarius*, Eversm., *discobolus*, Alph., var. *minor*, *corybas*, Fisch., *actius* and *delphius*, Ev., discussed; Staudinger, S. E. Z. xlii. pp. 256–259 & 275–279. *P. stubbendorfi*, Mén., is perhaps not truly distinct from *mnemosyne*; Graeser, Verh. Ver. Hamb. iv. p. 201.

Euryades corethrus, Boisd., and *duponcheli*, Luc., discussed, chiefly with reference to Burmeister's observations; Lucas, Ann. Soc. Ent. Fr. (6) i. pp. 218–230.

Thais cerisii, Boisd., larva described; Mathew, Ent. M. M. xviii. pp. 29 & 30. *T. rumina*, L., fig. 1, p. 1, and *polyxena*, varr. *cassandra*, Hübn., fig. 2, and *polymnia*, Mill., figs. 3–5, p. 2, noticed and figured; Millière, Lépidoptérologie, vii. pl. x.

Luehdorfia puziloi, Ersch., noticed and figured; Oberthür, *l. c.* v. p. 12, pl. v. fig. 3.

Ornithoptera brookeana, Wall., occurs in Malacca, Sumatra, and Borneo; Distant, Ent. M. M. xvii. p. 237. ♀ described; Gosse, Ent. xiv. pp. 156 & 157.

Papilio machaon, thoas, and *demoleus*, yellow varieties discussed, and *P. demoleus*, yellow var. from West Africa, named var. *nubila*; Capronnier, CR. Ent. Belg. xxv. pp. xlii. & xliii. *P. americus*, Koll, with abnormal neuration; Olliff, P. E. Soc. 1881, p. xxviii. *P. bias*, Rog., transformations described; Edmonds, Tr. E. Soc. 1881, pp. 474 & 475, pl. xxi. fig. 14 (larva). *P. castor* and *pollux*; Westwood regards these as distinct species, in which the sexes resemble each other. *P. dravidarum*, Wood-Mason [= *abrisa*, Kirby], is probably a local variety; P. Z. S. 1881, pp. 479–484. Figures: pl. xliv. figs. 1–3, *P. castor*, ♂; fig. 4, *P. pollux*, ♀, fig. 5, *P. pollux*, hermaphrodite; pl. xlv. figs. 1 & 2, *P. pollux*, local var. *dravidarum* [*abrisa*]. *P. cenea*, Stoll (*P. merope*, auct.): sexes noticed and figured; Trimen, Tr. E. Soc. 1881, pp. 169 & 170, pl. ix. figs. 1 & 2. *P. cresphontes*, Fabr.: transformations described; Comstock, Rep. Dep. Agric. 1880, pp. 246–248, and French, Canad. Ent. xiii. pp. 177–179: noticed and figured; Saunders, Rep. E. Soc. Ont. 1880, pp. 41 & 42, fig. 19. *P. dehaani*, var. (?) *tutanus*, from Yesso, described; Fenton, P. Z. S. 1881, p. 855. *P. dravidarum*, Wood-Mason, description reprinted; Ann. N. H. (5) vii. pp. 64–69. *P. feisthameli*, Dup., ab. *latteri*, Aust., discussed; Oberthür, *l. c.* vi. pp. 45 & 46. *P. laglaizii*, Dep., pupa described; Bull. Soc. Ent. (6) i. pp. cxxviii. & cxxix. *P. latreillianus*, Godt., var. *theorini* from the Gaboon described; Aurivillius, Ent. Tidskr. ii. p. 45. *P. machaon*, ab. *aurantiaca*, De Selys, noticed and figured; Donckier de Donceely; Feuill. Nat. xi. p. 34, pl. i. fig. 1. Dwarf variety from Palermo noticed and figured; Ragusa, Nat. Sicil. i. p. 24, pl. i. fig. 9. *P.* [*lysithous*, Hübn.]?: transformations described and figured; E. D. Jones, P. Liverp. Soc. xxxiv. pp. lxv. & lxvi. pl. i. *P. palamedes*, Dru., transformations described; W. H. Edwards, Canad. Ent. xiii. pp. 119–123. *P. philenor*, Linn., transformations described and figured; *id. l. c.* pp. 9–12; Saunders, *l. c.* pp. 39 & 40, figs. 16–18; Riley, Am. Nat. xv. pp. 327–329.

New genera and species:—

Dalchina, Moore, Lep. Ceyl. i. p. 143; type, *Papilio sarpedon*, Linn. *D. teredon*, Feld., redescribed and figured; *l. c.* pl. lxii. figs. 1*a*, *b*.

Harimala, id. *l. c.* p. 145; type, *Pap. crino*, Fabr. *H. montanus*, Feld., redescribed and figured; *l. c.* p. 146, pl. lxiii. fig. 1.

Charus, id. *l. c.* p. 149; type, *Pap. helenus*, Linn., redescribed and figured; *l. c.* pl. lviii. fig. 3.

Chilasa (*Clytia*, Swains.); type, *Pap. dissimilis*, Linn., redescribed and figured; *l. c.* pl. lvii. figs. 1, *a*, *b*. Add *C. clytioides*, sp. n., *l. c.*, fig. 1, p. 154, Ceylon, and *C. lankeswara*, Moore, redescribed and figured, *l. c.* figs. 2*a*, *b*, pl. lvi.

Druryia, Aurivillius, Ent. Tidskr. ii. p. 44. Section of *Papilio*; type, *P. antimachus*, Dru. (discussed, *l. c.* pp. 41–44).

Parnassius thor, Alaska, and *hermodur*, Southern Colorado; H. Edwards, Papilio, i. pp. 2 & 4.

Iliades parinda, Moore, *l. c.* p. 148, pl. lx. figs. 1*a*, *b*, Ceylon.

Menelaides ceylonica, id. *l. c.* p. 151, pl. lvii. figs. 2, *a*, *b*, Ceylon.

Papilio nicconicolens, tractipennis, spathatus, Nikko, p. 139, *nebulosus*

(probably an aberration of *P. antiphates*, Cram., *sec.* De Nicéville & Elwes, *op. cit.* pp. 385, 386, & 469), fig. 3, Darjiling, and *mariesi*, fig. 4, China, pl. iv. p. 33; Butler, Ann. N. H. (5) vii. *P. pandiyana*, Travancore, and *tamilana*, Malabar Hills; Moore, Tr. E. Soc. 1881, p. 313. *P. mechowi* and *hachii*, Dewitz, B. E. Z. xxv. p. 286, Quango, West Africa. *P. virginia* and *charoba*, Kirby, Tr. E. Soc. 1881, p. 352, East Ecuador. *P. jelskii*, Oberthür, Etudes d'Ent. vi. p. 113, pl. xx. fig. 6, Peru.

PIERIDÆ.

EDWARDS, W. H. On *Pieris bryoniæ*, Ochsenheimer, and its derivative forms in Europe and America. Papilio, i. pp. 83–99, pls. ii. & iii.

The various forms of this insect are fully discussed, and are tabulated as follows:—

EUROPEAN.	AMERICAN.
1. Arctic form, BRYONLÆ, Ochs., pl. ii. fig. 1.	1. Arctic form, BRYONLÆ, Ochs., pl. ii. fig. 4. var. *hulda*, Edw., pl. ii. fig. 5.
2. Winter form, NAPI, Esper, pl. ii. fig. 2.	2. (1) Winter form, VENOSA, Scudd., pl. ii. figs. 6 & 7. *nasturtii*, Boisd. aberr., ♀ *flava*. (2) Winter form, OLERACEA HYEMALIS, Harr., pl. ii. fig. 8. *oleracea*, Boisd. var. A. *borealis*, Grote, pl. ii. fig. 9. „ B. *frigida*, Scudd. aberr., *virginiensis*, Edw.
3. Summer form, NAPÆÆ, Esp. pl. ii. fig. 3.	3. (1) Summer form, ACADICA, pl. iii. figs. 10 & 11. (2) Summer form, *a.* PALLIDA, Scudd., pl. iii. figs. 12 & 13. Summer form, *b.* ♂ CASTORIA, Reak., pl. iii. fig. 14. aberr., *flava*. (3) Summer form, OLERACEA ÆSTIVA, Harr., pl. iii. figs. 15 & 16. *casta*, Kirby. *cruciferarum*, Boisd.
	4. Species (Southern), VIRGINIENSIS, Edw., pl. iii. figs. 17 & 18.

The following known species are described and generally figured by F. Moore (Lep. Ceyl. i.): *Nychitona xiphia*, Fabr., pl. xlvi. figs. 6 & 6*a*, *hecabe*, figs. 1 & 1*a–c*, p. 118, *hecaboides*, Mén., figs. 3 & 3*a*, *b*, pl. xlv. p. 119, *drona*, Horsf., figs. 3 & 3*a*, *cingala*, Moore, figs. 4 & 4*a*, p. 120, *rama*, Moore, figs. 5 & 5*a*, pl. xlvi. p. 121, *Catopsilia catilla*, Cram.,

pl. xlvii. figs. 3 & 3*a*, *erocale*, Cram., figs. 1 & 1*a*, *b*, p. 122, *gnoma*, Fabr., figs. 2 & 2*a*, pl. xlviii. p. 123, *ilea*, Fabr., figs. 1 & 1*a*, *b*, *pyranthe*, Linn., figs. 2 & 2*a*, pl. xlvii. p. 124, *chryseis*, Dru.; pl. xlviii. figs. 3 & 3*a*, *Ixias pirenassa*, Wall., pl. l. figs. 1 & 1*a*, p. 125, *marianne*, Cram., p. 116, *Hebomoia glaucippe*, Linn., figs. 1 & 1*a*, *b*, p. 117, *Callosune eucharis*, Fabr., fig. 4, p. 128, *danae*, Fabr., *sanguinalis*, Butl., *limbata*, Butl., fig. 5, p. 129, *Idmais tripuncta*, Butl., figs. 3 & 3*a*, p. 130, *modesta*, Butl., figs. 2 & 2*a*, pl. xlix., *Catophaga neombo*, Boisd., pl. l. figs. 3*a*, *b*, p. 131, *galene*, Feld., pl. li. figs. 2 & 2*a*, *b*, p. 132, *lankapura*, Moore, pl. l. figs. 4 & 4*a*, pl. li. figs. 1 & 1*a*, p. 133, *Hiposcritia narendra*, Moore, pl. li. figs. 4 & 4*a*, *b*, *Appias libythea*, Fabr., figs. 3 & 3*a*, p. 134, *vocans*, Butl., figs. 2 & 2*a*, *taprobana*, Moore, figs. 1 & 1*a–c*, pl. lii. p. 135, *Belenois taprobana*, Moore, pl. liii. figs. 3 & 3*a*, p. 137, *Nepheronia ceylonica*, Feld., p. 138, *Delias eucharis*, Dru., figs. 1 & 1*a*, *b*, p. 140, and *sita*, fig. 2, pl. liv. p. 141.

Heliochroma leucothea, Mol. (= *gayi*, Blanch.), *Colias vauthieri*, Guér., and *rutilans*, Boisd., *Callidryas drya*, Fabr. (= *amphitrite*, Blanch.), *Tatochila demodice*, Blanch., and *autodice*, Hübn. (= *mercedis*, Esch., = *polydice*, Blanch.), noticed by Butler, Tr. E. Soc. 1881, pp. 469–474.

Dismorphia hyposticta, Feld., ♂ described, *D. ela*, Hew., variation noticed: Kirby, Tr. E. Soc. 1881, pp. 356 & 357.

Terias messalina, Fabr. The following are synonyms: *gnathene* and *bulæa*, Boisd., *arabella*, Hübn., and *iradia*, Poey; Gundlach, Papilio, i. p. 112. *T. nicippe*, Cram., transformations described; W. H. Edwards, Canad. Ent. xiii. pp. 61–63. *T. zoe*, Hopff, ♂ noticed; Westwood, in Oates's "Matabele Land," p. 342.

Pieris daplidice, larva described; Mathew, Ent. M. M. xviii. pp. 30 & 31; var. *albidice*, from Spain and Algeria described (*P. beckeri*, Edw., from California, is an analogous form of *P. chloridice*), Oberthür, Études d'Ent. vi. pp. 47 & 48. *P. daplidice*, ♂, and *rapæ*, ♀, in coitu; Horner, JB. Mus. Kärnten, xv. p. 199. *P. brassicæ* and *rapæ*, on preserving the colours of the pupæ; Stefanelli, Bull. Ent. Ital. Resoconti, 1881, pp. 22 & 23: their parasites noticed; Reichenau, Ent. Nachr. vii. pp. 50 & 51. *P. rapæ*, observed on March 15, Downing, Ent. M. M. xvii. p. 258; yellow variety recorded, Barrett, *op. cit.* xviii. p. 110. *P. rapæ*, var. *orientalis*, and *napi*, var. *orientis*, from Askold, described; Oberthür, *l. c.* v. p. 13. *P. napi*, var. *bryoniæ*, recorded from Orkney; Meldola & Argent, P. E. Soc. 1881, p. xxvii. *P. monuste*, migrating from west to east, against the wind, in South Carolina; Mellichamp, Am. Nat. xv. p. 577. *P. saba*, Fabr., sexes noticed and figured; Trimen, P. E. Soc. 1881, pp. vii. & viii. pl. ix. figs. 3 & 4. *P. theodice*, Blanch. (*nec* Boisd.) = *autodice*, Blanch. (*nec* Hübn.), renamed *Tatochila blanchardi*; Butler, Tr. E. Soc. 1881, p. 472: larva described (by Edwards) and figured; *id. l. c.* pp. 472 & 473, pl. xii. fig. 15.

Appias narendra, Moore, ♀ noticed; Butler & Swinhoe, P. Z. S. 1881, p. 611.

Thyca berinda, Moore, figured; Waterhouse, Aid, i. pl. xii.

Nepheronia pingasa, Moore, var. noticed; Butler, P. Z. S. 1881, p. 612.

Catopsilia avellaneda, Herr.-Schäff., and *agarithe*, Boisd., are distinct from *thalestris*, Hübn., and *argante*, Fabr., respectively; Gundlach, *l. c.*

pp. 112 & 113. *C. crocale*, Cram., var. from the Andaman Islands, noticed; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 251. *C. eubule*: odour of the male; Murtfeldt, Psyche, iii. p. 198.

Colias pyrene, Swains. (*nec* Linn.), = *Callidryas florella*, Boisd. (*nec* Fabr.), renamed *swainsoni*; Westwood, *l. c.* p. 355.

Rhodocera cleopatra, hermaphrodite described and figured; Ragusa, Nat. Sicil. i. p. 36, pl. iii. fig. 1.

Papilio ecclipsis, Linn., discussed; Hagen & Butler, Papilio, i. pp. 42 & 59.

Colias eduza, varieties noticed; Fallou, Ann. Soc. Ent. Fr. (6) i. p. xiii.: var. *libanotica* (?), Led., from Cannes, described and figured; Millière, Lépidoptérologie, v. p. 12, pl. vi. figs. 7–9. *C. lesbia*, Fabr., monopolizing a field, and driving away intruders; White, "Cameos from the Silver Land" (London: 1881, 8vo), i. p. 263. *C. thisoa*, Mén., appears to be scarcely distinct from *myrmidone*; Staudinger, S. E. Z. xlii. p. 260.

Zerene hyale: its periodical appearance in Sweden; Sandahl, Ent. Tidskr. ii. pp. 5, 6, 36 & 37.

Hebomoia ræpstorffi, Wood-Mason & De Nicéville, figured by them; *l. c.* pl. xiv. figs. 3–5.

Idmais vesta, Reiche (?), redescribed; Westwood, *l. c.* p. 337.

Teracolus puellaris, *vestalis*, and *ochreipennis* differentiated by Butler, with remarks on the first species by Swinhoe; P. Z. S. 1881, pp. 608 & 609. Butler also (*l. c.* p. 610) notices his *T. bimbura*, *dirus*, and *dulcis*, and the true ♀ of his *T. parva*; the insect which he formerly figured as *T. parva*, ♀, proving to be *T. etrida*, ♀.

Callosune. Westwood (*l. c.*) redescribes or notices in detail *C. ione* Godt., p. 338, *regina*, Trim., figs. 9 & 10, p. 339, *buxtoni*, Butl. [as new!], figs. 7 & 8, *evenina*, Wallengr., p. 340, and *wallengreni*, Butl. [as new!], figs. 3 & 4, p. 341, pl. E.

Anthocharis cardamines: pugnacity of larva; Osborne, Sci. Goss. xvii. pp. 17 & 18. *A. charlonia*, Donz.: varieties noticed; Oberthür, *l. c.* vi. p. 48.

Huphina, Moore, g. n., Lep. Ceyl. i. p. 154. Allied to *Appias*; *H. phryne*, Fabr. (type), and *remba*, Moore, are redescribed and figured, *l. c.* pp. 154 & 155, pl. liii. figs. 1, 1 *a*, *b*, & 2, 2 *a*.

New species:—

Dismorphia hewitsoni, Kirby, Tr. E. Soc. 1881, p. 355, Chiquinda.

Terias simulata, figs. 2 & 2 *a*, *b*, *citrina*, figs. 4 & 4 *a*, pl. xlv. p. 119, *rotundalis*, figs. 1 & 1 *a*, *b*, *uniformis*, figs. 2 & 2 *a*, *b*, pl. xlvi. p. 120, Moore, Lep. Ceyl. i., Ceylon; *T. seruli*[*ana*], Westwood, Oates's "Matabele Land," p. 342, River Seruli, South Africa.

Leptosia morsii, Fenton, P. Z. S. 1881, p. 855, Yesso.

Pieris largeteaui, Oberthür, Etudes d'Ent. vi. p. 12, pl. vii. fig. 1, China; *P. imperator*, Eastern Ecuador and Bolivia, and *smithi*, Eastern Ecuador, Kirby, *l. c.* p. 357.

Catophaga venusta, Moore, *l. c.* p. 132, pl. li. fig. 3, Ceylon.

Appias hippoides, North East Bengal, and *latifasciata*, South India, *id.* Tr. E. Soc. 1881, p. 312.

Synchloe anomala, Butler, P. Z. S. 1881, p. 178, pl. xviii. fig. 3, Socotra. *Nepheronia fraterna*, pl. liv. figs. 3 & 3 *a*, and *spiculifera*, Moore, Lep. Ceyl. i. p. 139, Ceylon.

Colias elwesi and *subaurata*, Butler, Ann. N. H. (5) vii. pp. 135 & 138, Nikko; *C. minuscula*, pl. xxi. fig. 11, *cunninghami*, id. Tr. E. Soc. 1881, pp. 470 & 471, Chili; *C. hela* and *moina* (? = *nastes*, var.), Strecker, Bull. Brooklyn Soc. iii. pp. 33 & 34, Hudson's Bay; *C. dinora*, Kirby, *l. c.* p. 358, Chimborazo.

Lxias cingalensis, Moore, *l. c.* p. 126, pl. l. figs. 2 & 2 *a*, Ceylon.

Teracolus niveus and *candidus*, Butler, P. Z. S. 1881, pp. 177 & 178, pl. xviii. figs. 1 & 2, Socotra; *T. incretus*, id. Ent. M. M. xviii. p. 146, Mamboia, East Africa.

Callosune inornata, p. 338, *pseudetrida*, p. 340, *ramaquebana*, pl. E, figs. 5 & 6, p. 341, Westwood, *l. c.*, South Africa.

Anthocharis morrisoni, W. H. Edwards, Papilio, i. p. 43, S. California; *A. coloradensis*, H. Edwards, *tom. cit.* p. 50, Colorado.

Danaidæ.

Burgess, E. Contributions to the Anatomy of the Milk-Weed Butterfly, *Danais archippus*, Fabr. Anniv. Mem. Bost. Soc. pp. 16, pls. ii.

Contains a general sketch of the anatomy of *Lepidoptera*, as illustrated by the species in question. The most important original observations relate to the structure of the maxillæ (which is carefully described); the pharyngeal sac, which serves as a pumping-organ to suck the liquid food of the animal through the proboscis, and force it backwards into the digestive canal; the course of the dorsal vessels, and the male genital armature.

Danais similis, Linn., var. *nicobarica* and *Hestia cadelli*, W. & N., ♀ described and the former figured; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, pp. 225 & 244.

Danais archippus: migrations and swarming, with remarks on the migrations of other butterflies; Bowles & Hagen, Rep. E. Soc. Ont. 1880, pp. 30, 31, 35–37, figs. 12 & 14. *D. archippus*: habits and length of life; W. H. Edwards, Papilio, i. pp. 124 & 125. Driving away humming-birds; Meyer, Bull. Brooklyn Soc. ii. p. 74.

Amauris damocles, Beauv., var. *gabunica*, from the Gaboon, described; Aurivillius, Ent. Tidskr. ii. p. 39.

Euplœa. The corresponding Philippine and Javanese forms can only be considered local varieties; thus *E. diocletia*, Hübn., = *midamus*, Linn., *huebneri*, Moore, = *swainsoni*, Godt., *polita*, Erichs., = *eleusina*, Cram., *kadu*, Esch., = *eunice*, Godt. The varieties of *E. schlegeli*, Feld. (= *superba*, Voll.), are also noticed; Snellen, Tijdschr. Ent. xxiv. pp. xxi. & xxii. *E. esperi*, Feld. (= *frauenfeldi* and *lorquini*, Feld., = *felderi*, Butl.), and *camerta*, Moore, variation described; Wood-Mason & De Nicéville, *l. c.* pp. 227–229. *E. imitata*, Butl., supposed ♀ described; Schmeltz, Verh. Ver. Hamb. iv. pp. 86 & 87.

Euplœa (*Crastia*) *simulatrix*, sp. n., Wood-Mason & De Nicéville, *l. c.* p. 229, Nicobar Islands.

Heliconia aurea, sp. n., Moreira, Arch. Mus. R. Jan., iv. pp. 1–13, plate, Brazil.

Acræidæ.

Acræa cynthia, *petræa*, and *lycia*: larvæ, &c., noticed; Gooch, Ent. xiv. pp. 1 & 2. *A. neobule*, Doubl. & Hew., var.. from Socotra, noticed and figured; Butler, P. Z. S. 1881, p. 177, pl. xviii. fig. 5.

Telchinia violæ, Fabr. Transformations described and figured by F. Moore, Lep. Ceyl. i. pp. 66, pl. xxxiii. figs. 1 *a*, *b*.

Actinote. Godman & Salvin (Biol. Centr. Am. *Rhop.* pl. xvi.) redescribe and figure *A. anteas*, Doubl. & Hew., fig. 1, *guatemalena*, Bates, fig. 2, p. 141, and *nox*, Bates (= *leucomelas*, Bates, = *orizava*, Reak.), figs. 3–6, p. 142.

Acræa atergatis, figs. 1 & 2, p. 342, *atolmis*, figs. 3 & 4, p. 343, *axina*, figs. 5 & 6, p. 344, *acontias*, figs. 7 & 8, p. 345, *aglaonice*, figs. 9 & 10, *acronycta*, figs. 11 & 12, pl. F, p. 346, *amphimalla*, pl. E, figs. 1 & 2, p. 347, and *dircæa*, p. 348, Westwood, Oates's "Matabele Land," South Africa (chiefly from Victoria Falls); *A. barberi* and *fenestrata*, Trimen, Tr. E. Soc. 1881, pp. 433 & 435, Transvaal, &c.: spp. nn.

Actinote melampeplos, sp. n., Godman & Salvin, Biol. Centr. Am. *Rhop.* p. 142, Costa Rica.

Heliconiidæ.

Heliconius and *Eveides*. The following known species are figured or specially noticed by Godman & Salvin (Biol. Centr. Am. *Rhop.*) :—*H. melicerta*, Bates, figs. 12 & 13, *albucilla*, figs. 7–9, pl. xvi. p. 144, *jucundus*, Bates (= *xanthicus*, Bates), pl. xvi. figs. 10 & 11, pl. xvii. figs. 1 & 2, p. 146, *octavia*, Bates, figs. 9 & 10, *formosus*, Bates, figs. 7 & 8, p. 148, *clarescens*, Butl., figs. 5 & 6, *fasciatus*, Godm. & Salv., figs. 3 & 4, p. 150, *montanus*, Salv., fig. 11, pl. xvii. p. 152, *petiveranus*, Doubl. (= *demophoon*, Mén., = *mexicana* and *rosina*, Boisd., = *amaryllis*, Dist.). p. 153, *melpomene*, L., *guarica*, Reak. (= *euryas*, Boisd.), p. 154, *galanthus*, Bates (= *diotrephes*, Hew.), figs. 1 & 2, p. 155, *chioneus*, Bates, figs. 7 & 8, *leuce*, Doubl. (= *sappho*, Hübn.), figs. 3 & 4, p. 156, *sappho*, Dru., figs. 5 & 6, *theudela*, Hew., figs. 9 & 10, p. 157, *pachinus*, Salv., fig. 11, p. 158, *magdalena*, Bates (= *rhea*, Butl. & Druce, = *sara*, Dist.), fig. 13, *vera-pacis*, Bates, fig. 12, pl. xviii. p. 159, *erato*, L. (= *doris*, L., = *amathusia* and *quirina*, Cram., = *thetis*, Boisd., = *delila*, Hübn.), p. 160, *E. vibilia*, Godt. (= *pavana*, Mén.), *vulgiformis*, Butl. & Druce, fig. 3, p. 162, *lineata*, Salv. & Godm., fig. 2, p. 163, *olympia*, Fabr., fig. 1, pl. xix. p. 164, and *zorcaon*, Reak. (= *anaxa*, Mén.), p. 165.

Heliconia charitonia, Linn. Transformations described; W. H. Edwards, Canad. Ent. xiii. pp. 158–162. Males clinging to ♀ pupæ; *id.* Papilio, i. pp. 123, 209–215.

Heliconius claudia, Panama, and *chrysantis*, Nicaragua, Godman & Salvin, Biol. Centr. Am. *Rhop.* pp. 145 & 146, spp. nn.

Nymphalidæ.

White, W. Is *Vanessa polychloros* the type of *V. urticæ*? A query suggested by the aberrant form of a specimen of *V. urticæ* of *polychloros* type. Tr. Epp. Forest, ii. pp. 1–7, woodcut; Ent. xiv. pp. 169–174, woodcut.

The general opinion during the discussion on this paper was that the sport was merely a case of reversion.

The following known species are redescribed, and generally figured, often with transformations, by F. Moore (Lep. Ceyl. i.):—*Junonia lemonias*, Linn., pl. xxi. figs. 3 & 3 *a*, *orithya*, Linn., figs. 1 *a* & *b*, p. 41, *œnone*, Linn., figs. 3 & 3 *a*, p. 42, *asterie*, Linn., fig. 2, pl. xxii. p. 43; *Eryolis taprobana*, Westw., figs. 1 *a* & *b*, p. 44; *Byblia ilithyia*, figs. 3 & 3 *a*, pl. xxiii. p. 45; *Parthenos cyaneus*, Moore, pl. xxiv. p. 46; *Vanessa haronica*, Moore, pl. xxv. figs 2 & 2 *a*, p. 49; *Pyrameis indica*, Herbst, fig. 2, *cardui*, Linn., figs. 1 & 1 *a*, p. 50; *Cethosia nietneri*, Feld., figs. 3 *a* & *b*, pl. xxvii. p. 51; *Cynthia asela*, Moore, pl. xxvi. figs. 1 *a–c*, p. 53; *Neptis varmona*, Moore, figs. 1 *a* & *b*, p. 54, *disrupta*, Moore, figs. 4 & 4 *a*, *jumba*, Moore, figs. 2 *a* & *b*, pl. xxviii. p. 55; *Apatura bolina*, Linn., figs. 1 & 1 *b*, *jacintha*, Dru., fig. 1 *a*, pl. xxx. p. 58, *misippus*, Linn., pl. xxix. figs. 1 *a–c*. p. 59; *Acidalia niphe*, Linn., figs. 2 *a* & *b*, p. 60; *Atella phalanta*, Dru., figs. 1 & 1 *a*, pl. xxxi. p. 62; *Cirrochroa thais*, Fabr., figs. 2 & 2 *a*, *lanka*, Moore, figs. 4 & 4 *a*, pl. xxxii. p. 63.

Gooch, Ent. xiv. pp. 2–7, 35–37, publishes notes on the *Nymphalidæ* of Natal; the following are the most important:—*Atella phalanta* and *Hypolimnas misippus*, the larvæ differ from Horsfield & Moore's figures; *Pyrameis cardui*, *Junonia clelia*, and *Charaxes cithæron* exhibit sexual differences in the larvæ; *Philognoma varanes*, protective appearance of underside; *Crenis boisduvali* and *natalensis* may be dimorphous forms.

Argynnis arge, Streck., is distinct from *monticaga*, Behr.; Strecker, Bull. Brooklyn Soc. iv. p. 7. *A. lathonia*: melanic variety, from Norway, noticed and figured; Bowyer, Ent. xiv. p. 25. *A. myrina*: habits discussed, they do not appear to differ materially from those of other butterflies; W. H. Edwards, Papilio, i. pp. 134–141. *A. niobe*, var. described and figured, with larva; Millière, Lépidoptérologie, v. p. 10, pl. vi. figs. 3 & 4. *A. paphia*, gynandromorphous, left ♂, right ♀ *valezina*; Meldola & Argent, P. E. Soc. 1881, pp. xxvii. Varieties from the New Forest; Corbett, Ent. xiv. p. 224.

Brenthis cytheris, Dru. (= var. *siga*, Hübn., = *anna*, Blanch., ? = *montana*, Reed), discussed; Butler, Tr. E. Soc. 1881, pp. 465 & 466 (*cf.* also *id.* P. Z. S. 1881, p. 83).

Melitæa. Staudinger notices the following varieties, chiefly from Central Asia:—*M. maturna*, var. *uralensis*, Staud.; *aurinia*, var. *asiatica*, Staud.; *didyma*, var. *neera*, Fisch.; *aurelia*, var. *britomartis*, Assm. (?), and *parthenie*, var. n. *alatauica*, Staud.: S. E. Z. xlii. pp. 287–291. *M. aurelia*, Nick., redescribed, and a table by Goossens of the differences between the various stages of *M. athalia*, *aurelia*, and *parthenie* added;

Bercc, Lép. Fr. vi. pp. 374–376. *M. anicia*, Doubl., var. *wheeleri* from Sierra Nevada described; H. Edwards, Papilio, i. p. 52. *M. anocaona*, Herr.-Schäff., = *pelops*, Dru.; Gundlach, *op. cit.* p. 111. *M. aurinia*, Rott., aberration; Hering, S. E. Z. 1881, p. 137. *M. desfontanii*, Godt., discussed and figured; Oberthür, Études d'Ent. vi. pp. 51–54, pl. xi. fig. 12. *M. phaeton*, Drury, ab. *phæthusa*, from Brooklyn, described and figured; Hulst, Bull. Brooklyn Soc. iii. p. 77, iv. plate, fig. 6. *M. trivia*: larva described; Mathew, Ent. M. M. xviii. pp. 93 & 94.

Vanessa antiopa, *Pyrameis cardui*, and *P. atalanta*. Their constancy in different quarters of the globe may be due to frequent and recent migration from one part of the world to another; Riley, Am. Nat. xv. pp. 572 & 573.

Vanessa atalanta: aberration described; Dutreux, Feuill. Nat. xi. p. 75. *V. c-album*: on its supposed increasing rarity in Britain; Coverdale & Hutchinson, Ent. xiv. pp. 210, 250–252, 296 & 297. Food-plants and parasites (*Hemiteles melanarius*, Grav.) noticed; Holmgren & Zetterlund, Ent. Tidskr. ii. pp. 48–50, 58 & 59. Var. *interposita*, from Ala Tau described; Staudinger, S. E. Z. xiii. pp. 286 & 287.

Pyrameis cardui infested by *Ichneumon rufiventris*, Cress.; C. E. Heustis, Canad. Ent. xiii. pp. 143 & 144. Ab. *pallens* described; Noel, Feuill. Nat. xi. p. 102. Var. *pallida*, from Arctic Norway, described; Schφyen, Tromsö Mus. Aarsh.. iv. pp. 77–79.

Vanessa prorsa: aberration; Hering, *l. c.* p. 137. *V. urticæ*: study on its variation, as affected by food, climate, &c.; Swinton, Sci. Gos. xvii. pp. 147–149, 176–179, fig. 88: abb. *osborni* and *selysi* described and figured; Donckier de Douceel, Feuill. Nat. xi. pp. 33 & 34, pl. i. figs. 4 & 2.

Junonia lavinia (*cænia*) noticed; Saunders, Rep. E. Soc. Ont. 1880, p. 40.

Eurytela hiarbas. Transformations noticed; *P. hiarbas* and *dryope* may not be truly distinct; Gooch, Ent. xiv. p. 37.

Hypanis cora, Feisth., var. from Socotra noticed and figured; Butler, P. Z. S. 1881, p. 177, pl. xviii. fig. 4.

Cyrestis cocles, var. *andamanica*, and *thyodamas*, var. *andamanica* (cf also P. A. S. B. 1881, p. 142), described; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 246.

Megalura peeyi, Luc., = *Anæa echemus*, Doubl.; Gundlach, *l. c.* p. 102.

Diadema antevorta, Distant, figured by Waterhouse, Aid, i. pl. lxix. *D. bolina* (*misippus*) recorded from Florida; W. H. Edwards, Papilio, i. p. 30. *D. mima*, Trimen, sexes noticed by him; P. E. Soc. 1881, p. viii.

Euripus consimilis, Westw., from British Burma, and var. *meridionalis*, from Travancore, noticed and figured by Wood-Mason, J. A. S. B. l. pt. 2, pp. 85 & 86, pl. iv. figs. 3 & 2.

Penthema lisarda, Doubl., and *darlisa*, Moore, noticed and figured; *id. l. c.* pp. 86 & 87, pl. iii. figs. 1 & 2.

Limenitis arthemis not double-brooded; W. H. Edwards, Canad. Ent. xiii. pp. 237–242. *L. bredowi*, Hübn.: habits; Bush, Am. Nat. xv. p. 151. *L. camilla*: notes on transformations; Mathew, *l. c.* pp. 92 & 93. *L. disippus*: effect of cold applied to the pupa in producing

variation; W. H. Edwards, Psyche, iii. p. 174. *L. eros*, Fabr., = *L. misippus*, var. *floridensis*, Streck.; Strecker, Canad. Ent. xiii. pp. 29 & 30. Denied by Mead, *op. cit.* pp. 79 & 80; *cf.* also Grote, *op. cit.* p. 195. *L. sibylla*, black var., Meldola & Argent, *l. c.* p. xxvii.

Athyma reta, Moore, ♀, and *Adolias acontius*, Hew., ♂, described; Wood-Mason & De Nicéville, *l. c.* p. 247.

Tanaecia flora, M. R. Butler, figured by Waterhouse, Aid, i. pl. xx. i.

Apatura flora, Edw.: transformations described; W. H. Edwards, Canad. Ent. xiii. pp. 81–85. *A. iris*: life history; Farn, Ent. xiv. pp. 195–198. On its emergence from the pupa; Anderson, Ent. xiv. p. 183. Aberrations described; Dutreux, Feuill. Nat. xi. p. 75.

New genera and species:—

Moduza, Moore, Lep. Ceyl. i. p. 47. Allied to *Limenitis*; type, *Papilio procris*, Cram. *M. calidasa*, Moore, is figured and described; *l. c.* p. 48, pl. xxv. figs. 1 & 1*a*.

Rahinda, id. *l. c.* i. p. 56. Allied to *Neptis*; type, *Pap. hordonia*, Stoll. *R. sinuata*, Moore, is redescribed and figured, *l. c.* pl. xxviii. figs. 3 & 3*a*.

Cethosia logani, Distant, Ent. M. M. xviii. p. 134, Malay Peninsula.

Cirrochroa swinhoii, Butler, P. Z. S. 1881, p. 604, Nilgiris; *C. nicobarica*, Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 231, Nicobar Islands; *C. cognata*, Moore, Lep. Ceyl. i. p. 64, pl. xxxii. figs. 3*a*, *b*, Ceylon.

Cupha placida, id. *l. c.* p. 65, pl. xxxii. fig. 1, Ceylon.

Argynnis hegemone, Staudinger, S. E. Z. xlii. p. 292, Ala Tau, &c.; *A. gemmata*, pl. iv. figs. 1 & 1*a*, Darjiling, p. 32, *paphioides* and *locuples*, Nikko, p. 134, Butler, Ann. N. H. (5) vii.

Melitaea davidi, Oberthür, Études d'Ent. vi. p. 52, note, Crimea; *athene*, Saisan, p. 266, *minerva* and *asteroida*, Ala Tau, pp. 289 & 292, Staudinger, S. E. Z. xlii.; *M. colon*, Oregon, *perdiccas*, Idaho, *baroni*, Northern California, W. H. Edwards, Bull. Brooklyn Soc. iii. p. 80, and Papilio, i. pp. 44, 45, & 52; *M. rubicunda*, Bull. p. 97, and Pap. p. 52, and *dwinellii*, North California, Pap. p. 51, H. Edwards, *opp. citt.*

Araschnia obscura, Fenton, P. Z. S. 1881, p. 850, Yesso.

Vanessa lunigera and *connexa*, Butler, P. Z. S. 1881, pp. 850 & 851, Yesso.

Salamis nebulosa, Trimen, Tr. E. Soc. 1881, p. 441, South Africa.

Ergolis minorata, Moore, *l. c.* p. 44, pl. xxiii. figs. 2 & 2*a*, Kandy.

Crenis moranti, Trimen, *l. c.* p. 439, Natal.

Perisama eminens, Oberthür, *l. c.* p. 27, pl. x. fig. 6, Tambillo, Peru.

Cyrestis horatius, Wood-Mason & De Nicéville, P. A. S. B. 1881, p. 142, Andaman Islands (= *formosa*, Feld., *iid.* J. A. S. B. l. pt. 2, p. 246).

Diadema madagascariensis, Mabille, CR. Ent. Belg. xxv. pl. lv. Madagascar.

Herona sumatrana, Moore, Tr. E. Soc. 1881, p. 308, Sumatra.

Euripus cinnamomeus, Wood-Mason, J. A. S. B. l. pt. 2, p. 272, pl. iv. fig. 4, Khasi Hills.

Penthema binghami, id. *l. c.* p. 87, pl. iv. fig. 1, British Burma.

Limenitis homeyeri, Tancré, Ent. Nachr. vii. p. 120, Amur; *L. bocki*, Moore, *l. c.* p. 308, Sumatra.

Neptis anjana, Moulmein, *kallaura*, Travancore, *corticoides*, Darjiling, p. 309, *martabana*, Rangoon, *fuliginosa*, Moulmein, and *batara*, Sumatra, p. 310, *id. l. c.*

Apatura bhavana, id. *l. c.* p. 307, North East Bengal.

Charaxes balfouri, Butler, P. Z. S. 1881, p. 176, pl. xviii. fig. 6, Socotra; pl. *vi'teri* (= *cedreatis*, ♀, Hew.), Accra, West Africa, p. 108, and *kirki*, Zoia, East Africa, p. 105, Butler, Ent. M. M. xviii.

Morphidæ.

The following species of *Morpho* are figured or specially noticed by Godman & Salvin (Biol. Centr. Am. *Rhop.*): *M. theseus*, Deyr. (= *aquarius*, Butl.), p. 114, *justitiæ*, S. & G., figs. 1 & 2, *polyphemus*, Westw. & Hew. (= *luna*, Butl.), p. 115, *granadensis*, Feld. (= *polybaptus*, Butl., = *candelarius*, Staud.), fig. 1, p. 118, *peleides*, Koll. (= *montezuma* and *corydon*, Guén., = *hyacinthus*, Butl.), p. 119, *octavia*, Bates, figs. 4 & 5, pl. xi., and *marinita*, Butl. (= *limpida* and *hydorina*, Butl.), p. 121.

Morpho adonis, ♀ described and figured: it evidently = *P. marcus*, Schall.; Distant, Tr. E. Soc. 1881, pp. 397–399, pl. xx. *M. eugenia*, Bar, ♀ noticed and figured; Oberthür, Études d'Ent. vi. p. 27, pl. vi. fig. 1.

Brassolidæ.

The following species are figured or specially noticed by Godman & Salvin (Biol. Centr. Am. *Rhop.*): *Dynastor darius*, Fabr. (= *anaxarete*, Cram., = *superba*, Hübn., = *stygianus*, Butl.), *strix*, Bates, figs. 3 & 4, p. 122; *Brassolis isthmia*, Bates, figs. 5–8, pl. xii. p. 125; *Opsiphanes cassiæ*, L. (= *fabricii*, Boisd.) p. 127, *tamarindi*, Feld. (= *glycerie*, Butl., *nec* Fabr.), pl. xiii. figs. 5 & 6, p. 128; *Caligo eurylochus*, Cram. (= *brasiliensis*, Feld., = *galba*, Deyr.), p. 131, *oileus*, Feld. (= *scamander*, Boisd.), p. 132, *ilioneus*, Cram. (= *teucer*, Hübn.), *memnon*, Feld., figs. 1 & 4, p. 133, *telamonius*, Feld., figs. 2 & 3, pl. xiv. p. 134, *atreus*, Koll. (= *ajax*, Doubl. & Hew., p. 135, *uranus*, Herr.-Schäff. (= *telemachus*, Hew.), p. 136; *Eryphanis wardi*, Boisd., pl. xiii. figs. 1 & 2, p. 137, *bubocula*, Butl., figs. 1–3, p. 138; *Narope testacea*, Godm. & Salv., figs. 4–6, pl. xv. p. 139.

Opsiphanes bogotanus, Distant, figured by Waterhouse, Aid, pl. lv.

Opsiphanes josephus, Guatemala, pl. xiii. figs. 3 & 4, p. 126, *quirinus*, Guatemala, Nicaragua, Panama, p. 128, *xanthicles*, Panama, Upper Amazons, pl. xii. figs. 1 & 2, p. 130, Godman & Salvin, Biol. Centr. Am. *Rhop.*: spp. nn.

Dynastor hannibal, sp. n., Oberthür, Études d'Ent. vi. p. 28, pl. vi. fig. 4, New Granada.

Satyridæ (including *Elymnias*).

The following known species of *Satyrinæ* are figured or specially noticed by Godman & Salvin (Biol. Centr. Am. *Rhop.*):—*Euptychia seri-*

ceella, Bates, figs. 20 & 21, p. 89, *glaucina*, Bates, figs. 18 & 19, pl. viii. *philodice*, G. & S., pl. ix. figs. 15 & 16, p. 96, *argentella*, Butl. & Druce, pl. viii. fig. 26, p. 91, *rogersi*, G. & S., pl. ix. figs. 13 & 14, *gemma*, Hübn. (= *cornelius*, Butl.), fig. 12, p. 93, *pyracmon*, Butl., fig. 27, pl. viii., and *hedemanni*, Feld. (= *ithama*, Butl., = *vetones*, G. & S.), pl. viii. fig. 25, & pl. ix. figs. 17 & 18, p. 93; *Taygetis mermeria*, Cram. (= *tenebrosa* Blanch., = *excavata*, Butl.), p. 95, *armillata*, Butl. (= *jimna*, Butl.) p. 96; *Taygetis andromeda*, Cram. (= *thamyra*, Cram., = *sylvia*, Ivards, = *uzza* and *leuctra*, Butl.), pl. x. fig. 1, p. 98; *T. valentina*, Cram. (= *pessa*, Hew., = *zimri*, Butl.), p. 199; *Lymanopoda evopis*, G. & S., figs. 1, 10–12, p. 102; *Pedaliodes pisonia*, Hew. (= *dejecta*, Bates, = *lithochalcis*, Butl. & Druce), fig. 4, p. 103, *napæa*, Bates, figs. 2 & 3, and *hulda*, Butl. & Druce, figs. 7 & 8, p. 104, *cremera*, G. & S., figs. 3 & 4, *triaria*, G. & S., figs. 5 & 6, pl. ix. p. 105; *Gyrochilus patrobas*, Hew., fig. 5, p. 105, *Oxeoschistus hilarus*, Bates, figs. 14 & 15, p. 107, *tauropolis*, Doubl. & Hew. (= *latifica*, Bates), *cothon*, Salv., figs. 10 & 11, p. 108, *submaculatus*, Butl. & Druce, figs. 12 & 13, pl. x. p. 109, *rogersi*, G. & S., pl. ix. figs. 1 & 2, *gigas*, G. & S., figs. 8 & 9, p. 110; *Pronophila timanthes*, Salv., figs. 6 & 7, pl. x. p. 111.

Cyllo leda and *Gnophodes parmeno*: evening insects, coming freely to sugar; Gooch, Ent. xiv. p. 38.

Elymnias cottonis, Hew., ♀ described; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 245.

Parantirrhœa marshalli, Wood-Mason, description reprinted; Ann. N. H. (5) vii. pp. 333–336, woodcut.

Debis syrcis, Hew., and *diana*, Butl., noticed and figured; Oberthür, Études d'Ent. vi. pp. 14 & 16, pl. vii. figs. 3 & 2.

Melanitis zitenius, Herbst, ♂ from Andaman Islands noticed; Wood-Mason & De Nicéville, *l. c.* p. 244.

Cyllo leda, Linn., noticed; Westwood, in Oates's "Matabele Land," p. 350.

Neorinopsis sepulta. Restoration; Swinton, Sci. Goss. xvii. p. 177, fig. 104.

Erebia pawlowskii, Mén., var. *haberhaueri*, from Tarbagatai, described, p. 267; *E. turanica*, Ersch., and *ocnus*, Eversm., discussed, pp. 294–296; Staudinger, S. E. Z. xlii. *E. arete*, var. *albo-fasciata*, from the Sanalpe, described, and *E. eriphyle*, Freyer, discussed; Höfner, JB. Mus. Kärnten, xiii. pp. 138, 260 & 261.

Cosmosatyrus leptoneuroides, Feld. (= *antarctica*, Reed, and *germaini*, Reed, *nec* Feld.), and *plumbeola*, Butl., noticed: Butler, Tr. E. Soc. 1881, pp. 459 & 460.

Neosatyrus ambiorix, Wallengr., *boisduvali*, Blanch. (= *Homœonympha pusilla*, Feld.) and *humilis*, Feld. (= *ambiorix*, Reed), pp. 161–164, noticed; *id.* l. c. *N. reedi*, var. (?) *fuscenscens*, from Valdivia, defined *id. l. c.* p. 485.

Œneis bore, Schneid., larva described; Sandberg & Schøyen, Tromsö Mus. Aarsh. iv. p. 81. *Œ. norna*, Thunb., var. *fulla*, Eversm., noticed; Staudinger, *l. c.* p. 271.

Argyrophorus argenteus. Habits; Edmonds, Tr. E. Soc. 1881, p. 459.

Pararge eversmanni, Eversm., noticed; Standinger, *l. c.* pp. 297 & 298. *P. roxelana*, Cram., habits noticed; Mathew, Ent. M. M. xviii. p. 95.

Satyrus hausi (pl. ii. fig. i., pl. iii. fig. 1) and *sylvicola* (pl. iii. fig. 2), Aust., discussed and figured, they are probably varieties of *S. faunus*, pp. 55–57; *S. ægeria*, var., and *cudora*, var. *mauritanica*, from Algeria, described, and *S. pasiphae*, var. *philippina*, Aust., noticed, pp. 57–59; Oberthür, *l. c.* *S. actæa*, Esp., egg figured; Millière, Lépidoptérologie, v. pl. vi. fig. 12.

Epinephile limonias, Phil. (?= *janiroides*, Blanch., fig. 8; var. = *dryas*, Feld.); *valdiviæ*, Feld. (= *luctuosus* and *monachus*, Reed), *monachus*, Blanch. (= *lugubris*, Butl.), *tristis*, Guér., *coctei*, Guér. (= *tragiscus*, Reed), *pales*, Phil. (= var. *janiroides*, Blanch., text, *nec* Herr.-Schäff., = *blanchardi*, Kirby, = *coctei*, ♂, Reed), noticed by Butler, *l. c.* pp. 451–454. *E. naubidensis*, Ersch., ♀, described, and *interposita*, Ersch., noticed; Staudinger, *l. c.* pp. 272 & 273, 298 & 299. *E. janira*, captured by *Drosera*; Meldola, Tr. Epp. Forest, i. p. xxiii. Var. *hispulla*, Hübn., aberration described and figured; Ragusa, Nat. Sicil. i. p. 37, pl. iii. fig. 3.

Elina lefebvrii, Guér. (= *montrolii*, Feisth.), larva described by Edmonds; *nemyrioides*, Blanch., ♀ described; *E. flora*, Phil. (= *oaxes*, Butl., = *tristis*, Butl. & Reed, *nec* Guér., = *reedi*, Reed, *nec* Butl.), noticed: Butler, *l. c.* pp. 449–451.

Hipparchia chiliensis, Guér. (= *tristis*, Blanch., = *reedi*, Butl.); Butler, *l. c.* p. 460.

Cœnonympha californica, Doubl., var. *pulla*, from California, described; H. Edwards, Papilio, i. p. 51. *C. fettigi*, Oberth., ♀, and *dorus*, var. *austauti*, from Algeria, described; Oberthür, *l. c.* pp. 59 & 60. *C. pamphilus*, varieties noticed at Gallipoli; Mathew, *l. c.* p. 95. Variety noticed; Sharp, Ent. xiv. p. 19.

Tansima, g. n., Moore, Tr. E. Soc. 1881, p. 305. Allied to *Lethe*; type, *L. satyrina*, Butl.

New species:—

Elymnias mimus, Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 230, Nicobar Islands.

Debis segonacia, Kiang-si, *davidi* and *armandina*, Mou-pin, Oberthür, Etudes d'Ent. vi. pp. 14–16, pl. vii. figs. 4–6.

Lethe consanguis, Butler, Ann. N. H. (5) vii. p. 133, Nikko; *L. todara*, Moore, Tr. E. Soc. 1881, p. 305, Nilgiris.

Neope khasiana, id. *l. c.* p. 306, Khasia Hills; *N. niphonica*, Butler, *l. c.* p. 133, Nikko.

Euptychia nelsoni, Godman & Salvin, Biol. Centr. Am. *Rhop.* p. 91, Guatemala.

Neonympha thobiei and *nerita*, Capronnier, Ann. Ent. Belg. xxv. p. 102, Rio Janeiro.

Leptoneura oxylus, Trimen, Tr. E. Soc. 1881, p. 437, Kaffraria.

Erebia kindermanni, Altai, and *myops*, Ala T[illegible]; Staudinger, S. E. Z. xlii. pp. 269 & 296. *E. scoparia*, Butler, P. Z. S. 1881, p. 849, Yesso. *E. sofia*, Hudson's Bay, and *magdalena*, Colorado; Strecker, Bull. Brooklyn Soc. iii. p. 35.

Callerebia nada, Kunawur, and *yphthimoides*[*iph*-], Travancore, Moore, *l. c.* pp. 306 & 307.

Œneis mulla, Staudinger, *l. c.* p. 270, Tarbagatai.

Epinephile cadusina (? = *cadusia*, var. ?), *id. l. c.* p. 299, Lepsa; *E. edmondsi*, Butler, Tr. E. Soc. 1881, p. 451, pl. xxi. fig. 2, Chili.

Neomœnas cœnonymphina, fig. 4, *fractifascia*, fig. 3, and *wallengrenii*, pl. xxi. fig. 5, *id. l. c.* pp. 454–456, Chili.

Argyrophenga edmondsi, pl. xxi. fig. 6, *simplex*, id. *l. c.* pp. 457 & [illegible]rma-[illegible]nasi, Chili.

Faunula stelligera, id. *l. c.* p. 460, pl. xxi. fig. 10, Chili.

Neosatyrus minimus, fig. 7, p. 461, *ochreivittatus*, p. 462, *violaceus*, fig. 8, and *reedi*, fig. 9, p. 463, *id. l. c.* pl. xxi., Chili.

Hipparchia monticolens, id. *l. c.* p. 484, pl. xxi. fig. 1, Chili.

Mycalesis victorina, Westwood, Oates's "Matabele Land," p. 350, Victoria Falls.

Calysisme socotrana, Butler, P. Z. S. 1881, p. 175, pl. xviii. fig. 7, Socotra.

Mydosama marginata, Moore, *l. c.* p. 307, Sumatra.

Rahinda assamica, Assam, *siaka*, Sumatra, and *sattanga*, British Burma, *id. l. c.* p. 311.

Narathura subfasciata, id. *l. c.* p. 312, Andamans.

Iphthima evanescens, Butler, Ann. N. H. (5) vii. p. 134, Nikko.

Cœnonympha elko, W. H. Edwards, Canad. Ent. xiii. p. 57, Nevada.

Drucina championi, Godman & Salvin, *l. c.* p. 113, Guatemala.

Libytheidæ.

Libythea celtis, ab. *ochracea*, described and figured by Millière, Lépidoptérologie, v. p. 15, pl. vi. fig. 10. *L. rama*, Moore, redescribed and figured by him; Lep. Ceyl. i. p. 68, pl. xxxiii. figs. 2 & 2*a*. *L. bachmani*, Kirtl., transformations described and imago figured; W. H. Edwards, Canad. Ent. xiii. pp. 226–229, fig. 13: *cf.* also Saunders, Rep. E. Soc. Ont. 1880, p. 38, fig. 15.

Erycinidæ.

Abisara bifasciata, Moore (? = *kausambi*, Feld.), noticed; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 248. *A. prunosa*, Moore, transformations figured by him; Lep. Ceyl. i. p. 69, pl. xxxiii. figs. 1*a*, *b*.

Dodona longicaudata, sp. n., De Nicéville, P. A. S. B. 1881, p. 121, Assam.

Lycænidæ.

The following known species are redescribed and generally figured often with their transformations, by F. Moore (Lep. Ceyl. i.):—*Spalgis epius*, Westw., pl. xxxiv. figs. 1 & 1*a*, *b*, p. 71, *Curetis thetys*, Dru., figs. 2 & 2*a*, p. 74, *Cyaniris akasa*, Horsf., fig. 5, *lavendularis*, Moore, figs. 6, 6*a*, & 7, pl. xxxiv. p. 75, *singalensis*, Feld., figs. 1 & 1*a*, *lanka*, Moore, figs. 2 & 2*a*, pl. xxxv. p. 76, *Castalius rosimon*, Fabr., fig. 2, *ethion*, Doubl. & Hew., figs. 5 & 5*a*, p. 83, *decidia*, Hew., p. 84, *Everes parrhasius*, fig. 7,

p. 85, *Jamides bochus*, figs. 8 & 8*a*, pl. xxxvi. p. 86, *Lycænesthes lycænina*, Feld., pl. xxxv. figs. 8 & 8*a*, p. 87, *Catochrysops strabo*, Fabr., figs. 2 & 2*a*, *lithargyria*, Moore, p. 91, *cneius*, Fabr., *pandava*, figs. 1 & 1*a*, *b*, pl. xxxvii. p. 92, *Polyommatus baticus*, Linn., p. 93, *Lampides ælianus*, Fabr., figs. 3 & 3*a*, *b*, p. 94, *elpis*, Godt., figs. 4 & 4*a*, pl. xxxviii., *pseudelpis*, Butl., p. 95, *[illegible]ycana*, Moore, pl. xxxvi. figs. 9 & 9*a*, *b*, p. 96, *Catapœcilma elegans*, *C[illegible]*, pl. xxxix. figs. 3 & 3*a*, p. 97, *Zesius chrysomallus*, Hübn., pl. xl. sp. n. & 4*a*, *Deudorix epijarbas*, Moore, figs. 4 & 4*a*, *laukana*, Moore, fig. 5, *Ri[illegible]* xxix. p. 103, *Aphnæus ictis*, Hew., p. 107, *Surendra discalis*, Moore, Fa[illegible] pl. xliv. figs. 1 & 1*a*, p. 113, *Amblypodia naradoides*, Moore, fig. 2, *darana*, Moore, figs. 1 & 1*a*, pl. xliii. p. 114.

Lycæna adonis, W. V. (= *improba*, Reed) is probably not a Chilian species: *Scolitantides collina*, Phil. (= *lyrnessa*, Hew.), *chilensis*, Blanch. (= *atahualpa*, Wallengr.), *Chrysophanus bicolor*, Phil. (♀ = *quadrimaculata*, ♂, *sec.* Hew.), and *quadrimaculata*, Hew., noticed; Butler, Tr. E. Soc. 1881, pp. 467–469.

Lycæna alexis, var. *celina*, Aust., discussed; Oberthür, Etudes d'Ent. vi. pp. 50 & 51. *L. adonis* recorded from Oban; Sturge, Ent. xiv. p. 225. *L. agon*, Hübn., variation, and distinctive characters from *argus* discussed; Oberthür, *op. cit.* v. pp. 21 & 22: hermaphrodite (right side ♂, left side ♀), Cole, Tr. Epp. Forest, i. p. xi. *L. cyllarus* var. *æruginosa*, from Ala Tau, noticed; Staudinger, S. E. Z. xlii. p. 285. *L. eumedon* ab. *speyeri* described; Husz, Ent. Nachr. vii. p. 244. *L. icarus*, hermaphrodite (left side ♂, right side ♀); Sang, P. E. Soc. 1881, p. x.: var. *icarinus*, Scriba, on its occurrence in Britain, Long & Weir, *op. cit.* p. xxxii. *L. lochias*, Hew. (?), redescribed as new by Westwood; Oates's "Matabele Land," p. 352. *L. lœwii*, Zell., var. (?) *fergana*, from Saisan, described; Staudinger, *l. c.* p. 262. *L. lycidas*, Trapp, redescribed; it is the Valais form of *L. zephyrus*, Friv.; Jäggi, MT. schw. Ent. Ges. vi. pp. 95–99, plate. *L. medon*, with a white spot on each wing; Sang, *l. c.* p. x. *L. speciosa*, H. Edwards, redescribed by him; Papilio, i. p. 55. *L. telicanus*, ab. *bellieri*, from Sicily, described and figured; Ragusa, Nat. Sicil. i. p. 37, pl. iii. fig. 2. *L. tengstrœmi*, var. *davidi*, from North-east China, described and figured; Oberthür, *l. c.* vi. p. 13, pl. viii. fig. 1.

Castalius elna, Hew., noticed; Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 248.

Scolitantides plumbea, Butl., figured by Waterhouse; Aid, i. pl. lxxix.

Catochrysops cneius, Fabr., and *contracta*, Butl., noticed; Butler & Swinhoe, P. Z. S. 1881, pp. 605 & 606.

Polyommatus amphidamas, Esp., var. *lapponica*, described; Backhaus, Ent. Monatsbl. i. p. 40. [Omitted from Zool. Rec. xiii.] *P. dorilis*, var. *orientalis*, from the Caucasus and Asia Minor, noticed; Staudinger, *l. c.* p. 281. *P. mauritanicus*, Luc., variation noticed; Oberthür, *l. c.* p. 49.

Chrysophanus nais, Edw., belongs to *Apodemia* (*Erycinidæ*); Butler & Edwards, Canad. Ent. xiii. pp. 17 & 18.

Thecla w-album and *quercus*: cannibalism of larvæ; Bliss & others, Ent. xvi. pp. 157 & 177. *T. taxila*, Brem., var. *aurorina*, described; *T. diamantina*, Oberth., redescribed and figured: Oberthür, *l. c.* v. p. 18,

pl. i. fig. 1. *T. kali*, Streck., = *behri*, Edw., ♂ : but *T. siva*, Edw., is quite distinct from *damon*, Cram., being very near *dumetorum*, Boisd.; Graef, Bull. Brooklyn Soc. i. p. 91. *T. crysalus*, Edw., var. *citima* from Utah and Colorado, *nelsoni*, Boisd., var. *exoleta* from California, p. 53, and *irus*, Boisd., var. *mossi*, Vancouver's Island, p. 54, described; H. Edwards, Papilio, i. *T. betuloides* [!], Blanch., redescribed and figured by Butler; Ann. N. H. (5) vii. p. 34, pl. iv. fig. 2. *T. henrici*, Grote: transformations described; W. H. Edwards, Papilio, i. pp. 125 & 150–152. *T. jamasi*, Jans., noticed and figured; Oberthür, *l. c.* vi. p. 13, pl. viii. fig. 2. *T. rubi*, var. (?) *suaveola* from Central Asia, described; Staudinger, *l. c.* pp. 279 & 280.

Deudorix sphinx, Fabr. (= *varuna*, Hew.). *D. varuna*, Horsf., *D. elcia*, Hew., and *D. phranga*, Hew. (♀ probably = *manea*, Hew.), noticed; Snellen, Tijdschr. Ent. xxiv. pp. 127 & 128.

Amblypodia narada, var. *erichsoni* from the Andaman Islands, noticed; Wood-Mason & De Nicéville, *l. c.* p. 250.

Narathura fulla, var. *andamanica*, described; *iid.* P. A. S. B. 1881, p. 143, and *l. c.* p. 251.

New genera and species :—

Megisba, Moore, Lep. Ceyl. i. p. 71. Allied to *Pithecops*; type, *M. thwaitesi*, sp. n., *l. c.* pl. xxxiv. figs. 3 & 3*a*, *b*, Ceylon.

Chilades, id. *l. c.* p. 76. Type, *Papilio laius*, Cram.; *C. varunana*, Moore, and *putli*, Koll., are redescribed and figured, *l. c.* p. 77, pl. xxxv. figs. 3, 4 & 4*a*.

Zizera, id. *l. c.* p. 78: type, *Pap. alsus*, W. V.; *Z. karsandra*, Moore, figs. 6 & 6*a*, p. 78, *indica*, Murr., figs. 7 & 7*a*, and *pygmæa*, Snell., figs. 5 & 5*a*, pl. xxxv. p. 79, redescribed and figured.

Azanus, id. *l. c.* p. 79. Type, *Pap. ubaldus*, Cram.; add *A. crameri*, sp. n., *l. c.* p. 80, pl. xxxv. fig. 1, Ceylon.

Tarucus, id. *l. c.* p. 81. Type, *Hesperia theophrastus*, Fabr.; which is redescribed and figured, with *T. plinius*, Fabr., at pp. 81 & 82, pl. xxxvi. figs. 3 & 4.

Nacaduba, id. *l. c.* p. 88. Type, *Lampides prominens*, Moore, redescribed and figured, *l. c.* pl. xxxvii. figs. 3 & 3*a*, *b*. The following are also redescribed and figured: *M. atrata*, Horsf., *macrophthalma*, Feld., pl. xxxvii. figs. 4 & 4*a*, *viola*, figs. 1 & 1*a*, *b*, p. 89, and *ardates*, Moore figs. 2 & 2*a*, pl. xxxviii. p. 90.

Talicada, id. *l. c.* p. 96. Type, *Polyommatus nyseus*, Godt., redescribed and figured, *l. c.* p. 97, pl. xxxix. figs. 1 & 1*a*, *b*.

Horaga, id. *l. c.* p. 98. Allied to *Sithon*; type, *Myrina ciniata*, Hew., redescribed and figured, *l. c.* p. 99, pl. xxxix. figs. 2 & 2*a*.

Rathinda, id. *l. c.* p. 99. Type, *Papilio amor*, Fabr., redescribed and figured, *l. c.* pl. xlii. figs. 1 & 1*a*.

Iraota, id. *l. c.* p. 101. Type, *Hesperia mæcenas*, Fabr., redescribed and figured, *l. c.* p. 102, pl. xl. figs. 2 & 2*a*, *b*.

Virachola, id. *l. c.* p. 104. Allied to *Deudorix*; type, *D. perse*, Hew., redescribed and figured, *l. c.* pl. xl. figs. 1 & 1*a*, and *V. isocrates*, Fabr., redescribed, *l. c.*

Rapala, id. *l. c.* p. 105. Type, *Thecla varuna*, Horsf.; *R. lazulina*, Moore, redescribed and figured, *l. c.* pl. xl. figs. 3 & 3*a*.

Pratapa, id. *l. c.* p. 108. Allied to *Iolaus* and *Camena*; type, *Amblypodia deva*, Moore, redescribed, *l. c.*

Tajuria, id. *l. c.* Allied to last; type, *Hesperia longinus*, Fabr., redescribed and figured, *l. c.* p. 109, pl. xlii. figs. 2 & 2*a*, *b*.

Cheritra, id. *l. c.* p. 109. Type, *Myrina jafra*, Godt.; add *C. pseudojafra*, sp. n., *l. c.* p. 110.

Rindahara, Moore, Lep. Ceyl. i. p. 111. Type, *Hesperia phocides*, Fabr., redescribed and figured, *l. c.* p. 112, pl. xlii. figs. 2 & 2*a*.

Nilasera, id. *l. c.* p. 114. Type, *Pap. centaurus*, Fabr.; add *Amblypodia amantes*, Hew., redescribed and figured, *l. c.* p. 115, pl. xliv. figs. 2 & 2*a-c*, and *N. pirama*, sp. n., *l. c.* p. 116, pl. xliii. figs. 3 & 3*a-c*.

Purlisa, Moore & Distant, Ent. M. M. xvii. p. 245. Not characterized; type, *Iolaus* (*Purlisa*) *giganteus*, sp. n., Distant, *l. c.*: Waterhouse, Aid, i. p. 245, Penang.

Lampides trigemmatus, Butler, Tr. E. Soc. 1881, p. 468, Chili.

Lycæna dubia, Schulz, S. E. Z. xlii. p. 135, Banks of Oder, (= *argus*, var., Staudinger, *op. cit.* p. 261); *L. scylla* (Staud., MS.), Oberthür, Études d'Ent. v. p. 22, Askold and Amurland; *L. alope*, Fenton, P. Z. S. 1881, p. 851; *L. pseudargon* and *iburiensis*, Butler, *op. cit.* pp. 851 & 852, Yesso; *L. fugitiva*, id. *l. c.* p. 616, Quetta; *L. miris*, Staudinger, S. E. Z. xlii. p. 263, Persia, Saisan.

Pithecops dharma, Moore, Lep. Ceyl. i. p. 72, pl. 34, fig. 4, Kandy.

Castalius hamatus, id. *l. c.* p. 84, pl. xxxvi. figs. 6 & 6*a*, Ceylon.

Catochrysops ella, Butler, *l. c.* p. 606, Kurrachee.

Scolitantides plumbea, id. Tr. E. Soc. 1881, p. 486, Chili.

Lycænesthes livida, Trimen, Tr. E. Soc. 1881, p. 443, South Africa.

Polyommatus splendens and *dimorphus*, Staudinger, *l. c.* pp. 280 & 282, Lepsa.

Zeritis amanga, Westwood, Oates's "Matabele Land," p. 351, Zambesi.

Thecla michaelis, Askold, and *raphaelis*, Askold and Amurland, Oberthür, *l. c.* pp. 19 & 20, pl. v. figs. 2 & 1; *T. tyrianthina*, China, *stygiana*, Nikko, Butler, Ann. N. H. (5) v. pp. 34 & 35, pl. iv. figs. 5 & 6; *T. ibara*, *orsedice*, p. 852, *regina*, p. 853, *signata*, p. 854, *id.* P. Z. S. 1881, Japan; *T. butleri*, Fenton, *l. c.* p. 853, Hakodadi; *T. spadix*, *muiri*, p. 53, and *tacita*, p. 54, Edwards, Papilio, i., California.

Strymon fentoni, Butler, *l. c.* p. 854, Yesso.

Aphnæus schistacea[*-ceus*], figs. 3 & 3*a*, *b*, *fusca*[*-cus*], figs. 2 & 2*a*, *b*, p. 106, *lazularia*[*-rius*], figs. 1 & 1 *a-c*, p. 107, larva, Moore, *l. c.* pl. xli., Ceylon.

Sithon albimacula, Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, p. 249, Andaman Islands.

Loxura arcuata, Moore, *l. c.* p. 111, pl. xlii. figs. 4 & 4 *a-b*, Ceylon.

Amblypodia turbata, Butler, *l. c.* p. 855, Nikko.

Nilasera pirama, Moore, *l. c.* p. 116, pl. xliii. figs. 3 & 3*a-c*, larva, Ceylon.

Hesperiidæ.

Plötz, C. Die Hesperiinen-Gattung *Eudamus* und ihre Arten. S. E. Z. xlii. p. 500–504.

18 species tabulated in this first instalment of the paper, some new.

Ismene chromus, Cram., ♀, *malayana*, Feld., ♀, *lebadea*, var. *andamanica*, *druna*, Moore, ♀; *Tagiades bhagava*, Moore, var. *andamanica* (figured, pl. iv. fig. 5); *Plesioneura alyssos*, Moore, var., *dan*, Fabr., var. *andamanica*, *leucocera*, Koll. (varr. *sumitra*, *pulomaya*, *ambareesa*, *chamunda*, and *putra*, Moore); *Hesperia cahira*, Moore, ♀, and *occia*, Hew. (= *cahira*, ♀, Moore), *sala*, Hew., ♀, *narooa*, Moore, ♂; *Telegonus thyrsis*, Fabr., ♂, and *Pamphila purrcea*, Moore, ♀, from the Andaman Islands, described by Wood-Mason & De Nicéville, J. A. S. B. l. pt. 2, pp. 254–264.

The following known species redescribed and generally figured, often with transformations, by F. Moore (Lep. Ceyl. i.):—*Ismene œdipodea*, Swains., pl. lxiv. figs. 2 *a*, *b*, p. 168; *Astictopterus stellifer*, Butl., p. 163; *Taractrocera mævius*, Fabr., fig. 5, p. 172; *Halpe ceylonica*, Moore, p. 173, *brunnea*, Feld., figs. 4 & 4 *a*, pl. lxx.; *Tagiades atticus*, Fabr., fig. 2, p. 175, *minuta*, Moore, figs. 4 & 4 *a*, pl. lxxviii. p. 176; *Plesioneura alyssos*, Moore, figs. 3 *a*, *b*, p. 178, *spilothyrus*, Feld., figs. 4 & 4 *a*, pl. lxxvii. p. 179; *Hesperia galba*, Fabr., fig. 6; and *Gomalia albofasciata*, Moore, fig. 7, pl. lxxi. p. 183.

The habits of South African *Hesperiidæ*, several crepuscular, and the larvæ of *Ismene calmaran* and *ratek* and *Pyrgus vindex* briefly noticed; Gooch, Ent. xiv. p. 40.

Pyrgus americanus, Blanch. (= *notatus*, Blanch.); *P. valdivianus*, Reed, *Pamphila fasciolata*, Blanch. (= *signata*, Blanch.), *Carterocephalus flavomaculatus* (= *polyspilus*, Feld., = var. *vicina*, Reed), *paniscoides*, Blanch. (= *cauquenensis*, Reed), *valdivianus*, Phil. (= *exornatus*, Feld., = *paniscoides*, Reed, *nec* Blanch.), noticed by Butler, Tr. E. Soc. 1881, pp. 475–481.

Entheus marshalli, Kirby, and *Butleria sotoi*, Reed, figured by Waterhouse, Aid, i. pls. xxxvii. & lxxx.

Eudamus proteus, Linn., and *necada*, Scudd., noticed; Lintner, Papilio, i. p. 74. Transformations of the former described; Comstock, Rep. Dep. Agric. 1880, pp. 269 & 270.

Goniurus. Plötz tabulates 58 species, including several new ones; Bull. Mosc. lv. 2, pp. 1–22. *G. corydon*, Butl. (*nec* Cram.), is renamed *larius* (p. 9).

Ismene jankowskii, Oberthür (= *aquilina*, Spey.), redescribed and figured by him; Études d'Ent. v. p. 23, pl. i. fig. 2. *I. pisistratus*, Fabr. (= *calmaran*, Wallengr., = var. *forestan*, Cram.), noticed; Westwood, Oates's "Matabele Land," p. 352.

Pamphila comma, var. *cattena*, Meyer-Dür, noticed; Wocke, JB. schles. Ges. lviii. p. 200. *P. amadis*, Herr.-Schäff., probably = *baracoa*, Lef.; *P. misera* and *mayo*, Herr.-Schäff., are sexes; *P. arcas*, Dru., the following are synonyms:—*philemon*, Fabr., *flyas*, Cram., *velasquez*, Lef., *otreus*,

Cram., and *zephodes*, Hübn., but *Nisoniades brunnea*, Herr.-Schäff., is distinct: Gundlach, Papilio, i. pp. 113 & 114.

Ægiale confagui [sic], Strecker, ♂ described by him, the greater part of the wing is covered with long hair; Bull. Brooklyn Soc. iii. p. 66, fig.

Spilothyrus alceæ. Larva described; Mathew, Ent. M. M. xviii. pp. 95 & 96.

Pyrgus tethys, Mén., var. from North China described; Oberthür, *l. c.* v. p. 24. *P. evanidus*, Butl., and *galba*, Fabr., compared; Butler, P. Z. S. 1881, pp. 612 & 613.

Nisoniades propertius, Scudd. & Burg., and *icelus*, Lintn., discussed; Lintner, Papilio, i. pp. 71 & 72.

New genera and species:—

Badamia. Moore, Lep. Ceyl. i. p. 156. Allied to *Ismene*; type, *Pap. exclamationis*, Fabr. (redescribed and figured, *l. c.* p. 157, pl. lxvi. figs. 2*a*, *b*).

Choaspes, id. *l. c.* p. 158. Type, *Thymele benjamini*, Guér., redescribed and figured; *l. c.* p. 159, pl. lxiv. figs. 1*a*, *b*.

Hasora, id. *l. c.* p. 159. Type, *Goniloba badra*, Moore, redescribed and figured; *l. c.* pl. lxv. figs. 4*a*, *b*.

Bibasis, id. *l. c.* p. 160. Type, *Goniloba sena*, Moore, redescribed and figured; *l. c.* pl. lxv. figs. 3 & 3*a*.

Parata, id. *ibid.* Type, *Pap. chromus*, Cram., which, with *P. alexis*, Fabr., is redescribed and figured; *l. c.* p. 161, pl. lxv. figs. 1*a*, *b*, & 2*a*, *b*.

Baracus, id. *l. c.* p. 162. Type, *Isoteinon vittatus*, Feld., redescribed and figured; *l. c.* pl. lxix. figs. 1 & 1*a*.

Matapa, id. *l. c.* p. 163. Type, *Hesperia aria*, Moore, redescribed and figured with *M. subfasciata*, Moore; *l. c.* p. 164, pl. lxvi. figs. 1, 1*a*, & lxiv. figs. 3*a*, *b*.

Gangara, id. *l. c.* p. 164. Type, *Pap. thyrsis*, Fabr., redescribed and figured; *l. c.* p. 165, pl. lxvi. figs. 2 & 2*a*.

Baoris, id. *l. c.* p. 165. Type, *Hesperia oceia*, Hew.; add *B. penicillata*, sp. n., *l. c.* p. 166, Ceylon, and *B. kumara*, Moore, figs. 2 & 2*a*, and *seriata*, Moore, figs. 4 & 4*a*, pl. lxix., redescribed and figured, *l. c.*

Parnara, id. *l. c.* p. 166. Type, *Eudamus guttatus*, Brem.; add *P. narooa*, Moore, pl. lxix. figs. 3*a*, *b*, and *bada*, Moore, pl. lxx. figs. 2 & 2*a*, redescribed and figured, *l. c.* p. 167, and *P. cingala*, sp. n., *l. c.* pl. lxx. figs. 3*a*, *b*, Ceylon.

Suastus, id. *lc.* p. 168. Type, *Hesperia gremius*, Fabr.; redescribed with *S. subgrisea*, Moore, *l. c.*

Chapra, id. *l. c.* p. 169. Type, *Hesperia mathias*, Fabr., redescribed and figured, *l. c.* pl. lxx. figs. 1 & 1*a*; *C. aqua*, Moore, is also redescribed, *l. c.*

Telicota, id. *l. c.* Type, *Papilio augias*, Linn.; *T. bambusæ*, Moore, is figured and redescribed, *l. c.* p. 170, pl. lxxi. fig. 4.

Padraona, id. *l. c.* p. 170. Type, *Pamphila mæsa*, Moore; add *P. pseudomæsa* and *goloides*, pl. lxxi. figs. 3 & 3*a*, spp. nn., *l. c.* pp. 170 & 171, Ceylon; *P. mæsoides*, Butl., is redescribed and figured, *l. c.* p. 171, pl. lxxi. figs. 5 & 5*a*.

Ampittia, id. *l. c.* p. 171. Type, *Hesperia maro*, Fabr., redescribed and figured, *l. c.* p. 172, pl. lxxi. figs. 1 & 1*a*.

Hyarotis, id. *l. c.* p. 174. Type, *Hesperia adrastus*, Cram., pl. lxxvii. figs. 5 & 5*a*, p. 174.

Sarangesa, id. *l. c.* p. 176. Type, *S. purendra* [Moore, MS.!]; add *S. albicilla*, sp. n., *l. c.* p. 176, Ceylon.

Udaspes, id. *l. c.* p. 177. Type, *Papilio folus*, Cram., redescribed and figured, *l. c.* pl. lxviii. figs. 3 & 3*a*.

Hantana, id. *l. c.* p. 179. Type, *Eudamus infernus*, Feld., redescribed and figured, *l. c.* pl. lxviii. fig. 6.

Coladenia, id. *l. c.* p. 180. Type, *Plesioneura indrani*, Moore ; add *C. tissa*, sp. n., *l. c.* pl. lxvii. fig. 6, Ceylon.

Tapena, id. *l. c.* p. 181. Type, *T. thwaitesi*, sp. n., *l. c.* pl. lxxvii. figs. 2 & 2*a*, Ceylon.

Abaratha, id. *l. c.* p. 181. Type, *Pterygospidea ransonneti*, Feld., redescribed and figured, *l. c.* p. 182, pl. lxvii. fig. 1.

Goniurus gracilicauda, Central America, *pilatus*, Bahia, Surinam, p. 2, *procne* (= *simplicius*, var. 2, Herr.-Schäff.), Brazil, *zagorus* and *zalanthus*, Allagra, p. 3, *elongatus* (Prittw., MS.), *nicasius*, Brazil, p. 4, *procerus*, *ælius*, Para, p. 8, *retractus*, La Guayra, *velinus*, Bahia, p. 9, *galbula* (Hopff., MS.), Brazil, p. 10, *keferstcini*, Caracas, *proteoides*, North America, p. 11, *platowi*, locality not stated, p. 12, *ixion* (Hopff., MS.), p. 13, *herophilus*, Rio, p. 16, *nivosus* (Weym., MS., = *dorysus*, Herr.-Schäff., *nec* Swains.), p. 17, *albistria*, Rio, *cholus* (Kaden, MS.), p. 19, *gideon*, locality not stated, p. 21, and *hypozonius*, La Guayra, p. 22, Pöltz, Bull. Mosc. lv. 2.

Eudamus misitra, Mexico, *dinora*, Chiriqui, *zopyrus*, Surinam, p. 502, *erycina*, *aulus*, Brazil, p. 503, and *briccius*, South America, p. 504, *id.* S. E. Z. xlii.; *E. electra*, Lintner, Canad. Ent. xiii. p. 63, Ontario; *E. oberon*, Worthington, Papilio, i. p. 132, Florida.

Telegonus acroleucus, Wood-Mason & De Nicéville, P. A. S. B. 1881 (Aug.), p. 143 (= *Hesperia acroleuca* iid. J. A. S. B. l. pt. 2, p. 260; = *H. hiraca*, Moore, Tr. E. Soc. 1881, Sept., p. 313), Andaman Islands.

Hesperia jucunda, Butler, P. Z. S. 1881, p. 179, pl. xviii. fig. 8, Socotra.

Erycides okeechobee, Worthington, *l. c.* p. 133, Florida.

Proteides chrysaglia, Butler, P. Z. S. 1881, p. 856, Yesso.

Pamphila herculea, id. Ann. N. H. (5) vii. p. 140, Nikko ; *P. ranoha* and *harona*, Westwood, Oates's "Matabele Land," p. 353, Victoria Falls ; *P. siris* and *mardon*, Oregon, and *straton*, Florida, W. H. Edwards, Papilio, i. pp. 47 & 78.

Halpe decorata, Moore, Lep. Ceyl. i. p. 173, pl. lxxi. fig. 2, Ceylon.

Copaeodes eunus, W. H. Edwards, *l. c.* p. 47, Oregon.

Daimio felderi, Butler, Ann. N. H. (5) vii. p. 140, Nikko.

Pyrgus philetas, W. H. Edwards, *l. c.* p. 46, Texas; *P. fulvo-vittatus*, Butler, Tr. E. Soc. 1881, p. 475, Chili.

Syrichthus leuzea, pl. iii. fig. 10, and *ali*, pl. ii. fig. 3, Oberthür, Etudes d'Ent. vi. (3) pp. 60 & 61, Algeria.

Plesioneura restricta, Moore, Lep. Ceyl. i. p. 178, Ceylon ; *P. paralysos*, Wood-Mason & De Nicéville, P. A. S. B. 1881, p. 143, and J. A. S. B. l.

pt. 2, p. 257, Andaman Islands; *P. fritz-gærtneri*, Bailey, Bull. Brooklyn Soc. iii. p. 62, Salvador (?), Central America.

Cyclopides fruticolens, fig. 12, p. 477, with varr. *tractipennis*, *quadrinotatus* and *pulcher*, p. 478, and *C. philippii*, fig. 13, p. 479, Butler, Tr. E. Soc. 1881, pl. xxi., Chili.

Nisoniades nævius, p. 69, *petronius*, p. 70, and *somnus*, p. 73, Lintner, Papilio, i., Florida.

Tagiades distans, Moore, *l. c.* p. 175, pl. lxviii. figs. 1 & 1*a*, Ceylon.

SPHINGIDÆ.

DRUCE, H. Biologia Centrali Americana (cf. *Insecta*, General Subject, *sub* Godman & Salvin). *Lepidoptera Heterocera*, pp. 1–24, pls. i. & ii.

Includes *Sphingidæ*. The following known species are figured, or specially noticed:—*Perigonia lusca*, Fabr. (= *ilus*, Boisd.), p. 3; *Pachygonia subhamata*, Walk. (= *rubiginosa*, Feld.); *P. hopfferi*, Staud., pl. i. fig. 1, p. 4; *Chærocampa libya*, Druce, fig. 5, *C. lælia*, Druce, fig. 4, pl. ii., *salvini*, Druce, fig. 2, p. 9, *aristor*, Boisd., fig. 7, p. 10, *titana*, Druce, fig. 6, *belti*, Druce, figs. 3 & 4, *nitidula*, Clem. (= *lævis*, G. & R.), p. 11, *falco*, Walk. (= *fugax*, Boisd.), fig. 8, p. 12; *Smerinthus saliceti*, fig. 9, pl. i. p. 17; *Dilophonota obscura*, Fabr. (= *stheno*, Hübn., *rhæbus*, Boisd. (= *domingonis*, Butl.), p. 19; *Protoparce ochus*, Klug (= *instita*, Clem.), p. 20; *Sphinx lugens*, Walk. (= *andromedæ*, Boisd.), *justiciæ*, Walk. (= *merops*, Boisd.), p. 23.

GROTE, A. R. New Check List of North American *Sphingidæ*. Bull. Buff. Soc. iii. pp. 220–225.

MÜHLER, H. B. Die Familien und Gattungen der europäischen Schwärmer. Abh. Ges. Görl. xvii. pp. 1–40, pl.

Includes tables and detailed characters of the 5 families and 18 genera of *Sphinges*, according to Staudinger's Catalogue, and a plate of neuration.

Meldola (Weismann's Studies, ii.) makes, or records, many observations on *Sphingidæ*; the following being among the most important:—*Pergesa* and *Darapsa* should not be separated from *Chærocampa* (p. 190); larval classification of *Chærocampinæ* (pp. 104 & 105). *Acherontia atropos*, habits of larva in Spain (by Noll), p. 324; variation of larva in South Africa (Trimen), pp. 531 & 532. *Lophostethus dumolini*, Latr.: larva described by Trimen & Gooch, pp. 527 & 528.

Variation in larvæ of *Sphingidæ*, and frequent absence of the caudal horn noticed; Hulst, Bull. Brooklyn Soc. ii. pp. 35 & 36.

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species:—*Acosmeryx cinerea*, Butl., fig. 1, *sericeus*, Walk. (= *anceoides*, Boisd.), fig. 2, p. 1; *Pergesa aurifera*, Butl., fig. 4, p. 2, *velata*, Walk., fig. *f*, *gloriosa*, Butl., fig. 6, p. 3; *Panacra perfecta*, Butl., fig. 8, p. 4, *mydon*, Walk. (= *scapularis*, p., Walk.), fig. 9, pl. lxxviii. p. 5; *Angonyx automedon*, Walk. (♂ = *truncata*, Walk.), fig. 1, *busiris*, Walk., fig. 2, p. 6; *Chærocampa macromera*, Butl. (= *vicularis*, Boisd.) fig. 3, *fraterna*, Butl.,

fig. 4, p. 7, *lucasi*, Walk., fig. 5, *silhetensis*, Walk., fig. 6, p. 8, *lineosa*, Walk., fig. 7, pl. lxxix.; *Dilephila lathyrus*, Walk., fig. 1, p. 9; *Ambulyx maculifera*, Walk., fig. 3, p. 10; *Leucophlebia bicolor*, Butl., fig. 6, *damascena*, Butl., fig. 7, p. 11; *Triptogon gigas*, Butl., fig. 5, pl. lxxx. p. 12, *florale*, Butl., fig. 1, *indicum*, Walk., fig. 2, p. 13; *Clanis pudorina*, Walk., fig. 3, *bilineata*, Walk., fig. 4, p. 14, *deucalion*, Walk., fig. 5, *cervina*, Walk., fig. 6; *Pseudosphinx nyctiphanes*, Walk., fig. 7, p. 15, *inexacta*, Walk., fig. 8, *fo*, Walk., fig. 9, pl. lxxxi. p. 16.

Chœrocampa johanna, *Pholus hesperidum*, and *Protoparce dalica*, Kirby, and *Pergesa castanea*, Moore, figured by Waterhouse, Aid, i. pls. xxxviii., xlvii., lxx. & lvi.

Macroglossa thysbe, Fabr. (= *pelasgus*, Cram., = *cimbiciformis*, Steph.), larva described; *ruficaudis*, Kirb. (= *uniformis*, *buffaloensis*, and *floridensis*, Grote & Rob.), is only a dimorphic form: Hulst, Bull. Brooklyn Soc. ii. pp. 38–40. *M. croatica*, larva described; Mathew, Ent. M. M. xviii. p. 97. *M. stellatarum*: hibernation; Feuill. Nat. xi. pp. 103, 114 & 115.

Hemaris buffaloensis, Grote: its distinctness maintained; Grote, Canad. Ent. xiii. p. 175. *H. marginalis*, Grote: transformations described; Jewett, Bull. Brooklyn Soc. iv. pp. 17–19.

Thyreus abboti and larva noticed and figured; Saunders, Rep. E. Soc. Ont. 1880, p. 42, fig. 20, and Canad Ent. xiii. p. 2.

Darapsa choerilus: food plants; Hulst, *l. c.* p. 75.

Chœrocampa celerio established as an Irish species; Greene, Ent. xiv. p. 255.

Dilephila alecto: larva described; Mathew, *l. c.* p. 97. *D. elpenor*: the pupa uses its abdominal hooks to work itself out of the ground; Noël, Bull. Soc. Rouen (2) xvi. p. 140. *D. nicæa*, Dup., and *tithymali*, Boisd. (from which *mauritanica*, Staud., is not distinct), discussed, and the former figured, with larva; Oberthür, Études d'Ent. vi. pp. 62–65, pl. iii. figs. 9 & 9*a*. *D. spinifascia*, Butl.: life-history; Mathew, *l. c.* pp. 131–133.

Sphinx euphorbiæ: action of curare on the larva described; Krukenberg, Vergl. Phys. Stud. (1) i. pp. 156–159.

Daphnis nerii: larvæ noticed; Swinhoe, P. Z. S. 1881, p. 613.

Philampelus satellitia, Linn.: transformations popularly described, with figures of larvæ and imago; W. Saunders, Canad. Ent. xiii. pp. 41–43, figs. 4 & 5. *P. vitis*, Linn.: rapid development; Koebele, Bull. Brooklyn Soc. iv. pp. 22.

Pachylia achemenides, Cram.: noticed and figured; Oberthür, *l. c.* vi. p. 31, pl. v. fig. 2.

Smerinthus austauti, Staud., and var. *staudingeri*, Aust., discussed and figured; Oberthür, *l. c.* vi. pp. 65 & 66, pl. v. fig. 1, & pl. i. fig. 4. *S. askoldensis*, Oberthür, redescribed and figured by him; *l. c.* v. p. 2[illegible], pl. i. fig. 3. *S. modesta*: larva and pupa described; Kellicott, Bull. Buff. Soc. iv. p. 29. *S. myops*: note on habits, &c; Hulst, *l. c.* iii. p. 99. *S. geminatus*: varieties noticed, including *S. jamaicensis*, in the same brood; *id. l. c.* i. p. 67. *S. populi*: larva without horn; Schilde, Ent. Nachr. vii. p. 100. *S. populi* and *ocellatus*: hybrid-hermaphrodites;

Briggs & Kirby, Ent. xiv. pp. 217, 253 & 254, fig. *S. tremulæ*, Tr., discussed; Sintenis, SB. Ges. Dorp. v. pp. 287–289.

Basiana conspersa, Dew., = *stigmatica*, Mab.; Kraatz, Ent. Monatsbl. ii. pp. 105 & 106.

Acherontia: note on stridulation; Swinton, Ent. M. M. xvii. p. 238.

Atropos: tenacity of life; Dows, Ent. xiv. pp. 114 & 115.

Daremma catalpa, Boisd., and *Sphinx coniferarum*, Abbot & Smith. Transformations described; Koebele, Bull. Brooklyn Soc. iv. pp. 20 & 21.

Protoparce blackburni, Butl. Larva described; Blackburn, Ann. N. H. (5) vii. p. 319.

Sphinx ligustri: variation in larva; Argent, Tr. Epp. Forest, i. pp. xxxix. & xl. *S. quinque-maculata* popularly described and transformations figured; Bethune, Rep. E. Soc. Ont. 1880, pp. 25–27, fig. 10.

New genera and species:—

Cinogon, Butler, Tr. E. Soc. 1881, p. 1. Allied to *Pterogon*, but with the wings shaped nearly as in *Pergesa*; type, *C. cingulatum*, sp. n., *l. c.* p. 2, Tokei, Japan.

Dieneces, id. Ann. N. H. (5) viii. p. 308. Allied to last, margins of wings not sinuated; type, *Pterogon clarkiæ*, Boisd.

Pachygonia ribbei, Druce, Biol. Centr. Am. *Heter.* p. 4, pl. ii. fig. 2, Chiriqui.

Calliomma adalia, id. *l. c.* p. 6, pl. ii. fig. 1, Chiriqui.

Acosmeryx pseudonaga, Butler, Ill. Lep. Het. v. p. 2, pl. lxxviii. fig. 3, Bhotan.

Pergesa vagans, id. *l. c.* p. 4, pl. lxxviii. fig. 7, Borneo, Bhotan.

Cypa incongruens, id. *l. c.* p. 12, pl. lxxx. figs. 8 & 9, Darjiling.

Chærocampa virgo, Westwood, Oates's "Matabele Land," p. 354, pl. E, fig. 11, South Africa. *C. cyrene*, Druce [*nec* Westw.], *l. c.* p. 11, pl. i. fig. 5, Chiriqui.

Dilephila calida, Butler, Ann. N. H. (5) vii. p. 317, Hawaiian Islands.

Pachylia darceta, Druce, *l. c.* p. 15, pl. ii. fig. 4, Chiriqui.

Ambulyx junonia, Bhotan, and *consanguis*, Darjiling, Butler, *l. c.* pp. 9 & 11, pl. lxxx. figs. 2 & 4. *A. depuiseti*, Oberthür, Études d'Ent. vi. p. 31, pl. v. fig. 3, Colombia.

Smerinthus jankowskii, id. *l. c.* v. p. 26, pl. vi. fig. 1, Askold.

Anceryx edwardsi, Butler, Papilio, i. p. 105, Florida.

Sphinx davidis, Oberthür, *l. c.* v. p. 27, pl. vii. fig. 9, Askold. (Redescribed as *Hylæcus davidis*; Butler, Tr. E. Soc. 1881, p. 2.)

Sphinx albescens, Tepper, Bull. Brooklyn Soc. iv. p. 1, plate, fig. 3; *S. libocedrus*, Arizona, and *utahensis*, South Utah, H. Edwards, Papilio, i. p. 115; *S. halicarniæ*, Strecker, Bull. Brooklyn Soc. iii. p. 35, woodcut, Florida; *S.* (*Hylæcus*) *dolli*, Neumoegon, Papilio, i. p. 149, Arizona.

Diludia corallina, Druce, *l. c.* p. 22, pl. ii. fig. 3, Mexico, Guatemala.

ÆGERIIDÆ.

KELLICOTT, D. S. Observations on several species of *Ægeriadæ* inhabiting the vicinity of Buffalo, N. Y. Canad. Ent. xiii. pp. 3–8.

8 species noticed (1 new) with remarks on transformations, &c. Those of *A. tricincta*, Harr., are described in full, and its close resemblance to a wasp commented on.

List of North American *Ægeriidæ* described by Grote; Bull. U. S. Geol. Surv. vi. p. 257.

Sciapteron robiniæ, H. Edw., *syringæ*, Harr., *Bembecia sequoiæ*, H. Edw., and *marginata*, Harr., noted as injurious to various trees; H. Edwards, Ins. Inj. Trees, p. 261.

Trochilium crabroniforme, Lew., var. (?) or sp. n. (?), from Lepsa, noticed; Staudinger, S. E. Z. xlii. pp. 394 & 395.

Ægeria, H. Edwards (Papilio, i. pl. i.) copies Walker's descriptions of the following species, and adds figures:—*A. pleciiformis*, figs. 2 & 2 *a*, *pyramidalis*, figs. 5 & 5 *a*, *b*, *odyneripennis*, figs. 3 & 3 *a*, *emphytiformis*, figs. 1 & 1 *a*, p. 206, *hylotomiformis*, figs. 4 & 4 *a*, *pyralidiformis*, *sapygiformis*, figs. 6 & 6 *a*, *b*, p. 207, and *geliformis*, figs. 7 & 7 *a*, p. 208. *Æ. acerni*, Clem.: transformations popularly described and figured; Saunders, Canad. Ent. xiii. pp. 69 & 70, fig. 6. *Æ. exitiosa*, Say: habits, &c.; Comstock, Rep. Agric. Dep. 1879, pp. 254 & 255.

Sesia megilliformis. Natural history; Schreitmüller, Ent. Nachr. vii. pp. 319–321.

Sciapteron syringæ, Harr. Larva described; H. Edwards, *l. c.* p. 184. Infested by *Phœogenes ater*, Cress.; French, *tom. cit.* p. 106.

New genera and species:—

Euhagena, H. Edwards, Papilio, i. p. 180. Allied to *Tarsa*; type, *E. nebraskæ*, sp. n., *l. c.* p. 181, Nebraska.

Larunda, id. *l. c.* p. 182. Placed after *Bembecia*; type, *L. solitudæ*, sp. n., *l. c.*, Texas and Kansas.

Carmenta, id. *l. c.* p. 184. Allied to *Paranthrene*; type, *Ægeria pyralidiformis*, Walk.; add *C. ruficornis*, p. 184, *minuta*, Georgia, *sanborni*, Massachusetts, and *fraxini*, Washington, p. 185, spp. nn.

Albuna, id. *l. c.* p. 186. Allied to *Ægeria*; type, *A. hylotomiformis*, Walk.; add *A. resplendens*, California, *rutilans*, Nevada, p. 186, *rileyana*, Missouri, *artemisiæ*, California, p. 187, *montana*, White Mountains, California, *tanaceti*, Colorado, Oregon, California, Vancouver's Island, *vancouverensis*, Vancouver's Island, Colorado, p. 188, *coloradensis*, Colorado, *torva*, Mount Washington, Vancouver's Island, Colorado, p. 189, spp. nn.

Phryctena, Oberthür, Études d'Ent. vi. p. 114. Type, *P. glaucopidalis*, sp. n., *l. c.* pl. xx. fig. 4. (Referred, *l. c.*, to the *Pyralidæ*, but = *Acridura gryllina*, Butl., first referred by Butler to the Zygænoid *Arctiidæ*, and subsequently to the *Ægeriidæ*.)

Sphecia rhynchioides, Butler, Tr. E. Soc. 1881, p. 589, Tokei.

Ægeria flava, p. 189, *aurata*, Panama, *corni*, Massachusetts, *saxifragæ*,

verecunda, Colorado, p. 190, *brunneipennis*, *rubro-fascia*, Georgia, *bolli*, Texas, p. 191, *lupini*, California, *perplexa*, Texas, p. 192, *impropria*, California, Washington Territory, *sexfasciata*, *corusca*, Texas, p. 193, *aureola*, Nevada, *consimilis*, Massachusetts, p. 194, *hyperici*, West Virginia, *cupatorii*, *infirma*, Long Island, p. 195, *imitata*, Pennsylvania, *morula*, Texas, *Isabellæ*, Florida, p. 196, *washingtonia*, Washington Territory, *decipiens*, Colorado, *neglecta*, Washington Territory, p. 197, *imperfecta*, Colorado, *hemizoniæ*, Nevada, *senecioides*, California, Nevada, p. 198, *refulgens*, Georgia, *opalescens*, Virginia, Nevada, Colorado, *novaroensis* (Behrens, MS.), California, p. 199, *giliæ*, *mimuli*, Colorado, p. 200, *madariæ*, California, *albicornis*, Nevada, *proxima*, *inusitata*, White Mountains, Massachusetts, p. 201, and *nicotianæ*, Texas, p. 202, H. Edwards, Papilio, i.; *Æ. pini*, Kellicott, Canad. Ent. xiii. pp. 5 & 157, New York County and Ontario; *Æ.* (?) *aureo-purpura*, H. Edwards, Bull. Brooklyn Soc. iii. p. 72, Texas.

Pyrrhotænia polygoni, California, *fragariæ*, Colorado, p. 202, *helianthi*, Nevada, *achilleæ*, California, *tepperi*, Georgia, *eremocarpi*, California, p. 203, *meadii*, California, *orthocarpi*, Nevada, and *texana*, Texas, p. 204, *id.* Papilio, i.

Zenodoxus heucheræ, *potentillæ*, California, and *canescens*, Colorado, *id. l. c.* p. 205.

Sesia ceiformis and *pudorina*, Staudinger, S. E. Z. xlii. pp. 395 & 396, Saisan, &c.; *S. codeti*, *puigi*, *floricola*, Oberthür, Études d'Ent. vi. (3) p. 67, pl. xi. figs. 5–7, Algeria: *S. nigella*, New York, p. 75, *flavipes*, Brooklyn, *rubescens*, Colorado, p. 76, Hulst, Bull. Brooklyn Soc. iii.

Trochilium pacificum, H. Edwards, *l. c.* p. 180, Washington Territory, California; *T. grande*, Strecker, Canad. Ent. xiii. p. 156, Texas; *T.* (*Sciapteron*) *simulans*, Grote, Bull. Brooklyn Soc. iii. p. 78, and Bull. U. S. Geol. Surv. vi. p. 257, Illinois.

Sciapteron græfi, Nevada, *scepsiformis*, Texas, and *cupressi*, Colorado, H. Edwards, *l. c.* p. 183; *S. robiniæ*, id. Bull. Brooklyn Soc. iii. p. 72, California, Nevada.

Melittia gloriosa, id. *l. c.* p. 71, California, Texas.

Bembecia sequoiæ, California, and *superba*, Washington Territory, *id.* Papilio, i. p. 181.

THYRIDIIDÆ.

Pachythyris zelleri, sp. n., Dewitz, Verh. L.-C. Ak. xlii. p. 65, pl. ii. fig. 7, Chinchoxo.

URANIIDÆ.

Urania leilus: larva described; Kappler, quoted by E. Hofmann, S. E. Z. xlii. pp. 487 & 488. *U. sloanus*: larva and pupa described, and compared with those of *U. fernandinæ*; Gosse, Ent. xiv. pp. 241–245.

Coronis subpicta, Butl., noticed and figured; Oberthür, Études d'Ent. vi. p. 29, pl. vi. fig. 3.

Coronis westwoodi, sp. n., *id. l. c.* p. 28, pl. vi. fig. 2, New Granada.

Castniidæ.

Castnia hodeei, New Granada, and *mathani*, Teffé, Oberthür, Études d'Ent. vi. pp. 29 & 30, pl. iv. figs. 1 & 2. *C. erycina*, Westwood, P. Z. S. 1881, p. 141, pl. xii. fig. 4, and woodcuts, Eastern Ecuador.

Agaristidæ.

Butler (Ill. Lep. Het. v. pl. lxxxii.) figures and redescribes the following known species:—*Eusemia silhetensis*, Butl., fig. 1, *orientalis*, Butl., fig. 2, *distincta*, Butl., fig. 3, p. 17, *sectinotis*, Butl., fig. 5, *aruna*, Moore, fig. 6, *Nikæa longipennis*, Walk., fig. 7, p. 18, *Scudyra longipennis*, Walk., fig. 8, p. 19, and *catocalina*, Walk., fig. 9, p. 20.

Eusemia pardalina, Walk., noticed; Westwood, Oates's "Matabele Land," p. 355.

Edwardsia brillians, Neum., noticed and figured; Papilio, i. p. 12, pl. i.

Ægocera tripartita, Kirby, figured by Waterhouse, Aid, i. pl. xxxix.

Eudrimi, Grote, Papilio, i. p. 177. New tribe of "*Zygænidæ*," related to *Alypia* and *Castnia*; to include the genera *Eudryas*, Boisd., and *Euschirropterus*, *Copidryas* and *Ciris*, Grote (a list of North American species is given, *l. c.*), and the South African genus *Ovios*.

Eusemia adulatrix, South Africa, pl. G, fig. 1, pl. H, figs. 3, 3*a*, & 3*b*, *niveo-sparsa*, Cameroons, *æmulatrix*, locality unknown, *meretrix*, South Africa, p. 355, *nugatrix*, Cape Palmas, and *glossatrix*, South-east Africa, p. 356, Westwood, Oates's "Matabele Land"; *E. dives*, Butler, *l. c.* p. 18, pl. lxxxii. fig. 4, Darjiling; *E. falkensteini*, Dewitz, Verh. L.-C. Ak. xlii. p. 66, pl. ii. fig. 10, Chinchoxo: spp. nn.

Pais moldankii, sp. n., Dewitz, *l. c.* p. 65, pl. iii. fig. 15, Cape.

Chalcosiidæ.

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species:—*Heterusia magnifica*, Butl., fig. 2, p. 20, *Chalcosia adalifa*, Walk., fig. 5, *Milleria fuliginosa*, Walk., fig. 6, p. 22, *Pintia ferrea*, Walk, fig. 7, p. 23, *Amesia aliris*, Doubl., fig. 10, pl. lxxxiii. p. 24, *Codane zelica*, Doubl., fig. 2, *Retina rubrivitta*, Walk., fig. 4, p. 25, *Agalope basalis*, Walk., fig. 5, *primularis*, Butl., fig. 7, pl. lxxxiv. p. 26.

New genera and species:—

Chatamla, Moore, P. Z. S. 1881, p. 326. (*Chalcosiidæ*); type, *Euschema flavescens*, Walk.

Schistomitra, Butler, Tr. E. Soc. 1881, p. 3. Allied to *Chatamla*; type, *S. funeralis*, sp. n., *l. c.* p. 4, Nikko, Japan.

Elcysma, id. *l. c.* p. 4. Allied to *Agalope*; hind wings produced at the extremities of the third median branch, which is bifurcate; and radial vein produced into a long, narrow tail: type, *E. translucida*, sp. n., *l. c.* p. 4, Yokohama.

Chatamla tricolor, id. Ill. Lep. Het. v. p. 20, pl. lxxxiii. fig. 1, Silhet.

Heterusia virescens, India, and *dulcis*, Darjiling, *id. l. c.* p. 21, p. lxxxiii. figs. 3 & 4.

Amesia stelligera, id. *l. c.* p. 23, pl. lxxxiii. figs. 8 & 9, Bhotan.

Epyrgis imitans, id. *l. c.* p. 24, pl. lxxxiv. fig. 1, Bhotan.

Laurion miles, id. *l. c.* p. 25, pl. lxxxiv. fig. 3, Darjiling.

Agalope glacialis, id. *l. c.* p. 26, pl. lxxxiv. fig. 6, Darjiling.

Milleria pontioides, id. Ann. N. H. (5) vii. p. 35, Sarawak.

Zygænidæ.

Butler (Ill. Lep. Het. v. pl. lxxxiv.) figures and redescribes :—*Artona discivitta*, Walk., fig. 8, p. 26, *zebraica*, Butl., fig. 9, *confusa*, Butl., fig. 10, and *Notioptera dolosa*, Walk., fig. 11, p. 27.

Millière redescribes and figures *Zygæna hilaris*, Ochs., var. *ononidis*, Mill., figs. 6–10, and *occitanica*, Vill., figs. 11–14 ; Lépidoptérologie, v. pp. 4 & 8, pl. v.

Zygæna meliloti, Esp., var. *confusa*, and *exulans*, Hoch., var. (?) *exiliens*, from Ala Tau, noticed ; Staudinger, S. E. Z. xlii. pp. 398 & 399. *Z. algira*, Dup., ab. *concolor*, from Algeria, described and figured, and *Z. cedri*, Bruand, var. *staudingeri*, Aust., noticed ; Oberthür, Études d'Ent. vi. pp. 68 & 70, pl. ii. fig. 4.

Anthrocera minos recorded from Cornwall ; Gain & Birchall, Sci. Goss. xvii. pp. 41, 65 & 414.

Ino cognata, Ramb. (?), from the Stilfser Joch, described ; Wocke, JB. schles. Ges. lviii. p. 200.

Naclia punctata, Fabr., var. *ochrea*, Mill. : redescribed and figured ; Millière, *l. c.* vi. p. 1, pl. viii. fig. 2.

Histiæa meldolæ, Butl., figured by Waterhouse, Aid, i. pl. lxiii.

Œta compta, Clem., = *aurea*, Fitch, = *punctella*, Cram., = *pustalella*, Fabr. It probably belongs to the *Zygænidæ*. Eggs noticed ; Riley, Papilio, i. p. 120, and Index to Reports, p. 58.

New genera and species :—

Penthetria, H. Edwards, Papilio, i. p. 80. Allied to *Procris* : antennæ slender, simple ; abdomen with no anal tuft. Types, *P. majuscula*, Georgia, and *parvula*, Georgia, Florida, spp. nn., *l. c.*

Mimica, Oberthür, Études d'Ent. vi. p. 33. Allied to *Glaucopis*, but with a superficial resemblance to the Coleopterous genus *Calopteron* ; type, *M. lycoides*, sp. n., *l. c.* pl. x. fig. 9, Peru.

Zygæna tricolorata, Westwood, Oates's "Matabele Land," p. 354, South Africa ; *Z. nedroma* (Aust., MS.), Oberthür, Études d'Ent. vi. p. 68, pl. iii. fig. 3, Algeria.

Procris psychina, id. *l. c.* v. p. 28, pl. vii. fig. 6, Askold.

Anatolmis fulgens, H. Edwards, Papilio, i. p. 116, Arizona.

Syntomis erebina, Butler, Tr. E. Soc. 1881, p. 5, Tokei, Japan.

Arctiidæ.

Lovett, E. On the development of the pupa of *Arctia caja*. Ent. xiv. pp. 176 & 177.

The undeveloped pupa resembles the perfect insect; the pupa-skin appears to be afterwards formed by the exudation of a material somewhat resembling lac.

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species:—*Glanycus insolitus*, Walk., pl. lxxxiv. fig. 12, *Hypercompa plagiata*, Walk., fig. 1, *Areas moorii*, Butl., fig. 2, p. 28, *Icambosida nigrifrons*, Walk., fig. 3, *rhodophila*, Walk., fig. 4, p. 29, *Aloa diminuta*, Walk. (= *emittens*, ♀, and *strigata*, Walk.), fig. 5, *punctistriga*, Walk., fig. 6, *Alpenus spilosomoides*, Walk., fig. 7, p. 30, *Alphœa fulvo-hirta*, Walk., fig. 8, *Spilarctia abdominalis*, Moore, fig. 9, p. 31, *nydia*, Butl., fig. 12, p. 32, *confusa*, Butl., fig. 13, pl. lxxxv., *Nayaca imbuta*, Walk., fig. 1, *divisa*, Walk., fig. 2, p. 33, *florescens*, Moore, fig. 3, and *Rajendra tripartita*, Walk., fig. 4, pl. lxxxvi. p. 35.

Ctenucha rubro-scapus, Boisd. (*nec* Mén.), = *multifaria*, Walk.; Butler, Ann. N. H. (5) viii. p. 309. *C. walsinghami*, H. Edw., = *rubro-scapus*, Mén.; *id.* Papilio, i. p. 130.

Trichosoma boticum and *pierreti*, Ramb., and *Brachysoma codeti*, Aust., noticed, and the latter two figured; Oberthür, Études d'Ent. vi. pp. 71 & 72, pl. ii. figs. 8 & 9, and pl. xi. fig. 11.

Arctia achaia, Boisd., var. from California and Oregon, described; H. Edwards, Papilio, i. p. 39. *A. caia*: larva infested by *Phirocera agilis*, Desv.; Van Segvelt, Feuill. Nat. xii. p. 10. Stridulation; Lovett, Ent. xiv. p. 178. Occasionally double-brooded, Waters, Sci. Goss. xvii. p. 127. *A. cervini*: habits and transformations; Wackerzapp, Ent. Nachr. vii. pp. 345–352. *A. decorata*, Saund.: larva described; French, Papilio, i. p. 81. *A. figurata*: larva and variation noticed, its variation suggests the possibility that *A. saundersi*, *persephone* and *anna* are only varieties of one species; Graef, Bull. Brooklyn Soc. i. pp. 3 & 4. *A. fuliginosa* with black cilia to the hind wings; Anderson, Ent. xiv. p. 136. *A. glaphyra*, Eversm.: varieties from Central Asia noticed; Staudinger, S. E. Z. xlii. p. 402. *A. phalerata*, var. *incompleta* from Washington, described: Butler, Ann. N. H. (5) viii. p. 311. *A. quenseli*, Payk., var. *gelida*, Möschl.: discussed and larva described: Schøyen & Sandberg, Tromsö Mus. Aarsh. iv. pp. 84–86. *A. virgo*: yellow variety noticed; Graef, *l. c.* iv. p. 58. *A. virguncula*, Riley: larva described; Coquillett, Psyche, i. p. 7.

Pleretes matronula: habits of larva noticed; Hering, S. E. Z. xlii. p. 151.

Diacrisia metalkana, Led.: belongs to *Rhyparioides*; Butler, Tr. E. Soc. 1881, p. 6.

Euprepia phœosoma, Butler, var. *auripennis* from Tokei, described by him; *l. c.* p. 7.

Chelonia virginalis, Boisd., is a *Hypercompa*; id. Ann. N. H. (5) viii. p. 310.

Antarctia punctata, var. *proba*, from California, described; H. Edwards, *l. c.* p. 39.

Leptarctia californiæ, discussed, and 8 varr. from California and Oregon enumerated, as follows:—*stretchi* (n.), p. 312; *boisduvali* (n.), *dimidiata*, Stretch, *latifasciata* (n.), *fulvo-fasciata* (n.), *californiæ*, Walk. (= *adusta*, Boisd, and *lena*, Stretch), p. 313, *decia* and *lena*, Boisd., p. 314; Butler, Ann. N. H. (5) viii. (*cf.* also *id.* Papilio, i. pp. 130 & 131).

Spilosoma fuliginosa, L., varr. *placida*, Friv., *fervida*, Staud., *subnigra*, Mill., and *S. sordida*, Hübn., redescribed and figured; Millière, Lépidoptérologie, vi. pp. 4 & 17, pl. viii. figs 5–7, and pl. ix. fig. 11. *S. dœrriesi*, Oberth., = *punctarium*, Cram. *S. seriato-punctata*, Motsch., and *rosacea*, Butl., noticed; Butler, Ann. N. H. (5) vii. p. 230. *S. dœrriesi*, Oberth., and *striato-punctata*, Motsch., redescribed and figured; Oberthür, *l. c.* v. pp. 31 & 32, pl. i. figs. 7 & 8. *S. lubricipeda*, var. with red abdomen noticed; Graeser, Verh. Ver. Hamb. iv. p. 205, and note. *S. virginica*: transformations described and figured; Saunders, Rep. E. Soc. Ont. 1880, pp. 21 & 22, fig. 3, and Packard, Ins. Inj. Trees, pp. 88 & 89, fig. 39. *S.* (*Hyphantria*) *punctata*, Fabr., and *textor*, Harr., are varieties of *S. cunea*, Dru.; Graef & French, Bull. Brooklyn Soc. iii. pp. 14 & 31.

Hyphantria textor noticed, and transformations figured; Riley, Am. Nat. xv. pp. 747 & 748, fig. Variation noticed; Johnson, Canad. Ent. xiii. p. 18.

Eepantheria. Oberthür (*l. c.* vi. pp. 99–112) discusses this genus, and notices and figures *E. eridanus*, Cram., pl. xii. fig. 1, *eridane*, Hübn., pl. xii. figs. 2 & 3, p. 105, *oculatissima*, Smith (= *scribonia*, Stoll.), and var. *confluens*, pl. xvii. figs. 3 & 5, *kinkelini*, Burm., pl. xviii. figs. 1 & 6, p. 110, *indecisa*, Walk., pl. xviii. figs. 4 & 7, *aulæa*, Hübn. pl. xix. figs. 4 & 7, p. 111, and *picta*, Pack., pl. xix. figs. 5 & 8, p. 112. A great number of new species are also figured but not described.

Gnophæla vermiculata, G. & R., var. *continua* from Colorado, described: H. Edwards, *l. c.* p. 80.

Pseudapiconoma, Aurivillius, Ent. Tidskr. ii. p. 46. Allied to *Automolis*, Herr.-Schäff. (*nec* Walk.); type, *P. testacea*, sp. n., *l. c.* fig. 1 Gaboon.

New species:—

Scepsis edwardsi, Grote, Papilio, i. p. 4, Florida.

Ctenucha pyrrhoura[*-kura*], Hulst, Bull. Brooklyn Soc. iii. p. 77, iv. plate, fig. 4, Colorado.

Trichosoma gandolphii, Oberthür, Études d'Ent. vi. p. 71, pl. ii. fig. 7, Bône.

Euprepia opulenta, H. Edwards, Papilio, i. p. 38, Alaska.

Arctia dodgii, *ochreata*, and *rhoda*, Butler, Ent. M. M. xviii. p. 136, United States; *A. simplicior*, Butler, Ann. N. H. (6) viii. p. 311, Jacksonville; *A. flammea*, Florida, and *determinata*, Colorado, Neumoegen, Papilio, i. pp. 9 & 28; *A. incorrupta*, Arizona, Oregon, H. Edwards, *l. c.* p. 38; *A. jelskii*, Oberthür, *l. c.* p. 33, pl. x. fig. 3, Peru.

Nemeophila macromera and varr. *leucomera* and *melanomera*, Butler, Tr. E. Soc. 1881, p. 5, Tokei, Japan.

Antarctia walsinghami, Butler, Ann. N. H. (5) viii. p. 311; *A. rubra*, Neumoegen, *l. c.* p. 79: both from Oregon.

Diacrisia irene, Butler, Tr. E. Soc. 1881, p. 6, Tokei, Japan.

Rhyparioides simplicior, id. *ibid.*, Tokei.

Spilarctia basilimbata and *bifasciata*, id. *l. c.* pp. 6 & 7, Tokei, Japan; *S. lacteata* and *jucunda*, id. Ill. Lep. Het. v. pp. 31 & 32, pl. lxxxv. figs. 10 & 11, Darjiling.

Spilosoma jankowskii, Oberthür, *l. c.* v. p. 31, pl. viii. fig. 3, Askold.

Ecpantheria muzina, New Granada, fig. 4, *albicollis*, Brazil, fig. 5, *thiemii*, Rio Magdalena, fig. 6, p. 105, *abscondens*, Yucatan, fig. 7, *depauperata*, fig. 8, pl. xii. p. 106, *bolivar*, Colombia, fig. 1, *guadulpensis*, Guadeloupe, fig. 2, *garzoni*, New Granada, fig. 3, *xanthonota*, locality unknown, fig. 6, *yukatanensis*, Yucatan, fig. 4, *ganglio*, Brazil, fig. 5, pl. xiii., *cayennensis* and var. *decipiens*, Cayenne, Brazil, pl. xiv. figs. 1 & 3, pl. xv. fig. 6, p. 107, *alpha*, Mexico, fig. 2, *annexa*, Brazil, fig. 4, *bari*, Cayenne, fig. 5, *orbiculata*, Brazil, fig. 7, *dubiosa*, Cayenne, fig. 6, pl. xiv., *proxima*, Brazil, fig. 9, p. 108, *detecta*, Para, fig. 8, *mexicana*, Mexico, figs. 1 & 3, *haitensis*, Haiti, figs. 5 & 7, *heterogena*, Brazil, fig. 2, *atra*, Oaxaca, fig. 4, pl. xv., *mus*, Brazil, fig. 1, *contexta*, Brazil, fig. 2, *bahiensis*, Bahia, fig. 5, p. 109, *boisduvali*, Bahia, Pernambuco, fig. 6, *columbina*, New Granada, figs. 3, 4, & 7, pl. xvi., *quitensis*, Quito, pl. xvii. figs. 1 & 2, *aramis*, Minas Geraes, figs. 2 & 3, p. 110, *magdalenæ*, Colombia, figs. 5 & 8, pl. xviii., *præclara*, New Granada, fig. 1, *brasiliensis*, Brazil, figs. 2, 3 & 6, pl. xix., *chilensis*, Chili, fig. 5, p. 111, *sanguinea*, Mexico, figs. 1 & 2, pl. xx. p. 112, *detectiva* and *distans*, localities not stated, pl. xvii. figs. 4 & 6, Oberthür, *l. c.* vi.

Halesidota ingens, H. Edwards, *l. c.* p. 39, Arizona; *H. labecula*, Grote, *l. c.* p. 174, New Mexico.

Dioptidæ.

Phryganidea californica, Pack., belongs to this family; Butler, Papilio, i. p. 131.

Lithosiidæ (including Hypsidæ).

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species:—*Doliche gelida*, Walk., fig. 6; *Bizone pallens*, Butl., fig. 7, p. 36, *perornata*, Walk., fig. 8; *Cyana detrita*, Walk., fig. 9, p. 37; *Miltochrista nubifascia*, Walk. (= *punctifascia*, Walk.), fig. 11, p. 38, *mactans*, Butl., fig. 13; *Teulisna tetragona*, Walk., fig. 14, pl. lxxxvi., p. 39; *Castabala roseata*, Walk., fig. 1; *Agrisius guttivitta*, Walk., fig. 2; *Macrobrochis atrata*, Walk., fig. 3, p. 40, *gigas*, Walk., fig. 4, p. 41; *Philoma inops*, Walk., fig. 6; *Damalis plaginota*, Butl., fig. 7, p. 42, *egens*, Walk., fig. 8; *Neochera marmorea*, Walk. (= *dominia*, Walk.), figs. 10 & 11, pl. lxxxvii. p. 43.

Ameria, Rob., belongs to the *Lithosiidæ*, between *Euphanessa* and *Crocota*; Grote, Papilio, i. p. 153.

Eudule weyenberghi and *Hypocrita calochroma*, Snellen, redescribed; Period. Zool. iii. pp. 19 & 21.

Hypoprepia packardi, Grote. Habits and transformations; Murtfeldt, Psyche, iii. pp. 243 & 244.

Cyllene picta, Drury. Transformations figured and larva described; Packard, Ins. Inj. Trees, pp. 70 & 71, fig. 30.

Calligenia rosacea, Brem., noticed: Oberthür, Études d'Ent. v. p. 29.

Lithosia larvæ will eat any cryptogams, even those destructive to insects; Lichtenstein, Bull. Soc. Ent. Fr. (6) i. p. lxxvi. *L. gigantea*, Oberthür, redescribed and figured by him, *l. c.* v. p. 29, pl. i. fig. 6.

Gnophria (?) *ceramensis*, Voll., = *Phalæna entella*, Cram.; Ritsema, Notes Leyd. Mus. iii. p. 84.

Deiopeia bella, Linn., is a very local species; *speciosa* and *ornatrix* appear to be only varieties: Hulst, Bull. Brooklyn Soc. i. p. 83.

Setina irrorella, var. *insignata*, from Saisan, described; Staudinger, S. E. Z. xlii. p. 399.

Paidia mesogona. Transformations described and larva figured as *Euxestis dentula*, Led.; Millière, Lépidoptérologie, iii. p. 7, pl. iii. fig. 7.

Nola cucullatella and *centonalis*: cocoons; Haar & Snellen, Tijdschr. Ent. xxiv. p. xv. *N. centonalis*: variation in times of appearance; Tugwell, Ent. xiv. p. 226. *N. karelica*, Tengstr. (*arctica*, Schφyen), discussed; Schφyen, Tromsö Mus. Aarsh. iv. pp. 83 & 84.

New genera and species:—

Stigmatophora, Staudinger, S. E. Z. xlii. p. 399. Allied to *Setina*; type, *S. micans*, Brem. & Grey (= *albo-sericea*, Moore), redescribed, p. 400.

Pentacitrotus, Butler, Ill. Lep. Het. v. p. 35. Allied to *Coracia*; type, *P. calzeratus*, sp. n., *l. c.* pl. lxxxvi. fig. 5, Darjiling.

Hyaloscotes, id. Ann. N. H. (5) viii. p. 314. Aspect of *Psyche* and *Comacla*, venation nearly of *Byssophaga*, Behr. (= *Trichromia*, Hübn.): type, *H. fumosa*, sp. n., *l. c.*, California.

Lycomorpha constans and *desertus*; H. Edwards, Papilio, i. p. 81, Arizona.

Deiopeia cruentata, Butler, Ill. Lep. Het. v. p. 38, pl. lxxxvi. fig. 10, North India, Mauritius.

Teulisna sordida, id. *l. c.* p. 39, pl. lxxxvi. fig. 15, Darjiling.

Miltochrista tessellata, id. *l. c.* p. 39, pl. lxxxvi. fig. 12, Darjiling; *M. artaxidia*, id. Tr. E. Soc. 1881, p. 8, Tokei, Japan; *M. curtisi* and *collivolans* (= *meander*, pt., Snell.), *id.* Ann. N. H. (5) viii. pp. 379 & 380, Sumatra.

Calligenia askoldensis, Oberthür, Études d'Ent. v. p. 30, Askold.

Macrobrochis albicans, Butler, Ill. Dep. Het. v. p. 41, pl. lxxxvii. fig. 5, Bhotan.

Gampola noctis, id. Tr. E. Soc. 1881, p. 8, Tokei.

Sinna fentoni and *clara*, id. *ibid.*, Tokei.

Crocota ostenta, H. Edwards, *l. c.* p. 12, Arizona.

Æmene minuta, Butler, *l. c.* p. 595, Yokohama.

Nola anfracta, H. Edwards, *l. c.* p. 12, Yosemite Valley; *N. fuscula*,

Grote, Papilio, i. p. 76, Colorado ; *N. minna*, Butler, Ann. N. H. (5) viii. p. 315, California.

Camptoloma binotatum, id. *l. c.* vii. p. 35, Assam.

Hypsa lacteata, Butler, Ill. Lep. Het. v. p. 43, pl. lxxxvii. fig. 9, Darjiling, Silhet; *H. ambusta*, Mabille, CR. Ent. Belg. xxv. pl. lv., Madagascar.

Nycteolidæ.

Sarothripa nilotica, Rogenhofer, SB. z.-b. Wien, xxxi. p. 26, Lower Egypt.

Chionomera, g. n., Butler, Tr. E. Soc. 1881, p. 18. Allied to *Tyana*; type, *T. superba*, Moore ; add *C. argentea*, sp. n., *l. c.*, Japan.

Earias roseifera, id. *ibid.*, Tokei, Japan ; *E. tristrigosa*, id. *l. c.* p. 614, Punjab, &c.: spp. nn.

Nyctemeridæ.

Butler (Ill. Lep. Het. v.) figures and redescribes : *Leptosoma latistriga*, Walk., fig. 1, p. 44, and *Pitasila varians*, Walk., fig. 4, pl. lxxxviii. p. 46.

Hylemera doleris, Plötz, redescribed and figured; Dewitz, Verh. L.-C. Ak. xlii. p. 83, pl. iii. fig. 1.

Zonosoma [Led., *Lep.*, 1850], g. n., Butler, Ill. Lep. Het. v. p. 44. Allied to *Leptosoma* and *Pitasila*; type, *Nyctemera interlecta*, Walk., redescribed and figured, *l. c.* p. 45, pl. lxxxviii. fig. 2.

Trypheromera, g. n., id. *l. c.* p. 45. Allied to *Pitasila*; type, *Nyctemera plagifera*, Walk., redescribed and figured, *l. c.* pl. lxxxviii. fig. 3; add *T. zerenoides*, sp. n., *id.* Ann. N. H. (5) viii. p. 380, Sumatra.

Secusio picatus, sp. n., *id. ibid.*, Sumatra.

Pitthea trifasciata, sp. n., Dewitz, Verh. L.-C. Ak. xlii. p. 82, pl. iii. fig. 3, Zanzibar.

Liparidæ.

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species :—*Penora venosa*, Walk., fig. 1, *Redoa submarginata*, Walk., fig. 3, p. 48, *Gazalina antica*, Walk., fig. 4, *venosata*, Walk. (= *nervosa*, Feld.), fig. 5, *Himala argentea*, Walk. (= *Dasychira ilita*, Moore), fig. 6, p. 49, *Lalia circumdata*, Walk., fig. 7, *delineata*, Walk., fig. 8, *Euproctis lunata*, Walk., fig. 9, p. 50, *lutescens*, Walk., fig. 10, *latifascia*, Walk., fig. 11, *Porthesia marginalis*, Walk., fig. 12, *Charotriche plana*, Walk., fig. 13, p. 51, *Pida apicalis*, Walk., fig. 15, pl. lxxxix., *Artaxa scintillans*, Walk., fig. 1, p. 52, *atomaria*, Walk., fig. 2, *Cispia punctifascia*, Walk., fig. 4, p. 53, *Aroa substrigosa*, Walk., fig. 5, *Pseudomesa quadriplagiata*, Walk., fig. 6, *Nagunda semicincta*, Walk., fig. 7, p. 54, *Lymantria concolor*, Walk., figs. 8 & 9, *superans*, Walk., figs. 10 & 11, p. 55, *marginata*, Walk., fig. 12, pl. xc. p. 56, *grandis*, Walk. (= *maculosa*, Walk.), figs. 1 & 2, *Pegella lineata*, Walk., fig. 3, p. 57, *Mardara complicata*, Walk. (= *Trisula pustulifera*, Walk.), figs. 4 & 5, *Dasychira maruta*, Moore, fig. 6, pl. xci. p. 58.

Chrysopsyche mirifica, Butl., redescribed and figured, and *Lechriolepis*

anomala, Butl., figured; Dewitz, Verh. L.-C. Ak. xlii. p. 76, pl. ii. figs. 8 & 9.

Liparis dispar defoliating oaks in Crete; Lucas, Bull. Soc. Ent. Fr. (6) i. p. cxlviii.

Parorgyia, Pack., seems to be synonymous with *Dasychira*, Steph.; Tepper, Bull. Brooklyn Soc. i. p. 62.

Dasychira selenitica, note on larva; Brischke, Ent. Nachr. vii. p. 52. *D. virginea*, Oberthür, redescribed and figured by him; Études d'Ent. v. p. 33, pl. i. fig. 9, & pl. v. fig. 5.

Orgyia antiqua: larvæ from the same batch of eggs do not all moult the same number of times; Hellins, Ent. M. M. xviii. p. 86. Secluded habits of ♀; Barrett, *op. cit.* xvii. p. 211. Abundance in London; Perkins, Ent. xiv. pp. 178 & 179. *O. dubia*, var. *splendida*, Ramb., and *O. ramburi*, Mab., noticed; Ragusa, Nat. Sicil. i. pp. 37 & 38. *O. josephina*, Aust., redescribed and figured; Oberthür, *op. cit.* vi. pp. 77–79, pl. ii. fig. 5. *O. vetusta*, Boisd., redescribed in all its stages; *O. badia*, H. Edw., and probably also *O. nova*, Fitch, = *O. antiqua*, Linn.: H. Edwards, Papilio, i. pp. 60–62.

Leucoma subflava var. *piperita*, from Askold, described; Oberthür, *l. c.* p. 35.

Porthesia chrysorrhœa. The two raised tubercles in segments 6 and 7 of the larva, which secrete a poisonous liquid, are described by Passerini; Bull. Ent. Ital xiii. pp. 293–296, pl. ii.

Trisuloides, g. n., Butler, Ann. N. H. (5) vii. p. 36. Allied to *Trisula*; wings shorter; type, *T. sericea*, sp. n., *l. c.*, Assam, Darjiling.

New species :—

Epicopia excisa, Punjab, p. 46, *lidderdalii*, *maculata*, *caudata*, Bhotan, p. 47, Butler, Ill. Lep. Het. v. pl. lxxxviii. figs. 5–8.

Redoa cymbicornis, id. *l. c.* p. 48, pl. lxxxix. fig. 2, Darjiling.

Chærotriche immaculata, id. *l. c.* p. 52, pl. lxxxix. fig. 14, Darjiling; *C. niphonis* and *squamosa*, id. Tr. E. Soc. 1881, p. 9, Japan.

Porthesia (*Chærotriche*) *subnobilis*, Snellen, Tijdschr. Ent. xxiv. p. 128, Amboina.

Euproctis falkensteini, Dewitz, Verh. L.-C. Ak. xlii. p. 69, Chinchoxo.

Artaxa limbata, Butler, Ill. Lep. Het. v. p. 53, pl. xc. fig. 3, Darjiling.

Lymantria cara, id. *l. c.* p. 56, pl. xc. fig. 13, Bhotan, Borneo.

Porthetria umbrosa, p. 10, *hadina* (= *Lymantria fumida*, ♂ (*nec* ♀), Butl., *olim*), and *lucescens*, p. 11, *id.* Tr. E. Soc. 1881, Japan.

Dasychira olga, pl. ii. figs. 1 & 2, and *acronycta*, pl. v. figs. 7 & 8, Oberthür, Études d'Ent. v. pp. 34 & 35 (*D. acronycta* includes 2 species; the ♂ = *D. lunulata*, Butl., ♂ : Butler, Ann. N. H. 5, vii. p. 230); *D. niveo-sparsa*, Butler, Ill. Lep. Het. v. p. 59, pl. xci. fig. 7, Darjiling; *D. argentata*, id. Tr. E. Soc. 1881, p. 12, Yokohama; *D. saussurii*, Dewitz, *l. c.* p. 69, pl. ii. fig. 13, Chinchoxo; *D.* (?) *pumila*, Staudinger, S. E. Z. xlii. p. 405, Saisan.

Laria acuta, Snellen, *l. c.* p. 128, Manila, Luzon.

Lacipa quadripunctata, Chinchoxo, and *distanti*, Cape, Dewitz, *l. c.* pp. 67 & 68, pl. iii. figs. 4 & 7.

Orgyia flavo-limbata, Staudinger, *l. c.* p. 404, Saisan; *O. approximans* and *thyellina*, Butler, Tr. E. Soc. 1881, p. 10, Tokei, Japan; *O. gulosa* (cf. also Butler, Ann. N. H. 5, viii. p. 316) and *cana*, Edwards, Papilio, i. pp. 61 & 62, California.

Psychidæ.

Heylaerts, F. J. M. Essai d'une Monographie des Psychides de la Faune européene, précédé de considérations générales sur la famille des Psychides. 1ière partie. Ann. Ent. Belg. xxv. pp. 29–73, woodcuts.

Includes generalities; bibliography, classification, structure, &c.; a table of subfamilies and genera (several new), and a list of the European and the principal exotic species. The *Psychidæ* are considered as intermediate between the *Heterogynidæ* and *Liparidæ*, and are divided into 4 subfamilies—*Œceticina* and *Psychina*, Herr.-Schäff., *Psychoidina*, Heyl., and *Canephorida*, Herr.-Schäff. A reprehensible system of subgenera is employed.

Lepidopterous cases from Aden; Stainton, P. E. Soc. 1881, p. xxxv.

Psyche. Millière (Lépidoptérologie, iii.) figures and generally redescribes *P. apiformis*, Rossi, var. *melasoma*, Staud., figs. 1 & 3, p. 11, *lorquiniella*, Bruand, var. B., fig. 4, pl. iii. p. 13, *tarnierella*, Bruand, pl. iv. figs. 11-14, p. 18. *P. graslinella*: on rearing; Schmidt, Ent. Nachr. vii. pp. 283 & 284.

Œceticus, sp. The young larvæ float in the air like gossamer spiders: process of construction of their cases described; E. D. Jones, P. Liverp. Soc. xxxiv. pp. lxvi.–lxix. pl. ii.

Plat[y]œceticus gloveri, Pack.: transformations described; Comstock, Rep. Dep. Agric. 1880, pp. 251 & 252.

Thyridopteryx ephemeriformis, Haw.: habits and metamorphosis; King, Psyche, iii. pp. 241–243.

Pseudopsyche dembowskii, Oberthür, redescribed and figured by him; Études d'Ent. v. p. 41, pl. i. figs. 4 & 5.

Psycheoidina, subf. n., Heylaerts, *l. c.* p. 65. Fore-wings with two separate internal nervures, the upper one very slender; dorsal nervure not bifurcated; interposed cellule present or absent; hind tibiæ with only one pair of spurs, more or less developed. To include the genera *Diabosis* and *Heckmeyeria*, Heyl.

New genera and species :—

Lansdownia, Heylaerts, *l. c.* p. 65. Allied to *Œceticus*, antennæ pectinated to the tips, wings very broad and rather short, abdomen not extending beyond the anal angle; cases shorter than in *Œceticus*. To include *Œ. macleayi*, Guild., *consortus*, Templeton, *lewini* and *boisduvali*, Westw., *fuscescens*, Snell, and *crameri*, Westw. (= *variegatus*, Snell.).

Acanthopsyche, Heylaerts, *l. c.* p. 66. Placed between *Animula* and *Oreopsyche*; antennæ bipectinated to the tips, the branches diminishing in length from the middle to the tips; front tibiæ with one very long spine. It is divided into 3 subgenera: *Œceticoides* and *Amicta*, Heyl., and *Pachytelia*, Westw.

Oiketicoides[*Œcet*]. Heylaerts, *l. c.* Subgenus of *Acanthopsyche*; upper internal nervure anastomosing with the dorsal nervure, as in *Œceticus*; to include *Œ. doubledayi*, Westw., *inquinata*, Led., *opacella*, Herr.-Schäff., and *zelleri*, Mann.

Amicta, id. *l. c.* Subgenus of *Acanthopsyche*; the two internal nervures not anastomosing; to include *Psyche quadrangularis*, Christoph, *heylaertsi*, Mill. (= *sera*, Wiskott), *tedaldii* and *ritsemæ*, Heyl., sp. n., Heylaerts, Notes Leyd. Mus. iii. p. 89, Java, *lutea*, Staud., *febretta*, Fonsc., *ecksteini*, Led., and *uralensis*, Freyer, and var. *demissa*, Led.

Megalophanes, id. *l. c.* p. 67. Subgenus of *Psyche*; fore-wings very large, and with much rounded angles; pectinations of the antennæ very long. To include *Psyche detrita*, Led., *viciella*, Schiff., *stettinensis*, Her., *viadrina* and *turatii*, Staud., and *constancella*, Bruand.

Stenophanes, id. *l. c.* Subgenus of *Psyche*; fore-wings long and rather narrow; pectinations of the antennæ, more or less thickened at the tips. To include *Psyche apiformis*, Rossi, and var. *melasoma*, Staud.; *P. bruandi*, Led., *crassicornis* and *præcellens*, Staud., *graslinella*, Boisd., and *helicinella*, Herr.-Schäff.

Plateumeta, Butler, Tr. E. Soc. 1881, p. 22. *Psychidæ*; type, *P. aurea*, sp. n., *l. c.* p. 23, Yokohama (neuration figured).

Eutheca, Grote, Bull. U. S. Geol. Surv. vi. p. 257. *Psychidæ* (?), but with some resemblance to *Hepialus*; type, *E. mora*, sp. n., *l. c.*, New York.

Psyche heylaertsi, Millière, Lépidoptérologie, vii. p. 18, pl. x. figs. 16–19, Sicily; *P. leucosoma*, Snellen, Tijdschr. Ent. xxiv. p. 125, pl. xiv. figs. 1 & 1a, Java.

Thyridopteryx meadii, H. Edwards, Papilio, i. p. 116, California.

Eumeta minuscula, Butler, Tr. E. Soc. 1881, p. 22, Yokohama.

Gonometa bicolor, Dewitz, Verh. L.-C. Ak. xlii. p. 73, pl. ii. fig. 1, Chinchoxo.

Notodontidæ.

Oberthür (Études d'Ent. v.) redescribes and figures *Harpyia taczanowskii*, Oberth., pl. ii. fig. 5, p. 59, *Uropus ocypete*, Brem., pl. viii. fig. 6, p. 60, *Notodonta jankowskii*, Oberth., fig. 8, p. 61, *dembowskii* and *monetaria*, Oberth., p. 62, figs. 4 & 6, and *Lophopteryx ladislai*, Oberth., fig. 3, pl. ii. p. 66.

Harpyia furcula, var. *ajatar*, Schleich, from Finland, and *H. bifida*, var. *saltensis*, from Saltenfjord, described and figured; Schøyen, Ent. Tidskr. ii. p 120, pl. i. figs. 2 & 1.

Cerura sinula and *erminea*: larvæ differentiated; Stainton, Ent. M. M. xviii. pp. 161 & 162. *C. occidentalis*, Lintn., and *borealis*, Boisd.: larvæ described; French, Canad. Ent. xiii. pp. 142 & 143.

Platycerura furcilla, Pack. Larva noticed: the species should be transferred to the *Noctuæ*, near *Audela acronyctoides*, Walk.; Grote, Bull. U. S. Geol. Surv. vi. p. 258. Transformations also described by Packard, Ins. Inj. Trees, pp. 203 & 204.

Notodonta concinna: transformations popularly described and figured;

Saunders, Canad. Ent. xiii. pp. 138–140, figs. 9–11. *N. rimosa*, Pack., appears to be intermediate between *N. tremula*, Clerck, and *dictæoides*, Esp.; Tepper, Bull. Brooklyn Soc. ii. pp. 3 & 4 (woodcuts of larvæ).

Pterostoma palpina, L., var. *lapponica* described; Teich, S. E. Z. xlii. pp. 188 & 189.

Heterocampa subalbicans, Grote, larva described; Comstock, Rep. Dep. Agric. 1880, pp. 259 & 260.

Clostera anachoreta. Notes on larva; Briggs, Ent. xiv. pp. 133 & 134.

Nadata doubledayi, Pack., var. *oregonensis* described; Butler, Ann. N. H. (5) viii. p. 317.

Cerurida. Butler separates *Cerura* and allies as a family, on account of the structure of the larvæ, &c., placing them between the *Drepanulidæ* and *Notodontidæ*; Ann. N. H. (5) viii. p. 317.

New genera and species :—

Fentonia, Butler, Tr. E. Soc. 1881, p. 20. Allied to *Thiacidas*, but forewings and abdomen much longer; type, *F. lævis*, sp. n., *l. c.*, Yokohama.

Platychasma, id. *l. c.* p. 596. Allied to *Lophopteryx*; type, *P. virgo*, sp. n., *l. c.*, Tokei.

Dicranura askolda, Oberthür, Études d'Ent. v. p. 59, pl. viii. fig. 8, Askold; = *fulvia*, Butl., *sec.* Butler, Ann. N. H. (5) viii. p. 233.

Destolmia insignis, Butler, Tr. E. Soc. 1881, p. 19, Tokei, Japan.

Notodonta lineata, p. 61, pl. ii. fig. 7, *bombycina*, p. 63, pl. vi. fig. 3, and *plebeia*, p. 65, pl. viii. fig. 7, Oberthür, *l. c.*, Askold; *N. angustipennis*, Mabille, CR. Ent. Belg. xxv. p. lvi., Madagascar; *N. simplaria*, Graef, Bull. Brooklyn Soc. iii. p. 95, iv. plate, fig. 1, New York.

Drynobia tortuosa, Tepper, *op. cit.* iv. p. 2, plate, fig. 2, Colorado.

Ptilodontis plusiotis, Oberthür, *l. c.* p. 65, pl. vii. fig. 3, Askold.

Drymonia biloba, p. 63, *velutina* and *lichen*, p. 64, *id. l. c.* pl. viii. figs. 1, 2, & 5, Askold; *D. permagna*, Butler, Tr. E. Soc. 1881, p. 20, Tokei, Japan.

Heterocampa chapmani, Grote, Bull. U. S. Geol. Surv. vi. p. 258, Florida.

Œdemasia eximia, id. *l. c.* p. 275, New York, Massachusetts.

Uropus branickii, Oberthür, *l. c.* p. 60, pl. vi. fig. 6, Askold.

Asteroscopus barometricus, Goossens, Le Nat. iii. p. 380, Ontario. (The moth appears in November and December, and hibernates, giving notice of the return of fine weather by leaving its winter quarters.)

Phalera fuscescens, Butler, Tr. E. Soc. 1881, p. 597, Yokohama.

Trisula andrææ, Oberthür, *l. c.* p. 38, pl. v. fig. 4, Askold; = *Phalera flavescens*, Brem., *sec.* Butler, Ann. N. H. (5) vii. p. 231.

Datana floridana, Graef, *op. cit.* ii. p. 37, Florida. (Larva described, *id. op. cit.* iv. p. 21).

Nerice davidi, Oberthür, *op. cit.* vi. p. 17, pl. ix. fig. 2, China.

Limacodidæ.

Berg notices *Trogoptera erosa*, Herr.-Schäff. (= *Parasa excavata*, Walk.), *Streblota nesea*, Cram. (= *cœlestina*, Stoll., = *Antarctia fusca*, Hübn., =

Phalæna trimacula, Sepp., = *Nyssia fumosa*, Walk.), *vidua*, Sepp, *argentata*, Walk., and *rufa*, Butl., and considers them to belong to the *Bombycidæ*; Ann. Soc. Arg. xii. pp. 34–36.

Limacodes castaneus and *dentatus*, Oberthür, redescribed and figured by him; Études d'Ent. v. pp. 41 & 42, pl. i. figs. 11 & 10. *L. scapha*, Harr.: larva described and imago figured; Packard, Ins. Inj. Trees, p. 77, fig. 35. *L. undifera*, Walk., = *scapha*, Harr.; Butler, Papilio, i. p. 132.

Euclea pœnulata, Clem., and *monitor*, Pack.; French, Papilio, i. pp. 144 & 145.

Anapœa, sp. Larval variation; Meldola, Weismann's Studies, ii. p. 309, note.

Corma, g. n., Moore, P. Z. S. 1881, p. 326. Allied to *Pydna*, Walk.; types, *Eumeta horsfieldi* and *rafflesi*, Moore.

Mimerastria, g. n., Butler, Ann. N. H. (5) vii. p. 236. *Limacodidæ*, but with a superficial resemblance to *Erastria*; type, *E. mandschuriana*, Oberth.

Parasa fraterna, sp. n., Grote, Papilio, i. p. 5, Massachusetts.

Limacodes argentifera, sp. n., Westwood, Oates's "Matabele Land," p. 358, South Africa.

Packardia nigripunctata, sp. n., Goodell, Canad. Ent. xiii. p. 30, Massachusetts.

Aphendala sericea, sp. n., Butler, Tr. E. Soc. 1881, p. 595, Tokei.

Siculodidæ.

Siculodes plagula, Guén., = *werneburgalis*, Kef.; Saalmüller, S. E. Z. xlii. p. 443.

Tangoïdes, g. n., Möschler, Verh. z.-b. Wien, xxxi. p. 415. Type, *T. ochracea*, sp. n., *l. c.* pl. xviii. fig. 50, Surinam.

Siculodes mellea, Saalmüller, S. E. Z. xlii. p. 442, Nossi-Bè; *S. gracilis*, Möschler, Verh. z.-b. Wien, xxxi. p. 414, pl. xviii. fig. 49, Surinam: spp. nn.

Drepanulidæ.

Argyris plagiata, sp. n., Butler, Tr. E. Soc. 1881, p. 22, Tokei, Japan.

Drepana acuta, sp. n., *id. l. c.* p. 596, Tokei.

Saturniidæ.

Maassen, P., & Weymer, G. Beiträge zur Schmetterlingskunde. Heft iv. Berlin: 1881, sm. fol. pls. x. (col.).

After an interval of some years another part of this work has appeared, in which the following known species of *Saturniidæ* are figured:—*Bunæa buchholzi*, Plötz, fig. 56; *Tagoropsis natalensis*, Feld., figs. 57 & 58; *Antheræa arata*, Westw., fig. 59; *Attacus speculifer*, Walk., p. 60, *hopfferi*, Feld., p. 61, *speculum*, Maassen & Weymer, fig. 62; *Eustera argyphontes*, Kirby, figs. 63 & 64; *Argema madagascariensis*, Bartlett, fig. 65; *Philosamia plœtzi*, Plötz, figs. 66–69; *P. vacuna*, Westw., fig. 73; *Antheræa*

helena, White, fig. 74; *Eudelia rufescens*, Philippi, figs. 75 & 76; *Copaxa lavendera*, Westw., fig. 78, *expandens*, Walk., fig. 79; *Bunæa deyrollii*, Thomson, figs. 80 & 81.

WAILLY, A. On Silk-Producing *Bombyces*. Ent. xiv. pp. 121–124, 245–250; *cf.* also J. Soc. Arts, xxiv. pp. 283–285, 314–316.

Includes descriptive notices of the larvæ of various *Saturniidæ*.

WARDLE, T. Handbook of the Collection illustrative of the Wild Silks of India, in the Indian Section of the South Kensington Museum, with a Catalogue of the Collection, and numerous Illustrations (published by the Science and Art Department of the Committee of Council on Education, South Kensington). London: 1881, 8vo, pp. 163, including 65 pls.

Includes classification, with a full list of silk-moths by F. Moore; and an account of the history and preparation of silk, with special reference to *Bombyx mori*, *Antheræa mylitta* (Tusser), *Attacus ricini* (Eria), *Antheræa assama* (Moonga), and *Attacus atlas*. These, and many other allied species, are figured with their transformations, silk, scales, food-plants, maps of the districts in which they occur, and drawings of the apparatus used in preparing the silk. It will thus be seen that the present work is not only a technological handbook, but of considerable scientific value also.

Butler (Ill. Lep. Het. v.) figures and redescribes *Antheræa frithi*, Moore, pl. xci., fig. 8, p. 59; *Attacus edwardsi*, White, pls. xcii. & xciii.; *Philosamia lunula*, Walk., fig. 1, p. 60, & *Saturnia grotii*, Moore, figs. 3 & 4, pl. xciv. p. 61.

On the native silks of Assam; C. G. W. Lock, J. Soc. Arts, xxix. pp. 99 & 100.

Tasar sericiculture in India; Coussmaker, *op. cit.* pp. 576 & 577.

Attacus atlas: transformations briefly discussed; Testout, Feuill. Nat. xi. pp. 102 & 103. *A. cecropia*: cocoons punctured by *Picus villosa*, against which they afford no protection; Webster, Am. Nat. xv. pp. 241 & 242. *A. cynthia*: late emergence from the cocoon; Tarlé & Deschamps, Feuill. Nat. xi. pp. 74 & 91. *A. luna* and *selene*: rearing; Grapes, Ent. xiv. pp. 85 & 86: larva of *A. luna* described; *id. l. c.* pp. 115 & 116. *A. roylii* and *pernii*: hybrids bred; Wailly, Ent. xiv. pp. 246 & 247.

Samia gloveri and *ceanothi*, noticed: Mundt, Canad. Ent. xiii. pp. 35–37. Hybrids noticed; Hulst, Bull. Brooklyn Soc. iv. pp. 57 & 58. Hybrid larvæ, and larva of *S. gloveri* described; Wailly, Ent. xiv. pp. 122 & 246. *S. cynthia*: food-plants; Hulst & others, *op. cit.* i. p. 91, ii. pp. 77 & 78.

Platysamia gloveri, Streck. Note on pupa and cocoon; Graef, Bull. Brooklyn Soc. i. p. 75.

Callosamia promethea, Dru., recorded as feeding on *Cephalanthus occidentalis* and *Liriodendron tulipifera*, Linn.; Langdon, J. Cincinn. Soc. iv. p. 345.

Antheræa pernii, ♀ pairing with 2 ♂ ♂: Meinheit, Verh. Ver. Hamb. iv. p. 210.

Bombyx polyphemus reared from a larva found in a garden at Erfurt; Keferstein, S. E. Z. xlii. p. 122. *B. trifenestrata*, Helf., and silk noticed; Lucas, Bull. Soc. Ent. Fr. (6) i. pp. cxxi. & cxxii.

Saturnia pavonia, Linn. (*carpini*, W. V.): 10 hermaphrodites reared from a single brood, and described; A. Speyer, S. E. Z. xlii. pp. 477–486: 7 reared out of 10 larvæ; Maus. Ent. Nachr. vii. pp. 355 & 356. *S. pyri*: pupa destroyed by *Lema flavipes*; Chambolle, Feuill. Nat. xi. p. 91. *S. flavida*, Butl., redescribed as new, and *dyops*, Maass. & Weym., noticed; Westwood, Oates's "Matabele Land," p. 357. *S.* (*Tropæa*) *artemis*, Brem., is dark brown on first emerging from the pupa; Graeser, Verh. Ver. Hamb. iv. p. 206.

Eudæmonia argiphontes, Kirby, figured by Waterhouse, Aid, pl. xxx.; also redescribed and figured by Westwood, P. Z. S. 1881, p. 144, pl. xiii. fig. 1.

Hyperchiria io, Fabr. Habits and transformations; Riley & Packard, Ins. Inj. Trees, pp. 110 & 111, figs. 49 & 50. Variety described; Tepper, Bull. Brooklyn Soc. i. p. 36.

Aglia tau. Hermaphrodite noticed; Dewitz, B. E. Z. xxv. p. 297. Aberration with right hind-wing whitish; Frontin, Bull. Soc. Rouen (3) xvi. p. 140.

Gloveria arizonensis, Pack., ♀ described; H. Edwards, Papilio, i. p. 100.

Rhododipsa volupia, Grote, redescribed by him; Bull. Brooklyn Soc. iii. p. 47.

Pseudohazis eglanterina, Boisd., var. from California, noticed; Butler, Ann. N. H. (5) viii. p. 316.

Eacles imperialis. Notes on rearing and variation of larva; Wailly, Ent. xiv. pp. 247–249. Food-plants; Hulst, Bull. Brooklyn Soc. ii. p. 74.

Mimallo, Hübn. Berg notices *M. diagonalis*, Herr.-Schäff. (= *plana*, Walk., = *orthane*, pt., Herr.-Schäff.), *orthane*, Blanch., *pœnulata*, Clem., and *incisa*, Hara; *M. trilunata*, Herr.-Schäff., appears to be allied to *Lasiocampa*: Ann. Soc. Arg. xii. pp. 31–34.

Ithomisa, g. n., Oberthür, Études d'Ent. vi. p. 114. Allied to *Heliconisa*; type, *I. kinkelini*, sp. n., *l. c.* pl. xx. fig. 3, Argentine Republic.

New species:—

Antheræa hazina, *fentoni*, p. 13, *calida*, and *morosa*, p. 14, Butler, Tr. E. Soc. 1881, Japan; *A. macrophthalmus*, Kirby, Ent. M. M. xviii. p. 146, Gold Coast; *A. barcas*, Maassen & Weymer, Beitr. Schmett. iv. figs. 70 & 71, Zanzibar.

Copaxa simson (Schilde, MS.), *iid. l. c.* fig. 77, Panama.

Rinaca extensa, Butler, Ill. Lep. Het. v. p. 61, pl. xciv. fig. 2, Darjiling.

Tropæa dulcinea, Butler, Tr. E. Soc. 1881, p. 14, Tokei, Japan.

Saturnia arnobia, Calabar, pl. xii. fig. 2, p. 142, *hyperbius*, South Africa, pl. xiii. fig. 3, *sciron*, Waigiou, pl. xii. fig. 3, *sergestus*, Japan, pl. xiii. fig. 2, p. 143, *iole*, Assam, pl. xii. fig. 1, p. 164, Westwood, P. Z. S. 1881. *S. cervina*, *terpsichorina*, and *hyperbius*, id. Oates's "Matabele Land," p. 357, South Africa; *S. schencki*, Staudinger, S. E. Z. xlii. p. 406, Saisan;

S. jankowskii, Oberthür, Études d'Ent. v. p. 39, pl. viii. fig. 4, Askold; *S. kuntzii*, Dewitz, Verh. L.-C. Ak. xlii. p. 70, pl. iii. fig. 14, Guinea.

Eochroa (?) *dido*, Maassen & Weymer, *l. c.* fig. 72, East Africa.

Hemileuca yavapai, Grote, Papilio, i. p. 172, Arizona.

Rhododipsa miniana, id. *l. c.* p. 175, New Mexico.

Euleucophæus sororius, Lower California, and *neumœgeni*, Arizona, H. Edwards, Papilio, i. pp. 100 & 171.

Dirphia lauta, Berg, S. E. Z. xlii. p. 47, and Exped. Rio Negro, Zool. p. 92, pl. ii. fig. 11, Patagonia.

Ceratocampidæ.

Anisota pellucida: larva described; French & Riley in Packard, Ins. Inj. Trees, p. 46. *A. rubicunda*, Fabr.: habits and transformations; Riley & Packard, Ins. Inj. Trees, pp. 109 & 110, fig. 68.

Quadrina, g. n., Grote, Papilio, i. p. 175. Allied to *Citheronia*; type, *Q. diazoma*, sp. n., *l. c.*, New Mexico.

Ceratocampa vogleri, sp. n., Weyenbergh, Period. Zool. Argent. iii. p. 369, Cordova.

Bombycidæ.

(*Cf.* also *Saturniidæ*.)

Crozier, L. S. Treatise on the Culture and Raising of Silkworms. New Orleans: 1880, 8vo.

Desuzeau, J. Rapport de la Commission des Soies sur ses Opérations de l'année 1880. Ann. Agric. Lyon (5) iii. pp. 1141–1156.

Louis, J. A. H. A few words on the present state and future prospects of Sericiculture in Bengal. London: 1880, 8vo, pp. 31.

Perret, A. Compte Rendu des opérations de la Condition des Soies de Lyon pendant l'année 1880. Ann. Agric. Lyon (5) iii. pp. 20 (separately paged) & pl. iii.

Bombyx, sp. (fossil from Aix). Restoration; Swinton, Sci. Goss. xvii. p. 177, fig. 105.

Bombyx mori. Anatomy; Tichomiroff, Nachr. Ges. Mosc. xxxvii. pp. 19–22, plate. Jacobs has partially confirmed the experiments of Mélise, so far as to ascertain that legs and antennæ amputated in the larva are defective in the imago likewise; CR. Ent. Belg. xxv. p. cxxii. Monstrous pupa, produced by a single larva, and containing a male and female moth in a reversed position [!]; Kay-Robinson, Ent. xiv. pp. 193–195, woodcuts. Silkworms feeding on camphor-tree, and, when opened, yielding silk in the form of catgut, useful for fishing lines; Nature, xxiv. p. 341. Both sexes pair several times, apparently between the deposition of each batch of eggs; Barrett, Ent. M. M. xvii. p. 212. Effect of cold on larva and pupa; Colasanti, Accad. Med. Roma, sed. 29 Giugno, 1879. Experiments on feeding silkworms with coloured food; Passerini, Bull. Ent. Ital. Resoconti, 1881, pp. 14–17.

Euphranor, g. n., Oberthür, Études d'Ent. v. p. 40; type, *E. cæca*, sp. n., *l. c.*, pl. vi. fig. 2, Askold.

LASIOCAMPIDÆ.

Butler (Ill. Lep. Het. v.) figures and redescribes the following known species:—*Brahmæa whitii*, Butl., figs. 1 & 2, p. 62, *conchifera*, Butl. (= *certhia*, Walk.), figs. 3 & 4, *wallichi*, Gray (= *spectabilis*, Hope), figs. 5 & 6, pl. xcv. p. 63, *Apha subdives*, Walk., figs. 7 & 8, pl. xciv., *Ganisa glaucescens*, Walk., figs. 1 & 2, p. 65, *plana*, Walk., figs. 4 & 5, p. 66, *Eupterote mutans*, Walk., fig. 8, *lineosa*, Walk., fig. 9, pl. xcvi., *testacea*, Walk., fig. 1, p. 67, *imbecilis*, Walk., fig. 2, p. 68, *Dreata* (restricted, p. 69) *hades*, Walk., fig. 7, pl. xcvii., *Tagora patula*, Walk., figs. 1 & 2, p. 70, *pallida*, Walk. (= *Sphingognatha asclepiades*, Feld.), fig. 3, *Jana lineosa*, Walk., fig. 4, *incandescens*, Walk., fig. 5, pl. xcviii. p. 71, *Odonestis latipennis*, Walk., figs. 1 & 2, *ampla*, Walk. (♂ = *Lebeda ferruginea*, Walk.), figs. 3 & 4, p. 72, *Lebeda plagifera*, Walk., fig. 5, pl. xcix. p. 73, *nobilis*, Walk., *l. c.* pl. c. figs. 5 & 6, p. 74.

Bombyx lanestris, L.: on a brood of larvæ from Russian Lapland; Teich, S. E. Z. xlii. pp. 187 & 188. *B. neustria* infested by *Pimpla instigator*; Van Segvelt, Feuill. Nat. xii. p. 11. *B. quercus*: eggs hatching in the body of the ♀; id. *l. c.* *B. philopalus*, Donz., *serrula*, Guén., pl. iii. figs. 6, 6 *a*, & *b* (larva, pupa, and imago), p. 75, *trifolii*, Esp., p. 74, and *luteus*, Oberth., pl. i. fig. 2, p. 75, noticed; Oberthür, Etudes d'Ent. vi.

Brahmæa nigrans, Butl., figured by Waterhouse, Aid, i. pl. xxix.

Odonestis potatoria. Varieties noticed; Porritt & others, Ent. xiv. pp. 17 & 68. With ♂ coloration and ♀ antennæ; Wellman, Ent. xiv. p. 227. Var. *askoldensis* and *O. excellens*, Butl., var. *unicolor*, both from Askold, noticed; Oberthür, Études d'Ent. v. p. 38.

Pachypasa subfascia and *Lasiocampa rudis*, Walk., redescribed and figured; Dewitz, Verh. L.-C. Ak. xlii. pp. 72 & 79, pl. ii. fig. 12, and iii. fig. 24.

Crateronyx dumi, Linn. Notes on its assembling and pairing, also description of egg; Borgmann, Ent. Nachr. vii. pp. 6–10.

Clisiocampa, Curt., discussed: *C. californica* (= *pseudoneustria*, Boisd.), transformations described; *C. americana*, Harr. (= *decipiens*, Walk., = *castrensis*, Smith, = *frutetorum*, Boisd.), and *disstria*, Hübn. (= *neustria*, Smith, = *sylvatica*, Harr., = *drupacearum*, Boisd.), are probably not Californian species: Stretch, Papilio, i. pp. 63 & 64, 68 & 69. *C.* sp.: undetermined larva from Montana described; Packard, Ins. Inj. Trees, p. 42.

Artace punctistriga, Doubl., noticed; Comstock, Rep. Dep. Agric. 1880, p. 252.

Jana mariana, White, noticed and figured by Westwood; Oates's "Matabele Land," p. 358, pl. G, fig. 6, pl. H, figs. 4 & 4 *a*, *b*.

New genera and species:—

Leptojana, Butler, Ill. Lep. Het. v. p. 68. Allied to *Eupterote*; wings narrower; wings and thorax more woolly; type, *Dreata lineata*, Walk., redescribed and figured; *l. c.* p. 69, pl. xcvii. fig. 5.

Pachyjana, id. *l. c.* p. 69. Allied to *Eupterote* and *Jana*; wings shorter and broader, antennæ distinctly curved and shorter than in *Eupte-*

rote; fore-wings more woolly below; type, *Dreata undans*, Walk., redescribed and figured; *l. c.* pl. xcvii. fig. 6.

Pyrosis, Oberthür, Études d'Ent. v. p. 36; type, *P. eximia*, sp. n., *l. c.* pl. iv. figs. 4 & 5, Askold.

Apha floralis, Butler, Ill. Lep. Het. v. p. 64, pl. xciv. figs. 5 & 6, Darjiling.

Ganisa pallida, id. *l. c.* p. 65, pl. xcvi. fig. 3, Bhotan.

Eupterote discordans, Calcutta, p. 66, pl. xcvi. figs. 6 & 7, *invalida*, Darjiling, p. 68, pl. xcvii. figs 3 & 4, *id. l. c.*.

Eutricha dolosa, p. 16, *zonata*, *fentoni*, p. 17, *id.* Tr. E. Soc. 1881, Tokei, Japan; *E. rennii*, Dewitz, Verh. L.-C. Ak. xlii. p. 71, pl. ii. figs. 12 & 16, Cape.

Pachypasa graberi and *honrathi*, id. *l. c.* pp. 72 & 73, pl. ii. figs. 3 & 11, Chinchoxo.

Gastropacha gerstæckeri, fig. 6, and *knoblauchi*, figs. 2 & 4, *id. l. c.* pl. i. pp. 74 & 75, Chinchoxo.

Amydona burchardi, id. *l. c.* p. 74, pl. ii. fig. 5, Chinchoxo.

Lasiocampa radii, fig. 16, *kœllikeri*, fig. 15, and *distanti*, fig. 14, *id. l. c.* pp. 77–79, pl. ii., Chinchoxo.

Trabala splendida, Oberthür, Études d'Ent. v. p. 65, pl. v. fig. 6, Askold.

Bombyx warionis, id. *l. c.* vi. p. 75, pl. ii. fig. 6, Oran.

Lebeda lidderdalii, figs. 1 & 2, Bhotan, *stigmata*, figs. 3 & 4, Darjiling, Butler, Ill. Lep. Het. v. p. 73, pl. c.

Poecilocampa subpurpurea, id. Tr. E. Soc. 1881, p. 18, Tokei, Japan.

Clisiocampa fragilis, Nevada, p. 64, *constricta*, San Francisco, p. 65, *strigosa*, Yosemite Valley, *erosa*, Oregon, p. 67, *thoracica*, California, p. 68, Stretch, Papilio, i.

Zeuzeridæ.

Xyleutes robiniæ: habits and transformations; Fitch & Packard, Ins. Inj. Trees, pp. 6–11. Larva noticed; Kellicott, Bull. Buff. Soc. iv. p. 30.

Hypopta cæstrum, Hübn.: eggs figured; Millière, Lépidoptérologie, v. pl. vi. figs. 13–15.

Zeuzera æsculi: larva infested by a vast number of *Copidosoma truncatellum*, Dalm.; Fitch, P. E. Soc. 1881, p. xxi. *Z. paucipunctata*, Walk., = *indica*, Herr.-Schäff.; Moore, P. Z. S. 1881, p. 327.

Hypopta bertholdi, sp. n., Grote, Bull. Brooklyn Soc. iii. p. 45, Colorado.

Zeuzera leuconotum[!], Butler, Tr. E. Soc. 1881, p. 22, Tokei, Japan; *Z. multistrigata*, Moore (= *indica*, Walk., *nec* Herr.-Schäff.), P. Z. S. 1881, p. 327, Darjiling: spp. nn.

Hepialidæ.

Hepialus baroni, Behrens, mentioned as a doubtful species, and *H. inutilis*, Edw., variation noticed; Butler, Ann. N. H. (5) viii. p. 318. *H. humuli*, aberration; Barrett, Ent. M. M. xviii. p. 111.

Hepialus alticola, Oberthür, Ann. Soc. Ent. Fr. (6) i. p. 527, Cauterets;

H. rectus, p. 36, *anceps*, and *inutilis*, p. 36, H. Edwards, Papilio, i. California: spp. nn.

Gorgopis zelleri and *butleri*, spp. nn., Dewitz, Verh. L.-C. Ak. xlii. p. 64, pl. iii. figs. 22 & 25, Cape.

Cymatophoridæ.

List of North American *Bombyciæ*; Grote, Canad. Ent. xiii. pp. 151–153.

Thyatira, Ochs., recharacterized, and *T. batis*, L., indicated as type; Moore, P. Z. S. 1881, p. 327.

Gonophora indica, Moore, figured by Waterhouse, Aid, i. pl. ix.

Cymatophora argenteo-picta, Oberth., and *ampliata*, Butler, noticed and figured; Oberthür, Études d'Ent. v. p. 67, pl. iii. figs. 1 & 2. *C. ampliata*, Oberth. (*nec* Butl.), = *or*, var. (?); *C. ocularis*, Walk. (*octogesima*, Staud.), from Japan, renamed *C. intensa*; *Leptina macroptera*, Oberth., = *Cyana decipiens*, Butl.: Butler, Ann. N. H. (5) vii. p. 234.

Asphalia flavicornis, Linn., var. *finmarchica*, described and figured; Schøyen, Ent. Tidskr. ii. p. 121, pl. i. figs. 3 & 4.

New genera and species :—

Risoba, Moore, P. Z. S. 1881, p. 328. Allied to *Thyatira*; type, *T. repugnans*, Walk.; add *R. obstructa* (Walk., MS.), Calcutta, Ceylon, p. 328, *prominens*, Khasia Hills, Malacca, *literata*, Nilgiris, spp. nn.; and *Heliothis diversipennis*, Walk. (♀ described), p. 329.

Kerala, id. *l. c.* p. 329. Placed after *Risoba*; type, *K. punctilineata*, sp. n., *l. c.* p. 330, Darjiling.

Saronaga, id. *l. c.* p. 330. Placed after *Kerala*; type, *Thyatira albicosta*, Moore.

Gonophora aurorina, Butler, Tr. E. Soc. 1881, p. 171, Yokohama.

Thyatira pryeri, id. *l. c.* p. 172, Yokohama; *T. locata*, Grote, Papilio, i. p. 75, Washington Territory; *T. decorata*, Moore, *l. c.* p. 328, pl. xxxvii. fig. 1, Darjiling.

Palimpsestis alternata and *cuprina*, id. *l. c.* p. 331, pl. xxxvii. figs. 2 & 3, Darjiling.

Bombycia semicircularis, Grote, *l. c.* p. 75, Washington Territory.

Leptina macroptera, Oberthür, Études d'Ent. v. p. 68, pl. vii. fig. 2, Askold; *L. grata*, Butler, *l. c.* p. 172, Tokei.

Noctuidæ.

Edwards, H. Notes upon the genus *Catocala*, with Descriptions of New Varieties and Species. Bull. Brooklyn Soc. iii. pp. 53–62.

The following new varieties are characterized, or important observations made :—*C. lachrymosa*, Guén., var. *paulina*, Ohio, *relicta*, Walk., varr. *phrynia*, United States, and *bianca*, Maine, *C. nebraskæ*, Dodge, = *luciana*, H. Edw., p. 54, *C. junctura*, Walk., = *unijuga*; *C. irene*, Behr., varr. *virgilia* and *volumnia*, California, and *valeria*, Arizona, p. 56, *mariana*, H. Edw., var. *francisca*, California, *C. concumbens*, Walk., var. *diana*, Maine, *C. cara*, Guén., var. *silvia*, Florida; *C. circe*, Streck., is a good

species ; *C. ultronia*, Hübn., varr. *adriana*, p. 57, *celia* and *mopsa*, Florida, *C. verrilliana*, Grote, var. *ophelia*, amended description, p. 58, *C. cœlebs*, Grote, is a good species, p. 59, *C. formula*, Grote & Rob., var. *isabella*, Texas, *fratercula*, G. & R., var. *jacquenetta*, Albany, p. 60, and *amica*, Hübn., var, *nerissa*, Texas, p. 61.

English, J. The first night's "Sugaring" in England : a Reminiscence of Epping Forest in 1843. Tr. Epp. Forest, ii. pp. 32–35.

A contribution to the history of practical collecting.

Grote, A. R. North American *Noctuidæ* in the "Zutraege"—Fourth and Fifth Hundreds. Canad. Ent. xiii. pp. 90–92.

Critical remarks on several of Hübner's figures.

Hulst, G. D. Remarks upon the genus *Catocala*, with a Catalogue of Species and accompanying Notes. Bull. Brooklyn Soc. iii. pp. 2–13.

81 species are admitted, many being sunk as varieties. The synonymy is too extensive to be copied in full.

Moore, F. On the Genera and Species of the Lepidopterous Subfamily *Ophiderinæ* inhabiting the Indian Region. Tr. Z. Soc. xi. pp. 63–76, pls. xii.–xiv.

The proper position of the subfamily appears to be with the subfamily *Phyllodinæ*, between the *Bendidæ* and *Ophiusidæ*. The following known genera and species are redescribed and figured (pl. xii. represents larvæ and pupæ) :—*Othreis*, Hübn., *O. fullonica*, Linn., pl. xii. figs. 1 & 1 *a*, pl. xiii. figs. 1 & 1 *a*, p. 64, *caieta*, Cram. (= *multiscripta*, Walk.), pl. xiii. figs. 2 & 2 *a*, *ancilla*, Cram. (= *bilineosa*, Walk.), pl. xii. figs. 2 & 2 *a*, pl. xiii. figs. 3 & 3 *a*, p. 67, *smaragdipicta*, Walk., p. 68 ; *Mænas*, Hübn. : *M. salaminia*, Cram., pl. xii. figs. 3, 3 *a*, & 3 *b*, pl. xiv. fig. 2, p. 71 ; *Rhytia*, Hübn., p. 72 : *R. cocale*, Cram. (= *maculata*, Weber, = *plana*, Walk.), pl. xii. figs. 5 & 5 *a*, pl. xiv. figs. 5 & 5 *a*, *hypermnestra*, Cram., pl. xii. fig. 6, pl. xiv. figs. 4 & 4 *a*. p. 73. For known species of *Ophideres* referred to new genera, see *infrà*.

Smith, J. B. A Synopsis of the North American Genera of the *Noctuidæ*. Bull. Brooklyn Soc. iv. pp. 47–52.

Snellen, P. C. T. *Lepidoptera* van Celebes verzameld door M. C. Piepers, met Aanteekeningen en Beschrijving der nieuwe Soorten. *Heterocera*, ii. *Noctuina*. Tijdschr. Ent. xxiv. pp. 64–68, pls. v.–vii.

Includes supplementary notes on various species already described in vol. xxiii., and figures of a number of *Deltoidæ*.

Thalenhorst, A. Ueber Fang, Zucht und Krankheiten der an Gräsern lebenden Noctuinen-Raupen, sowie über die von diesen Raupen angerichteten Verwüstungen. Verh. Ver. Hamb. iv. pp. 212–221.

On the affinities of the *Noctuæ* ; Butler, Papilio, i. pp. 168 & 169.

Millière (Lépidoptérologie) figures and generally redescribes *Bryophila glandifera*, W. V., var. (?) *liguris*, from Cannes, fig. 8, p. 8, *Dian-*

thœcia compta, ab. *armeriæ*, Boisd., fig. 9, p. 9, *D. luteo-cincta*, Ramb., fig. 10, p. 10, pl. iii.; *Episema glaucina*, Esp., var. *gruneri*, Boisd., pl. iv. figs. 8–10, p. 16, Lép. iii.; *Pachnobia faceta*, Tr., fig. 1, p. 18; *Proxenus dispar*, Frey, figs. 4 & 5, p. 20; *Bryophila oxybiensis*, M., figs. 9–11, p. 25, *B. perla*, F., var. B., figs. 12 & 13, p. 27, *B. galathea*, M., fig. 14, p. 28, pl. vii., Lép. v.

Agrotis ripæ, Hübn., and *Hadena funerea*, Hein., recorded as new to the Fauna of the Lower Elbe; Verh. Ver. Hamb. iv. pp. 242 & 243.

Grote gives his identifications of 68 *Noctuæ* described by Morrison; Bull. Brooklyn Soc. iii. pp. 36–39.

The following American *Noctuæ* are synonymous with European species: *Agrotis obeliscoides*, Guén. (= *sexatilis*, Grote), = *obelisca*, Herr.-Schäff.; *Hadena finitima*, Grote, = *basilinea*, Linn.; *Pyrrhia exprimens*, Walk., = *Chariclea umbra*, Hufn.; *Calocampa germana*, Morr., = *solidaginis*, Hübn., and *Xylina pexata*, Grote, = *ingrica*, Herr.-Schäff.; Graef, *op. cit.* i. pp. 9 & 10.

Apatela americana, Harr., *lobeliæ* and *superans*, Guén., *falcula*, Grote, *Catocala fratercula*, Grote & Rob., *amica*, Hübn., *Mamestra trifolii*, Behr., *Eustrotia carneola*, *Tarache erastrioides*, Guén., *Pyrrhia angulata*, Grote, *Chamyris cerintha*, Treit., *Apatela brumosa*, Guén., *Heliothis luteicinctus*, *Catocala coccinata*, Grote, and *Scoleopteryx libatrix*, Linn. Larvæ described; Coquillett, Papilio, i. pp. 6, 8, & 56.

Mamestra trifolii, Esp., *Prodenia lineatella*, Harv., and *Leucania pseudargyria*, Guén. Transformations described; French, Canad. Ent. xiii. pp. 23–25.

Aletia argillacea and *Leucania unipuncta* figured and contrasted; Riley, Am. Nat. xv. pp. 244 & 245, figs.

Cannibalism in the larva of a Brazilian *Noctua*; E. D. Jones, P. Liverp. Soc. xxxiv. pp. lxiv. & lxv.

Grote publishes a list of the North American *Bombyceidea* (Bull. U. S. Geol. Surv. vi. p. 277), in which he includes the genera *Audela*, Walk., *Platycerura*, Pack., *Charadra*, Walk., *Raphia*, Hübn., *Feralia* and *Momaphana*, Grote, and *Diphthera*, Hübn.

Nearly all the larvæ of the *Noctuæ Trifidæ* are half-loopers when first hatched; Logan, Ent. M. M. xvii. p. 237.

Bryophila par noticed and figured; Carrington, Ent. xiv. p. 304, plate, fig. 18.

Thaumasta expressa, Led., ab. *ochracea*, from Saisan, noticed; Staudinger, S. E. Z. xlii. pp. 410 & 411.

Charadra propinquilinea, Grote. Larva described; Goodell, Papilio, i. p. 15.

Apatela (*Acronycta*) *major*, Brem., noticed and figured; Oberthür, Études d'Ent. v. p. 69, pl. vii. fig. 5.

Acronycta aceris with undeveloped hind-wings: Gauchler, Ent. Nachr. vii. p. 216. *A. alni*: larva noticed; Le Nat. iii. p. 390. *A. walkeri*, Andrews, = *albo-rufa*, Grote; Graef, Bull. Brooklyn Soc. i. p. 93.

Simyra buettneri, Hering, noticed by him, S. E. Z. xlii. p. 340.

Leucania obsoleta: larva noticed; Ralfe, Ent. xiv. pp. 179 & 180. *L.*

singularis, Butl., probably = *flavo-stigma*, Brem. *L. radiata*, Brem., and *elymi*, Tr., var. noticed and figured; Oberthür, *l. c.* pp. 70 & 71, pl. iii. fig. 5, and pl. ix. fig. 2.

Heliophila (*Leucania*) *unipuncta*, Haw., and parasites discussed; Comstock, Rep. Dep. Agric. 1879, p. 187–191, pl. i. figs. 1–3. Notes on number of broods, hibernation, causes of increase, &c.; Riley, P. Am. Ass. 1880, pp. 640–642.

Nonagria despecta recorded from Pembrokeshire; Barrett, Ent. M. M. xviii. p. 109.

Gortyna: notes on several North American species; Grote, Bull. U. S. Geol. Surv. vi. pp. 267–269. *G. nebris* and *nitela*, Guén., are only varieties; Graef, Bull. Brooklyn Soc. i. p. 7, Riley, Papilio, i. p. 107.

Nephelodes violans, Guén.: larva redescribed: Riley, Am. Nat. xv. pp. 574–577.

Heliophobus hispidus. Larva described; Porritt, Ent. xiv. pp. 134 & 135.

Charæas graminis. Ravages of larvæ; P. E. Soc. 1881, pp. xiii., xiv., & xxiii.; Ent. M. M. xviii. pp. 39, 68, 87, & 111; Ent. xiv. pp. 166 & 167; Gutheil, Ent. Nachr. vii. pp. 253 & 254.

Luperina rubella, Dup., var. *dayensis*, from Algeria, noticed and figured; Oberthür, *l. c.* vi. p. 86, pl. xi. fig. 9.

Mamestra: revised list of North American species; Grote, Canad. Ent. xiii. pp. 126–130. *M. trifolii*, var. *oregonica* described; id. *l. c.* p. 230. *M. assimilis*, Morr.: larva described; Goodell, *l. c.* p. 15. *M. leineri*, var. (?) *pomerana* appears to be a good species; Hering, *l. c.* p. 347. *M. stoliczkæ*, Feld., described; Moore, P. Z. S. 1881, p. 347.

Miana arcta, Led., noticed and figured; Oberthür, *l. c.* v. p. 72, pl. iii. fig. 14. Oberthür's figure, however, represents *Raphia fasciata*, var., and not the true *arcta*; Butler, Ann. N. H. (5) vii. p. 235. *M. expolita*: natural history; Buckler, Ent. M. M. xviii. pp. 76–78.

Caradrina quadripunctata, Fabr.: variation discussed; *leucoptera*, Thunb., *cinerascens*, and *petræa*, Tengstr., *menetriesi*, Kretschm., and *grisea*, Eversm., are probably synonyms; Schφyen, Ent. Tidskr. ii. pp. 216–218 & 220. *C. ambigua*, W. V., recorded as new to Britain; Meek, Ent. xiv. p. 281. *C. albo-signata*, Oberthür, redescribed and figured by him (with var. *cæca*); *op. cit.* v. pp. 73 & 74, pl. iv. fig. 1.

Agrotis. Grote has published a preliminary list of the North American species of *Agrotis*, Hübn., with which he includes *Aniela*, *Anytus*, and *Agrotiphila*, Grote, *Ammoconia*, Led., and *Pachnobia*, Guén., as sections (Bull. U. S. Geol. Surv. vi. pp. 149–164). The genus *Pleonectopoda*, Grote, is not sufficiently distinct. The synonymic remarks prefixed to the paper being solely of a controversial character, are here omitted; the other species specially noticed are as follows:—*Agrotis clandestina*, Harr. (= *Mamestra unicolor*, Walk.), var. *havilæ*, Grote, from California and Nevada, defined (p. 157); *Aniela simplaria*, Morr., briefly redescribed (p. 158); *A. hilaris*, Grote (*nec* Freyer), renamed *bolli*; *A. hero*, Morr., is distinct; *A. citricolor*, Grote, variation noticed (p. 160); *A. gagates* and *mimallonis*, Grote, are distinct (p. 162); *A. gladiaria* and *stigmesa*, Morr., noticed (p. 163); *A. atrifera* and *brunneigera*, Grote, noticed, from

Maine and Washington Territory respectively, *l. c.* p. 261 ; *A. havilæ*, Grote, noticed, p. 76 ; *A. repentis*, Grote & Rob., is distinct from *messoria*, Harr., pp. 126–128 ; *A. texana*, Grote, var. from Arizona noticed, p. 153, *id.* Papilio, i. ; *A. baja*, Fabr., var. *bajula*, from Lepsa, p. 411, *islandica*, Staud., varr. *rossica*, from Saisan, and *labradoriensis*, from Labrador, p. 419, noticed, Staudinger, S. E. Z. xlii. ; *A. ashworthi*, note on eggs and larvæ, Porritt, Ent. M. M. xviii. p. 162 ; *A. exclamationis* and *segetum*, the larvæ will not attack *Soia hispida*, Girard, Bull. Soc. Ent. Fr. (6) i. p. cxlviii. ; *A. florida*, Schmidt, noticed by him, Arch. Ver. Mecklenb. xxxiii. pp. 96 & 97 ; *A. ripæ*, var. *weissenhorni*, larva noticed, Hering, *l. c.* p. 345.

Noctua, sp. from South Wales, attacked by a species of *Isaria*; McLachlan, P. E. Soc. 1881, p. ii.

Triphæna subsequa. Habits of larva ; Williams, Ent. M. M. xvii. p. 211.

Trachea, sp. Larva supposed to belong to this genus noticed ; Packard, Ins. Inj. Trees, p. 207.

Perigrapha. List of (5) North American species ; Grote, Canad. Ent. xiii. p. 133.

Orthosia suspecta, white form ; Mayes, P. Bristol Soc. ii. p. 247.

Dasycampa sebdonensis, Aust., = *vaccinii*, Linn., var. ; Oberthür, *l. c.* vi. p. 87.

Cosmia distincta, Butler, noticed and figured ; *id. l. c.* p. 19, pl. ix. fig. 7.

Dianthœcia cucubali, double-brooded ; Thornewell, Ent. xiv. p. 214. *D. proxima*, Hübn., recorded as new to Silesia ; Naacke, J B. schles. Ges. lviii. p. 126.

Oncocnemis. List of North American species ; Grote, Papilio, i. p. 34.

Polia. List of North American species ; *id.* Bull. U. S. Geol. Surv. vi. pp. 266 & 267.

Ammoconia vetula, Dup. Transformations described ; Pagenstecher, Ent. Nachr. vii. pp. 170–172.

Aplecta nebulosa, Hufn., var. *askolda* from Askold noticed ; Oberthür, *op. cit.* v. p. 79.

Berrhœa, Walk., recharacterized, and *B. aurigera*, Walk., redescribed ; Moore, P. Z. S. 1881, p. 356.

Hadena. Grote publishes a list of North American species, and appends some conjectures as to various species of other authors (Bull. U. S. Geol. Surv. vi. pp. 262–266). He arranges the species under 4 subgenera : *Luceria*, *Hadena*, Tr., *Pseudanarta*, H. Edw., and *Oligia*, Hübn. *H. impulsa*, Guér., var. *mixta*, from Texas, is described at p. 264, and *H. characta* and *tracta*, Grote, and *paginata*, Morr., are noticed, pp. 261 & 262.

Hadena. Oberthür (*l. c.*) notices and figures *H. jankowskii*, Oberth. (= *Apamea gemina*, var., *sec.* Butler, Ann. N. H. 5, vii. p. 236) v. p. 79, pl. iii. fig. 11, *lucia*, Butl., vi. p. 20, pl. viii. fig. 3, and *solieri*, Boisd., var. (?) *arabs*, from Algeria, vi. p. 88, pl. xi. fig. 8.

Phlogophora pallens, Oberthür (= *beatrix*, Butl.), redescribed and figured by him ; *l. c.* v. p. 78, pl. iii. fig. 3 (? = *periculosa*, Guén. ; Butler, Ann. N. H. 5, vii. p. 235).

Auchmis sikkimensis, Moore, figured by Waterhouse, Aid, i. pl. x.

Rhodophora (*Alaria*) *florida*, Guén. Habits of larva; Smith, Bull. Brooklyn Soc. iv. p. 28.

Heliothidæ. Characters and position discussed; the family should be placed between the *Acontiidæ* and *Anthophilidæ*: Moore, P. Z. S. 1881, pp. 360 & 361.

Adonisea pulchripennis, Grote, var. *languida*, from California, described; H. Edwards, Papilio, i. p. 20.

Heliothis imperspicua, Streck., = *Schinia gracilenta*, Hübn.; *H. spectanda*, Streck., = *Aspila rhexiæ*, Abb. & Smith; *H. rubiginosa*, Streck., = *Lygranthœcia saturata*, Grote; *H. fastidiosa*, Streck., = *L. meskeana*, Grote, and *H. subnuda*, Streck., = *Euleucyptera cumatilis*, Grote: Grote, Papilio, i. pp. 156 & 157. *H. armigera*, and var. *conferta*, Walk., noticed from the Hawaiian Islands; Butler, Ann. N. H. (5) vii. p. 324.

Annaphila arvalis, H. Edwards (nec *Axenus arvalis*, Grote), renamed *salicis*; H. Edwards, *l. c.* p. 23.

Agrophila. Oberthür (*l. c.* vi.) notices *A. flavo-nitens*, Aust., pl. iii. fig. 4, *deleta*, Staud., pl. iii. fig. 5, p. 89, and *sulphuralis*, L., var. *algira*, pl. ii. fig. 2, p. 90.

Tarache (*Acontia*). List of North American species; Grote, Canad. Ent. xiii. pp. 15 & 16. *T. binocula*, Grote, var. *virginalis* from Arizona, described; *id.* Papilio, i. p. 155.

Acontia variegata and *flavo-maculata*, Oberthür, redescribed and figured by him; *l. c.* pp. 81 & 82, pl. iii. figs. 7 & 8.

Anthophila albida, Dup, noticed and figured; *id. l. c.* vi. p. 91, pl. xi. fig. 15.

Eustrotia. List of North American species; Grote, Papilio, i. pp. 10 & 11.

Litoprosopus futilis, Grote & Rob., compared with *confligens*, Walk.; *id.* Bull. U. S. Geol. Surv. vi. p. 271.

Dacela, probably = *Microphysa* (= *Acantholipes*); Butler, P. Z. S. 1881, p. 618.

Brephos parthenias. There is a tuft on segments 5 & 6 in ♀; Poujade, Bull. Soc. Ent. Fr. (6) i. p. lii.

Plusia brassicæ, Riley, noticed by him; Papilio, i. pp. 106 & 107. *P. eriosoma*: transformations described; P. Buller, Tr. N. Z. Inst. xiii. pp. 237 & 238. *P. moneta*, Fabr.: larva noticed; Brants, Ent. Tijdschr. xxiv. p. xxiii. Var. *esmeralda* from Askold, described; Oberthür, *op. cit.* v. p. 85. *P. precationis*, Guén.: transformations described; Coquillett, Canad. Ent. xiii. pp. 21-23. *P. v-aureum*: larva described; Porritt, Ent. xiv. pp. 66 & 67.

Orasia emarginata, Fabr., redescribed; Dewitz, Verh. L.-C. Ak. xlii. p. 80, pl. iii. fig. 9.

Ænigma paradoxa, Streck., = *Hyblæa puera*, Fabr.; Grote, Canad. Ent. xiii. p. 17.

Phycodes, Guén. (= *Tegna*, Walk.), recharacterized; *T. hyblæella*, Walk., = *P. hirundicornis*, Guén.: Moore, *l. c.* p. 377.

Aletia argillacea, Hübn., appears, from the figure, scarcely to agree with *xylina*, Say, but probably represents an allied Brazilian species;

Riley, Index to Reports, p. 56, & Papilio, i. pp. 107 & 108. Range, habits, and parasites noticed; *id.* P. Am. Ass. 1879. Best means of destroying the young larvæ; *id. l. c.* 1880, pp. 642-649. Food-plants; Hoy & Bethune, Rep. E. Soc. Ont. 1880, p. 19.

Prospalta leucospila, Walk.: ♀ described; Moore, *l. c.* p. 347.

Amphipyra pyramidea, L., var. *obscura*, from Askold, noticed; Oberthür, *l. c.* v. p. 85.

Nænia typica: ♀ pairing with two ♂♂; Meinhelt & Thalenhorst, Verh. Ver. Hamb. iv. pp. 210 & 211.

Mania maura, Linn.: transformations described; Wackerzapp, Ent. Nachr. vii. pp. 32–35.

Toxocampa victoria, Grote, variation noticed by him; Bull. Brooklyn Soc. iii. p. 48.

Leucanitis. Graef regards *Syneda*, Guén., and *Bolina*, Dup., as synonymous with *Leucanitis*, Guén., and gives a list of the North American species; *l. c.* i. pp. 53 & 54.

Litocala sexsignata, Harv., var. *deserta* from Colorado and Arizona described; H. Edwards, *l. c.* p. 25.

Syneda hastingsi, H. Edwards, var. *perpallida*, from California, and *S. adumbrata*, Behr., var. *saxea*, from Colorado, described; *id. l. c.* p. 26.

Catocala. Dewitz notices the tuft of fan-like hairs concealed in a cavity of the tibiæ in the male; B. E. Z. xxv. p. 297. Controversy on various *Catocalæ* between Grote & Hulst; Papilio, i. pp. 159–164, & 215–218. *C. sappho*, Streck.: its specific claims, p. 57. *C. lachrymosa*, Guén., varr. *evelina*, p. 110 (*cf.* also H. Edwards, *op. cit.* p. 117), and *zelica*, and *innubens*, Guén., var. *hinda*, p. 111, and *C. robinsoni*, Grote, var. *curvata*, from Illinois, described, p. 218; French, Papilio, i. *C. ilia*, Guén., *carissima*, Hulst, and *grynea*, Cram.: larvæ described; Koebele, Bull. Brooklyn Soc. iv. p. 22. *C. arizonæ*, Grote, noticed by him; Canad. Ent. xiii. p. 232. *C. cara*, var. *carissima*, from the Southern States, described; Hulst, Bull. Brooklyn Soc. ii. p. 97. *C. communis*, Grote, noticed by him; Papilio, i. pp. 158 & 159. *C. flebilis* and *amatrix*: larvæ described; Kellicott, Papilio, i. pp. 141 & 142. *C. grynea*, var. from Philadelphia, noticed; Grote, Canad. Ent. xiii. p. 35. *C. nebraskæ*, Dodge, var. *somnus*, described; Dodge, Canad. Ent. xiii. p. 40. *C. nupta*, L., var. *obscurata*, from Askold and North China, noticed; Oberthür, *l. c.* v. p. 86 (= *unicuba*, Walk.; Butler, Ann. N. H. 5, vii. p. 237). *C. similis*, W. H. Edw., noticed; Grote, Papilio, i. p. 159. *C. unijuga*: transformations described; Kellicott, Canad. Ent. xiii. pp. 38 & 39.

Sypna. List of 28 species, 9 being described as new:—*S. lugens*, Walk., = *Achæa reversa*, Walk.; 5 species of *Tavia* described by Walker in his Supplement, belong to *Sypna*; Butler, Tr. E. Soc. 1881, pp. 201–210.

Cyligramma. Notes on Madagascar species; Mabille, CR. ent. Belg. xxv. pp. lviii. & lix. The following synonymy is given:—*C. magus* and *goudoti*, Guén., are sexes; *C. importuna*, Kef., = *argillosa*, Guén.; *C. conturbans* and *disturbans*, Walk., are sexes, and = *raboudou*, Luc.

Calliodes lanipes, Butl., figured by Waterhouse, Aid, i. pl. xlviii.

Ophiusa guenei, Snellen (= *joviana*, Guén., *nec* Cram.), = *arcuata*, Moore; Snellen, Tijdschr. Ent. xxiv. p. 67.

Euclidia glyphica. Larva described; Porritt, Ent. M. M. xvii. pp. 210 & 211.

Pelamia tehuelcha, Berg, = *Euclidia conica*, Feld. & Rog.; Berg, S. E. Z. xlii. p. 48, and Exped. Rio Negro, Zool. p. 93.

Dicopinæ, subf. n., Grote, Bull. U. S. Geol. Surv. vi. p. 276. Head depressed, squamation rough or thick, antennæ pectinated in ♂, legs unarmed, except fore tibiæ, which have a stout claw; eyes naked, labial palpi short, ocelli present. The species appear early in the year, after passing the winter in the pupa state. To include the genera *Eutolype*, *Dicopis*, and *Copipanolis*, Grote; a list of the species is also given.

New genera and species :—

Borolia, Moore, P. Z. S. 1881, p. 334. Placed after *Aletia*; type, *B. fasciata*, sp. n., *l. c.* pl. xxxvii. fig. 12, Darjiling.

Norraca, id. *l. c.* p. 340. Allied to *Ipana*; type, *I. longipennis*, sp. n., *l. c*, Penang.

Sasunaga, id. *l. c.* p. 342. Allied to *Dipterygia*; type, *Hadena tenebrosa*, Moore (redescribed, *l. c.* p. 343).

Dadica, id. *l. c.* p. 349. Allied to *Radinacra*; type, *D. lineosa*, sp. n., *l. c.*, Punjab Hills.

Tiracola, id. *l. c.* p. 351. Placed after *Agrotis*; type, *A. plagiata*, Walk.

Appana, id. *l. c.* p. 355. Allied to *Habryntis*; type, *Phlogophora indica*, Moore (redescribed, *l. c.*).

Naranga, id. *l. c.* p. 359. Allied to *Xanthodes*; type, *X. diffusa*, Walk. (redescribed, *l. c.*); add *N. æneseens*, sp. n., *l. c.*, Formosa.

Charia, id. *ibid.* Placed after *Naranga*; type, *C. nigrisigna*, pl. xxxvii. fig. 13, *ochracea*, Calcutta, and *maculata*, Ceylon; spp. nn., *l.* c. p. 360.

Raghuva, id. *l. c.* p. 362. Placed after *Heliothis*; type, *Leucania confertissima*, Walk.

Sophaga, id. *ibid.* Placed after *Raghuva*; type, *S. sinuata*, sp. n., *l. c.*, p. 363, Bombay.

Dorika, id. *l. c.* p. 363; type, *D. sanguinolenta*, sp. n., *l. c.*, Bombay; add *Leucania aureola*, Walk.

Masalia, id. *l. c.* p. 364. Placed after *Dorika*; type, *M. radiata*, Manpuri; add *M. irrorata*, Darjiling, spp. nn., *l. c.*

Pradatta, id. *ibid.*; type, *P. beatrix*, sp. n., Canara, Cashmere, &c.; add *Leucania bivittata*, Walk., and *decorata*, p. 365, *artaxoides*, Cashmere, &c., and *modesta*, Manpuri, p. 366, spp. nn.

Curubasa, id. *l. c.* p. 366. Placed after *Pradatta*; type, *Alaria lanceolata*, Walk., redescribed, *l. c.*; add *C. cruentata*, Cashmere, *calamaria*, Bombay, and *marginata*, North-west Himalaya, spp. nn., *l. c.* p. 367.

Adisura, id. *l. c.* p. 367. Placed after *Curubasa*; type, *A. atkinsoni*, sp. n., fig. 6, Darjiling; add *Anthophila marginalis*, Walk. (redescribed); *Heliothis delicia*, Feld. & Rog.; and *A. leucanioides*, Kutch, *dulcis*, fig. 20, Darjiling, p. 368, *pallida*, Ceylon, and *similis*, Calcutta, p. 369, spp. nn., pl. xxxvii.

Methorasa, id. *l. c.* p. 374. Allied to *Callopistria*; type, *Eriopus latreillii*, Dup.

Cotanda, id. *ibid.* Placed next to last; type, *Eriopus placodoides*, Guén.

Phalga, id. *l. c.* p. 375. Allied to *Lincopalpa*; type, *P. sinuosa*, sp. n., *l. c.* pl. xxxvii. fig. 7, Darjiling.

Culasta, id. *l. c.* p. 376. *Calpidæ*; type, *C. indecisa*, sp. n. *l. c.* p. 377, India.

Khadira, id. Tr. Z. S. xi. p. 69. Allied to *Othreis*; type, *Ophideres aurantia*, Moore, redescribed and figured, *l. c.* pl. xiii. fig. 4.

Adris, id. *ibid.* Allied to *Othreis*; type, *Ophideres tyrannus*, Guén., redescribed and figured, *ibid.* pl. xiii. fig. 5; add *A. rutilus*, sp. n., *l. c.* p. 70, Ceylon.

Purbia, id. *l. c.* p. 70. Allied to last; type, *Ophideres discrepans*, Walk. (= *O. archon*, Feld.), redescribed and figured, p. 71, pl. xiv. fig. 1.

Vandana, id. *l. c.* p. 72. Allied to *Mænas*; type, *Ophideres dividens*, Walk., redescribed, *l. c.*

Argadesa, id. *l. c.* p. 74. Allied to *Othreis*; type, *Phalæna materna*, Linn., redescribed and figured, *l. c.* pl. xii. figs. 4 & 4 *a–d*, pl. xiv. figs. 3 & 3 *a*.

Pyrinioides, Butler, Tr. E. Soc. 1881, p. 199. Allied to *Thermesia*, but with the aspect of *Pyrinia* (*Geometridæ*); type, *P. aurea*, sp. n., *l. c.* p. 200, Tokei, Japan.

Lathosea, Grote, Bull. U. S. Geol. Surv. vi. p. 270. Affinities uncertain; possibly allied to *Arzama* and *Admetovis*; type, *L. pulla*, sp. n., *l. c.*, Oregon.

Nycterophæta, J. B. Smith, Bull. Brooklyn Soc. iv. p. 45. Intermediate between *Cleophana* and *Cucullia*; type, *N. magdalena*, Hulst, sp. n., *l. c.* "Black Hills."

Triocnemis, Grote, Papilio, i. p. 77. Allied to *Heliothis* and *Chariclea*; type, *T. saporis*, sp. n., *l. c.*, Washington Territory.

Bessula, id. *l. c.* p. 176. Allied to *Pippona* and *Antiplaga*; type, *B. luxa*, sp. n., *l. c.*, New Mexico.

Euros, H. Edwards, Papilio, i. p. 19. Allied to *Anarta*; type, *E. proprius*, sp. n., *l. c.*, California.

Oribates, id. *l. c.* p. 22. Placed after *Melicleptria*; types, *O. muiri*, California, and *limbatus*, Mazatlan, spp. nn., *l. c.*

Dicopis depilis, Grote, Papilio, i. p. 48, Ohio.

Bryophila plumbeola, Staudinger, S. E. Z. xlii. p. 410, Saisan; *B. literata*, Cashmere, p. 331, *nilgiria*, Nilgiris, *mediana*, Punjab, and *modesta*, North-west Himalayas, p. 332, Moore, P. Z. S. 1881.

Trisena maxima, id. *l. c.* p. 333, Punjab Hills; *T. anædina*, Butler, Tr. E. Soc. 1881, p. 19, Tokei, Japan.

Apatela jankowskii, Oberthür, Études d'Ent. v. p. 69, pl. vii. fig. 1, Askold; *A. edolata*, Grote, *l. c.* p. 153, Arizona.

Acronycta bicolor, Moore, *l. c.* p. 332, Punjab.

Pharetra leucoptera, Butler, *l. c.* p. 595, Yokohama.

Mythimna limbata, id. *l. c.* p. 173, Tokei, Japan.

Leucania bistrigata, Darjiling, fig. 18, p. 384, *penicillata*, Punjab, &c., *modesta*, fig. 11, Darjiling, *lineatipes*, Cherra Punji, *adusta*, Darjiling, &c., p. 335, *subsignata*, North-west Himalayas, *consimilis*, fig. 19, Darjiling, *compta*, fig. 8, Pudda River, p. 336, *nainica*, fig. 15, Naini Tal, *albistigma*,

fig. 9, Darjiling, *howra*, fig. 14, Calcutta, *rufistrigosa*, Umballa, p. 338, *abdominalis*, Bengal, *dharma*, fig. 17, *albicosta*, Darjiling, fig. 10, p. 338, *canaraica*, Canara, *uniformis*, North-west Himalayas, *prominens*, Darjiling, Cherra Punji, *griseo-fasciata*, North-west Himalayas, p. 339, and *lanceata*, Ceylon, p. 340, Moore, *l. c.* pl. xxxvii.; *L. inanis*, Oberthür, *l. c.* p. 70, pl. iii. fig. 4, Askold; *L. nigro-fascia*, Hulst, Bull. Brooklyn Soc. iii. p. 77, iv. plate, fig. 9, Florida.

Heliophila bicolorata, Grote, *l. c.* p. 154, Arizona; *H. oxygala*, Colorado, p. 14, *flabilis*, Long Island, and *farcta*, California, p. 15, *id.* Canad. Ent. xiii.; *H. patricia*, id. Bull. Brooklyn Soc. iii. p. 46, Colorado.

Nonagria innocens, Butler, *l. c.* p. 173, Yokohama.

Glottula sordida, id. *l. c.* p. 174, Yokohama.

Dandaca (?) *megii*, Oberthür, *l. c.* vi. p. 20, pl. ix. fig. 6, China (Quei-Chow).

Gortyna impecuniosa, Massachusetts, *erepta*, Kansas, *juvenilis*, Colorado, p. 267, *harrisi*, Massachusetts, p. 268 (and larva noticed, p. 276), Grote, Bull. U. S. Geol. Surv. vi.

Hydrœcia khasiana, Moore, *l. c.* p. 342, pl. xxxvii. fig. 5, Khasia Hills.

Arzama melanopyga, Grote, Papilio, i. p. 148, Florida.

Pseudoglœa decepta, id. Bull. U. S. Geol. Surv. vi. p. 271, Colorado.

Axylia renalis, Cashmere, Punjab, *fasciata*, Punjab, Ceylon, *irrorata*, North-west Himalayas, p. 341, and *albivena*, Punjab, p. 342, Moore, *l. c.*

Xylophasia commixta, Butler, *l. c.* p. 174, Japan.

Xylomyges bella, id. *l. c.* p. 175, Yokohama; *X. perlubens*, Grote, Canad. Ent. xiii. p. 132, Washington Territory.

Rhizogramma aurilegula, Oberthür, *l. c.* v. p. 71, pl. iii. fig. 16, Askold; *R. inextricata*, Moore, *l. c.* p. 342, Punjab, &c. (Referred by Butler, *op. cit.* p. 619, to the *Hypogrammidæ*, near *Gadirtha*, with the following species.)

Selepa docilis, Butler, *l. c.* p. 619, Kurrachee.

Neuria simulata, pl. xxxviii. fig. 1, Darjiling, p. 343, *incisa*, and *simillima*, Punjab, &c., p. 344, Moore, *l. c.*

Thalpophila indica, Masuri, and *callopistrioides*, North India, *id. l. c.* p. 344; *T. digna*, Butler, *l. c.* p. 176, Yokohama.

Luperina lasserrii, Oberthür, *l. c.* vi. p. 86, pl. xi. figs. 13 & 14, Algeria.

Mamestra culta, Moore, *l. c.* p. 347, North-west Himalayas; *M. sutrina*, Colorado, and *liquida*, Washington Territory, Grote, Papilio, i. pp. 5 & 58; *M. crotchi*, id. Bull. Brooklyn Soc. iii. p. 29, Oregon, Colorado; *M. anguina*, Illinois, and *bisulca*, Arizona, *id.* Canad. Ent. xiii. pp. 129 & 230.

Apamea nivalis, Butler, *l. c.* p. 177, Tokei, Japan; *A. chersotoides* and *cinctipennis*, id. Ann. N. H. (5) vii. p. 322 & 323, Hawaiian Islands; *A. cuprina*, fig. 2, Sikkim, *pannosa*, Nilgiris, Ceylon, *latifasciata*, Manpuri, *mucronata*, fig. 8, p. 345, *strigidisca*, fig. 9, Darjiling, *basalis*, North-west Himalayas, and *nubila*, fig. 10, Darjiling, p. 346, Moore, *l. c.* pl. xxxviii.; *A. askoldis*, Oberthür, *l. c.* v. p. 72, pl. iii. fig. 13, Askold.

Miana parietum and *fodinæ*, id. *l. c.* p. 73, pl. iii. figs. 15 & 12, Askold.

Phothedes bipars, Moore, *l. c.* p. 373, pl. xxxviii. fig. 7, Cherra Punji, Assam.

Hattia monilis, fig. 11, *cervina*, fig. 12, Darjiling, *calamistrata*, Khasia Hills, *id. l. c.* p. 348, pl. xxxviii.

Celæna sikkimensis, id. *l. c.* p. 348, pl. xxxviii. fig. 16, Sikkim.

Perigea loculosa, Grote, Papilio, i. p. 154, Arizona; *P.* (?) *argyrosticta*, Butler, Tr. E. Soc. 1881, p. 177, Tokei, Japan.

Caradrina arenacea and *delecta*, pl. xxxviii. fig. 15, Moore, *l. c.* p. 349, Darjiling, &c.

Acosmetia nebulosa, pl. xxxviii. fig. 13, Darjiling, *nigrescens*, Bombay, *id. l. c.* p. 350.

Agrotis similis, Saisan, p. 412, *ala*, Ala Tau, p. 413, *decorata*, Tarbagatai, *parnassiphila*, Ala Tau, p. 414, *junonia*, p. 415, *senescens*, Saisan, p. 416, *cognita*, Lepsa, p. 417, *costata* (? = *albifarca*, Ersch.), p. 420, *confinis*, Saisan, &c., p. 422, *opisoleuca*, Shahkuh, and *bifurca*, Saisan, p. 423, Staudinger, *l. c.*; *A. autumnalis*, Oberthür, *l. c.* v. p. 74, pl. vii. fig 10, Askold; *A. tokionis* and *fucosa*, Butler, Tr. E. Soc. 1881, pp. 178 & 179, Tokei, Japan; *A. quadrisigna*, *costigera*, Punjab, &c., p. 350, *junctura*, North-west Himalayas, and *modesta*, Cashmere, p. 351, Moore, l. c.; *A. apicalis* and *cloanthoides*, Colorado, p. 153, and *rubefactalis*, Washington Territory, p. 154, *A. quarta*, California, p. 258, *washingtoniensis*, Washington Territory, *immixta*, Texas, *docilis*, Colorado, p. 259, *viralis*, Nebraska, p. 260, Grote, Bull. U. S. Geol. Surv. vi.; *A. nanalis*, Nevada, *esurialis*, Washington Territory, *colata*, Mount Hood, p. 131, *semiclarata*, Western States, p. 132, *id.* Canad. Ent. xiii.; *A. verticalis*, id. Bull. Brooklyn Soc. iii. p. 39, Colorado; *A. clodiana*, id. Papilio, i. p. 76, Washington Territory.

Spælotis lucens, Butler, *l. c.* p. 179, Tokei, Japan; *S. crinigera*, id, Ann. N. H. (5) vii. p. 321, Hawaiian Islands.

Onigena arenosa, id. Tr. E. Soc. 1881, p. 179, Tokei, Japan.

Graphiphora flavirena, Darjiling, and *nigro-signa*, Sikkim, Moore, *l. c.* p. 352, pl. xxxviii. figs. 3 & 4; *G. agrotiformis*, Grote, Canad. Ent. xiii. p. 14, Colorado; *G. consopita*, id. Papilio, i. p. 154, Arizona.

Megasema cinnamomea, Moore, *l. c.* p. 352, pl. xxxviii. fig. 6, Darjiling.

Noctua stupens and *hysgina*, Oberthür, *l. c.* v. pp. 75 & 76, pl. vii. figs. 7 & 8, Askold. The latter = *Graphiphora lubentia*, Butl.; Butler, Ann. N. H. (5) vii. p. 235.

Ochropleura magellanica, Butler, P. Z. S. 1881, p. 83, Terra del Fuego; *O. plumbata*, id. Tr. E. Soc. 1881, p. 180, Japan; *O. consanguinea*, Moore, *l. c.* p. 353, Punjab, &c.

Hermonassa chalybeata and *sinuata*, id. *l. c.* p. 353, pl. xxxviii. figs. 17 & 5, Darjiling.

Tæniocampa auraria, Oberthür, *l. c.* v. p. 76, pl. iii. fig. 6, Askold.

Pachnobia coppingeri, Butler, P. Z. S. 1881, p. 84, Puerto Bueno.

Orthosia rectivitta, Moore, *l. c.* p. 353, Darjiling; *O. decipiens*, Indiana, and *inops*, Kittery Point, Grote, Bull. U. S. Geol. Surv. vi. pp. 269 & 270; *O.* (?) *arcifera* and *O. ochroglene*, Mabille, CR. Ent. Belg. xxv. p. lvi. Madagascar.

Cerastis lævis and *subdolens*, Butler, Tr. E. Soc. 1881, p. 181, Tokei, Japan.

Xanthia austauti, Oberthür, *l. c.* vi. p. 87, pl. i. fig. 3, Algeria.

Mesogona exigua, Butler, *l. c.* p. 182, Tokei, Japan.

Cosmia hypenoides, Moore, *l. c.* p. 354, pl. xxxviii. fig. 19, Bengal.

Dianthœcia confluens, id. *l. c.* p. 354, pl. xxxviii. fig. 20, Darjiling; *D. admiranda*, Oberthür, *l. c.* v. p. 77, pl. vii. fig. 11, Askold.

Metopoceras codeti, id. *l. c.* vi. p. 88, pl. xi. fig. 10, Algeria.

Oncocnemis gracillinea [!], Grote, Canad. Ent. xiii. p. 231, Arizona; *O. major*, Colorado, and *aqualis*, California, *id.* Papilio, i. p. 33.

Polia jelskii, Oberthür, *l. c.* vi. p. 38, pl. x. fig. 11, Penumarca.

Valeria (?) *conserta*, Grote, Papilio, i. p. 58, Washington Territory.

Dichonia goliath, Oberthür, *l. c.* v. p. 68, pl. vi. fig. 7, Askold.

Lamprosticta bella, Butler, *l. c.* p. 183, Tokei.

Miselia cinerea, id. *l. c.* p. 184, Yokohama.

Plat[y]aplecta plumbea, id. *ibid.*, Tokei.

Aplectoides caliginea, id. *l. c.* p. 185, Tokei.

Euplexia distorta, Moore, *l. c.* p. 354, pl. xxxviii. fig. 18, Darjiling.

Polyphænis largeteaui, Oberthür, *op. cit.* vi. p. 19, pl. viii. fig. 4, Quei-Chow.

Chytonix sensilis, Grote, Papilio, i. p. 49, Massachusetts.

Berrhæa olivacea, Moore, *l. c.* p. 357, Darjiling.

Hadena kosakka, Oberthür, *l. c.* v. p. 80, pl. vii. fig. 4, Askold; *H. tokiensis*, Butler, *l. c.* p. 186, Tokei, Japan; *H. adjuncta*, North-west Himalayas, and *siderifera*, Punjab, Moore, *l. c.* p. 357; *H. cymosa*, *semilunata*, and *cinefacta*, Grote, *l. c.* pp. 34, 58 & 76, Washington Territory; *H. separans*, New York, Wisconsin, p. 260, *violacea*, California, p. 261, and *fuscimacula*, United States, p. 262, *id.* Bull. U. S. Geol. Surv. vi.; *H. tortilis*, Washington Territory, *id.* Bull. Brooklyn Soc. iii. p. 46; *H. perpenoa*, id. Canad. Ent. xiii. p. 229, Arizona.

Trigonophora albo-signata, Moore, *l. c.* p. 355, Kussowlie.

Cucullia albescens, id. *l. c.* p. 357, North-west Himalayas.

Callænia pullata, id. *l. c.* p. 358, North-west Himalayas.

Calophasia cashmirensis, Cashmere, and *lobifera*, Bombay, *id. ibid.*

Chariclea pernana, Grote, Papilio, i. p. 155, Arizona.

Grotella sexseriata, id. *ibid.*, Arizona.

Xanthothrix neumœgeni, H. Edwards, *l. c.* p. 101, California.

Heliothis perigeoides, Kutch, and *succinea*, Bombay, Moore, *l. c.* pp. 361 & 362; *H. fervens*, Butler, *l. c.* p. 186, Tokei; *H. interjacens*, Grote, Bull. Brooklyn Soc. iii. p. 30, Arizona (is the western form of *H. phlogophagus*, Grote & Rob.; *id.* Papilio, i. p. 158).

Schinia buxea, id., Canad. Ent. xiii. p. 230, Arizona.

Lygranthœcia walsinghami, H. Edwards, Papilio, i. p. 20, Oregon; *L. balba* and *coercita*, Grote, Papilio, i. p. 156, Arizona; *L. tumida*, Colorado, and *rufimedia*, Florida, *id.* Bull. Brooklyn Soc. iii pp. 30 & 31.

Melicleptria hoyi, id. Bull. Brooklyn Soc. iii. p. 30, Wisconsin; *M honesta*, id., Papilio, i. p. 77, Oregon; *M. belladonna*, Southern Utah, p. 20, *elaborata*, Colorado, and *perminuta*, California, p. 21, H. Edwards, *l. c.*

Xanthodes mariæ, Mabille, CR. Ent. Belg. xxv. p. lx., Nossi-Bé.

Leocyma nervosa, Butler, *l. c.* p. 187, Tokei.

Dyrzela cara, id. *l. c.* p. 188, Tokei.

Apsarasa liturata, id., Ann. N. H. (5) vii. p. 37, Cameroons, Old Calabar; *A. wallacii*, Moore, *l. c.* p. 359, Dorey.

Acontia malgassica, Mabille, *l. c.* p. lx., Madagascar.

Tarache sedata, H. Edwards, *l. c.* p. 23, Arizona.

Annaphila aurantiaca, California, and *pustulata*, Arizona, *id. ibid.*

Spragueia pardalis, Florida, and *funeralis*, Arizona, Papilio, i. pp. 50 & 158.

Fruva acerba, California, and *accepta*, Florida, H. Edwards, *l. c.* p. 24; *F. georgica*, Grote, Canad. Ent. xiii. p. 232, Arizona.

Oribates versutus and *opiparus*, H. Edwards, *l. c.* pp. 116 & 117, Texas, The generic name, being preoccupied in *Arachnida*, is changed to *Gyras*, *id. ibid.*; its proper place is near *Eustrotia*.

Eustrotia aeria, Grote, Papilio, i. p. 11, Wisconsin.

Erastria atrata, *senex*, and *fentoni*, Butler, *l. c.* pp. 188–190, Japan; *E. nemorum*, fig. 2, p. 82, *costimacula*, fig. 4, pl. iv., and *mandschuriana*, pl. ii. fig. 9, p. 83, Oberthür, *l. c.* v., Askold; *E. pallidisca* and *marginata*, Moore, *l. c.* p. 372, pl. xxxvii. figs. 14 & 21, Darjiling.

Bankia angulifera, North-west Himalayas, *lativitta* and *erecta*, Nilgiris, *id. l. c.* p. 373.

Hydrelia conjugata, id. *l. c.* p. 369, Darjiling.

Leptosia quinaria, id. *l. c.* p. 371, Allahabad, Manpuri.

Thalpochares parvula, p. 370, *albida*, *roseana*, Bombay, *trifasciata*, fig. 21, *quadrilineata*, fig. 14, Calcutta, pl. xxxviii. p. 370, *divisa*, Allahabad, Calcutta, Ceylon, *bifasciata*, *flavida*, Allahabad, Punjab, p. 371, *id. l. c.*; *T. trigrammos*, Mabille, *l. c.* p. lxi., Congo.

Anthophila virginalis and *caid*, Oberthür, *op. cit.* vi. pp. 90 & 91, pl. xi. figs. 1 & 2, Algeria; *A. heterogramma*, Congo, and *i-græcum*, Madagascar, Mabille, *l. c.* p. lxi.

Eutelia siccifolia, Moore, *l. c.* p. 375, Darjiling.

Ingura snelleni, Saalmüller, S. E. Z. xlii. p. 433, Nossi-Bé.

Varnia fenestrata, Moore, *l. c.* p. 376, Darjiling.

Telesilla malachites, Oberthür, *op. cit.* v. p. 80, pl. iii. fig. 9, Askold.

Plusia metabractea, Butler, *l. c.* p. 190, Tokei, Japan; *P. nadeja* (= *zosima*, Hübn., var. *sec.* Butler, Ann. N. H. 5, vii. p. 236), pl. iii. fig. 10, and *locuples*, pl. ix. fig. 3, Oberthür, *l. c.* pp. 84 & 85, Askold; *P. celsa*, H. Edwards, *l. c.* p. 101, Oregon.

Euchalcia cashmirensis, Moore, *l. c.* p. 376, Cashmere.

Basilodes chrysopis, Grote, Papilio, i. p. 154, Arizona.

Calpe lata, Butler, *l. c.* p. 21, Tokei.

Deva palligera, Grote, *l. c.* p. 35, Sierra Nevada, California.

Phycodes tortricina, Canara, *minor*, Bengal, and *maculata*, Darjiling, Moore, *l. c.* p. 378.

Hyblæa fortissima, Butler, *l. c.* p. 191, Tokei.

Aletia angulifera, Cashmere, and *distincta*, Darjiling, pl. xxxvii. fig. 4, Moore, *l. c.* p. 333.

Apopestes inconspicua, Butler, *l. c.* p. 191, Japan.

Toxocampa vulcanea, id. *l. c.* p. 192, Tokei.

Pandesma virens, id. *l. c.* p. 192, Tokei.

Ercheia umbrosa, id. *l. c.* p. 194, Tokei.

Syneda seposita, Colorado, p. 25, *occulta*, Texas, p. 118, and *faceta*, Florida, p. 119, H. Edwards, *l. c.*

Melipotis tenella, id. *l. c.* p. 26, Texas.

Synedoida sabulosa, p. 26, *inepta*, Southern Colorado, *morbosa*, Colorado, Utah, Arizona, Florida, p. 27, and *valens*, p. 119, *id. l. c.*

Homoptera rubi, id. *l. c.* p. 28, California.

Gerbatha subfasciata and *granitalis*, Butler, *l. c.* pp. 193 & 194, Tokei.

Catocala oberthueri (Aust., MS.), pl. i. fig. 1, p. 92, Algeria, *C. triphænoides*, p. 21, fig. 5, *largeteaui*, fig. 8, *davidi*, fig. 7, p. 22, China, pl. viii., Oberthür, *op. cit.* vi.; *C. omphale*, p. 195, *connexa* and *nubila*, p. 196, Butler, *l. c.* Tokei; *C. dulciola*, Ohio, *chelidonia*, Arizona, Grote, Papilio, i. pp. 5 & 159; *C. sinuosa*, id. Bull. Brooklyn Soc. i. p. 77, Florida; *C. miranda*, H. Edwards, *l. c.* p. 118, Washington, *C. rosalinda*, Albany, p. 55, *violenta*, Colorado, p. 58, *calphurnia*, Kansas, *cordelia*, Georgia, Texas, Florida, p. 59, and *timandra*, Texas, p. 60, *C. hermia*, Colorado, p. 93, *portia*, California, p. 94, *ophelia* (= *verrilliana*, Grote, var.), California, *olivia*, Texas, p. 95, *id. op. cit.* ii.; *C. pura*, Hulst, *op. cit.* ii. p. 96, Colorado; *C. gisela*, Meyer, *ibid.*, Georgia; *C. dejecta*, Strecker, *tom. cit.* p. 97, Northern States.

Phyllodes dux, Saalmüller, S. E. Z. xlii. p. 441, Nossi-Bé.

Sypna mormoides, p. 202, *tenebrosa*, Darjiling, p. 203, *umbrosa*, Assam, p. 204, *apicalis*, *lucilla*, Darjiling, p. 206, *obscurata*, Assam, Darjiling, p. 207, *pulchra*, Darjiling, p. 208, *moorii*, Assam, and *kirbii*, Darjiling, p. 209, Butler, *l. c.*

Cyligramma concors, Mabille, *l. c.* p. lix., Madagascar.

Spirama agrota and *simplicior*, Butler, *l. c.* pp. 197 & 198, Japan.

Ophiodes pelor, Mabille, *l. c.* p. lvii., Madagascar.

Ophisma imperatrix, Saalmüller, *l. c.* p. 214, Madagascar.

Chrysorithrum fuscum and *rufescens*, Butler, *l. c.* p. 198, Japan.

Achæa orea, Mabille, *l. c.* p. lviii., Madagascar.

Athyrma saalmuelleri, id. *l. c.* p. lvii., Madagascar.

Ophiusa lenzi, Saalmüller, *l. c.* p. 435, Nossi-Bé; *O.* (?) *cyanea*, Snellen, Tijdschr. Ent. xxiv. p. 129, pl. xiv. figs. 2, 2*a* & 2*b*, Luzon.

Thria (?) *inepta*, Butler, P. Z. S. 1881, p. 620, Chaman.

Acantholipes metalligera, id. Tr. Soc. 1881, p. 190, Tokei; *A. flavisigna*, p. 371, *nigrisigna*, Bombay, and *hypenoides*, Darjiling, p. 372, Moore, *l. c.*; *A. maculifera* and *angulina*, Mabille, *l. c.* pp. lx. & lxi., Congo.

Azeta reuteri, Saalmüller, *l. c.* p. 437, Nossi-Bé.

Selenis affulgens, id. *l. c.* p. 439, Nossi-Bé.

Capnodes jankowskii, Oberthür, *op. cit.* v. p. 87, pl. ix. fig. 1, Askold.

Megacephalon stygium, Saalmüller, *l. c.* p. 217, Madagascar.

Homopyralis repentis, Grote, Papilio, i. p. 165, Arizona.

DELTOIDÆ.

Snellen (Tijdschr. Ent. xxiv.) figures the following species, with two exceptions described by him, *l. c.* xxiii.: — *Hypena leucotænia*, *semifusculis*, *sublividalis*, *rhynchalis*, *semifascialis*, *argialis*, *inconspicua*, *fontinalis*, *robustalis*, *Hypenodes jucundalis*, pl. v. figs. 1–10; *Schrankia*

calligrapha, *Rivula scapularis*, *Simplicia spurialis*, *Nodaria fracturalis*, *Echana plicalis*, Moore, *Hydrillodes lentalis*, Guén., *Epizeuxis pupillalis*, *inductalis*, pl. vi. figs. 1–8; *E. tenuipalpis*, *Sitophora feniscalis*, *Heterogramma pseudopsodos*, *didyma*, *fuscicollis*, *nigricans*, *clavalis*, and *aripalpis*, pl. vii. figs. 1–8.

Hypena obsoleta, Butl., and *Hypenodes alticolans*, Butl., var. *simplex*, from the Hawaiian Islands, discussed; Butler, Ann. N. H. (5) vii. pp. 324 & 325.

Bleptina dimissalis, Walk., = *Bocana metisalis*, Walk.; *id.* Tr. E. Soc. 1881, pp. 580 & 581.

Egnasia trimantesalis, Walk., belongs to *Saraca*; id. *l. c.*

Platyhypena scabra, Fabr.: transformations described; Comstock, Rep. Dep. Agric. 1879, p. 252, and Coquillett, Canad. Ent. xiii. pp. 137 & 138.

New species :—

Madopa flavo-macula, Oberthür, Études d'Ent. v. p. 87, pl. iv. fig. 5, Askold.

Bomolocha fecialis, New York, and *B.* (?) *incusalis*, Colorado, Arizona, p. 133, Grote, Canad. Ent. xiii.

Megachyta subflavidalis, id. Papilio, i. p. 166, Arizona; *M. gypsalis*, id. Bull. Brooklyn Soc. iii. p. 65, North Carolina.

Hypena albo-punctata, Tepper, *op. cit.* iv. p. 2, plate, fig. 5, Washington Territory; *H. rivuligera*, Butler, Tr. E. Soc. 1881, p. 579, Tokei.

Gisira hercules, id. *ibid.*, Tokei.

Rivula subrosea, id. *l. c.* p. 580, Tokei.

Locastra elegans, id. *l. c.* p. 581, Yokohama.

Saraca costinotata and *subviolacea*, id. *ibid.*, Yokohama.

Egnasia vasava, id. *l. c.* p. 582, Yokohama.

Olybama japonica, id. *ibid.*, Tokei.

Meranda inconspicua, id. *ibid.*, Yokohama.

Geometridæ.

Butler, A. G. On the *Lepidoptera* of the Amazons, collected by J. W. H. Trail during the years 1873 to 1875. Part. iv. Geometrites. Tr. E. Soc. 1881, pp. 315–349.

82 species enumerated, 30 new. The author includes the *Uraniidæ* with the *Geometridæ*. The synonymic notes in this paper are too numerous for transcription.

Gumppenberg, C. v. Ueber die Genera der Familie *Geometra*. MT. Münch. ent. Ver. v. pp. 105–120.

The author compares and criticises the classifications of the *Geometridæ* by Lederer and Herrich-Schäffer, which he points out to be exceedingly faulty, without, however, proposing any classification of his own.

Snellen, P. C. T. *Lepidoptera* van Celebes gezameld door M. C. Piepers, met Aanteekeningen en Beschrijving der nieuwe Soorten. *Heterocera*. iii. *Geometrina*. Tijdschr. Ent. xxiv. pp. 69–96, pls. viii.–x.

44 species noticed, including the following previously described:—

Urapteryx crocopterata, Koll., *Hyperythra lutea*, Cram. (= *limbolaria*, Guén.), *Boarmia cornaria*, Guén., *Hypochroma pseudoterpnaria*, Guén., *Nemoria ruficinctaria*, Snell. (figured, pl. ix. fig. 1), *Thalassodes quadraria*, Guén., *Agathia lycænaria*, Koll. (= *albiungalaria*, Herr.-Schäff.), *Eumelea aureliata*, Guén., *Anisodes* (?) *intortaria*, Guén., *Acidalia eulomata*, Snell., *Timandra aventiaria*, Guén. (?), *Zanclopteryx saponaria*, and *zincaria*, *Pigia infantularia*, *Micronia gannata*, Guén., *adspersata*, *Nedusia luctiferata* (figured, pl. x. figs. 4 & 5), *Erosia plicata*, Snell., *Macaria sufflata*, Guén., *eleonora*, Cram., *Tephrina medardaria*, Herr.-Schäff. (= *Bargosa fasciata*, Moore), *Hyposidra janiaria*, Guén.; *Bursada*, Walk., recharacterized; *Collix foraminata* and *Remodes abortivata*, Guén.

Millière (Lépidoptérologie) figures and generally redescribes *Thamnonoma acquiaria*, M., pl. i. figs. 14 & 15, p. 6, *Nemoria advolata*, Ev., pl. ii. figs. 1–3, p. 7, Lép. i., *Aventia flexula*, W. V., figs. 1–3, p. 2, *Phibalapteryx lapidata*, Hübn., figs. 4–6, p. 4, Lép. iii., *Strenia immorata*, L., figs. 2 & 3, p. 19, *Acidalia marginepunctata*, Borkh., fig. 6, p. 22, pl. vii., Lép. v., *A. esterelata*, M., figs. 1–5, p. 9, *Halia loricaria*, Eversm., figs. 6–8, p. 12, *Eupithecia gueneata*, M., fig. 9, p. 15, pl. ix. Lép. vi., *veretraria*, Herr.-Schäff., figs. 8–10, p. 6, *E. fenestrata*, M., fig. 11, p. 8, and *Gnophos serotinaria*, Hübn., fig. 12, p. 10, pl. x., Lép. vii.

Several undetermined larvæ of *Geometridæ* feeding on pine noticed; Packard, Ins. Inj. Trees, pp. 206 & 207, 232 & 233, 237 & 238, 242. Some are remarkable for their resemblance to pine-needles.

Oberthür (Études d'Ent. v.) notices the following species from Askold: *Phorodesma jankowskiaria*, Mill., pl. iv. fig. 7, p. 47; *Macaria nigronotaria*, Brem., belongs to *Epione*, p. 43; *Phasiane griseo-limbata*, Oberth., pl. iv. fig. 14, p. 50; *Rhyparia melanaria*, L., var. *askoldinaria*, pl. ix. fig. 11, p. 52; *Eupithecia prolongata*, Zell., fig. 9; *Melanippe bella*, Butl., and *luctuosaria*, Oberth., figs. 11 & 13, p. 53; *Eucosmia varia*, Hedem., var. (?) *hedemannaria*, Oberth., fig. 10, p. 53; and *Cidaria ludovicaria*, Oberth., fig. 3, pl. iv. p. 57.

Phasiane griseo-limbata, Oberth., = *Nematocampa straminea*, Butl., *Eucosmia hedemannaria*, Oberth., = *Scotosia certata*; *Cidaria corussaria*, Oberth., ? = *russata*, var.; *C. fabrefactaria*, Ob., = *corylata*; *C. askoldaria*, Ob., = *jameza*, Butl., ♀; *C. achatinellaria*, Ob., = *achatinaria*, var. Butler, Ann. N. H. (5) vii. pp. 231–233.

Anaitis paludata, Thunb., var. *obscurata*, and *Cidaria turbata*, Hübn., var. *arctica*, from Finland, described and figured; Schφyen, Ent. Tidskr. ii. pp. 122 & 123, pl. i. figs. 5 & 6.

Caterva catenaria, Dru., and *Eupithecia interrupto-fasciata*, Pack. Larvæ described; Coquillett, Papilio, i. p. 56.

Urapteryx sambucaria: aberration; Waterhouse, P. E. Soc. 1881, p. xxx.

Sericoptera mahometaria, Herr.-Schäff., = *area*, Cram.; Möschler, Verh. z.-b. Wien, xxxi. p. 394.

Drepanodes varus, Grote & Rob.: transformations described and figured; Packard, *l. c.* pp. 246–248, fig. 95.

Azelina. Butler revises this genus, noticing the described species

(51, including some new ones), as well as several uncertain species; and others incorrectly referred to the genus. These notices, though highly important, cannot be given here in detail; Ann. N. H. (5) viii. pp. 29–46.

Ennomos tiliaria: variety noticed; Boyd, P. E. Soc. 1881, p. xxxvii.

Himera pennaria. Egg and young larva described: the latter has a pair of undeveloped ventral legs on the ninth segment, after the first moult, which disappear upon the fourth moult; Hellins, Ent. M. M. xviii. pp. 33 & 34.

Boarmia repandata, var. *sodorensium*, from the Hebrides, described; Weir, Ent. xiv. p. 220. (Noticed and figured, with var. *conversaria*, Hübn.; Carrington, *op. cit.* p. 304, pl., figs. 12–14.)

Cymatophora pampinaria, Guén.: larva noticed; French, Papilio, i. p. 82.

Tephrosia undularia, Blanch., = *Larentia tepidata*, Guén.; Berg, S. E. Z. xlii. p. 48, and Exped. Rio Negro, Zool. p. 93, pl. ii. fig. 12.

Nemoria chloroleucaria: transformations described; Hulst, Bull. Brooklyn Soc. ii. p. 78.

Iodis vernaria: note on oviposition and eggs; Swinton, P. E. Soc. 1881, p. xx.

Ophthalmophora, Guén.: remarks on the genus, and list of 11 species (2 new); Butler, Ent. M. M. xviii. pp. 59–61.

Byssodes politata, Cram.: the insect which Stoll figures as the male is specifically distinct; Möschler, Verh. z.-b. Wien, xxxi. p. 405.

Ephyra punctaria: seasonal dimorphism; Cole, Tr. Epp. Forest, i. pp. x. & xi.

Anisodes diremptaria, Walk., redescribed and figured; Dewitz, Verh. L.-C. Ak. xlii. p. 85, pl. iii. fig. 20. *A. lateritiaria*, Herr.-Schäff., and *globaria*, Guén., discussed; Butler, Tr. E. Soc. 1881, pp. 333 & 334.

Acidalia herbariata: note on transformations; Sorhagen, B. E. Z. xxv. p. 17. *A. immutata*, food-plants; Ent. xiv. p. 212. *A. ochrata*, habits of larva; Tugwell, Ent. xiv. pp. 158 & 159. *A. strigaria*, Hübn.: larva described; Stange, S. E. Z. xlii. pp. 113 & 114.

Phasiane artesiaria, larva noticed; Le Nat. iii. p. 390.

Deilinia glomeraria, Grote, noticed by him; Canad. Ent. xiii. p. 134.

Zerene catenaria, Guén., unusual abundance in 1880; Comstock, Rep. Dep. Agric. 1880, p. 274.

Abraxas grossulariata, varieties; Sang. P. E. Soc. 1881, p. x. With transverse black bands on hind wings; Lhotte, Bull. Soc. Rouen (2) xvi. p. 145. Food-plants; Johnson & Crewe, Ent. xiv. pp. 18 & 43. *Ab. malmundariense*, described and figured; Donckier de Donceel, Feuill. Nat. xi. p. 34, pl. i. fig. 3.

Euschema andamana, Moore, figured by Waterhouse, Aid, i. pl. xi.

Hybernia defoliaria: larva stripping the oaks in the New Forest; Ent. xiv. p. 179. *H. tiliaria*, Harr., habits, &c.; Comstock & Coquillett, Rep. Dep. Agric. 1879, pp. 255 & 256, pl. vi. fig. 4, and Packard, *l. c.* p. 125, fig. 60.

Anisopteryx vernata, Peck, noticed and figured; Packard & Riley, Ins. Inj. Trees, pp. 61 & 62, figs. 22 & 23.

Oporabia. Note on eggs, &c.; Buckler, Ent. M. M. xviii. pp. 87 & 88.

Larentia didymata. Larva on *Anemone nemorosa*; Inchbald, Ent. M. M. xviii. p. 68.

Emmelesia albulata, var. *hebudium*, from the Hebrides, described (a pure white variety, occurring in the proportion of about one to six of the normal form); Weir, Ent. xiv. p. 221, pl., fig. 17.

Eupithecia, sp. (Hebrides), fig. 1, *E.* sp. (Shetland Isles), figs. 2 & 3, and *ultimaria*, Dup. ?, figs. 6 & 7; Carrington, Ent. xiv. pl. (for *E. ultimaria*, cf. Webb, *tom. cit.* p. 300). *E. absynthiata*: varieties of larva feeding on tansy; Thornewill, Ent. xiv. p. 258. *E. atraria*, Herr.-Schäff., redescribed: it is quite distinct from *castigata*; Wocke, JB. schles. Ges. lviii. pp. 201 & 202. *E. chloerata*, Mab., larva noticed; Stange, *l. c.* p. 115. *E. expallidata*, two years in pupa; Cambridge, Ent. xiv. p. 228. *E. inturbata*, Hübn. (= *subciliata*, Guén.): transformations described; A. Speyer, S. E. Z. xlii. pp. 473–477, and Ent. M. M. xviii. p. 142. *E. miserulata*, Grote, larva described; Packard, *l. c.* pp. 248 & 249. *E. tæniata*, note on young larvæ; Hodgkinson, Ent. xiv. p. 257.

Lobophora carpinata, var. *insontata*, from the Amur, described; Christoph, Bull. Mosc. lv. (2) p. 90.

Melanthia albiciliata, var. *suffusa*, noticed and figured; Carrington, *l. c.* p. 73.

Melanippe hastata and *montanata*. Varieties figured; *id. l. c.* pp. 1 & 304, plate, fig. 20.

Cidaria blomeri, Curt.: habits; Höfner, JB. Mus. Kärnten, xiv. pp. 264 & 265. *C. salicata*, vár. (?) or sp. (?) described; *id. op. cit.* xiii. p. 145. *C. fulvata*; larva described; Mathew, Ent. xiv. pp. 67 & 68 (Porritt believes these larvæ to belong to *Anticlea badiata*; *l. c.* p. 87). *C. immanata* alone appears to occur in the Shetlands, and *C. russata* alone in the Hebrides; Weir, *l. c.* p. 279.

New genera and species:—

Ligonia, Möschler, Verh. z.-b. Wien, xxxi. p. 399. Placed after *Scardamia*; type, *L. exquisitata*, sp. n., *l. c.*, Surinam.

Sericophara, Christoph, Bull. Mosc. lv. (2) p. 64. Allied to *Selenia* (?); type, *S. guttata*, sp. n., *l. c.* p. 65, Amur.

Loxochila, Butler, P. Z. S. 1881, p. 615. Allied to *Tanaorrhinus* and *Geometra*; type, *T. smaragdus*, Butl., add *L. mutans*, sp. n., *l. c.*, Nilgiris.

Blechroma, Möschler, *l. c.* p. 403. Placed after *Racheospila*; type, *B. exertata*, sp. n., *l. c.* p. 404, pl. xvii. fig. 11, Surinam.

Tachyphyle, Butler, *l. c.* p. 329. Allied to *Iodis* and *Phyle*; type, *T. acuta*, sp. n., *l. c.*, Rio Solimoens.

Ballantiophora, id. *l. c.* p. 344. Allied to *Berberodes*; type, *B. gibbiferata*, Guén. (= *Chrysocestis bisignata*, Walk.), add *B. lanaris*, sp. n., *l. c.* p. 345, Rio Negro.

Pseudostegania, id. *l. c.* p. 416. Allied to *Stegania*; fore-wings relatively larger, and subcostal branches of hind-wings forking from a long footstalk; type, *P. chrysidia*, sp. n., *l. c.* p. 417, Tokei.

Pogonitis, Christoph, *l. c.* p. 60. Allied to *Bapta*; type, *P. cumulata*, sp. n., *l. c.* p. 61, Amur.

Metabraxas, Butler, *l. c.* p. 419. Intermediate between *Abraxas* and *Icterodes*; type, *M. clerica*, sp. n., *l. c.* p. 419, Tokei.

Macrochthonia, id. *l. c.* p. 599. (*Ligiinæ*.) Type, *M. fervens*, sp. n., *l. c.*, Tokei.

Tyloptera, Christoph, *l. c.* p. 114. Allied to *Eupithecia*; type, *T. eburneata*, sp. n., *l. c.* p. 116, Amur.

Ptychoptera, id. *l. c.* p. 83. Allied to *Sparta* (?); type, *P. staudingeri*. sp. n., *l. c.* p. 85, Amur.

Leptostegna, id. *l. c.* p. 86. Allied to *Lobophora* and *Sparta*, but with no appendage to the hind-wings. Type, *L. tenerata*, sp. n., *l. c.* p. 88, Amur.

Tuerckheimia. Dewitz, Verh. L.-C. Ak. xlii. p. 81. *Erateininæ* (?). Allied to *Sangala*; type, *T. lynckeri*, sp. n., *l. c.* pl. iii. figs. 2 & 2 *a*, Chinchoxo.

Cimicodes illectata, Möschler, Verh. z.-b. Wien, xxxi. p. 394, pl. xvii. fig. 1, Surinam.

Paragonia nummularia and *discuncata*, id. *l. c.* pp. 395 & 396, pl. xvii. figs. 2 & 3, Surinam.

Drepanodes cyclopeata and *depranaria*, id. *l. c.* p. 397, pl. xvii. figs. 4 & 5, Surinam; *D. andinaria*, Oberthür, Études d'Ent. vi. p. 34, pl. x. fig. 8, Monte Rico.

Cratoptera triviata, Möschler, *l. c.* p. 397, pl. xvii. fig. 6, Surinam; *C. brunnea*, Rio Jurua, and *primularis*, Rio Jutahi, Butler, Tr. E. Soc. 1881, pp. 319 & 320.

Therapis stramínea, id. *l. c.* p. 401, Tokei.

Epione emundata, Christoph, Bull. Mosc. lv. (2) p. 72, Amur; *E. ossea* and *lachrymosa*, Butler, *l. c.* p. 402, Tokei.

Plagodis flosculária, Grote, Papilio, i. p. 40, Ohio.

Eversmannia illotata and *erasaria*, Christoph, *l. c.* pp. 69 & 70, Amur.

Hyperythra phantasma, Butler, P. Z. S. 1881, p. 615, Kurrachee.

Rumia balteária, Hulst, Bull. Brooklyn Soc. iii. p. 43, Minnesota, Colorado.

Tacparia (?) *morosa*, Butler, Tr. E. Soc. 1881, p. 403, Tokei.

Gynopteryx vulgaris, Amazons, and *lapidea*, Nikko, *id. l. c.* pp. 321 & 403.

Scardamia todillaria, Möschler, *l. c.* p. 399, Surinam.

Magida aurantiaca, Butler, *l. c.* p. 322, Fonteboa.

Nematocampa arenosa and *reticulata*, id. *l. c.* p. 323, Rio Jurua.

Endropia nachtigali, figs. 8 & 10, Chinchoxo, and *packardi*, figs. 5 & 6, Guinea, Dewitz, Verh. L.-C. Ak. xlii. pp. 83 & 84, pl. iii.; *E. helveolaria*, Hulst, *op. cit.* iv. p. 33, Colorado; *E. tambillaria*, Oberthür, *op. cit.* vi. p. 33, pl. x. fig. 7, Tambillo, Peru; *E. singularis*, Obydos, and *evanescens*, Yokohama, Butler, *l. c.* pp. 324 & 404.

Garæus fenestratus, id. *ibid.*, Tokei.

Pericallia testacea, id. *l. c.* p. 405, Tokei.

Selenia versicoloraria, Christoph, *l. c.* p. 66, Amur.

Azelina traili, Rio Purus, p. 31, *mollis*, Rio Janeiro, *buckleyi*, Ecuador, p. 34, *frigida*, Rio Janeiro, p. 35, *mathilda*, *semiusta*, Ecuador, p. 36,

inconstans, *amica*, p. 38, *ochracea*, p. 39, *minima*, Rio Janeiro, p. 41, *denticulata*, Ecuador, p. 42, *juruana*, Rio Jurua, p. 43, *decora*, Rio Janeiro, p. 44, Butler, Ann. N. H. (6) viii. *A. morrisonaria*, H. Edwards, Papilio, i. p. 121, Washington Territory.

Pero gammaria, Möschler, Verh. z.-b. Wien, xxxi. p. 400, pl. xvii. fig. 8, Surinam.

Odontoptera consociaria, Christoph, *l. c.* p. 68, Amur.

Halesa glauca, Butler, *l. c.* p. 319, Amazons.

Calcaritis oberthueri, id. *l. c.* p. 597, Tokei.

Fascellina cervinaria, Snellen, Tijdschr. Ent. xxiv. p. 71, pl. viii. fig. 1, Celebes.

Nyssiodes olgaria, Oberthür, *op. cit.* v. p. 44, pl. iv. fig. 12, Askold.

Hemerophila atrilineata, Butler, *l. c.* p. 405, Tokei, Yokohama.

Boarmia stipitaria, pl. iv. fig. 6, p. 45, var. (?) *piperitaria*, fig. 13, *dembowskiaria*, fig. 5, and *amphidasygaria*, fig. 6, pl. ix. p. 46, Oberthür, *l. c.* v., Askold; *B. suifunaria*, p. 74, *crassestrigata*, p. 75, *doerriesiaria*, p. 77, *hedemanni*, p. 79, Christoph, *l. c.*, Amur; *B. inflexaria*, figs. 2 & 2 *a*, p. 72, *spilotaria*, figs. 5 & 5 *a*, and *fidoniaria*, fig. 4, p. 74, Snellen, *l. c.* pl. viii., Celebes; *B. paupera*, Yokohama, *nikkonis*, Nikko, p. 406, *mœsta*, Yokohama, *definita*, p. 407, and *picata*, Tokei, p. 408, Butler, l. c.; *B. cogigaria*, Möschler, *l. c.* p. 401, Surinam.

Cymatophora (*Boarmia*) *pulmonaria*, Grote, *l. c.* p. 167, Arizona.

Tephrosia exculta, Yokohama, p. 408, *noctivolans*, Tokei, p. 598, and *T.* (?) *cretacea*, Prainha, p. 327, Butler, *l. c.*

Ophthalmophora bella, Limas, and *lucilla*, Rio Janeiro, *id.* Ent. M. M. xviii. p. 60.

Xandrames sericea, id. Tr. E. Soc. 1881, p. 409, Tokei.

Stenotrachelys cinerea, id. *ibid.*, Tokei.

Bargosa rivulosa, id. *l. c.* p. 410, Tokei.

Geometra dioptasaria, Christoph, *l. c.* p. 41, Amur.

Nemoria amphitritaria, Oberthür, Études d'Ent. v. p. 49, pl. iv. fig. 8, Askold; *N. iris*, Butler, *l. c.* p. 328, Tapajos; *N. frequens*, id. P. Z. S. 1881, p. 616, Kurrachee; *N. delicataria*, Möschler, *l. c.* p. 402, pl. xvii. fig. 9, Surinam.

Iodis opaca, Butler, Tr. E. Soc. 1881, p. 328, Santarem; *I. nercidaria*, Snellen, *l. c.* p. 76, pl. x. figs. 10 & 11, Celebes.

Thalassodes saturata, id. *l. c.* p. 77, pl. viii. fig. 3, Celebes.

Dyspteris suffectaria, Möschler, *l. c.* p. 402, pl. xvii. fig. 10, Surinam.

Comibæna lepidaria, id. *l. c.* p. 404, pl. xvii. fig. 14, Surinam; *C. vaga*, Butler, *l. c.* p. 410, Tokei.

Phorodesma amœnaria, Oberthür, Études d'Ent. v. p. 48, pl. ix. fig. 4, Askold; *P. eogenaria*, Snellen, *l. c.* p. 78, pl. x. fig. 1, Celebes; *P. sarptaria*, Möschler, *l. c.* p. 402, pl. xvii. fig. 12, Surinam.

Rhacheospila pacificaria, id. *l. c.* p. 403, pl. xvii. fig. 13, Surinam; *R. nympha*, Butler, *l. c.* p. 411, Tokei, Yokohama.

Aplodes malina, id. *l. c.* p. 330, Rio Jutahi; *A. viridicaria*, Hulst, *l. c.* iii. p. 41, Colorado; *A. juncto-linearia*, Graef, Bull. Brooklyn Soc. iii. p. 87, iv. plate, fig. 7, Colorado.

Chrysocestis pœcilmidia, Butler, *l. c.* p. 332, Amazons.

Numia (?) *flava*, id. *ibid.*, Rio Jurua.

Ephyra rubripennis, id. *l. c.* p. 333, Rio Negro; *E. lutearia*, Dewitz, *l. c.* p. 84, pl. iii. figs. 17 & 21, Lagos, Guinea.

Zonosoma dispergaria, Möschler, *l. c.* p. 406, pl. xvii. fig. 15, Surinam.

Anisodes perpolitaria, *importaria*, id. *l. c.* pp. 406 & 407, pl. xvii. figs. 16 & 17, Surinam; *A. suspicaria* and *strictaria*, Snellen, *l. c.* pp. 80 & 81, pl. viii. figs. 6, 6*a–c*, & 7, Celebes; *A. nodigera*, Rio Purus and Rio Jurua, p. 334, *nebuligera*, Rio Napo, and *peculiaris*, Rio Negro, p. 335, Butler, *l. c.*

Synegia esther (= *Anisodes hadassa*, ♂, Butl.), p. 411, *inconspicua* and *S.* (?) *fentoni*, p. 412, *id. l. c.*, Japan.

Trygodes spoliataria, Möschler, *l. c.* p. 407, pl. xvii. fig. 18, Surinam.

Thamnonoma pervolata, Hulst, *l. c.* iii. p. 42, Colorado.

Somatina fervens, Amazons, and *simplicior*, Tokei, Butler, *l. c.* pp. 340 & 412.

Asthena sancta, id. *l. c.* p. 413, Tokei; *A. snellenaria*, Möschler, *l. c.* p. 408, pl. xvii. fig. 19, Surinam.

Acidalia acquifasciata, p. 42, *plumbo-scriptaria*, *nudaria*, p. 44, *effusaria*, p. 45, *subfalcaria*, p. 46, *accurataria*, p. 47, *nisaria*, p. 49, *multisignata*, p. 50, *salutaria*, p. 51, *disclusaria*, p. 52, *apicipunctata*, p. 54, Christoph, *l. c.* Amur; *A. unio*, Oberthür, *l. c.* v. p. 50, pl. ix. fig. 12, Askold; *A. stella*, Rio Jurua, p. 337, *pulverea*, p. 338, *juruana*, Rio Jurua, and *stictopteris*, Rio Jutahi, p. 339, Butler, l. c.; *A. distracta*, id. P. Z. S. 1881, p. 616, Kurrachee; *A. dimorphata*, Snellen, *l. c.* p. 81, pl. x. fig. 6, Makassar; *A. minutularia*, Florida, and *quæsitata*, Colorado, Hulst, *l. c.* iii. pp. 44 & 45; *A. consumtata* and *dispunctata*, Möschler, *l. c.* pp. 408 & 409, Surinam.

Timandra (?) *cancellata*, Christoph, *l. c.* p. 55, Amur.

Calothysanis pulcherrima, Butler, Tr. E. Soc. 1881, p. 342, Prainha.

Micronia opposita, Snellen, *l. c.* p. 84, pl. ix. figs. 6 & 6*a*, *b*, Makassar.

Menda cinerea, Butler, *l. c.* p. 346, Rio Jurua.

Myrteta angelica, id. *l. c.* p. 413, Japan.

Erosia cretacea, Tokei, *plagifera*, Yokohama, p. 414, *schidacina*, Tokei, Hakodadi, p. 415, and *styx*, Yokohama, p. 416, *id. l. c.*

Stegania ustulataria, Christoph, *l. c.* p. 63, Amur; *S. henricaria*, Oberthür, *l. c.* vi. p. 82, pl. xi. figs. 16 & 17, Algeria.

Cabera magna, Butler, *l. c.* p. 416, Tokei.

Deilinia glomeraria, Ohio, Canada, and *septemfluaria*, Ohio, Grote, *l. c.* p. 41.

Macaria elongaria, Snellen, Tijdschr. Ent. xxiv. p. 86, pl. x. fig. 3, Makassar; *M. respersata*, iii. p. 42, Colorado, *grassata*, Colorado, and *vellivolata*, Florida, iv. pp. 33 & 34, Hulst, l. c.; *M. cometifera*, Butler, *l. c.* p. 347, Amazons.

Eutropa (?) *columbaris*, id. *l. c.* p. 347, Serpa.

Semiothisa obditaria, *pellucidaria*, and *separataria*, Möschler, *l. c.* pp. 409–411, pl. xvii. figs. 20–22.

Ischnopteryx pexatata and *velledata*, id. *l. c.* pp. 412 & 413, pl. xviii. figs. 24 & 25, Surinam.

Parasemia distans (= *Phalæna notata*, Cram., *nec* Clerck, pl. cccl xxi. G.), Prainha, and *pryeri*, Japan, Butler, *l. c.* pp. 343 & 417.

Tephrina lucinda, Butler, *l. c.* p. 348, Serpa; *T. austautaria*, and var. *unicolorariu*, Oberthür, *l. c.* vi. p. 83, pl. iii. fig. 11, Oran.

Eremia maturaria, Christoph, *l. c.* p. 81, Amur.

Marmopteryx dryadata, Hulst, *op. cit.* iii. p. 43, Colorado.

Lozogramma bifilata, id. *l. c.* p. 44, Colorado.

Phasiane hebetata, id. *op. cit.* iv. p. 34, Colorado; *P. curvata*, Grote, *op. cit.* iii. p. 47, Nevada, Colorado; *P. colata* and *hypothrata*, id. Papilio, i. p. 167, Arizona.

Hyposidra albo-macularia and *vampyraria*, Snellen, *l. c.* pp. 89 & 90, pl. ix. figs. 2, 3 & 3*a*, Celebes.

Fidonia davidaria, China, p. 18, pl. ix. fig. 4, North China, and *megearia*, p. 84, pl. iii. fig. 8, Oran, Oberthür, *l. c.* vi.

Bupalus mirandus, Butler, *l. c.* p. 599, Yokohama.

Numeria japonica, id. *l. c.* p. 418, Tokei; *N. scolopaciata*, Möschler, *l. c.* p. 411, pl. xvii. fig. 23, Surinam.

Cleogene sordida, Butler, *l. c.* p. 418, Tokei.

Gorytodes personaria, H. Edwards, *l. c.* i. p. 120, California; *G. dulciaria*, Grote, Bull. Brooklyn Soc. iii. p. 46, Colorado.

Aspilates geholaria, Oberthür, *l. c.* vi. p. 18, pl. ix. fig. 3, Peking, &c. *A. violentaria*, Christoph, *l. c.* p. 82, Amur; *A. gausaparia*, Grote, Papilio, i. p. 41, Wisconsin; *A. viridirufaria*, Neumoegen, Papilio, i. p. 145, Colorado.

Microsema concomitaria, Möschler, *l. c.* p. 398, pl. xvii. fig. 7, Surinam.

Osicerda paupera, Butler, *l. c.* p. 418, Tokei.

Nadagara flaviceps, id. *l. c.* p. 419, Tokei.

Rhyparia jaguarinaria and *leopardaria*, Oberthür, *l. c.* vi. p. 17, pl. ix. figs. 1 & 5, Quei-chow.

Callabraxas propinqua and *evanescens*, Butler, *l. c.* p. 420, Tokei.

Abraxas festinaria and *A.* (?)*askoldaria*, Christoph, *l. c.* pp. 57 & 59, Amur.

Zerene elegantaria, H. Edwards, *l. c.* p. 121, Arizona.

Milionia guentheri, Sumatra, and *latifasciata*, Malacca, Butler, Ann. N. H. (5) viii. p. 381 & note.

Ligia yaminaria, Oberthür, *l. c.* vi. p. 84, pl. xi. fig. 4, Algeria; *L. curvaria*, Dewitz, Verh. L.-C. Ak. xlii. p. 86, pl. iii. fig. 23, Cape.

Argyrophora bifasciata, id. *ibid.* fig. 18, Cape.

Anisopteryx membranaria, Christoph, *l. c.* p. 73, Amur.

Oporabia nexifasciata, Butler, Tr. E. Soc. 1881, p. 420, Tokei.

Larentia longipedaria, Tambillo, Peru, and *anthocharidaria*, Punamarca, Oberthür, *l. c.* vi. pp. 36 & 37, pl. x. figs. 1 & 2.

Tephronia codetaria, id. *l. c.* p. 80, pl. xi. fig. 3, Algeria.

Eupithecia jasioneata, Crewe, Ent. M. M. xviii. p. 80, Ent. xiv. pp. 198 & 199, plate, figs. 4 & 5 (*cf.* also Meek, Ent. xiv. pp. 212 & 213), North Devon, Ireland; *E. blancheata*, Cook, Ent. xiv. pp. 20 & 43, Isle of Man; *E. zibellinata*, p. 117, *agilata*, p. 118, and *amplexata*, p. 119, Christoph, *l. c.*, Amur; *E. catocalaria*, Snellen, *l. c.* p. 92, pl. x. fig. 2, Makassar; *E. monticolens*, Butler, Ann. N. H. (5) vii. p. 320, Maui; *E. tenuata*, Hulst, *op. cit.* iii. p. 45, Colorado.

Collix minuta, Butler, Tr. E. Soc. 1881, p. 421, Yokohama; *C. boarmiata*, Snellen, *l. c.* p. 93, pl. x. fig. 9, Celebes.

Rhopalodes lobophoraria, Oberthür, *l. c.* vi. p. 37, pl. x. fig. 10, Tambillo, Peru.

Remodes cupitheciata, Snellen, *l. c.* p. 94, pl. x. figs. 7 & 8, Makassar.

Lobophora muscigera, Butler, *l. c.* p. 421, Yokohama; *L. expressata*, and *ustata*, Christoph, *l. c.* pp. 88 & 91.

Melanthia yokohamæ, Butler, *l. c.* p. 422, Yokohama.

Heterusia jelskiaria, Ropaybamba, and *stoltzmannaria*, E. Peru, Oberthür, *l. c.* vi. p. 35, pl. x. figs. 4 & 5.

Anticlea taczanowskiaria, id. *op. cit.* v. p. 54, pl. ix. fig. 8, Askold.

Coremia fulvida, Butler, *l. c.* p. 422, Yokohama.

Scotosia ignobilis, id. *l. c.* p. 423, Yokohama; *S. corticea*, id. Ann. N. H. (5) vii. p. 319, Maui; *S. multivagata*, Hulst, *l. c.* iv. p. 27, Colorado.

Eucosmia largeteauaria, Oberthür, *l. c.* vi. p. 19, pl. ix. fig. 8, Queichow; *E. exultata* and *veternata*, Christoph, *l. c.* pp. 92 & 94, Amur.

Cidaria semistrigata, p. 99, *lepidaria*, p. 100, *suavata*, p. 101, *muscicapata*, p. 102, *semiorbiculata*, p. 103, *pudicata*, p. 105, *inanata*, p. 106, *defectata*, p. 108, *chloro-venosata*, p. 109, *pervagata*, p. 110, *cæspitaria*, p. 112, *id. l. c.*, Amur; *C. minna*, *mariesi*, p. 424, *pryeri*, and *C.* (?) *anomala*, p. 425, Butler, Tr. E. Soc. 1881, Japan; *C. corussaria*, fig. 7, *venulata*, fig. 10, pl. ix. p. 55, *fabrefactaria*, pl. iv. fig. 15, p. 56, *askoldaria*, pl. ix. fig. 9, p. 57, and *achatinellaria*, pl. iv. fig. 16, p. 58, Oberthür, *l. c.* v. Askold; *C. euclidiata*, Snellen, *l. c.* p. 95, pl. ix. fig. 7, Celebes; *C. erythrata* and *luteolata*, iii. p. 42, *C. nocticolata*, *semiatrata*, iv. p. 26, *opacaria* and *malleolata*, iv. p. 27, Hulst, *l. c.*, Colorado.

Lygris tigrinata, Christoph, *l. c.* p. 96, Amur.

Thera granitalis, Butler, *l. c.* p. 426, Yokohama, Tokei.

Lithostege virginata, Graef, Bull. Brooklyn Soc. iii. p. 96, iv. plate, fig. 8, Colorado.

Callipia constantinaria, Oberthür, *l. c.* vi. p. 38, pl. x. fig. 12, Punamarca.

Emplocia cephisaria and *fervefactaria*, Grote, Papilio, i. p. 177, New Mexico.

Bursada piepersiata and *vestigiata*, Snellen, *l. c.* p. 91, pl. ix. figs. 4 & 5, Makassar.

PYRALIDÆ.

Millière (Lépidoptérologie, vi.) redescribes and figures *Stenia siberialis*, M., pl. viii. fig. 4, p. 3, *Ennychia fascialis*, Hübn., fig. 10, p. 16, and *Spilodes æruginalis*, Hübn., fig. 12, pl. ix. p. 19.

Undetermined larva belonging to the *Pyralidæ* and feeding on pine noticed; Packard, Ins. Inj. Trees, p. 207.

Omphalocera cariosa, Led., redescribed, and generic characters noticed; Grote, Bull. U. S. Geol Surv. vi. pp. 271 & 272.

Ennychia octomaculalis. Transformations described; Buckler, Ent. M. M. xviii. p. 57–59 (*cf.* also Barrett, *op. cit.* pp. 69 & 70).

Asopia lienigialis, Zell., recorded as new to Britain; Thompson, *op. cit.* pp. 256 & 257, and Ent. xiv. pp. 84 & 85, plate, fig. 21. *A. costalis*,

var. *auro-tænialis*, from the Amur, described; Christoph, Bull. Mosc. lvi. (1).

Lamprosema, Hübn., recharacterized; Möschler, Verh. z.-b. Wien, xxxi. p. 430.

Diasemia literalis noticed; Barrett, Ent. M. M. xviii. p. 69.

Cataclysta helopalis, Clem., and allied species, noticed; Grote, Papilio, i. p. 16.

Paraponyx stratiotalis, variety noticed; F. Sharp, Ent. xiv. p. 19.

Hydrocampa nymphæalis. Additional notes on transformations; Buckler, *l. c.* xvii. pp. 249–254.

Phacellura hyalinatalis, Linn. Habits and ravages discussed; Comstock, Rep. Dep. Agric. 1879, pp. 218–220, pl. iii. fig. 5.

Margaronia glaucalis, Guén., noticed from Honolulu; Butler, Ann. N. H. (5) viii. p. 327.

Botys verbascalis, var. *egentalis*, from the Amur, described; Christoph, *l. c.* p. 19. *B. punctiferalis*, Guén., noticed; Snellen, Tijdschr. Ent. xxiv. p. 131. *B. langdonalis*, Grote, noticed; Langdon, J. Cincinn. Soc. iv. pp. 345 & 346. *B. volupialis*, Grote, noticed by him; Papilio, i. p. 178.

Scopula lutealis. Transformations described; Buckler, *l. c.* xviii. pp. 147 & 148.

Mecyna exigua, Butler, supposed ♀ described by him; Ann. N. H. (5) vii. p. 329.

Scoparia coarctata, Zell., recorded from the Hawaiian Islands; id. *l. c.* p. 332. *S. truncicolella*: larva described; Porritt, Ent. M. M. xviii. p. 106.

New genera and species:—

Craneophora, Christoph, Bull. Mosc. lvi. (1) p. 1. Allied to *Asopia*; type, *C. ficki*, sp. n., *l. c.*, Amur.

Pseudebulea, Butler, Tr. E. Soc. 1881, p. 587. Allied to *Ebulea*, but more robust; type, *P. fentoni*, sp. n., *l. c.*, Tokei.

Neophrida, Möschler, Verh. z.-b. Wien, xxxi. p. 416. Placed after *Chrysauge*; type, *N. auro-limbalis*, sp. n., *l. c.* p. 417, pl. xviii. fig. 26, Surinam.

Liopasia, id. *l. c.* p. 426. Placed after *Orobena*; type, *L. reliqualis*, sp. n., *l. c.* pl. xviii. fig. 35, Surinam.

Pilemia, id. *l. c.* p. 427. Allied to last; type, *P. deformalis*, sp. n., *l. c.* pl. xviii. fig. 36, Surinam.

Singamia, id. *l. c.* p. 433 (= *Ametris*, Herr.-Schäff., *nec* Hübn.); type, *A. quadrifenestrata*, Herr.-Schäff.

Linosta, id. *l. c.* Affinities uncertain; type, *L. sinceralis*, sp. n., *l. c.* pl. xviii. fig. 40, Surinam.

Agastya, Moore, P. Z. S. 1881, p. 378. Affinities not stated; types, *A. hyblæoides* and *flavo-maculata*, spp. nn., *l. c.* p. 379, Darjiling.

Plectroctena, Snellen, Tijdschr. Ent. xxiv. p. cxxi. Affinities not stated; type, *P. dohrni*, sp. n., *l. c.* Colombia.

Scotomera, Butler, *op. cit.* p. 622. Allied to *Scoparia*; type, *S. tristis*, sp. n., *l. c.* p. 623, Kurrachee.

Omphalocera dentosa, Grote, Bull. U. S. Geol. Surv. vi. p. 272, Alabama.

Stemmatophora ingrata, Butler, P. Z. S. 1881, p. 621, Kurrachee; *S.*

meridionalis, Möschler, Verh. z.-b. Wien, xxxi. p. 417, pl. xviii. fig. 27, Surinam.

Hypotia vulgaris, Butler, *l. c.* p. 621, Kurrachee.

Boreophila minuscula, id. Ann. N. H. (5) vii. p. 325, Maui.

Aporodes austautalis, Oberthür, Études d'Ent. vi. p. 93, pl. iii. fig. 7, Algeria; *A.* (?) *micacea*, Butler, *l. c.* p. 326, Maui.

Pgrausta chrysitis, Tokei, and *unipunctata*, Yokohama, *id.* Tr. E. Soc. 1881, p. 584.

Ennychia diversa, id. *l. c.* p. 585, Hakodadi.

Rhodaria arida, id. P. Z. S. 1881, p. 621, Kurrachee.

Desmia propinqualis, Möschler, *l. c.* p. 430, pl. xviii. fig. 37, Surinam.

Asopia amœnalis, id. *l. c.* p. 418, Surinam.

Sparagmia (?) *obtusalis*, Christoph, Bull. Mosc. lvi. (1) p. 26, Amur.

Agrotera fenestralis, id. *l. c.* p. 39, Amur.

Endotricha costæmaculalis[*costi-*] and *penicillalis*, id. *l. c.* pp. 4 & 6, Amur.

Leucinodes (?) *preciosalis*, Möschler, *l. c.* p. 431, pl. xviii. fig. 38, Surinam.

Stenia fusco-cilialis, Ragonot, Ent. M. M. xvii. p. 230, Portugal; *S. baltealis*, Mabille, CR. Ent. Belg. xxv. p. lxii., Madagascar; *S.* (?) *dissipatalis*, Christoph, *l. c.* p. 28, Amur.

Oligostigma incommoda, Butler, *l. c.* p. 180, Socotra; *O. obscuralis*, Grote, Papilio, i. p. 18, United States.

Toripalpus trabalis, id. *l. c.* Colorado.

Amaurophanes amœnialis, Christoph, *l. c.* p. 30, Amur.

Orphnophanes (?) *turbatalis*, id. *l. c.* p. 31, Amur.

Herpetogramma expictalis, id. *l. c.* p. 36, Amur.

Antigastra (?) *virgatalis*, id. *l. c.* p. 38, Amur.

Cataclysta midas, Butler, Tr. E. Soc. 1881, p. 585, Tokei; *C. medicinalis*, Grote, *l. c.* p. 15, Illinois.

Paraponyx turbata, Butler, Tr. E. Soc. 1881, p. 586, Yokohama; *P. obnubilalis* and *rufo-terminalis*, Christoph, *l. c.* pp. 32 & 34, Amur; *P. minoralis*, Mabille, *l. c.* p. lxiii., Madagascar; *P. plenilinealis*, Grote, *l. c.* p. 17, Wisconsin; *P. obscuralis*, Möschler, *l. c.* p. 432, pl. xviii. fig. 39, Surinam.

Hydrocampa pacalis, Grote, *l. c.* p. 17, New York.

Pagyda quadrilineata, Butler, *l. c.* p. 586, Yokohama.

Phacellura imparivirgalis, Madagascar, *peridromella*, Congo, Mabille, *l. c.* pp. lxii. & lxiii.

Eudioptis fuscicaudalis, Möschler, *l. c.* p. 429, Surinam

Botyodes insignis, Butler, *l. c.* p. 587, Tokei.

Botys fibulalis, p. 9, *solemnalis*, p. 10, *pullatalis*, p. 12, *dotatalis*, p. 13, *limitalis*, p. 14, *explicatalis*, p. 16, *clausalis*, p. 18, *extinctalis*, *tritalis*, p. 20, *orbicentralis*, p. 22, *hilaralis*, p. 23, *moderatalis*, p. 25, Christoph, *l. c.*, Amur; *B. butleri*, fig. 13, Chinchoxo, p. 87, *sordidalis*, fig. 11, Lagos, and *fumarialis*, fig. 19, Chinchoxo, Guinea, p. 88, Dewitz, Verh. L.-C. Ak. xlii. pl. iii.; *B. holoxanthalis*, Mabille, *l. c.* p. lxii., Madagascar; *B. crocotalis*, Arizona, and *toralis*, New Mexico, Grote, *l. c.* pp. 167 & 178; *B. dapalis*, p. 17, *lethalis*, California, *vacunalis*, Sierra Nevada, *turmalis*, Colorado, p. 33, *rufifimbrialis*, Massachusetts, *flavinotalis*, Pennsylvania,

annaphilalis, California, p. 34, and *commortalis*, Arizona, p. 233, *id.* Canad. Ent. xiii.; *B. capitalis*, Florida, p. 272, *fissalis*, Buffalo, and *angustalis*, Colorado, p. 273, *id.* Bull. U. S. Geol. Surv. vi.; *B. repetitalis*, id. Rep. Dep. Agric. 1880, p. 270, Georgia; *B. stercoralis*, fig. 29, p. 419, *glutalis*, fig. 30, p. 420, *patronalis*, fig. 31, p. 421, *luciferalis*, fig. 32, *delavalis*, fig. 33, *percludalis*, p. 422, *dolosalis*, *metricalis*, p. 423, *flexalis*, *terricolalis*, p. 424, *tenuialis*, fig. 34, p. 425, Möschler, *l. c.* pl. xviii. Surinam.

Eurycreon clautalis, Grote, Papilio, i. p. 168, Arizona; *E. ornamentalis*, Möschler, *l. c.* p. 418, pl. xviii. fig. 28, Surinam.

Anemosa pryeri, Butler, *l. c.* p. 588, Yokohama; *A. aurora*, id. Ann. N. H. (5) vii. p. 327, Hawaiian Islands.

Orobena lemniscalis, Möschler, *l. c.* p. 425, Surinam.

Mecyna emmychiodes, *nigrescens*, p. 328, *virescens*, p. 329, Butler, *l. c.* Maui.

Eudorea conspicualis, Hodgkinson, Ent. M. M. xviii. p. 134, and Ent. xiv. pp. 223 & 231, pl., figs. 8 & 9, Windermere and York.

Scoparia mandschurica, Christoph, *l. c.* p. 8, Amur; *S. hawaiensis*, p. 330, *jucunda*, and var. *formosa*, *frigida*, p. 331, and *venosa*, p. 332, Butler, *l. c.* Hawaiian Islands.

Crambidæ.

Ephestia kuehniella, Zell., noticed; Snellen, Tijdschr. Ent. xxiv. pp. xx. & xxi.

Euzophera. Millière (Lépidoptérologie, i.) figures, and generally redescribes his *E. australella*, p. 2, pl. i. fig. 3, *maritanella*, fig. 15 (err. 14), p. 13, and *mediterranella*, fig. 16, p. 14, pl. ii.

Acrobasis angusella, Grote, noticed by him; Papilio, i. p. 14.

Pempelia hostilis, Steph. Reoccurrence in England, transformations described: Wood, Buckler, & Barrett, Ent. M. M. xvii. pp. 177–180; *P. contatella*, Grote: transformations described; Comstock, Rep. Dep. Agric. 1880, pp. 261 & 262.

Asarta rubricostella, Staud., *alpicolella*, Zell., and *æthiopella*, Dup., differentiated; Ragonot, Ent. M. M. xvii. pp. 230 & 231.

Dakruma, Grote, is hardly distinct from *Zophodia*; Riley, Index to Reports, p. 57. *D. turbatella*, Grote, = *Pempelia grossulariæ*, Pack., *id.* Papilio, i. p. 108 (*cf.* Grote, *tom. cit.* pp. 142–144). *D. coccidivora*, Comstock, redescribed by him; Rep. Dep. Agric. 1879, pp. 241–243.

Tetralopha dilucidella, Grote, transformations described; *id. l. c.* 1880, pp. 263 & 264.

Crambus pyramidalis, Tr., and *speculalis*, Hübn., taken in coitû; Weller, Progr. Ober. Realschule in Innsbrück, 1879–80. *C. warringtonellus*, natural history; Buckler, Ent. M. M. xviii. pp. 129–131. *C. sericinellus*, Zell., *minimellus*, Rob., *undatus*, *occidentalis*, and *attenuatus*, Grote, noticed; Grote, Canad. Ent. xiii. pp. 66 & 67. *C. vulgivagellus*, injurious to meadows in New York; eggs described: Riley & others, Am. Nat. xv. pp. 574–576, 750, 914 & 915, 1008 & 1009; *cf.* also Lintner & Saunders, Canad. Ent. xiii. pp. 181–183, 199 & 200.

Chilo saccharalis, Fabr. (*Diatræa sacchari*, Guild.). Life-history, &c.; Comstock, Report on Insects Injurious to Sugar-cane, pp. 8–11, figs., and Rep. Dep. Agric. 1880, pp. 240–245.

New genera and species:—

Cataprosopus, Butler, Tr. E. Soc. 1881, p. 589. Allied to *Lamacha* and *Margisca*; type, *C. monstrosus*, sp. n., *l. c.* p. 590, Tokei.

Diphryx, Grote, Bull. U. S. Geol. Surv. vi. p. 273. Allied to *Crambus*, but with rather broader fore-wings, and short labial palpi; type, *D. prolatella*, sp. n., *l. c.*, Wisconsin.

Aphomia spoliatrix, Christoph, Bull. Mosc. lvi. 1, p. 59, Amur.

Ephestia ragonotella, Millière, Lépidoptérologie, vii. p. 4, pl. x. fig. 6, Alpes Maritimes; *E. astericella* (Mill., MS.), Bercc, Lep. France, vi. p. 319, Cannes; *E. humeralis* and *albo-sparsa*, Butler, Ann. N. H. (5) vii. pp. 332 & 333, Hawaiian Islands.

Euzophera cupro-taniella, Christoph, *l. c.* p. 58, Amur; *E. zellerella*, Sorhagen, B. E. Z. xxv. p. 104, bred from dates.

Acrobasis fallowella (Ragonot, MS., = *rhenella*, Dup., var.), Bercc, *l. c.* p. 328, pl. ix. fig. 3, France; *A. squalidella*, Christoph, *l. c.* p. 51, Amur; *A. caryæ* and *demotella*, Grote, Canad. Ent. xiii. pp. 13 & 14, United States.

Myelois clothella (Millière, MS.), Bercc, *l. c.* p. 341, Cannes; *M. tuerckheimiella*, Sorhagen, B. E. Z. xxv. p. 103, larva among raisins from Malaga; *M. injunctella*, p. 52, *cynicella*, p. 54, *obrutella*, p. 55, *colon*, p. 57, Christoph, *l. c.*, Amur.

Nephopteryx scintillans, Grote, Papilio, i. p. 18, Sierra Nevada.

Perispasta immixtalis, id. Canad. Ent. xiii. p. 232, Arizona.

Pempelia ophthalmicella and *sejunctella*, Christoph, *l. c.* pp. 49 & 50, Amur; *P. gleditschiella*, Fernald, Rep. Dep. Agric. 1880, p. 262, Columbia.

Dakruma pallida, Comstock, *op. cit.* 1879, p. 244, Florida.

Prionopteryx olivella, Grote, Bull. U. S. Geol. Surv. vi. p. 274, Illinois.

Diptychophora exsectella, Christoph, *l. c.* p. 41, Amur.

Schœnobius vittatus, Möschler, Verh. z.-b. Wien, xxxi. p. 435, Surinam.

Scirpophaga zelleri, id. *ibid.*, Surinam.

Chilo spatiosellus, *surinamellus*, *irrectellus*, p. 436, *ingloriellus*, p. 437, *id. l. c.* pl. xviii. figs. 41–44, Surinam.

Crambus splendidellus, p. 43, *mandschuricus*, p. 44, *fucatellus*, p. 45, *textellus*, p. 47, *immaturellus*, p. 48, Christoph, *l. c.*, Amur; *C. undatus*, Grote, Canad. Ent. xiii. pp. 35 & 66, California.

Prionophora (?) *bivitta*, Möschler, *l. c.* p. 437, pl. xviii. fig. 45, Surinam.

Eromene expansa, Butler, Tr. E. Soc. 1881, p. 590, Tokei.

Argyria candida, id. *ibid.*, Tokei.

Apurima fulvo-sparsa, id. *l. c.* p. 591, Tokei.

TORTRICIDÆ.

BARRETT, C. G. Notes on British Tortrices. Ent. M. M. xvii. pp. 262–267, xviii. pp. 152–154.

Relates to *Peronea* (*Teras*) *logiana*, Schiff., *rufana*, Schiff., *hastiana*, L.,

variegana, Schiff., *aspersana*, Hübn., *shepherdana*, Steph., *lorquiniana*, Dup. (= *Bactra uliginosana*, Steph.), and *Eupœcilia ambiguella*, Hübn., habits of larva. The form of the fore-wings seems to be a constant character in *Peronea*. One species is described as new.

MEYRICK, E. Descriptions of Australian *Micro-Lepidoptera*. v., vi. *Tortricina*. P. Linn. Soc. N. S. W. vi. pp. 410–536, 629–706.

The author considers the *Tortricina* to be clearly separable into the three following families, the first only being well represented in Australia:—

1. *Tortricidæ*. Lower median vein of hind-wings not pectinated at base; vein 2 of fore-wings rising from before posterior third of cell.

2. *Grapholithidæ*. Lower median vein of hind-wings pectinated at base; vein 2 of fore-wings rising from before posterior third of cell.

3. *Conchylidæ*. Lower median vein of hind-wings not pectinated at base; vein 2 of fore-wings rising from posterior fourth of cell.

A list of Walker's Australian *Tortricina* is appended to the paper. The Australian genera (mostly new) are tabulated as follows:—

I. TORTRICIDÆ.

I. Veins 8 and 9 of fore-wings stalked . . . . . 1. *Mictoneura*, g. n.
II. Veins 8 and 9 of fore-wings separate.
  A. Veins 3 and 4 of hind-wings remote at origin.
    1. Veins 3, 4, and 5 of hind-wings remote and equidistant at origin.
      a. Veins 7 and 8 of fore-wings separate . 2. *Proselena*, g. n.
      b. Veins 7 and 8 of fore-wings stalked . 4. *Isochorista*, g. n.
    2. Vein 5 closely approximated at base to 4.
      a. Fore-wings with 11 separate veins . . 5. *Atelodora*, g. n.
      b. Fore-wings with 12 veins.
        i. Veins 7 and 8 of fore-wings separate. 3. *Palæotoma*, g. n.
        ii. Veins 7 and 8 of fore-wings stalked.
          * Thorax smooth.
            † Hind-wings narrower than fore-wings . . . . . 6. *Aristocosma*, g. n.
            †† Hind-wings broader than fore-wings . . . . . 7. *Adoxophyes*, g. n.
          ** Thorax strongly crested.
            † Veins 6 and 7 of hind-wings stalked 10. *Pyrgotis*, g. n.
            †† Veins 9 and 7 of hind-wings separate.
              ‡ Palpi arched, appressed to face 8. *Thrincophora*, g. n.
              ‡‡ Palpi porrected. . . . . 9. *Acropolitis*, g. n.
  B. Veins 3 and 4 of hind-wings from a point or short-stalked.
    1. Veins 7 and 8 of fore-wings stalked.
      a. Costa of male with basal fold.
        i. Costal fold strong . . . . . 11. *Capua*, Steph.
        ii. Costal fold very small and imperfect.
          * Palpi arched upwards; thorax crested . . . . . 13. *Asthenoptycha*, g. n.
          ** Palpi porrected; thorax smooth . 12. *Acroceuthes*, g. n.

b. Costa of male without fold.
i. Palpi arched upwards ; thorax crested 14. *Anatropia.*
ii. Palpi porrected ; thorax smooth.
* Anal valves of male very large, tufted 15. *Anisogona*, g. n.
** Anal valves of male moderate . . 16. *Dichelia*, Guén.
2. Veins 7 and 8 of fore-wings separate.
a. Hind-wings with a costal tuft of raised scales . . . . . 17. *Cryptoptila*, g. n.
b. Hind-wings without tuft.
i. Costa of male more or less strongly folded . . . . . 18. *Cacœcia*, Hübn.
ii. Costa of male without fold.
* Veins 6 and 7 of hind-wings separate.
† Antennæ of male filiform, finely ciliated . . . . . 19. *Tortrix*, Linn.
†† Antennæ of male strongly dentate, with tufts of cilia. . . . 21. *Arotrophora*, g. n.
** Veins 6 and 7 of hind-wings stalked 20. *Dipterina*, g. n.

II. Grapholithidæ.

1. Fore wings with 12 veins.
A. Veins 7 and 8 of fore-wings stalked.
1. Veins 3 and 4 of hind-wings from a point. 1. *Phricanthes*, g. n.
2. Veins 3 and 4 of hind-wings stalked.
a. Hind-wings with a membranous discal ridge near base . . . . . 11. *Epitymbia*, g. n.
b. Hind-wings smooth.
i. Costa in male with basal fold . . . 14. *Holocola*, g. n.
ii. Costa in male simple . . . . . 13. *Palœobia*, g. n.
B. Veins 7 and 8 of fore-wings separate.
1. Veins 3 and 4 of hind-wings from a point.
a. Vein 7 of hind-wing rising from cell much before upper angle . . . . 5. *Scolioplecta*, g. n.
b. Vein 7 of hind-wing rising from upper angle of cell.
i. Thorax smooth . . . . . 8. *Aphelia*, Steph.
ii. Thorax crested.
* Thorax with three crests ; apex of fore-wings falcate . . . . . 6. *Epalxiphora*, g. n.
** Thorax simply crested ; apex of fore-wings rounded.
† Palpi porrected . . . . . 4. *Penthina*, Tr.
†† Palpi ascending, appressed to face 3. *Antithesia*, Guén.
2. Veins 3 and 4 of hind-wings stalked.
a. Costa in male with basal fold.
i. Antennæ of male notched above basal joint.
* Veins 6 and 7 of hind-wings stalked. 15. *Bathrotoma*, g. n.
** Veins 6 and 7 of hind-wings separate . . . . . 16. *Strepsiceros*, g. n.
ii. Antennæ of male simple . 12. *Crocidosema*, Zell.

b. Costa in male simple.
i. Hind-wings in male with discal groove and ridge near base . . 10. *Carpocapsa*, Tr.
ii. Hind-wings in male smooth.
* Thorax crested. . . . . 2. *Helictophanes*, g. n.
** Thorax smooth. . . . . 9. *Stigmonota*, Haw.
3. Veins 3 and 4 of hind-wings separate at origin . . . . . 7. *Eudemis*, Hübn.
II. Fore-wings with 11 veins . . . . . 17. *Hendecasticha*, g. n.

III. Conchylidæ.

A. Veins 3 and 4 of hind-wings remote at origin 1. *Heliocosma*, g. n.
B. Veins 3 and 4 of hind-wings stalked or from a point.
1. Palpi very long . . . . . 2. *Paramorpha*, g. n.
2. Palpi moderate.
a. Fore-wings in male with a raised membranous ridge near base . . . . 4. *Coscinoptycha*, g. n.
b. Fore-wings in male without membranous ridge . . . . . 3. *Oistophora*, g. n.

The following known species (in addition to those subsequently noticed) are redescribed: — Capua: *Grapholita decolorana*, Walk.; *Conchylis vacuana*, Walk. (= *Graph. mutatana*, Walk.); *Teras semiferana*, Walk. (= *Sciaphila detritana*, = *Tinea admotella*, = *Graph. abnegatana*, Walk.). Dichelia: *Pædisca luciplagana*, Walk., *Sciaphila disputana*, Walk., *Conchylis fuscicepsana*, Walk. (= *Conchylis cepsana* and *mundulana*, Walk.), *C. humerana* and *retractana*, *Teras solana*, Walk. Caccecia: *Tortrix australana*, Lew., *Teras spurcatana*, Walk. (= ? *Teras congestana*, = *Sciaphila transtrigana*, = *S. turbulentana*, Walk., = *Grapholitha ropeana*, Feld.); *Batodes jactatana*, Walk. (= *Sciaphila flavivittana*, = *Pædisca privatana*, Walk., = *Grapholitha voluta*, Feld.), *Teras oblongana*, Walk. (= *T. inaptana*, Walk.), *Teras cuneigera*, Butl., *T. biguttana*, *excessana*, Walk., *obliquana* (= *T. cuneiferana*, Walk.), *flavescens*, Butl., *Idiographis* (?) *amplexana*, Zell. (= *Caccecia vilis*, Butl.), *Teras ænea*, Butl.; *Tortrix polygraphana*, Walk., *miserana*, Walk. (= *Teras canigerana* and *absumptana*, = *Sciaphila debiliana*, Walk.), *Teras responsana*, Walk., *Teras post-vittana*, Walk. (= ? *Teras retractana*, *scitulana*, *dotatana*, *basialbana*, *secretana*, *Pandemis secundana*, *consociana*, *Dichelia reversana*, *fœdana*, *sobriana* and *Pædisca immersana*, Walk.). Tortrix: *Conchylis amænana*, Walk. (= *C. semirectana*, Walk. = *C. galbana*, Feld.), *C. subfurcatana*, Walk., *C. leucaniana*, Walk. (= *Gelechia intactella*, Walk., = *Teras pauculana*, Walk.), *Tortrix standishana*, Newm., *Eudemis botrana*, Schiff. = *Grapholita parvulana*, Walk.), *Aphelia lanceolana*, Hübn. Stigmonota: *Carpocapsa confinitana*, Walk.; *Carpocapsa pomonella*, Linn., and *Crocidosema plebiana*, Zell.

Exartema, Clem., probably = *Eccopsis*, Zell., *Bactra stagnicolana*, Zell., = *Ancylolomia siccella*, Walk., = *Aphelia lanceolana*, Hübn.

WALLENGREN. H. D. J. Skandinaviens *Conchylidider* [*Conchylidæ*]. Ent. Tidskr. ii. pp. 137–144.

Includes descriptions of the Swedish species of *Conchylis* and *Coccyx* (none new).

Analytical and critical notice of Walsingham's "North American *Tortricidæ*"; Riley, Am. Nat. xv. pp. 484–486.

Notes on the *Tortricidæ* described by A. Fitch; Fernald, Papilio, i. pp. 36 & 37.

Sorhagen (B. E. Z. xxv. pp. 17–26) notices the following species, and describes the larvæ of several of them:—*Teras boscana*, Fabr., and var. *parisiana*, Guén., *Tortrix conwayana*, Fabr., *viridana*, Linn., var. *coeruleana*, *angustiorana*, Haw., *Cochylis maculoviana*, Haw., *purpuratana*, Herr.-Schäff., *Grapholitha tripoliana*, Barr., *annulana*, Schleich, *infidana*, Hübn., *messingiana*, Fisch., *incana*, Zell., *nebritana*, *funebrana* and *cosmophorana*, Treitschke, *rosticolana*, Zell., *corollana*, Hübn., *wæberiana*, Wien. Verz., *Carpocapsa amplana*, Hübn., *Coptoloma janthinana*, and *Dichrorrhampha alpinana*, Treitschke.

Millière (Lépidoptérologie) figures and redescribes *Sciaphila cannisana*, M., fig. 6, p. 3, *Penthina* (*Grapholitha*) *silphana*, M., fig. 9, p. 4, pl. i., *Grapholitha opulentana*, M., p. 12, pl. ii. fig. 14 (err. 15), Lép. i., *Cochylis rubricana*, Pey. & M., Lép. v., p. 10, pl. vi. fig. 2.

Ld. Walsingham (Tr. E. Soc. 1881, pp. 221–232) notices the following South African *Tortricidæ*:—*Teras reciprocana*, Walk., variation; *T. capensana* and *meridionana*, Walk., are identical; *Tissa inquinatalis*, *Thapara natalana*, and *Galaria subauratana*, Walk., = *Compsoctena primella*, Wallengr. (figured, pl. x. fig. 5).

Tortrix rostrana, Walk., *Grapholitha interstinctana*, *Tortr. sulfureana*, *flavedana*, and *disco-punctana*, and *Sericoris instrutana*, Clem. Transformations described; Comstock, Rep. Dep. Agric. 1880, pp. 253–258.

Penthina vitivorana, Pack., = *botrana*, W. V.; *Eurypteychia saligneana*, Clem., = *scudderiana*, Clem., = ? *roborana*, W. V.: Riley, Index to Reports, p. 57.

Penthina postremana. Transformations noticed; Gregson, Ent. xiv. pp. 143 & 144.

Ecdytolopha insiticiana, Zell. Transformations described; Comstock, Rep. Dep. Agric. 1880, pp. 260 & 261.

Cenopis gracilana, Wals., = *sulfureana*, Clem.; Grote, Papilio, i. p. 9.

Tortrix, sp. Larvæ from pine and horse-chesnut described: Packard, Ins. Inj. Trees, p. 133, note, pp. 207 & 208, fig. 5. *T. lafauriana*, Rag., noticed as new to Britain; Atmore & Barrett, Ent. M. M. xviii. p. 17, and Ent. xiv. pp. 153 & 154, plate, fig. 22. *T. cinderella*, Riley, = *T. oxycoccana*, Pack., and *T. malivorana*, Le Baron, = *vacciniivorana*, Pack., is a dimorphic orange form (egg also noticed); Riley, Papilio, i. pp. 109 & 110. *T. fumiferana*, Clem.: contributions to life-history, with special notice of oviposition; Fernald, Am. Nat. xv. pp. 63–66. *T. politana*, Haw. ?: transformations described; *id.* Rep. Dep. Agric. 1880, pp. 264 & 265. *T.* (*Argyrotoxa*) *trifaceulana*, Zell., = *Argyrolepia quercifoliana*, Fitch; *id.* Papilio, i. p. 37.

Lozotænia retana, Wals., = *houstonana*, Grote; Grote, Papilio, i. p. 9.

Holocola, p. 669. To include *Grapholita perspectana*, Walk. (redescribed, p. 671), *triangulana*, Melbourne, p. 668 (larva described, p. 706), *thalassinana*, New South Wales, p. 672, *quietana*, Brisbane, p. 673, and *biscissana*, New South Wales, p. 674, spp. nn.

Bathrotoma, p. 675. To include *B. constrictana*, *ruficomana*, and *B.* (?) *scopulosana*, spp. nn., *l. c.* pp. 675–677, Sydney and Paramatta.

Strepsiceros, p. 678. To include *Sciaphila ejectana*, Walk. (redescribed, p. 681, = ? *S. absconditana*, *S. servilisana*, *S. saxana*, and *Conchylis ligniferana*), and *S. limnephilana*, Hunter River, p. 680, *macropetana*, Queensland, New South Wales, p. 683, *seditiosana*, New South Wales, p. 684, *pericyphana*, p. 685, *fluidana*, p. 686, *sollicitana*, Sydney, &c., p. 687, *zopherana*, Sydney, New Zealand, p. 688, *plinthinana*, Paramatta, p. 689, *obeliscana*, p. 690, *sicariana*, Sydney, &c., p. 691, spp. nn.

Hendecasticha, p. 692; type, *H. athaliana*, sp. n., *l. c.*, New Zealand.

Heliocosma, p. 693; types, *H. rhodopnoana*, sp. n., *l. c.* p. 694, Melbourne, and *Conchylis incongruana*, Walk. (redescribed, p. 695; = *Eromene apertella*, Walk.).

Paramorpha, p. 696; types, *P. aquilana*, sp. n., *l. c.* p. 697, and *Gelechia adreptella*, Walk. (redescribed, *l. c.* p. 698).

Oistophora, p. 699; type, *O. pterocosmana*, sp. n., *l. c.*, Sydney, Melbourne.

Coscinoptycha, p. 700; type, *C. improbana*, sp. n., *l. c.* p. 701, Sydney.

Chiloides, Butler, Ann. N. H. (5) vii. p. 392. Allied to *Pædisca*; hind-wings with second and third median branches emitted separately; head clothed with long, coarse hair; palpi longer, more depressed, and second joint clothed below with a long projecting fringe of hair; type, *C. stramina*, sp. n., *l. c.* p. 393.

Proteopteryx, Walsingham, Ill. Lep. Het. iv. p. 68. [Omitted from Zool. Rec. xvii.] Allied to *Grapholitha*; type, *P. emarginana*, sp. n., *l. c.* pl. lxxvi. figs. 2–6, California; add *P. blackburni*, sp. n., Butler, Ann. N. H (5) vii. p. 393, Maui.

Antithesia phyllanthana, Sydney, and *sphærocosmana*, Richmond River, Meyrick, P. Linn. Soc. N. S. W. vi. pp. 641 & 642.

Penthina transversana and *semicremana*, Christoph, Bull. Mosc. lvi. 1, pp. 75 & 77, Amur; *P. doxasticana*, Paramatta, Brisbane, and *helicana*, New South Wales, Queensland, Meyrick, *l. c.* pp. 644 & 645.

Dichelia isoscelana, Melbourne, &c., p. 470, *clarana*, Sydney, Paramatta, p. 475, *montivagana*, Sydney, Melbourne, &c., p. 477, *atristrigana*, Paramatta, p. 478, *hyperetana*, Tasmania, Gippsland, Victoria, *argillosana*, Melbourne, p. 479, *panoplana*, New South Wales, p. 480, *id. l. c.*

Tortrix deçosseana, Rössler, JB. nass. Ver. xxxiii. & xxxiv. p. 234, Biebrich; *T. catoniana*, Ragonot, Ent. M. M. xvii. p. 231, Portugal; *T. ingentana*, p. 64, *circumclusana*, p. 66, *inumbratana*, p. 67, *liratana*, p. 68, *indignana*, p. 69, *askoldana*, p. 70, Christoph, *l. c.*, Amur; *T. ceramicana*, Brisbane, p. 512, *aulacana*, New South Wales, p. 513, *peloxythana*, p. 514, *trygodana*, New South Wales (*cf.* also p. 535), *philopoana*, New Zealand, p. 515, *glaphyrana*, New South Wales, p. 516, *centurionana*, Sydney, Paramatta, p. 518, *concordana*, Melbourne, &c., p. 519, *indigna*.

ney, *aerodana*, p. 520, *siriana*, New Zealand, p. 521, *concolorana*, Sydney, p. 522, Meyrick, *l. c.*

Lozotænia dorsiplagana, p. 223, *diluticiliana* and *elegans*, p. 224, Walsingham, Tr. E. Soc. 1881, pl. x. figs. 2–4, South Africa.

Aspis circumfluxana [sic] and *argutana*, Christoph, *l. c.* pp. 78 & 79, Amur.

Cacœcia adustana, Walsingham, *l. c.* p. 222, pl. x. fig. 1, S. Africa; *C. charactana*, New Zealand, p. 492, *pyrosemana*, Paramatta, p. 496, *lythrodana*, p. 497, *jugicolana*, New South Wales, p. 499, *mnemosynana*, New South Wales, p. 504, *liquidana*, p. 505, *tessulatana*, Melbourne, *æsmotana*, Blue Mountains, p. 506, Meyrick, *l. c.*

Capua aoristana, New Zealand, p. 446, *hemicosmana*, Gippsland, Victoria, p. 449, *melancrocana*, Sydney, Paramatta, p. 450, *montanana*, New South Wales, p. 451, *chimerinana*, Sydney, Paramatta, p. 452, *sordidatana*, Melbourne, p. 454, *obfuscatana*, New South Wales, p. 455, *scutiferana*, New South Wales, Queensland, p. 456, *plathanana*, p. 457, *parmiferana*, Sydney, p. 531, *id. l. c.*

Steganoptycha granitalis, Butler, Tr. E. Soc. 1881, p. 591, Tokei; *S. fœtorivorans*, id. Ann. N. H. (5) vii. p. 394, Oahu; *S. infausta*, Walsingham, *l. c.* p. 232, pl. x. fig. 8, South Africa.

Phoxopteris natalana, id. *l. c.* p. 233, pl. x. fig. 9, South Africa; *P. rufipennis*, Butler, *l. c.* p. 395, Oahu.

Chimatophila ignavana, Christoph, *l. c.* p. 73, Amur.

Peronea perplexana, Barrett, Ent. M. M. xvii. p. 265, England.

Teras delicatana, p. 60, *hispidana*, p. 61, *albiscapulana*, p. 63, Christoph, *l. c.*, Amur.

Stigmonota zapyrana, New South Wales, Queensland, *parvisignana*, Sydney, *iridescens*, New South Wales, *floricolana*, Paramatta, &c., Meyrick, *l. c.* pp. 653–656.

Sciaphila vetulana, Christoph, *l. c.* p. 72, Amur.

Retinia frustrana (Scudd., MS.), Nantucket, pl. v. fig. 2, and *rigidana*, New York, Fernald, Rep. Dep. Agric. 1879, pp. 236 & 237.

Grapholitha bracteatana, id. *l. c.* 1880, p. 265, California.

Eccopsis fluctuatana, Walsingham, *l. c.* p. 230, pl. x. fig. 7, South Africa.

Cochylis punctiferana, Ragonot, *l. c.* p. 232, note, Portugal; *C. excellentana*, Christoph, *l. c.* p. 74, Amur; *C. africana*, Walsingham, *l. c.* p. 227, pl. x. fig. 6, South Africa.

Tineidæ.

Riley, C. V. Further Notes on the Pollination of *Yucca*, and on *Pronuba* and *Prodoxus*. P. Am. Ass. 1880, pp. 617–639, woodcuts.

Contains an account of the habits, transformations, &c., of species of these genera, with descriptions of several new ones.

Stainton, H. T. Notes on the Entomology of Portugal. v. *Lepidoptera* (continued), *Micro-Lepidoptera* (*Tineina*) collected by A. E. Eaton in 1880. Ent. M. M. xvii. pp. 246–249.

No new species described.

WALLENGREN, H. D. J. Skandinaviens med ögonlock försedda Tineïder (*Tineæ Operculatæ*). Ent. Tidskr. ii. pp. 124–136.

The author separates the *Tineæ* with eye-caps into the following groups and genera:—*Nepticulina* (*Nepticula*, *Opostega*), *Bucculatricina* (*Bucculatrix*), *Cemiostomina* (*Cemiostoma*), *Phyllocnistina* (*Phyllocnistis*), and *Lyonetina* (*Lyonetia*), and describes the Swedish species (none new).

The following species are mentioned among others; and the larvæ are generally specially noticed or described (Sorhagen, B. E. Z. xxv. pp. 26–34): *Simaethis pariana*, Clerck, *Tinea granella*, Linn., *fuscipunctella*, Haw., *Tineola biselliella*, Humm., *Hyponomeuta rorella*, Hübn., *malinella*, Zell., *Argyresthia dilectella*, Zell., *Idophasia messingiella*, Fisch., *Cerostoma xylostellum*, Linn., *Telia dodecella*, Linn., *Ergatis brizella*, Treitschke, *Hypsilophus marginellus*, Fabr., *Œcophora lambdella*, Don., *schefferella*, Linn., *Elachista stabilella*, Frey, *Œnophila v-flavum*, Haw., and *Micropteryx semipurpurella*, Steph.

WALSINGHAM [LORD]. On some North American *Tineidæ*. By Thomas, Lord Walsingham. P. Z. S. 1881, pp. 301–325, pls. xxxv. & xxxvi. (*cf.* also Chambers, Canad. Ent. xiii. pp. 191–194).

Millière (Lépidoptérologie) figures and generally redescribes *Gelechia aristotelis*, M., figs. 1 & 2, p. 1, *Hypsilophus millierellus*, Staint., figs. 4 & 5, p. 2, *Butalis cistorum*, M., figs. 7 & 8, p. 3, *Mesophleps corsicellus*, Herr.-Schäff., figs. 10 & 11, *Ochsenheimeria hederarum*, M., figs. 12 & 13, p. 5, pl. i., *Ergatis staticella*, M., p. 12, pl. ii. figs. 12 & 13, Lép. i.; *Coleophora* (?) *argentilimbella*, M., pl. vi. fig. 1, p. 9, *Butalis acanthella*, Godt., pl. vii. figs. 7 & 8, p. 23, Lép. v.; *Parasia lugdunosella*, M., and *Adela ascoldella*, M., pp. 1 & 2, figs. 1 & 2, *Carcina quercana*, L., var. *purpurana*, M., fig. 10, p. 8, pl. viii. Lép. vi.

Walsingham (Tr. E. Soc. 1881, pp. 234–272) notices the following known South African *Tineidæ*:—*Choreutis vibralis* and *australis*, Zell., = *bjerkandrella*, Thunb.; *Tinea horridella*, Walk., is a *Euplocamus*; *T. gigantella*, Staint., = *T. lucidella*, Walk., = *vastella*, Zell.: habits of larva discussed; it probably does not feed on living horn (*cf.* also P. E Soc. 1881, p. viii.); *T. obligatella* and *ignotella*, Walk., = *fuscipunctella*, Haw.; *T.* (?) *erinacea*, Walk., figured (pl. xi. fig. 12), and structure described; *Blabophanes pellucida*, Wallengr. ? = *Tinea rejectella*, Walk.; *Adela albicornis*, Walk., = *natalensis*, Staint.; *Micropteryx* (?) *electella*, Walk., may be an *Adela*; *Hyponomeuta perficitella*, Walk., noticed and figured (pl. xi. fig. 17); *Psecadia livida*, Zell., = *circumdatella*, Walk.; *Cryptolechia straminella*, Zell. (*nec* Walk.), discussed and figured (pl. xi. fig. 21), *Drosica abjectella*, Walk., figured (pl. xii. fig. 32), and structure noticed; *Œcophora* (?) *sabiella*, Feld. & Rog., described; *Exodomorpha*, Walk., = *Staintonia*, Staud., = *Eretmocera*, Zell.; *Ex. inclusella* and *derogatella*, Walk., = *Er. fuscipennis*, Zell., and *Ex. divisella*, Walk., = *Er. latissima*, Zell.

Coleophora olivaceella, *Tinea argentimaculella* and *Elachista humilis* (? = *perplexella*, ♂), larvæ, &c., noticed; Threlfall, Ent. M. M. xviii. p. 16.

Improved method of preparing and mounting wings of *Micro-Lepidoptera* ; Fernald, P. Am. Ass. 1880, pp. 380 & 381.

Blabophanes longella, Walk., and *rusticella*, Hübn., noticed from Honolulu ; Butler, Ann. N. H. (5) vii. pp. 395 & 396.

Psychoides verhuellella. Cases noticed ; Eedle, Ent. xiv. p. 116.

Pronuba, Riley, is preoccupied in *Coleoptera*, and must take the name of *Tegeticula*, Zell. ; Horn & Riley, P. Am. Ass. 1880, p. 639, note.

Hyponomeuta malinella, Zell. (?) : ravages in Silesia ; Kiefert, JB. schles. Ges. lviii. pp. 237 & 238. *H. 5-punctella* and *paradoxica*, Chamb., = *Prodoxus decipiens*, Riley ; Riley, P. Am. Ass. 1880, p. 639.

Plutella cruciferarum, Zell. (? = *Tinea spilotella*, cf. Am. Nat. v. p. 194), *P. porrectella*, L., *Cerostoma instabilella*, Mann., and *radiatella*, Don., recorded from California ; the occurrence of *C. xylostella* in North America requires confirmation : Walsingham, P. Z. S. 1881, pp. 304–307.

Depressaria. Revision of American species : *D. clausella*, Walk., = *cinereocostella*, Clem. ; *D. fernaldella*, Chamb., = *Machimia tentoriferella*, Clem., and belongs to *Cryptolechia*, *D. georgiella*, Walk., belongs to *Trichotaphe*, Clem. The following European species are recorded as American, chiefly from Oregon : *D. ciliella*, Staint., *yeatiana*, Fabr., *nervosa*, Haw., *parilella*, Treitschke, and *emeritella*, Staint. ; *id. l. c.* pp. 311–319.

Gelechia brizella : transformations described ; Moncreaff, Ent. M. M. xviii. p. 56. *G. cerealella* bred from maize ; Bond, Ent. xiv. p. 186. *G. crescentifasciella*, Chambers, noticed by him ; J. Cincinn. Soc. iii. p. 290. *G. liturella*, Walk., = *Menesta tortricieformella*, Chamb. ; Walsingham, *l. c.* p. 319. *G. pinifoliella*, Chamb., noticed ; Packard, Ins. Inj. Trees, pp. 208–211, fig. 86. *G. pseudacaciella* : transformations noticed ; Comstock & Chambers, Rep. Dep. Agric. 1879, pp. 252 & 253. *G. scotinella*, Herr.-Schäff. : recorded as new to Britain ; Fletcher, Ent. M. M. xviii. p. 143.

Hamadryas bassettella, Clem., noticed ; Comstock, Rep. Dep. Agric. 1879, p. 245.

Parasia sedata, Butler, noticed by him from Hawaii ; Ann. N. H. (5) vii. p. 399.

Safra, Walk. (*Gelechiidæ*), nec *Safra*, Walk. (*Crambidæ*), renamed *Chrestotes* ; id. *l. c.* p. 401.

Anarsia lineatella, Zell. : habits of larva noticed ; Comstock, *l. c.* p. 255.

Harpella staintoniella, Zell. ?, aberr. or sp. n. ?, from Portugal, noticed ; Stainton, Ent. M. M. xvii. pp. 247 & 248.

Butalis palustris, Zell., ♀ noticed ; Stange, S. E. Z. xlii. p. 117.

Acrolepia assectella, Zell. (= *Lita alliella*, Boisd.), noticed ; Girard, Bull. Soc. Ent. Fr. (6) i. pp. lxi. & lxii.

Ætole, Chamb., probably = *Heliodines*, Staint. ; Walsingham, *l. c.* pp. 323 & 324.

Antispila rivillii, Stainton, figured by Waterhouse ; Aid, i. pl. lvii.

Aspidisca saliciella, Chamb. The mode of climbing of its larva compared with that of the mussel (*Mytilus edulis*) ; Lockwood, Am. Nat. xv. p. 737. *A. splendoriferella*, Clem., redescribed and figured, with full life-history ; Comstock, *l. c.* pp. 210–213, pl. ii. fig. 2.

Argyresthia, sp. destructive to the black spruce (*Abies nigra*); Hagen, Rep. E. Soc. Ont. 1880, p. 35.

Gracilaria stigmatella, Fabr. Transformations described; Chambers, Canad. Ent. xiii. pp. 25–28.

Coleophora: note on the case of an undetermined Russian species; Ragonot, Bull. Soc. Ent. Fr. (6) i. pp. xiv. & xv. *C. apicella*: irregularity of its appearance connected with the growth of its food-plant; Stainton, *l. c.* xviii. p. 141. *C. cæspitiella* (?), noticed; Sandahl, Ent. Tidskr. ii. pp. 5 & 56. *C. medio-strigata*, Frey (?), noticed; Wocke, JB. schles. Ges. lviii. p. 204. *C. olivaceella*, Staint., noticed; Threlfall, Ent. xiv. p. 136.

Elachista humiliella, Herr.-Schäff., perhaps = *perplexella*, Staint., ♂; *id. l. c.* p. 137.

Tischeria and *Lithocolletis*. Larvæ extracted from their mines by small birds (?); Fletcher & Stainton, Ent. M. M. xviii. p. 143.

Lithocolletis alpina, Frey, noticed; Wocke, JB. schles. Ges. lviii. pp. 204 & 205. *L. pastorella*, Zell., var. (?) noticed; Rössler, JB. nass. Ver. xxxiii. & xxxiv. p. 331. *L. hamadryadella* and *fitchella*, Clem.: life-histories; the former is figured: Comstock, *l. c.* 1879, pp. 226–233, pl. iv. fig. 4.

Cemiostoma wailesella, Staint., bred from galls of *Cynips kollari*; Fletcher, Ent. xiv. p. 21.

Nepticula sericopeza noticed; Warren, Ent. M. M. xviii. pp. 142 & 143.

Prodoxidæ, fam. nov.; Riley, P. Am. Ass. 1880, p. 637. Allied to the *Tineidæ*; head rough, labial palpi of moderate size, curved upwards; maxillary palpi long, elbowed, 5-jointed, the basal joint either protuberant or modified into a prehensile tentacle; anal joint of ♀ compressed from the sides, bare and horny, ovipositor extensile, terminal joint in one piece, and adapted to piercing and sawing; egg very soft, elongate, and flexible; larva either without prolegs or entirely apodous; pupa with a strong thorn on the head. To include the genera *Pronuba* and *Prodoxus*, Riley.

New genera and species:—

Ischnopsis, Walsingham, Tr. E. Soc. 1881, p. 236. Allied to *Tiquadra*; type, *I. angustella*, sp. n., *l. c.* p. 237, pl. x. fig. 11, South Africa.

Phryganeopsis, id. P. Z. S. 1881, p. 301. Allied to *Incurvaria* (?); type, *P. brunnea*, sp. n., *l. c.* p. 302, pl. xxxv. figs. 1 & 1*a*–1*c*, California.

Coleotechnites, Chambers, Rep. Dep. Agric. 1879, p. 206. Affinities not stated; type, *C. citriella*, sp. n., *l. c.*, Florida.

Arœolepia, Walsingham, *l. c.* p. 303. Allied to *Plutella* and *Plutellopteva*; type, *A. subfasciella*, sp. n., *l. c.* pl. xxxv. figs. 3 & 3*a*, Oregon.

Siganorosis, Wallengren, Ent. Tidskr. ii. p. 94. Allied to *Depressaria*, to include *D. olerella* and *chærophylli*, Zell., *weirella*, Staint., *albipunctella*, *depressella*, *pimpinella*, and *badiella*, Hübn., *nervosa*, Haw., and *heracliana*, Deg.

Exoteleia, id. *l. c.* p. 94. Allied to *Gelechia*; type, *Tinea dodecella*, Linn.

Syncunetis, id. *l. c.* p. 95. Allied to *Gelechia*; type, *G. inopella*, Zell.

Teratopsis, Walsingham, Tr. E. Soc. 1881, p. 259. Allied to *Crypto-*

lechia; apical joint of palpi somewhat coarsely scaled; costa suddenly arched, and almost angulated: type, *T. tunicella*, sp. n., *l. c.* p. 260, pl. xii. fig. 28, South Africa.

Eucleodora, id. *l. c.* p. 263. Placed next to *Drosica*; type, *E. chalybeella*, sp. n., *l. c.* p. 264, pl. xii. fig. 33, South Africa.

Diastoma, Möschler, Verh. z.-b. Wien, xxxi. p. 439. Allied to *Antæotricha*; type, *D. nubilella*, sp. n., *l. c.* p. 440, pl. xviii. fig. 48.

Hyposmochoma, Butler, Ann. N. H. (5) vii. p. 399. Allied to *Holcocera*; type, *H. blackburni*, sp. n., *l. c.* p. 400, Maui.

Euperissus, id. *l. c.* p. 401. Allied to *Taruda*; type, *E. cristatus*, sp. n., *l. c.* p. 402, fig. 1 (hind-wing), Honolulu.

Staberhinus, id. *l. c.* p. 402. Allied to *Urbara*; type, *S. testaceus*, sp. n., *l. c.* fig. 2 (palpus), Honolulu.

Psecadioides, id. Tr. E. Soc. 1881, p. 593. Allied to *Psecadia* and *Hypsilophus*; type, *P. aspersus*, sp. n., *l. c.*, Tokei.

Fernaldia, Grote, Bull. U. S. Geol. Surv. vi. p. 274. Differs from *Psecadia* in neuration, and in the long narrow curved third joint of the palpi; type, *F. anatomella*, sp. n., *l. c.*, New York.

Euceratia, Walsingham, P. Z. S. 1881, p. 310. Allied to *Topeutis*; types, *E. castella*, figs. 13 & 13*a-d*, and *securella*, fig. 14, spp. nn., *l. c.* pp. 310 & 311, pl. xxxv.

Acrocercops, Wallengren, *l. c.* p. 95. Allied to *Gracilaria*; type, *Tinea brongniardella*, Fabr.

Casas, id. *l. c.* Allied to *Coleophora*; types, *Tinea leucapennella*, Hübn., and *ballotella*, Fisch.

Casigneta, id. *l. c.* p. 96. Allied to *Coleophora*; to include *Tinea sternipennella* and *laripennella*, Zett., *troglodytella* and *muripennella*, Dup., *therinella*, Tengstr., *linearielle*, *millefolii*, *directella*, *flavaginella*, *gnaphalii*, *argentula*, and *granulatella*, Zell., and *artemisiicolella*, Bruand.

Idioglossa, Walsingham, Tr. E. Soc. 1881, p. 273. Differs from *Stathmopoda* and *Cosmopteryx* by the tufted base of the tongue, and the brightly ornamented hind-wings; type, *I. bigemma*, sp. n., *l. c.* p. 273, pl. xiii. fig. 42, South Africa.

Cnemidolophus, id. *l. c.* p. 275. Probably allied to *Laverna*; type, *C. lavernellus*, sp. n., *l. c.* p. 275, pl. xiii. fig. 43, South Africa.

Hecista, Wallengren, *l. c.* p. 96. Allied to *Elachista*; types, *Tinea subalbidella*, Schleich, *argentella*, Clerck, and *pollinariella*, Zell.

Choreutes silphiella, Grote, Papilio, i. p. 40, Illinois.

Chimabacche nolckenella, Millière, Lépidoptérologie, vii. p. 5, pl. x. fig. 7, Valley of Cannet.

Tiquadra goochi, Walsingham, Tr. E. Soc. 1881, p. 234, pl. x. fig. 10, South Africa.

Tinea oberthurella and *liguriella*, Millière, *l. c.* v. pp. 13 & 16, pl. vi. figs. 5, 6, & 11, Cannes; *T. falstriella*, Haas, Nat. Tidsk. (3) xiii. p. 198, Denmark.

Blabophanes obumbrata, Butler, Ann. N. H. (5) vii. p. 396, Honolulu.

Hapsifera eburnea, id. P. Z. S. 1881, p. 623, Kurrachee.

Guenea pandorella, Millière, *l. c.* vii. p. 16, pl. x. fig. 20, Alpes Maritimes.

Pronuba maculata, Riley, P. Am. Ass. 1880, p. 633, fig. 10, California.

Prodoxus intermedius, Texas, Colorado, *marginatus*, p. 635, *cinereus*, and *æneseens*, California, p. 636, *id. l. c.* figs. 11–14, details.

Nemophora elongatella, *alternipunctella*, and *trigoniferella*, Walsingham, Tr. E. Soc. 1881, pp. 244–246, pl. xi. figs. 13–15, South Africa.

Nemotois aurifera (= *fasciella*, Motsch., *nec* Fabr.), Yokohama, and *paradisea*, Tokei, Butler, Tr. E. Soc. 1881, p. 592.

Calantica polita, Walsingham, P. Z. S. 1881, p. 302, pl. xxxv. fig. 2, North America.

Hyponomeuta subplumbellus[*-la*], id. Tr. E. Soc. 1881, p. 248, pl. xi. fig. 16, South Africa.

Psecadia semiopaca, Grote, Bull. U. S. Geol. Surv. vi. p. 275, Colorado.

Eustixis flavivittella, Walsingham, *l. c.* p. 250, South Africa.

Plutella interrupta, Oregon, p. 304, *albidorsella*, California, *vanella*, p. 305, *id.* P. Z. S. 1881, pl. xxxv. figs. 4–6.

Cerostoma falciferella, *cervella*, p. 307, *sublucella*, *dentiferella*, p. 308, *canariella*, *frustella*, California, p. 309, *id. l. c.* pl. xxxv. figs. 7–12, California, Oregon.

Depressaria eryngiella, Millière, Lépidoptérologie, vi. p. 7, pl. viii. figs. 8 & 9. *D. peucedanella* and var. *esterella*, id. *l. c.* vii. p. 13, pl. x. figs. 14 & 15, Esterel; *D. sabulella*, *argillacea*, p. 313, *arnicella*, *klamathiana*, p. 314, *posticella*, p. 315, *nubiferella*, p. 316, *psoraliella*, p. 317, *umbraticostella*, p. 318, Walsingham, *l. c.* pl. xxxvi. figs. 1–8, California and Oregon; *D. trimenella*, id. Tr. E. Soc. 1881, p. 251, pl. xi. fig. 19, South Africa; *D. usitata*, p. 396, *gigas*, *indecora*, p. 397, *lactea*, p. 398, and *argentea*, p. 399, Butler, Ann. N. H. (5) vii., Hawaiian Islands.

Psoricoptera (?) *hirsutella*, Walsingham, *l. c.* p. 261, pl. xii. fig. 29, South Africa.

Enicostoma coarctata, id. *l. c.* p. 252, pl. xi. fig. 20, South Africa.

Acrolophus pallidus, Möschler, Verh. z.-b. Wien, xxxi. p. 438, pl. xviii. fig. 46, Surinam.

Gelechia rumicivorella, Millière, *l. c.* vii. p. 11, pl. x. fig. 13, Alpes Maritimes; *G. zulu* and *flavipalpella*, Walsingham, *l. c.* pp. 261 & 262, pl. xii. figs. 30 & 31, South Africa; *G. chambersella*, *formosella*, *cinerella*, and *beneficentella*, Murtfeldt, Canad. Ent. xiii. pp. 242–245, Missouri; *G. goodellella* and *epigæella*, Chambers, J. Cincinn. Soc. iii. p. 289, Massachusetts; *G. robiniæ-foliella*, United States, and *pinifoliella*, pl. v. fig. 6, New York, *id.* Rep. Dep. Agric. 1879, pp. 225 & 240.

Cryptolechia obliquella, p. 254, *dilutella*, p. 255, *atro-punctella*, *roseo-flavida*, p. 256, and *roseo-costella*, p. 257, Walsingham, *l. c.* pl. xi. figs. 22–24, pl. xii. figs. 25 & 26, South Africa.

Antaotricha basimacula, Möschler, Verh. z.-b. Wien, xxxi. p. 439, pl. xviii. fig. 47, Surinam; *A.* (?) *ovata*, Walsingham, *l. c.* p. 258, South Africa.

Chelaria albo-grisea, id. *l. c.* p. 264, pl. xii. fig. 34, South Africa.

Chrestotes (vide suprà) *dryas*, Butler, *l. c.* p. 401, Honolulu.

Hypsilophus latipalpis, *straminis*, and *siccifolii*, Walsingham, *l. c.* pp. 265–267, pl. xii. figs. 35–37, South Africa.

Nothris meridionella, id. *l. c.* p. 268, pl. xiii. fig. 38, South Africa; *N. citrifoliella*, Chambers, *l. c.* p. 205, Florida.

Topeutis drucella, Walsingham, *l. c.* p. 268, pl. xiii. fig. 39, South Africa.

Hypercallia subreticulata, id. *l. c.* p. 269, pl. xiii. fig. 40, South Africa.

Lecithocera maculata, id. *l. c.* p. 276, pl. xi. fig. 18, South Africa.

Œcophora schmidi, Saalmüller, S. E. Z. xlii. p. 218, Chaumont; *Œ. seeboldiella*, Kreithner, SB. z.-b. Wien, xxxi. p. 20, Bilbao; *Œ. obliquestrigella*, Walsingham, *l. c.* p. 258, pl. xii. fig. 27, South Africa.

Blastobasis citreicolella and *coccivorella*, Chambers, *l. c.* pp. 207 & 245, Florida.

Eretmocera ignipicta, Butler, Tr. E. Soc. 1881, p. 593, Tokei.

Menesta rubescens, Walsingham, *l. c.* p. 319, pl. xxxvi. fig. 9, Texas.

Glyphipteryx regalis, p. 319, *californiæ*, p. 320, *bifasciata*, p. 321, *unifasciata*, *quinqueferella*, p. 322, *id. l. c.* pl. xxxvi. figs. 10–14, California; *G. circumscriptella*, Chambers, J. Cincinn. Soc. iii. p. 291, Massachusetts.

Douglasia (?) *obscuro-fasciella*, id. *l. c.* p. 291, and figs. of neuration, Massachusetts.

Argyresthia walsinghamella, Millière, *l. c.* vii. p. 21, Cannes; *A. zebrina* and *A.* (?) *aurisquamosa*, Butler, *l. c.* p. 403, Honolulu.

Gracilaria loriolella, Frey, MT. schw. ent. Ges. vi. p. 146, Canton de Vaud; *G. inana*, Honolulu, *auripennis*, Maui, Butler, *l. c.* p. 404; *G. aceriella*, Chambers, *l. c.* p. 295, Massachusetts.

Coleophora mariniella, Hodgkinson, Ent. xiv. p. 68, Fleetwood; *C. ononidella*, Millière, *l. c.* v. p. 3, pl. v. figs. 4 & 5, Cannes; *buettneri*, Rössler, JB. nass. Ver. xxxiii. & xxxiv. p. 307 (*Coleophora*, sp. Büttner, S. E. Z. 1880, p. 455), Wiesbaden; *C. trigeminella*, p. 462, *filaginella*, p. 465, and *simillimella*, p. 467, Fuchs, S. E. Z. xlii., Rheingau.

Laverna jurassicella, Frey, *l. c.* p. 146, Cressier; *L. abjecta*, p. 404, *corvina*, *domicolens*, p. 405, *parda*, p. 406, Butler, *l. c.*, Hawaiian Islands; *L. œnotheræ-vorella*, *L.* (?) *quinquicristatella*, p. 293, and *L. minimella*, p. 294, Chambers, *l. c.*, Massachusetts; *L. sabulella*, id. Rep. Dep. Agric. 1879, p. 210, pl. ii. fig. 1, Florida.

Chrysoclista tigrina and *C.* (?) *haleakalæ*, Butler, *l. c.* pp. 406 & 407, Maui.

Heliodines extraneella, Walsingham, *l. c.* p. 323, pl. xxxvi. fig. 15, California.

Elachista monosemiella, Rössler, JB. naas. Ver. xxxiii. & xxxiv. p. 325, Wiesbaden, Livonia; *E. albapalpella*, Chambers, J. Cincinn. Soc. iii. p. 294, Massachusetts.

Lithocolletis zulella, Walsingham, Tr. E. Soc. 1881, p. 277, pl. xiii. fig. 44, South Africa; *L. gregariella*, Murtfeldt, Canad. Ent. xiii. p. 245, Missouri.

Opostega nonstrigella [!], Chambers, J. Cincinn. Soc. iii. p. 296, Massachusetts (?).

Nepticula gilvella and *ligustrella*, Rössler, JB. nass. Ver. xxxiii. & xxxiv. p. 338, Wiesbaden; *N. stelviana*, Wocke, JB. schles. Ges. lviii. p. 205, Stilfser Joch (not described); *N. ptelialella*, Chambers, Psyche, iii. p. 276, Kentucky. (Larva previously described, *l. c.* pp. 137–147.)

Pterophoridæ.

Jordan, R. C. R. A Comparison of the *Pterophori* of Europe and North America, suggested by Lord Walsingham's "*Pterophoridæ* of California and Oregon." Ent. M. M. xviii. pp. 73–76, & 117–122.

A critical analysis, with list of European and N. American species.

South, R. Contributions to the History of the British *Pterophori*. Ent. xiv. pp. 49–53, & 73–77, figs. 1 & 2.

Includes lists of the British Plume-Moths according to Doubleday and Wallengren, and remarks on localities, &c. Wings of *P. lithodactylus*, Tr., and *trigonodactylus*, Haw., are figured.

Oxyptilus direptalis, Walk., = *Pterophorus acanthodactylus*, Zell., = *Amblyptilus cosmodactylus*, Hübn., and *P. rutilalis*, Walk., = *O. wahlbergi*, Zell., noticed; Walsingham, Tr. E. Soc. 1881, pp. 277–284.

Millière (Lépidoptérologie) figures, and generally redescribes his *Agdistis statices*, figs. 4–8, p. 8, *satanas*, fig. 9, p. 10, *lerinsis*, figs. 10 & 11, pl. ii. Lép. i., and *Mimæseoptilus fauna*, p. 1, pl. v. figs. 1–3, Lép. v.

Pterophorus galactodactylus and *tephradactylus*: larvæ described; Porritt, Ent. xiv. pp. 118 & 260. *P. dichrodactylus* and *bertrami* contrasted; Sang, Ent. M. M. xviii. pp. 143 & 144. *P. nemoralis*, Zell. (?), noticed and figured; Carrington, Ent. xiv. p. 304, plate, fig. 19.

Cnemidophorus, Wallengren (preocc.), renamed by him *Eucnemidophorus*; Ent. Tidskr. ii. p. 96.

Platyptilia repletalis, Walk., and *cosmodactyla*, Hübn., var. noticed from the Hawaiian Islands; Butler, Ann. N. H. (5) vii. p. 407.

Oxyptilus parvidactylus, var. noticed; Rössler, JB. nass. Ver. xxxiii. & xxxiv. p. 222.

Pselnophorus, g. n., Wallengren, Ent. Tidskr. ii. p. 96. Allied to *Pterophorus*; type, *P. brachydactylus*, Treitschke.

New species: —

Platyptilus albicans, Nevada, and *edwardsi*, Massachusetts, Fish, Canad. Ent. xiii. pp. 71 & 72.

Amblyptilus africæ, Walsingham, *l. c.* p. 278, pl. xiii. fig. 45, S. Africa.

Oxyptilus walkeri, id. *l. c.* p. 279, South Africa.

Œdematophorus gratiosus, California, *cineraceus*, Washington Territory, *baroni*, p. 73, *lugubris*, California, p. 140, Fish, *l. c.*

Lioptilus bonæspei, Walsingham, *l. c.* p. 281, pl. xiii. fig. 46, South Africa; *L. grandis*, California, and *kellicotti*, Buffalo, Fish, *l. c.* p. 141.

Aciptilia hawaiiensis, Butler, Ann. N. H. (5) vii. p. 408, Maui.

Aciptilus vilis, Butler, Tr. E. Soc. 1881, p. 594, Tokei; *A. adumbratus* and *tripunctatus*, Walsingham, *l. c.* pp. 282 & 283, pl. xiii. figs. 47 & 48, South Africa; *A. belfragii*, Fish, *l. c.* p. 142, Texas.

Trichoptilus ochrodactylus, id. *ibid.*, Texas.

Alucitidæ.

Alucita fortis, pl. xiii. fig. 49, and *ferruginea*, Walsingham, *l. c.* pp. 284 & 285, South Africa, spp. nn.

DIPTERA.

BY

W. F. KIRBY, M.E.S., &c.

THE GENERAL SUBJECT.

BIGOT, J. M. F. Diptères nouveaux ou peu connus. 16e–18e parties. Ann. Soc. Ent. Fr. (6) i. pp. 13–24, 363–374, 453–460.

Includes notes on *Nemestrinidæ*, *Bombyliidæ*, *Acanthomeridæ*, &c.

DIMMOCK, G. The Anatomy of the Mouth-parts, and of the Sucking Apparatus of some *Diptera*. Dissertation for the purpose of obtaining the Philosophical Doctorate of the Leipzig University. Boston: 1881, 4to, pp. 60, pls. iv.

After an historical introduction, the writer treats of the anatomy of the mouth-parts of *Culex*, *Bombylius*, *Eristalis*, and *Musca*. He then compares the mouth-parts and suctorial apparatus in different families of *Diptera*, and appends a short bibliography. The mouth-parts of *Diptera* are the labrum-epipharynx, the hypopharynx, the mandibles, the maxillæ, and the labium, the last being the most fully developed mouth-organ in *Diptera*; it is furnished at the tip with more or less developed labellæ, on the inner surface of which are the channels termed pseudotracheæ. *Culex* is provided with an œsophageal bulb as a sucking apparatus, behind the œsophageal ring, a structure not known to exist in any other *Diptera*.

——. Anatomy of the Mouth-parts, and of the suctorial apparatus of *Culex*. Psyche, iii. pp. 231–241, pl. i.

An abstract of the preceding work, with additions and alterations, so far as it relates to *Culex*.

KÜNCKEL D'HERCULAIS, J. Recherches sur l'Organisation et la developpement des Diptères, et en particulière les Volucelles de la Famille des Syrphides. Paris: 1881, fol.

To be completed in three parts, of which only Part 1 and atlas of plates to Part 2 have appeared as yet.

——, & GAZAGNAIRE, J. Du siège de la gustation chez les Insectes Diptères. Constitution anatomique et valeur physiologique de l'epipharynx et de l'hypopharynx. C. R. xciii. pp. 347–350.

The epipharynx (or labrum of authors) and hypopharynx are two central chitinous valves, one upper and one lower, situated in the upper

cavity of the lower lip. Their structure in *Volucella* is described; the epipharynx is set with small transformed hairs, and the salivary duct opens into the hypopharynx. The authors' observations lead them to conclude that the seat of taste in *Diptera* commences in the paraglossæ, at the opening of the orifices of the pseudo-tracheæ, continues throughout the length of the latter, and culminates at the extremity of the epipharynx, where there is a regular tuft of nerve-terminations, extending along the edges, as far as the opening, or over the whole surface of the pharynx.

MEADE, R. H. Notes on *Diptera*. Ent. xiv. pp. 285–289.

A general article, relating chiefly to the *Tachinidæ*, a list of those known to the writer, with their hosts, being appended.

MEINERT, F. Fluernes Munddele Trophi Dipterorum. Kjöbenhavn: 1881, 4to, pp. 91, pls. vi.

The mouth-organs of a considerable number of *Diptera* belonging to most of the principal sections are described and figured. The author sums up his results in Latin.

MIK, J. *Diptera* gesammelt von H. Krone auf den Aucklands-Inseln bei Gelegenheit der deutschen Venus-Expedition in den Jahren 1874 und 1875. Verh. z.-b. Wien, xxxi. pp. 195–206, pl. xiii.

Only 8 species recorded (6 new), most of those mentioned by Nowicki in 1875 being really from New Zealand.

——. Einige Worte über P. Gabriel Strobl's "Dipterologische Funde um Seitenstetten." *L. c.* pp. 345–352.

Consists of brief critical and synonymic notes, which, though important, hardly admit of being reproduced here.

OSTEN-SACKEN, C. R. An essay of comparative Chætotaxy, or the arrangement of characteristic bristles of *Diptera*. MT. Münch. ent. Ver. v. pp. 121–138.

It is impossible to give an abstract of this paper, much of which consists of an elaborate descriptive terminology of the bristles of *Diptera*.

——. Enumeration of the *Diptera* of the Malayan Archipelago, collected by O. Beccari, L. M. D'Albertis, and others. Ann. Mus. Genov. xvi. pp. 393–492.

Short notes on many known species frequently occur, but many are not of sufficient importance to demand further notice. The synonymy is given here in full.

RITSEMA, C. Nieuwe Naamlijst van Nederlandsche *Suctoria* met eene Tabel voor het bestemmen der inlandsche Geslachten en Soorten naar Aanleiding van O. Taschenberg's Monographie. Ent. Tijdschr. xxiv. pp. lxxxi.–lxxxviii.

16 species enumerated and tabulated, with occasional notes.

VERRALL, G. H. *Diptera* of the Norfolk Broads. Ent. M. M. xviii. pp. 149–152.

A list of species, with notes on the more interesting forms, including 2 new to Britain.

VIALLANES, H. Sur l'histologie des muscles de la larve, durant le développement post-embryonnaire des Diptères. C. R. xcii. pp. 416–418, and Ann. N. H. (5) vii. pp. 352–354.

The muscles of the larva of *Musca vomitoria* disappear as it passes into the pupa state; first, by proliferation of the muscular nuclei, which give origin to a swarm of embryonic cells, multiplying at the expense of the contractile mass: subsequently the muscular nuclei degenerate and die, and the contractile substance disappears.

——. Sur le développement post-embryonaire des Diptères. C. R. xciii. pp. 800–802.

When the larva is about to become a pupa, it returns to an embryonic condition, even the skin becoming disintegrated, except a very slender cuticle; and the embryonic cells which it contains are not only derived from the muscular nuclei, but also from the proliferation of the cells of the adipose tissue. [Künckel criticises this paper (*op. cit.* pp. 901–903), and Viallanes replies (*l. c.* pp. 977 & 978)].

WESTWOOD, J. O. Notæ Dipterologicæ. No. 6. On the minute species of Dipterous Insects, especially *Muscidæ*, which attack the different kinds of cereal crops. Tr. E. Soc. 1881, pp. 605–626.

Consists of descriptions of species described by various old authors, and remarks by recent authors, with critical observations. The following are the principal species referred to:—*Cecidomyia tritici*, Kirby, *destructor*, Say, *Tipula cerealis*, Santer, *Oscinis frit*, Linn., *Chlorops saltatrix*, Linn. (= *tæniopus*, Meig.), *Musca secalis*, *calamitosa*, *hordei*, *velox*, *tripunctata*, *truncata*, *nivalis*, *pumilionis*, and *avenæ*, of Bjerkander (figured by Westwood as *Oscinis avenæ*), *Oscinis atricilla* and *pusilla*, Zett.; *Tephritis hordei*, *flavipes*, *nigra*, and *pallida*, and *Leptocera nigra*, of Olivier, *Oscinis lineata*, Fabr., *Chlorops herpini*, Guér., *Oscinis vastator*, and *granarius*, Curt., and *Oscinis pusilla*, Meig.

WULP, F. M. VAN DER. *Diptera*, in: Midden-Sumatra, Reizen en Onderzoekingen der Sumatra-Expeditie, &c. iv. 2de Aflevering (Leiden: 1881, 4to), Natuurlijke Historie, 9de Afdeeling, pp. 1–60, pls. i.–iii.

Notice of a collection formed by D. D. Veth, consisting of between 400 and 500 specimens, representing 122 species, of which a large number (all but 78) proved to be new. About 2000 species of *Diptera* are known from the East Indian Archipelago, and a table is given of the number in each family. Six of the Sumatran species are European, viz., *Sciara thomæ*, L., *Glaphyroptera winthemi*, Lehm., *Syrphus balteatus*, De Geer, *Stomoxys calcitrans*, L., *Musca domestica*, L., and *M. corvina*, Fabr. A short bibliography terminates the introductory portion of the work. Many known species are discussed in detail, and often redescribed.

——. Amerikaansche *Diptera*. Tijdschr. Ent. xxiv. pp. 141–168, pl. xv.

Includes notes on various known species, besides descriptions of new ones.

Swarms of flies (?) at Lurgan in April, 1881; Lett, Sci. Goss. xvii. p. 262.

Captures of *Diptera* in Germany; Preudhomme de Borre, CR. Ent. Belg. xxv. pp. xxiv. & xxv. In the Harz (chiefly *Œstridæ*); Röder, B. E. Z. xxv. p. 216.

Notes on *Diptera* new to Holland; Van der Wulp, Tijdschr. Ent. xxiv. pp. cxix.–cxxi.

East Indian butterflies attacked by Dipterous larvæ; Rössler, S. E. Z. xlii. pp. 189 & 190.

Notice of Loew's collection of *Diptera*; Stein, S. E. Z. xlii. pp. 489–491.

On the preparation of *Diptera*; Mik, Ent. Nachr. vii. pp. 189–213, woodcuts.

Cecidomyiidæ.

Parasitism in *Cecidomyiidæ*; Comstock, Rep. Dep. Agric. 1880, pp. 270 & 271.

Cecidomyia. Galls noticed; Fitch, P. E. Soc. 1881, p. xxii. Galls observed on *Aristolochia sipho*; Hagen, Canad. Ent. xiii. p. 37. *C. destructor*, Say (Hessian Fly), origin; Hagen, Rep. E. Soc. Ont. 1880, pp. 17 & 18. Destroyed by drought; Riley, Am. Nat. xv. p. 916. Infested by *Platygaster*; Warneck, Bull. Mosc. lvi. 1, Séances, pp. 17 & 18. *C. foliorum*, Loew, recorded as new to Britain: Cole, Tr. Epp. Forest, ii. p. xx. *C. secalina*, Linn.: corn destroyed by its ravages supposed to be destroyed by hail; Cornelius, CB. Ver. Rheinl. xxxviii. pp. 157 & 158. *C. leguminicola*, Lintn., and *trifolii*, Loew, and parasites discussed, and *C. trifolii* figured; Comstock, Rep. Dep. Agric. 1879, pp. 193–199, pl. i. fig. 5.

Diplosis resinicola, Osten-Sacken. Life-history; *id. l. c.* pp. 256 & 257, pl. vi. fig. 5, and Packard, Ins. Inj. Trees, pp. 211–213, fig. 87.

Lasioptera (*Cecidomyia*) *cerealis*, Fitch. Transformations, ravages, and parasites described; Lindeman, Bull. Mosc. lv. 2, pp. 133–138, figs. 5–7, pp. 386–389. It is infested by species of *Geniocerus*, *Platygaster*, and *Pteromalus*.

Cecidomyia steini, sp. n., Karsch, B. E. Z. xxv. p. 227, Berlin (with life-history by Dewitz).

Diplosis catalpæ, sp. n., Comstock, *op. cit.* 1880, p. 267, United States.

Mycetophilidæ.

Sciara, sp. (Yellow Fever Fly) noticed; Am. Nat. xv. p. 150.

Platyura tridens, sp. n., Hutton, Cat. N. Z. Dipt. p. 12, Wellington.

Trichonta perspicua, sp. n., Van der Wulp, Tijdschr. Ent. xxiv. p. 142, Quebec.

Mycetophila guttata, sp. n., Hutton, *l. c.* p. 11, New Zealand.

Sciara rufescens, id. *l. c.* p. 13, New Zealand; *S. rufithorax*, Van der Wulp, *l. c.* p. 6, pl. i. fig. 1, Sumatra: spp. nn.

Simuliidæ.

Simulium. A species from Lake Superior noticed; Hagen, Canad. Ent. xiii. pp. 150 & 151.

Simulium vexans, sp. n., Mik, Verh. z.-b. Wien, xxxi. p. 201, pl. xiii. fig. 14 (wing), Auckland Islands.

Bibionidæ.

Dilophus trisulcatus, Macq., noticed; Van der Wulp, Tijdschr. Ent. xxiv. p. 146.

Plecia. The species tabulated:—*P. dorsalis*, Walk., = *fulvicollis*, Fabr.; *P. japonica* and *lignicollis*, Walk., and *motschulskii*, Gimmerth., = *melanaspis*, Wied.; Osten-Sacken, Ann. Mus. Genov. xvi. pp. 397 & 398.

Bibio obediens and *plecioides*, id. *l. c.* pp. 395 & 396, New Guinea; *B. abbreviatus*, Van der Wulp, Tijdschr. Ent. xxiv. p. 145, Argentine Republic: spp. nn.

Dilophus melanarius, sp. n., *id. l. c.* p. 146, Mexico.

Plecia discolor, id. *l. c.* p. 143, Argentine Republic; *B. forcipata*, Osten-Sacken, *l. c.* p. 397, Sumatra: spp. nn.

Blepharoceridæ.

Müller, F. Verwandlung und Verwandtschaft der Blepharoceriden. Zool. Anz. iv. pp. 499–502.

The larva of *Paltostoma* agrees with that of *Culex* in breathing through a terminal pair of air-tubes; and it possesses five urinary vessels, as in the *Culicidæ* and *Psychoda*. Some larvæ deceptively like those of the *Blepharoceridæ* produced a gnat closely resembling *Psychoda*. This, with *Psychoda*, and the *Culicidæ* and *Blepharoceridæ*, may form a special group of *Diptera* under the name *Pentanephria*.

Notes on *Blepharoceridæ*; Karsch, Biol. Centralbl. i. pp. 463 & 464. Larvæ; Riley, Am. Nat. xv. pp. 567, 568 & 748. Dimorphism of ♀; F. Müller & Osten-Sacken, Ent. M. M. xvii. pp. 206 & 207.

Blepharocera. Larva of a species allied to *B. fasciata* described; Wierzejski, Zool. Anz. iv. pp. 212–216.

Paltostoma torrentium. Female dimorphism; F. Müller, Kosmos, viii. pp. 37–42, figs., Nature, xxiii. p. 277, xxiv. p. 214, and Ent. M. M. xvii. pp. 225 & 226. The two forms of female have mouths respectively adapted for blood-sucking (as in *Culex* or *Tabanus*) and for feeding on honey.

Liponeura brevirostris, Löw. Transformations described; Dewitz, Zeit. E. Z. xxv. pp. 61–66, pl. iv. figs. 3–16.

Culicidæ.

Dimmock, G. See *Diptera* (General Subject).

Hibernation, &c., of gnats; Young, Sci. Goss. xvii. p. 141. Eggs and young larvæ; Fullagar, *tom. cit.* pp. 55 & 56, figs. 40–42.

Culex, sp. A swarm damaging paper in Sweden by getting mixed with the pulp; Clarke, P. Bristol Soc. ii. p. 419.

Megarrhina splendens, Wied., ♀ described; Van der Wulp, Midden-Sumatra, Dipt.. p. 8, pl. i. fig. 2 (wing).

Culex longipalpis and *crassipes*, spp. nn., *id. l. c.* p. 7, pl. i. figs. 3 & 4 (heads), Sumatra.

Chironomidæ.

Balbiani, E. G. Sur la structure du noyau des cellules salivaires chez les larves de *Chironomus*. Zool. Anz. iv. pp. 637–641, 662–666, woodcuts.

The salivary glands are two flattened organs, formed of a small number of large, clear, transparent cellules, and furnished with a large and very transparent nucleus, containing two large irregular nucleoli, and a pale cylindrical body convoluted like an intestine. This is not homogeneous, but consists of dark transverse striæ regularly alternating with bands of an intermediate clear substance. This cord appears to be enclosed in a membranous envelope, thus forming a tube. The action of reagents on the various parts of the nucleus is described, and the opinions of other histologists on similar structures discussed.

Gercke, G. Ueber die Metamorphose nachtflügeliger *Ceratopogon*-Arten sowie über die von *Tanypus nigro-punctatus*, Sieg., und von *Hydrellia mutata*, Meig. Verh. Ver. Hamb. iv. pp. 222–227, pl. ii.

Relates to *Ceratopogon bicolor*, Panz., &c.

Giard, A. Découvertes récentes sur les Champignons du groupe des *Entomophthoreæ*. Bull. Sci. Nord, (2) iv. pp. 162–165.

Relates to *Entomophthora rimosa*, Sirok., a parasite on *Chironomus*.

Chironomus lucens, Zett., ♀ described; Hansen, Nat. Tidskr. (3) xiii. p. 275.

Chironomus niger, id. *l. c.* p. 274, Färöe Islands; *C. proximus* (*bonariensis* in errata, and in S. E. Z. xlii. p. 119), Arribálzaga, Exped. Rio Negro, Zool. pp. 88, Buenos Aires: spp. nn.

Psychodidæ

Psychoda conspicillata, sp. n., Hutton, Cat. N. Z. Dipt. p. 13, Wellington.

Tipulidæ.

Wallengren, H. D. J. Revision af Skandinaviens *Tipulidæ*. Ent. Tidskr. ii. pp. 177–268.

32 genera are characterized (some new), and the Swedish species of 27 of these described, the paper not being quite completed.

Westhoff, P. Beitrag zur Kenntniss der westfälischen Arten der Abtheilung *Tipulinæ*, Schiner. JB. zool. Sect. Westf. Ver. viii. pp. 39–54, plate.

44 species enumerated, 2 new.

Westwood, J. O. Notæ Dipterologicæ. No. 5. Descriptions of new species of Exotic *Tipulidæ*, with an annotated summary of species belonging to the same family, previously described. Tr. E. Soc. 1881, pp. 363–385, pls. xvii.–xix.

Includes descriptions of species described by the author in former papers. The following are figured, or corrections of synonymy given:— *Gynoplistes vilis*, Walk. (= *nervosa*, Westw.), antenna figured, pl. xviii. fig. 6; *G. variegata*, Westw., = *Ctenophora bella*, Walk.; *G. annulata*, Westw., antenna figured, pl. xviii. fig. 7; *Geranomyia*, Curt., and *Limboriorrhynchus*, Westw., discussed; *Megistocera dimidiata*, Westw., details figured, pl. xviii. fig. 9, *M. dispar*, Walk., = *costalis*, Swed., = *limbipennis*, Macq.; *Cerazodia interrupta*, Westw., details figured, pl. xix. fig. 13; *Ozodicera ochracea*, Macq., = *pectinata*, Wiedem.; *O. gracilis*, Westw., details figured, pl. xviii. fig. 8; *Ptilogyna ramicornis*, Walk. (= *marginalis*, Westw.), details figured, pl. xix. fig. 14; *Bittacomorpha clavipes*, Fabr., details figured, pl. xix. fig. 12.

Van der Wulp notices *Tipula pedata*, Wied., *umbrata*, Wied. (= *congruens*, Walk.); *Pachyrrhina bombayensis*, Macq., *Eriocera bicolor*, Macq. (pl. i. figs. 5 & 6, details), *Conosia irrorata* and *Libnotes notata*, Van der Wulp, Midden Sumatra, Dipt. pp. 10–13.

Dicranomyia vicarians, Schin., from the Auckland Islands, redescribed; Mik, Verh. z.-b. Wien, xxxi. p. 196, pl. xiii. fig. 1 (wing).

Elephantomyia westwoodi. The occurrence of this North American species (or one very closely allied) at Munich is recorded by Osten-Sacken, MT. Münch. ent. Ver. v. pp. 152–154. It is a Tertiary form, which has survived almost unaltered to the present day.

Trichocera hiemalis, De Geer (winter gnat). Habits; Eaton, Nature, xxiii. pp. 554 & 555.

Tipula atomaria, Deg., discussed; Mik, *l. c.* pp. 353 & 354. It probably = *Epidapus venaticus*, Hal.

Pachyrrhina javanensis, Dolesch. (nec *javana*, Wied.), = ? *fasciata*, Macq. (*nec* Degeer), renamed *P. doleschalli*, and redescribed; Osten-Sacken, Ann. Mus. Genov. xvi. p. 399. *P. elegans*, Fabr., noticed; Van der Wulp, Tijdschr. Ent. xxiv. p. 152.

Ctenophora atrata, Linn. The larva is provided with two small warts, set with fine bristles, above each stigma, and two below, which it closes over the stigma when boring into rotten wood. The larvæ of allied species do not possess this structure; Hermann, MT. Münch. ent. Ver. iv. pp. 146 & 147. Noticed from Quebec; Van der Wulp, *l. c.* p. 147. *C. ornata*, Meig., taken in the New Forest; C. W. Dale, Ent. M. M. xviii. p. 89.

New genera and species:—

Nasiterna, Wallengren, Ent. Tidskr. ii. p. 179. Allied to *Idioptera*; subradial nervure simple, carpal nervure bifurcate, interstitial cell emitting four nervures, the two middle ones sometimes united in a very short common stalk. Type, *Limnobia variinervis*, Zett.

Diazoma, id. *l. c.* p. 180. Allied to *Pedicia*, wings hairy, dorsal nervure long, twice arched.

Veruina, Wallengren, *l. c.* Allied to *Trichocera*; wings deflexed, subradial nervure bifurcate, costal nervure straight, or nearly so. Type, *Limnobia bifurcata*, Zett.

Ninguis, id. *l. c.*, p. 206. Allied to *Tricyphona*; types, *Limnobia alpina*, *juvenilis*, and *virgo*, Zett.

Mongoma, Westwood, Tr. E. Soc. 1881, p. 364. Allied to *Empeda* (?), or *Paratropesa* (?); type, *M. fragillina*, sp. n., *l. c.* pl. xvii. fig. 1, Mongoma Lobah, Tropical Africa.

Dapanoptera (Osten-Sacken, MS.), *id. l. c.* p. 365. Allied to *Limnobia*; tip of the first longitudinal vein and the cross-vein adjoining evanescent; first posterior cell with a cross-vein; wings variegated. Type, *L. plenipennis*, Walk. (noticed, and wing figured, *l. c.* p. 366, pl. xvii. fig. 2); add *L. latifascia*, *unroatra*, and *perdecora*, Walk.

Elliptera hungarica, Madarassy, Term. füzetek, v. p. 87, Hungary.

Sigmatomera amazonica, Westwood, *l. c.* p. 366, pl. xvii. fig. 3, Amazons.

Dicranomyia insularis, figs. 2–4, *kronii*, figs. 5, 7 & 8, Mik, Verh. z.-b. Wien, xxxi. pp. 197 & 199, pl. xiii. Auckland Islands.

Trichocera antipodum, id. *l. c.* p. 200, pl. xiii. figs. 9–12, Auckland Islands.

Dicranota reitteri, id. *l. c.* p. 317, Tirol.

Tricyphona livida, Madarassy, *l. c.* p. 38, Hungary.

Ozodicera argentina, Van der Wulp, Tijdschr. Ent. xxiv. p. 147, pl. xv. figs. 1 & 2 (details), Argentine Republic.

Tipula rufescens, Westhoff, JB. zool. sect. Westf. Ver. viii. pp. 46 & 50, Westphalia; *T. retorta*, Quebec, p. 149, *microcephala*, Guadeloupe, *vitrea*, Quebec, p. 150, *nubifera*, Buenos Aires, p. 151, Van der Wulp, *l. c.* pl. xv. figs. 3–6 (wings); *T. parvicauda*, Hansen, Nat. Tidskr. (3) xiii. p. 272, Färöe Islands.

Megistocera vulpina, Hutton, Cat. N. Z. Dipt. p. 16, Dunedin.

Limnophila bryobia, Mik, *l. c.* p. 205, Auckland Islands.

Pachyrrhina guestfalica, Westhoff, *l. c.* pp. 49 & 51, figs. 7–12, Westphalia (3 allied species are figured for comparison); *P. familiaris*, Sumatra, *melanura*, New Guinea, Osten-Sacken, Ann. Mus. Genov. xvi. p. 401.

Libnotes simplex, Ternate, *pæciloptera*, Sumatra, *id. l. c.* pp. 402 & 403.

Teucholabis bicolor, id. *l. c.* p. 404, Sumatra.

Gynoplistia jucunda, id. *l. c.* p. 405, Celebes; *G. wakefieldi*, Westwood, *l. c.* p. 372, pl. xviii. fig. 5, New Zealand.

Eriocera morosa, Celebes, *selene*, Sumatra, Osten-Sacken, *l. c.* p. 406; *E. lunata*, Westwood, *l. c.* p. 367, pl. xviii. fig. 4, Sarawak.

XYLOPHAGIDÆ.

Solva, Walk., is not distinct from *Subula*; Osten-Sacken, Ann. Mus. Genov. xvi. p. 407.

Rhachicerus zonatus, sp. n., *id. l. c.* p. 408, Sumatra.

Stratiomyiidæ.

Beris javana, and *Odontomyia consobrina*, Macq., *O. diffusa*, Walk., *Ephippium bilineatum*, Fabr. (= *bivittata*, Wied., = *spinithorax*, Macq., and *spinigerum*, Dol.), and *Sargus quadrifasciatus*, Walk., noticed and generally redescribed; Van der Wulp, Midden-Sumatra, Dipt. pp. 13–15.

Ptilocera smaragdina and *amethystina*, Voll., are hardly distinct; *Tinda*, Walk., = *Elasma*, Jaenn., = ? *Phyllophora*‖, Macq.; *P. bispinosa*, Thoms., = *T. modifera*, Walk.; *Rosapha habilis*, Walk. (= *Calochætis bicolor*, Bigot), amended description; *Evasa pallipes*, Bigot, = *Nerua scenopinoides*, Walk. Osten-Sacken, Ann. Mus. Genov. xvi. pp. 412–415.

Stratiomys. Larvæ recorded from the quaternary tufas of Bernouville, Gisors (Eure); Brongniart, Bull. Soc. Géol. France (3) viii. p. 419.

Odontomyia nigriceps, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 361, Alps.

Stratiomyia convexa, sp. n., Van der Wulp, Tijdschr. Ent. xxiv. p. 154, Argentine Republic.

Lasiopa vittata, id. *l. c.* p. 155, Argentine Republic; *L. manni*, Mik, Verh. z.-b. Wien, xxxi. p. 315, Brussa, Trieste: spp. nn.

Nemotelus fasciatifrons, sp. n., Arribálzaga, S. E. Z. xlii. p. 190, and Exped. Rio Negro, Zool. p. 89, Patagonia.

Campeprosopa munda, sp. n., Osten-Sacken, Ann. Mus. Genov. xvi. p. 409, Sumatra.

Nerua mollis, sp. n., *id. l. c.* p. 415, Sumatra.

Acanthomeridæ.

Acanthomeridæ discussed, with table of genera and species; Bigot, Ann. Soc. Ent. Fr. (6) i. pp. 453–460.

Megalemyia argyropasta, sp. n., *id. l. c.* p. 455, Panama.

Acanthomera rubriventris, Guatemala, and *fulvida*, Guiana, *id. l. c.* p. 456: spp. nn.

Tabanidæ.

Bellardia, Rond., is not distinct from *Tabanus*. *Atylobus*, Ost.-Sack., amended diagnosis. *Dichælacera*, Macq., = *Acanthocera*, Macq.; Bigot, Ann. Soc. Ent. Fr. (6) i. pp. 372 & 373.

Tabanus immunis, Wied., *striatus*, Fabr. (= *dorsilinea*, Wied., *Chrysops dispar*, Fabr., *Hæmatopota javana*, Wied., fig. 12, *irrorata*, Macq. (? = *paupera*, Dol.), fig. 13, and *lunulata*, Macq., fig. 14, pl. i. (wings), noticed by Van der Wulp, Midden-Sumatra, Dipt. pp. 16–20.

Pangonia longirostris, Hardw., redescribed; Röder, S. E. Z. xlii. pp. 384–386. *P. depressa*, Macq., noticed; Van der Wulp, Tijdschr. Ent. xxiv. p. 157.

Silvius (?) *dimidiatus*, Van der Wulp, ♀ described; Osten-Sacken, Ann. Mus. Genov. xvi. p. 478.

Pangonia morio, sp. n., Van der Wulp, Tijdschr. Ent. xxiv. p. 156, Argentine Republic.

Tabanus hamatus, uncinatus, p. 159, and *rubricosus*, p. 160, *id. l. c.* pl. xv. figs. 7–9 (wings), Argentine Republic; *T. geniculatus*, p. 16, *incultus* and *tristis*, p. 17, *fumipennis* and *minimus*, p. 18, *id.* Midden-Sumatra, Dipt. pl. i. figs. 7, 7 *a*–11, 11 *a* (details), Sumatra; *T. exclamationis*, Girard, J. Sci. Lisb. viii. p. 230, and Capello & Ivens, "De Benguella às Terras de Iácca," ii. p. 367, Angola: spp. nn.

Leptidæ.

Leptis and *Vermileo*. Generic characters; Signoret, Bull. Soc. Ent. Fr. (6) i. p. liii.

Chrysopila vacillans, Walk., ♂ described; Osten-Sacken, Ann. Mus Genov. xvi. p. 420.

Chrysopila lupina, sp. n., *id. ibid.*, Sumatra.

Leptis uniguttata, sp. n., *id. l. c.* p. 422, Sumatra.

Asilidæ.

Arribálzaga, F. L. Asilides Argentinos. An. Soc. Arg. viii. pp. 145–153 [1879]; ix. pp. 26–33, 49–57, 224–230, & 252–265 [1879?] x. pp. 110–121, & 174–184 [1880]; xi. pp. 17–32, & 112–128.

A great number of new genera and species are described in this series of papers [*cf.* Zool. Rec. xvii. *Ins.* pp. 197 & 198], and the following known species, &c., are redescribed, or specially noticed:—*Allopogon vittatus*, Wied. (= *longiungulatus*, Wied., and *gracile*, Big.); *Planetolestes* (viii. p. 147; *cf.* Zool. Rec. xvii. *Ins.* p. 198) *coarctatus*, Perty (= *bonariensis*, Macq., ? = *luridus*, Rond., *subcontractus* and *secabilis*, Walk.; *Blepharepium*, Rond., has priority over *Planetolestes*, Arrib.); *Morunna* Walk., = *Lastaurus*, Loew; *Prolepsis*, Walk., = *Cacodæmon*, Schin.; *C. lucifer*, Wied. (= *satanas*, Wied., = *rufipennis*, Macq., = *fumiflamma*, Walk.); *Dasypogon annulitarsis*, Rond., *rufipennis*, Macq.; *Cormansis*, Walk., = *Atomoria*, Macq.; *A. limbativentris*, Thoms., *beckeri* Jaenn., and *pilosipes*, Thoms.; *Megaphorus*, Big., = *Mallophora*, Serv.; *M. ruficauda*, Wied., *nigriventris*, Jaenn., *soccata*, Thoms.; *Acanthodelphia*, Big., = *Proctacanthus*, Macq.; *P. rubriventris*, Macq. (= *xanthopogon*, Burm., = *speciosus*, Phil.), *vetustus* and *macrotelus*, Walk., *leucopogon*, Wied.; *Erax singularis*, Macq., *senilis*, Wied., *patagoniensis*, Macq., *flavidus*, Wied., *striola*, Fabr. (= *maculatus*, Macq.), *mellinus*, Wied., *flavidus*, Macq. (*nec* Wied.), and *longiterebratus*, Macq.; *Proctophorus connexus*, Wied.; *Heligmoneura*, Big., = *Mochtherus*, Loew; *M. rufipalpis*, Macq., *Allopogon vittatus*, Wied., *heydeni*, Jaenn., and *Plastomma semirufa*, Wied., *Trupanea strenua*, Walk., = *Promachus bifasciatus*, Macq.

Ommatius inextricatus, pennus, coryphe, and *androcles*, Walk., and *Asilus garnotii*, Guér., = *O. fulvidus*, Wied.; *O. noctifer*, Walk., = *spinibarbis*, V. d. W.; *Laphria partita*, Walk., = ? *auricincta*, V. d. W.; *L. ardescens* and *flagrantissima*, Walk., = *notabilis*, Macq., *Maira kollari*, V. d. W. (*nec* Dol.), = *gloriosa*, Walk.; *L. congrua*, Walk., = *spectabilis*, Guér. Osten-Sacken, Ann. Mus. Genov. xvi. pp. 421–432.

Damalis major, *Laphria blumii*, *ignobilis*, and *histrionica*, Van der Wulp, *vulcanus*, Wied., and *flavifacies*, Macq., *Maira niveifacies*, Macq., *nigrithorax*, Van der Wulp, *Itamus longistylus*, Wied. (= *Asilus latro*, Dol.), *fraternus*, Macq., *Ommatus fulvidus*, Wied. (pl. i. figs. 15 & 16, details), and several other species of *Asilidæ* noticed; Van der Wulp, Midden-Sumatra, Dipt. pp. 20–26.

Maira bisnigra, Bigot, = *Laphria basifera*, Walk.; Bigot, Ann. Soc. Ent. Fr. (6) i. p. 373.

Asilus, sp. attacking a dragon-fly; Todd, Am. Nat. xv. p. 1005.

Itamus dentipes, V. d. Wulp, = ? *involutus*, Walk., ♂; Osten-Sacken, Ann. Mus. Genov. xvi. p. 423.

Mochtherus flavipes, Meig.: male described; Mik, Verh. z.-b. Wien, xxxi. pp. 354–356.

New genera and species:—

Asicya, Arribálzaga, An. Soc. Arg. ix. p. 224. Allied to *Dasythrix*; type, *A. fasciata*, sp. n. *l. c.* p. 227, Buenos Aires.

Leptoharpacticus, id. *l. c.* x. p. 178 (*Asilus*, South American spp., group 7, Walk.); type, *A. mucius*, Walk. (redescribed, *l. c.* p. 180).

Phonicocleptes, id. *l. c.* xi. p. 18. Allied to *Allopogon*, &c.; type, *A. busiris*, sp. n., *l. c.* p. 21, Buenos Aires.

Tolmerolestes, id. *l. c.* p. 27. Allied to *Dasypogon*; type, *D. lax*, sp. n., *l. c.* p. 30, Buenos Aires; add *T. pluto*, Buenos Aires, and *rubripes*, San Luis, spp. nn., *l. c.* pp. 112 & 114.

Cylicomera, id. *l. c.* p. 115. Allied to last; types, *C. fraterna* and *rubro-fasciata*, spp. nn., *l. c.* pp. 117 & 119, Buenos Aires.

Chrysopogon, Röder, B. E. Z. xxv. p. 213. Differs from *Laparus* by the first hind-marginal cell being closed; type, *C. crabroniformis*, sp. n., *l. c.*, Peak Downs, Australia.

Leptogaster angelus and *inflatus*, Osten-Sacken, Ann. Mus. Genov. xvi. p. 426, Kandari, Celebes.

Anisopogon (*Heteropogon*) *glabellus* (Löw, MS.), Röder, B. E. Z. xxv. 215, Corfu.

Dicranus tucma, Arribálzaga, *op. cit.* ix. p. 26, and xi. p. 124, Tucuman.

Laphria diversa, Van der Wulp, Midden-Sumatra, Dipt. p. 22, Sumatra.

Aphestia chalybæa, Röder, S. E. Z. xlii. p. 386, Australia.

Maira elysiaca, Osten-Sacken, *l. c.* p. 430, New Guinea.

Mallophora lugubris, p. 252, *scutellaris*, Misiones, p. 254, *bergi*, Uruguay, p. 257, Arribálzaga, *l. c.* ix.

Philonicus nigro-setosus, Van der Wulp, *l. c.* p. 24, Sumatra.

Dasypogon costalis, Arribálzaga, *op. cit.* ix. p. 29, and xi. p. 124, Buenos Aires; *D.* (?) *caudatus*, Bigot, Ann. Soc. Ent. Fr. (6) i. p. 364, Alps.

Atomosia venustula, Arribálzaga, *op. cit.* ix. p. 50, Buenos Aires.

Ceratotænia violaceithorax, id. *l. c.* p. 52, Buenos Aires.

Dasythrix leucophæa, id. *l. c.* p. 55, Buenos Aires.

Proctacanthus vittatus and *cruentus*, id. *l. c.* pp. 261 & 264, Misiones.

Asilus cuyanus, id. *op. cit.* x. p. 175, Mendoza.

Allopogon ferrugineus, Mendoza, *infumatus*, Buenos Aires, Arribálzaga, *tom. cit.* pp. 182 & 183, and xi. p. 17.

Holcocephala uruguayensis, id. *l. c.* p. 126, Uruguay.

Scylaticus distinguendus, id. *l. c.* p. 121, Buenos Aires.

Midaidæ.

Midas bifascia, Walk. Variation noticed: Osten-Sacken, Ann. Mus. Genov. xvi. p. 423.

Nemestrinidæ.

Table of genera of *Nemestrinidæ*; Bigot, Ann. Soc. Ent. Fr. (6) i. pp. 15-18.

New genera and species:—

Parasymmictus, Bigot, Ann. Soc. Ent. Fr. (6) i. p. 15. Allied to *Symmictus*; type, *Hirmoneura clausa*, Ost.-Sack.

Dicrotrypana, id. *ibid.* Allied to last; type, *D. flavo-pilosa*, sp. n., *l. c.* p. 21, South Europe ?.

Trichophthalma scapularis, Australia, p. 18, *scalaris*, p. 19, and *amœna*, Chili, p. 20, *id. l. c.*

Hirmoneura simplex, id. *l. c.* p. 20, Chili.

Bombyliidæ.

Riley, C. V. Larval Habits of Bee-Flies. Am. Nat. xv. pp. 438–447, pl. vi.

Adapted from 2nd Rep. U. S. Ent. Comm. (1880).

Report on *Bombyliidæ* destructive to locust eggs; P. E. Soc. 1881, pp. xxxviii.–xl.

Systœchus oreas and *Triodites mus*, Ost.-Sack. Larvæ destructive to locust eggs; Riley, P. Am. Ass. 1880, p. 649.

Exoprosopa erythrocephala, Fabr., *albiventris*, Macq., *proserpina*, Wied., *sanctipauli*, *maldonadensis*, and *fasciata*, Macq., noticed, and wings of all but the first and last figured; Van der Wulp, Tijdschr. Ent. xxiv. pp. 164–168, pl. xv. figs. 11–14.

Anthrax ventrimacula, Dolesch., *A. pelops*, Walk., and *Exoprosopa leuconoe*, Jaenn., = *E. doryca*, Boisd.; Osten-Sacken, Ann. Mus. Genov. xvi. p. 433.

Comptosia, Macq., and allied genera noticed; Bigot, Ann. Soc. Ent. Fr. (6) i. pp. 22 & 23.

Callostoma fascipennis, Macq. Report of the Committee appointed by the Entomological Society to investigate this insect as destructive to locust eggs in the Troad; P. E. Soc. 1881, pp. xiv.–xix.

Systœchus oreas. Transformations figured and compared with those of *Bombylius major*; Riley, Am. Nat. xv. pp. 143–145, figs.

Lygira rubrifera, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 23, Australia.

Dischistus amabilis, sp. n., Van der Wulp, Tijdschr. Ent. xxiv. p. 162, pl. xv. fig. 10, Argentina.

THEREVIDÆ.

Hilarimorpha, Schin. Mik discusses the affinities of this genus, and considers it to be nearest related to the *Therevidæ*; Verh. z.-b. Wien, xxxi. pp. 327–329, pl. xvi. figs. 19–22.

SCENOPINIDÆ.

Scenopinus fenestralis, Linn., bred from dried roots of *Aconitum*; Waterhouse, P. E. Soc. 1881, p. xxxvii.

CYRTIDÆ.

Astomella carniventris, Duf., = *marginata*, ♂, Meig., = *aurea*, ♀, Erichs., but *A. lindeni*, Erichs., is distinct; Röder, B. E. Z. xxv. pp. 214 & 215.

Henops brunneus, sp. n., Hutton, Cat. N. Z. Dipt. p. 25, New Zealand.

EMPIDÆ.

Clinocera, Meig. Mik divides this genus into ten, all new, except *Clinocera*, Meig., *Helcodromia*, Hal., and *Wiedemannia*, Zett.; a list of species is added under each: Verh. z.-b. Wien, xxxi. pp. 320–329, pl. xvi. (details).

New genera and species:—

Kowarzia, Mik, Verh. z.-b. Wien, xxxi. p. 325. Allied to *Clinocera*, face hairy; types, *C. barbatula*, *plectrum*, and *tibialis*, Mik, and *bipunctata*, Hal.

Phæobalia, id. *l. c.* p. 326. Allied to *Helcodromia*, face naked, stigma present, wings chequered; types, *Clinocera trinotata*, Mik, *dimidiata* and *inermis*, Loew, and *varipennis*, Now.

Bergenstammia, id. *ibid.* Allied to last, wings not spotted, pulvillæ rudimentary; type, *Clinocera nudipes*, Loew.

Chamædipsia, id. *ibid.* Allied to last, pulvillæ well developed, scutellum with two marginal bristles; type, *Clinocera hastata*, Mik.

Rœderia, id. *ibid.* Allied to last, scutellum more bristly, acrostichal bristle not extending to the scutellum; type, *Clinocera longipennis*, Mik.

Eucelidia, id. *ibid.* Allied to last, acrostichal bristle extending to the scutellum, femora with terminal bristles; types, *Clinocera escheri*, Zett., *zetterstedti*, Fall., and *pirata*, Mik.

Philolutra, id. *l. c.* p. 327. Allied to last, and to *Wiedemannia*, femora with no terminal bristles; stigma rounded, commencing beyond the origin of the first longitudinal nervure. To include *Clinocera phantasma*, *wachtlii*, and *impudica*, Mik, *aquilar*, *hygrobia*, and *fallaciosa*, Loew, *bohemani*, Zett., and *lota*, Walk.

Rhamphomyia brusewitzi, *hovgaardi*, *kjellmani*, and *nordquisti*, Holmgren, Nov. Spec. Ins. pp. 20–23, Novaya Zemlya.

Platypalpus nigripalpis, Bigot, Ann. Soc. Ent. Fr. (6) i. p. 365, Alps.

Dolichopodidæ.

Gymnopternus chalybeus, Wied., recorded as new to Britain ; Verrall, Ent. M. M. xviii. pp. 149 & 150.

Psilopus flavicornis, Wied., redescribed ; Van der Wulp, Midden-Sumatra, Dipt. p. 27.

Diaphorus gredleri, sp. n., Mik, Verh. z.-b. Wien, xxxi. p. 356, Botzen.

Psilopus patellatus, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 27, Sumatra.

Syrphidæ.

Notes on some Italian *Syrphidæ* ; Fiori, Bull. Ent. Ital. Resoconti, 1881, pp. 19 & 20.

Didea ellenziederi, Dolesch., *Syrphus fascipennis*, Macq., and *S. infirmus*, Rond., = *S. ægrotus* (Fabr.), Wied. ; *Didea macquarti*, Dolesch., = ? *S. salviæ* (Fabr.), Wied. ; *Syrphus alternans*, Macq., and ? *triligatus*, Walk., = *nectarinus*, Wied. ; *Axona volucelloides*, Walk., and *Eristalis maxima*, Dolesch., = *E. chalcopygus*, Wied. ; *E. cupreo-fasciatus*, V. d. W., = *metallicus*, Dol., = *splendens*, Le Guillou ; *E. flavo-fasciatus*, Macq., = *zonalis* (Fabr.), Wied. ; *E. varipes*, Macq., *macquarti*, Dolesch., and *amphicrates*, Walk., = *errans* (Fabr.), Wied. : Osten-Sacken, Ann. Mus. Genov. xvi. pp. 437–441.

Helophilus bengalensis, Wied., *Megaspis zonalis*, Fabr. (= *flavo-fasciatus*, Macq.), *errans*, Fabr. (= *varipes*, Macq., and *macquarti*, Dol.), *Eristalis arvorum*, Fabr., *Syrphus ægrotus*, Fabr. (= *fascipennis*, Macq.), *salviæ*, Fabr. (= *ericetorum*, Fabr., *incisuralis*, Macq., and *Didea macquarti*, Dol.), *confrater* and *javana*, Wied., and *balteatus*, De Geer (= *alternata*, Schrank, *nectareus*, Fabr., *nectarinus*, Wied, and *alternans*, Macq.), and *javanus*, Wied., noticed ; Van der Wulp, Midden-Sumatra, Dipt. pp. 30–33.

Volucella obesa, Fabr., figured by Waterhouse ; Aid, i. pl. xxxi.

Sericomyia borealis singing while at rest ; Bloomfield, Ent. M. M. xviii. pp. 159 & 160. Observed in Sussex, *id. l. c.* p. 260.

Eristalis tenax widely distributed in North America ; Williston, Canad. Ent. xiii. p. 176.

Scæva peltata hermaphrodite ; Malm, Ent. Tidskr. ii. pp. 5 & 36.

Solenaspis, g. n., Osten-Sacken, Ann. Mus. Genov. xvi. p. 442. Allied to *Eristalis* and *Pteroptila* ; type, *S. beccarii*, sp. n., *l. c.*, p. 443, New Guinea.

Microdon sumatranus and *apicalis*, spp. nn., Van der Wulp, Midden-Sumatra, Dipt. p. 29, pl. ii. figs. 1 & 2, Sumatra.

Syrphus striatus, sp. n., *id. l. c.* p. 32, pl. ii. fig. 3, Sumatra.

Graptomyza lineata, sp. n., Osten-Sacken, *l. c.* p. 439, Ternate.

Œstridæ.

Œstrus. Larvæ infesting mice and other small mammals from Peru : Waterhouse, P. E. Soc. 1881, pp. xxii. & xxiii.

Cephenomyia stimulator, Clark. Habits of larvæ described; they infest the nose and throat of the roe-deer (Rehbock) near Bonn. Troschel, SB. Ver. Rheinl. xxxviii. pp. 119–121.

Muscidæ.

Stilbomyia nitidissima, Voll., and ? *fulgida*, Bigot, = *prospera*, Walk.; *Amenia imperialis*, Desv., and *Ptilostylum albo-maculatum*, Macq., = *A. leonina* (Fabr.), Wied.; *Rutilia atribasis*, Walk., = *pretiosa*, Voll.; *R. plumicornis*, Macq., = *mirabilis*, Guér.; *Idia australis*, Walk., ? = *xanthogaster*, Wied.; *Ochromyia promittens*, Walk., = *ferruginea*, Dolesch.; *Lucilia flaviceps*, Macq., and *Chrysomyia duvauceli*, Desv., = *L. dux* (Esch.), Wied.; *Nerius fuscus*, Wied., and *brevipennis*, Macq., = *phalanginus*, Dolesch.; *N. tibialis*, Dolesch., = *mantoides*, Walk.; *Calobata* noticed, and 5 species tabulated, and *C. albimana*, Dolesch., redescribed; *Sophira punctifera*, Walk., = *Trypeta stellipennis*, Walk.; *T. atilia*, Walk., = *melaleuca*, Walk.; *Themara ampla*, Walk., and *Achias horsfieldi*, Westw., = *T.* (*Acanthoneura* ?) *maculipennis*, Westw.; *Michogaster bambusarum*, Dolesch., *Stenopterina abrupta*, Thoms., and *labialis*, Rond., = *S. eques*, Schin.; *Stenopterina chalybea*, Dolesch., characters noticed; *Poticara triarcuata*, Walk., = *Clitamia astrolabii*, Boisd.; *Platystoma stellata* and *atomaria*, Walk., and *parvula*, Schin., = *punctipleura*, Walk.; *Achias aspiciens*, Walk., = *dacoides*, Walk.; *Achias* species tabulated; *Acinia facie-striata*, Dolesch., and *Lamprogaster transversa*, *marginifera*, and *sexvittata*, Walk., = *Scholastes cinctus*, Guér.; *Enicoptera rufiventris* and *Psila cruciata*, Walk., = *Adrama selecta*, Walk.; *Adrama* (= *Acanthineza*, Rond.), recharacterized; *Enicoptera pictipennis*, Walk., = *Sophira distorta*, Walk.; *Elaphomyia polita*, Saund., and *Anguitula longicollis*, Walk., = *A. cyanea*, Guér. (*Anguitula* recharacterized); *Elaphomyia cervicornis*, Saund., = *Phytalmia cervicornis*, Gerst.; *Diopsis latimana* and *lativola*, Rond., = *attenuata*, Dolesch.; Osten-Sacken, Ann. Mus. Genov. xvi. pp. 445–492.

Morinia chloe, *Sarcophaga princeps*, Wied., *Lucilia dux*, Esch. (= *flaviceps*, Macq., = *duvauceli*, Desv.), *flavidipennis*, Macq. (= *philippensis*, *flavicalyptrata*, and *cæruleifrons*, Macq., ? = *indica* and *eximia*, Desv.), *orientalis*, Macq. (3 undetermined species of *Lucilia* also described); *Ophyra nigra*, Wied. (= *riparia*, Dol., and *gracilis*, Wied.), *Cœnosia simplex*, Thoms., *Sciomyza orientalis*, Wied., *Loxoneura decora*, Fabr., *Senopterina ænea*, Wied. (= *labialis*, Rond.), *Celyphus obtectus*, Dalm., *Nerius fuscus*, Wied. (= *phalanginus*, Dol.), *Calobata cæruleifrons*, Macq., and several other known species of *Muscidæ* discussed; Van der Wulp, Midden-Sumatra, Dipt. pp. 42–53.

List of 36 *Muscidæ Calypteræ* taken in a greenhouse; C. W. Dale, Ent. M. M. xvii. p. 207.

Oscinis frontella, Fall., and *Drosophila fenestrarum*, Fall., bred from figs from the Dardanelles and Egypt; S. S. Saunders, P. E. Soc. 1881, p. xxxii.

Parasites on house-flies; Lewin, Sci. Goss. xvii. p. 189.

Tachininæ.

Hemyda aurata, Desv. Characters discussed; the genus is distinct from *Hermyia*: Röder, B. E. Z. xxv. pp. 242 & 243.

Nemoræa leucaniæ, Kirkp., noticed and figured; Comstock, Rep. Dep. Agr. 1879, p. 190, pl. i. fig. 2.

Tachina, sp. parasitic on *Phacellura hyalinatalis*, noticed and figured; *id. l. c.* p. 220, pl. iii. fig. 6.

Phirocera [sic] *agilis*, Desv. Parasitic on the larva of *Arctia caia*; Van Segvelt, Feuill. Nat. xii. p. 10.

Masicera cilipes, Macq., redescribed and figured; Van der Wulp, Midden-Sumatra, Dipt. p. 36, pl. ii. fig. 5.

Degeeria. Should this generic name be retained in *Diptera*? Meade & McLachlan, Ent. M. M. xviii. pp. 19 & 43.

New genera and species :—

Echinosoma, Girschner, Ent. Nachr. vii. p. 277. Allied to *Macronychia* and *Trixa*; type, *E. pectinata*, sp. n., *l. c.* figs. 1*a–c*, Meiningen (= *Tricholyga*, Rond.; Mik, *op. cit.* pp. 326 & 327).

Orectocera, Van der Wulp, Midden-Sumatra, Dipt. p. 39. Allied to *Tachina*; type, *O. micans*, sp. n., *l. c.* p. 40, Sumatra.

Macronychia flacipalpis, Girschner, Ent. Nachr. vii. p. 279, figs. 2 *a*, *b*, Meiningen.

Germaria cervini, Bigot, Ann. Soc. Ent. Fr. (6) i. p. 365, the Görnergrat.

Exorista pallidicornis, id. *l. c.* p. 366, St. Germain.

Metopia palliceps, id. *l. c.* p. 367, France.

Sphyxapata (?) *nitidula*, id. *ibid.*, France.

Melia forcipata, id. *l. c.* p. 368, Alps.

Gymnosoma ramulosa, Madarassy, Term. füzetek, v. p. 38, Hungary.

Ocyptera umbripennis, Van der Wulp, Midden-Sumatra, Dipt. p. 35, Sumatra.

Gonia minuta, id. *l. c.* pl. ii. fig. 4, Sumatra.

Masicera rubriventris and *elongata*, p. 37, and *longiseta*, p. 38, *id. l. c.* pl. ii. figs. 6–8 (heads), Sumatra.

Meigenia ciliata, figs. 9 & 10, and *late-striata*, fig. 11, *id. l. c.* pp. 38 & 39, pl. ii. (details), Sumatra.

Myobia robusta, id. *l. c.* p. 40, Sumatra.

Eurygaster feredayi and *marginatus*, Hutton, Cat. N. Z. Dipt. pp. 50 & 51, Dunedin.

Dexinæ.

Dexia festiva, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 41, pl. ii. fig. 13, Sumatra.

Dexiosoma flavescens, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 369, France.

Sarcophaginæ.

Hagen, H. A. List of North American *Sarcophagidæ* examined by R. H. Meade. Canad. Ent. xiii. pp. 146–150.

Sarcophaga. Larva extracted from a swelling on a girl's neck at Toronto; Hagen, P. Bost. Soc. xx. pp. 409 & 410. *S. lineata*, Fall, destructive to locusts in the Troad; S. S. Saunders, P. E. Soc. 1881, pp. xxiii.–xxvi. *S. truncata*, Schin., = *flavifrons*, Macq., Arribálzaga, S. E. Z. xlii. p. 46, Exped. Rio Negro, Zool. p. 89.

Sarcophaga rufipalpis, sp. n., Van der Wulp, Midden-Sumatra, Dipt p. 42, Sumatra.

Phrissopoda metallica, sp. n., *id. l. c.* p. 43, pl. iii. fig. 1, Sumatra.

Muscinæ.

Conil's paper on Myiasis [*cf.* Zool. Rec. xvii. *Ins.* p. 190] is reprinted in Arch. Zool. ix. pp. 276–298; also in Ann. Sci. Nat. (6) x. No. 6, pp. 27, pl. xxiv.

Calliphora dasyophthalma, Macq., from the Auckland Islands discussed; Mik, Verh. z.-b. Wien, xxxi. p. 203.

Graphomyia picta, Zett., recorded as new to Britain; Verrall, Ent. M. M. xviii. pp. 149 & 151.

Musca domestica. Monstrosity with three wings; Rudow, Ent. Nachr. vii. p. 84. *M. vomitoria* (cf. Viallanes, H., *antea*, p. 235).

Glossina morsitans, Westw. (Tsetze), discussed and figured by him; Oates's "Matabele Land," p. 363, pl. G, fig. 2, pl. H, figs. 4 & 4 *a*, *b*. Localities, habits, destructiveness, &c.; Bradshaw, Tr. S. Afr. Soc. ii. pp. 51–55. Said to breed in buffalo dung; *id.* P. R. G. S. iii. p. 212.

Rutilia smaragdifera, Bigot, = *pretiosa*, Voll.; Bigot, Ann. Soc. Ent. Fr. (6) i. p. 373.

Idia cervina, Osten-Sacken, Ann. Mus. Genov. xvi. p. 448, Amboina. *I. lateralis*, Van der Wulp, Midden-Sumatra, Dipt. p. 44, pl. iii. fig. 2, Sumatra; spp. nn.

Calliphora fulviceps, id. *l. c.* p. 44, pl. iii. figs. 3 & 4 (heads), Sumatra; *C. antennatis*, Hutton, Cat. N. Z. Dipt. p. 60, Dunedin; spp. nn.

Ochromyia bicolor, sp. n., Van der Wulp, *l. c.* p. 45, Sumatra.

Anthomyinæ.

Hagen, H. A. List of North American *Anthomyidæ*, examined by R. H. Meade. Canad. Ent. xiii. pp. 43–51.

The identity of many species in an American collection examined by Meade, with European species, is pointed out.

Inchbald, P. Remarks on our Dipterous Plant-miners, and the plants they affect. Ent. xiv. pp. 41–43.

Includes a general sketch of the habits of the larvæ, and instructions for rearing them.

——. Dipterous Plant-miners in their perfect state. *L. c.* pp. 290–292.

A series of observations classified under the orders of plants on which the insects feed.

Kowarz, F. Die Dipterengattung *Lasiops*, Meig., ap. Rond., ein Beitrag zum Studium der europäischen Anthomyiden. MT. Münch. ent. Ver. iv. pp. 123–140.

8 good species of this restricted genus are described, those already

known being *L. glacialis*, Zett. (= *hirticeps*, Zett.), *anthomyina*, Rond., and *eriophthalma*, Zett. Several other doubtful species are also mentioned.

Meade, R. H. Annotated List of British *Anthomyiidæ*. Ent. M. M. xviii. pp. 1–5, 27, 28, 62–65, 123–126, figs. 1 & 2.

The genera are characterized, and various species remarked on as follows:—*Hyetodesia serva*, Meig., distinguishing characters, *nivalis*, Zett., = *dispar*, Fall., *vagans*, Fall., perhaps = *basalis*, Zett., var., *scutellaris*, Fall. (*populi* and *variegata*, Meig., are varr.); *Mydæa nigritella*, Zett., *allotalla*, *urbana*, and *separata*, Meig., *angelicæ*, Scop., redescribed, *flavcola*, Fall.; *Spilogaster maculosa*, Meig., *notata* and 4-*maculata*, Fall., *duplicata*, Meig. (redescribed), *duplaris*, Zett., *communis*, Desv., *quadrum*, Fabr., *flavipes*, Rond., *depuncta*, *consimilis* and *fuscata*, Fall.; *Limnophora compuncta*, Meig., *septem-notata*, *triangulifera*, *contractifrons*, and 7-*notata*, Zett.; *Hydrophoria ambigua*, Fall., and *divisa*, Meig., *caudata* and *brunneifrons*, Zett., *anthomyica*, Rond., and *socia*, Fall.; *Hydrotæa cyrtoneurina*, Zett., *irritans*, Fall., *dentipes*, Fabr. (wing figured), *palæstrica*, Meig., *meteorica*, Linn., *armipes*, Fabr.

Anthomyia (*Chortophila*) *betæ*, Curt. (Mangold Fly). Habits and transformations described and figured; Fitch & others, Ent. xiv. pp. 8–13, 25–30, 71, 164–166, woodcuts.

Trichopticus armipes, Bellardi. Dermal appendages of the legs described and figured; Camerano, Atti Acc. Tor. xvi. pp. 99–102, pl. i.

New species:—

Hyetodesia dubia, Meade, Ent. M. M. xviii. p. 4, England, Hungary.

Hydrotæa rondanii and *fasciculata*, id. *ibid.*, Britain.

Lasiops roderi, Bohemia, Harz., p. 128, *ctenocnema*, Bohemia, England, p. 130, *meadii*, Bradford, p. 131, *parviceps*, p. 132, and *adelpha*, Bohemia, p. 133, Kowarz, MT. Münch. ent. Ver. iv.

Aricia almquisti, Holmgren, Nov. Spec. Ins. p. 17, Novaya Zemlya.

Spilogaster albiceps, Van der Wulp, Midden-Sumatra, Dipt. p. 47, Sumatra.

Cœnosia modesta, id. *l. c.* p. 48, Sumatra.

Cordylurinæ.

Hydromyza livens, Fall. Transformations described; Gercke, Verh. Ver. Hamb. iv. pp. 229–234, pl. viii.

Scatophaga villipes, Zett., redescribed; Hansen, Nat. Tidskr. (3) xiii. pp. 264 & 265.

Scatomyza stuxbergi, sp. n., Holmgren, Nov. Spec. Ins. p. 24, Novaya Zemlya.

Thyreophora antipodum, sp. n., Osten-Sacken, Ent. M. M. xviii. p. 35, Tasmania.

Helomyzinæ.

Blephariptera cartereaui, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 370, Bar-sur-Seine.

Sciomyzinæ.

Day remarks on several known species of *Sciomyzidæ*, and describes some new ones; *Tetanocera sparsa*, Loew, is only a variety of *combinata*, Loew. Canad. Ent. xiii. p. 85.

Actora æstuans, Meig. Habits, transformations, and parasite noticed. Both the perfect insect and the larva are subject to frequent immersion in sea-water; the former is protected by a wax-like secretion, which is constantly renewed. Joseph, JB. schles. Ges. lviii. pp. 114 & 115.

Scyomyza nigrifrons, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 371, Lower Alps.

Tetanocera pubescens, Washington Territory, *montana*, Wyoming, and *lineata*, Connecticut, Day, Canad. Ent. xiii. pp. 86–88: spp. nn.

Dryomyza pallida, sp. n., id. *l. c.* p. 89, Connecticut.

Micropezinæ.

Telostylus bimaculatus, Bigot, = *Conurgia remipes*, Walk.; Bigot, Ann. Soc. Ent. Fr. (6) i. p. 374.

Nestima, g. n., Osten-Sacken, Ann. Mus. Genov. xvi. p. 457. Allied to *Calobata*; type, *C. polita*, sp. n., *l. c.* p. 458, New Guinea.

Calobata prudens, Sumatra, p. 455, *lunaria*, Ternate, p. 456, *morbida*, Java and Sumatra, p. 457, and fig., Osten-Sacken, Ann. Mus. Genov. xvi.; *C. nigripes*, fig. 13, and *tuberculata*, fig. 14 (head), Van der Wulp, Midden-Sumatra, Dipt. p. 54, pl. iii. Sumatra: spp. nn.

Ortalinæ.

Ulidia and allies. Table of European genera, and list of species; Röder, B. E. Z. xxv. pp. 209–211.

Dacus oleæ and parasites noticed; Lucas, Bull. Soc. Ent. Fr. (6) i. pp. xiii. & xiv.

Zygotricha robusta, Bigot, belongs to *Achias*; Bigot, Ann. Soc. Ent. Fr. (6) i. p. 373.

New genera and species :—

Eurycephala, Röder, B. E. Z. xxv. p. 211. Allied to *Œdopa*, and connects the *Ulidiinæ* with the *Ortalinæ*; type, *E. myopiformis*, sp. n., *l. c.* p. 212, California.

Antineura, Osten-Sacken, Bull. Soc. Ent. Fr. (6) i. p. xcix. Allied to *Stenopterina*; types, *A. stolata* and *sericata*, spp. nn., *l. c.*, Philippines.

Philocompus, id. *ibid.* Allied to last; type, *P. cupidus*, sp. n., *l. c.*, Philippines.

Xenaspis, id. *ibid.* Type, *X. polistes*, sp. n., *l. c.*, Philippines.

Naupoda, id. *l. c.* p. c. Type, *N. platessa*, sp. n., *l. c.*, Philippines.

Asyntona, id. *ibid.* Allied to last; type, *A. doleschalli*, sp. n., *l. c.*, Amboina.

Diplochorda, id. Ann. Mus. Genov. xvi. p. 484. Allied to *Elaphomyia*; types, *Dacus turgida*, Walk. (= *D. concisus*, Walk., = *E. brevicornis*, Saund., ♀); *brevicornis*, Saund., ♂, and *D. ophion* and *myrmea*, spp. nn., *l. c.* p. 488, New Guinea.

Platystoma superba[*-bum*], Van der Wulp, Midden-Sumatra, Dipt. p. 50, pl. iii. fig. 5. (wing), Sumatra.

Herina cyaneicentris, id. *l. c.* p. 51, pl. iii. fig. 6 (wing), Sumatra.

Stenoperina didyma, Osten-Sacken, Ann. Mus. Genov. xvi. p. 465, fig., New Guinea.

Clitamia liturata, *amabilis*, p. 468, fig., *rivellioides*, p. 469, fig., *id. l. c.*, New Guinea.

Euxesta prima, id. *l. c.* p. 470, fig., Kandari, Celebes.

Euprosopia tigrina, id. *l. c.* p. 473, fig., Dorey.

Achias albertisi, id. *ibid.*, New Guinea.

Trypetinæ.

Tephritis meleagris, Schin., = *Acinia rufa*, Macq.; Arribálzaga, S. E. Z. xlii. p. 46, and Exped. Rio Negro, Zool. p. 90.

Atopognathus, g. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 24. Allied to *Urophora*; type, *A. flatipalpus*, sp. n., *l. c.*, Ternate.

Trypeta (*Acanthoneura*) *polyxena*, sp. n., Osten-Sacken, Ann. Mus. Genov. xvi. p. 462, fig., Java.

Xiria obliqua, sp. n., *id. l. c.* p. 463, fig., Sumatra.

Ptilona sexmaculata, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 51, pl. iii. figs. 7–11 (details), Sumatra.

Amethysa intermedia, sp. n., Arribálzaga, S. E. Z. xlii. p. 191, and Exped. Rio Negro, Zool. p. 90, Rio Colorado (Patagonia).

Lonchæinæ.

Lonchæa fulvicornis, sp. n., Bigot, Ann. Soc. Ent. Fr. (6) i. p. 370, Lower Alps.

Sapromyzinæ.

Sapromyza bipunctata, Meig., recorded as new to Britain; Bloomfield, Ent. M. M. xvii. p. 260.

Minettia signata, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 52, pl. iii. fig. 12 (abdomen), Sumatra.

Celyphinæ.

Celyphus levis, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 53, Sumatra.

Diopsinæ.

Diopsis argentifera, Bigot, = *subnitida*, Westw.; *Sphyracephala cothurnata*, Bigot, amended description: Bigot, Ann. Soc. Ent. Fr. (6) i. p. 373.

Phycodrominæ.

Cælopa littoralis, sp. n., Hutton, Cat. N. Z. Dipt. p. 69, New Zealand.

Piophilinæ.

Piophila ruficornis, sp. n., Van der Wulp, Midden Sumatra, Dipt. p. 49, Sumatra.

Chloropsinidæ.

Cerais, g. n., Van der Wulp, Midden-Sumatra, Dipt. p. 64. Allied to *Chloropsinus*; type, *C. magnicornis*, sp. n., *l. c.* p. 65, pl. iii. figs. 15–17, Sumatra.

Ephydrinæ.

Notiphila ciliata, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 55, Sumatra.

Clasiopa albitarsis, sp. n., *id. l. c.* p. 56, Sumatra.

Discomyza punctipennis, sp. n., *id. l. c.* p. 56, pl. iii. fig. 18 (wing), Sumatra.

Parydra bicuspidata, sp. n., Karsch, Arch. f. Nat. xlvii. p. 15, pl. i. figs. 1–2, Porto Allegre.

Geomyzinæ.

Diastata, sp. mining corn; Comstock, Rep. Dep. Agric. 1880, pp. 245 & 260.

Drosophilinæ.

Drosophila cellaris, bred in a bottle of pickle; Fitch, P. E. Soc. 1881, p. xxi. *D. uvarum* apparently parasitic on *Polistes*; Bigot, Bull. Soc. Ent. Fr. (6) i. pp. xxiii. & xxiv.

Drosophila lineata, sp. n., Van der Wulp, Midden-Sumatra, Dipt. p. 57, Sumatra.

Oscinides.

Oscinis granarius, Curt., probably = *O. avenæ*, Bjerk.; Fitch, P. E. S. 1881, p. xxxvi. *O. trifolii* and *malvæ*, Burgess, Rep. Dep. Agric. 1879, pp. 200 & 201.

Chlorops nasuta, Schrank: swarms at Lippstadt; Ent. Nachr. vii. p. 17. *C. proxima*, Say, noticed; Comstock, Rep. Dep. Agric. 1879, pp. 257 & 258. *C. tæniopus*: natural history; Portchinsky (in Russian, St. Petersburg: 1881, 8vo, pp. 27).

Callistorrhina vittigera, Bigot, = *Cephaloconus tenebrosus*, Walk.; Bigot, Ann. Soc. Ent. Fr. (6) i. p. 374.

Agromyzinæ.

Agromyza australensis, Mik, Verh. z.-b. Wien, xxxi. p. 203, pl. xiii. fig. 15 (wing), Auckland Islands.

Leucopis puncticornis, Meig. The larva, which feeds in the galls of *Tetraneura ulmi*, creeps like a leech; Dewitz, SB. nat. Fr. 1881, pp. 103–106, figs.

Phorinæ.

Phora, sp. (?) parasitic on the larva of *Lina tremulæ*; Bugnion, Bull. Soc. Vaud. (2) xvii. p. 29, pl. ii. fig. 15. *P. rufipes*, &c., Meig., parasitic on various *Hymenoptera*; P. E. Soc. 1881, p. xxxvii.

Hippoboscidæ.

Ornithomyia nigricans, Leach, noticed ; Van der Wulp, Midden-Sumatra, Dipt. p. 57.

Ornithomyia synallaxides, sp. n., Arribálzaga, S. E. Z. xlii. p. 192, and Exped. Rio Negro, Zool. p. 90. Parasitic on *Synallaxis* (*Bathmicercus*) *patagonica* (Lafr.), Gray, Patagonia.

Nycteribia : on the oviposition and larva of a species observed by Humbert in Ceylon ; Osten-Sacken, Tr. E. Soc. 1881, pp. 359–361, pl. xvi. *N. jenynsi*, Westw., noticed ; Van der Wulp, Midden-Sumatra, Dipt. p. 58.

Nycteribia minuta, sp. n., *id. l. c.* p. 58, Sumatra.

(APHANIPTERA.)

Pulicidæ.

Weyenbergh, H. Sobre la familia *Pulicidæ*, con descripcion de algunas nuevas especies. Period. Zool. Argent. iii. pp. 261–277.

A list of species, according to Ritsema ; notes on those previously described by the author, and descriptions of several new ones.

Pulex. The mandibles form a proboscis by the union of their dentated sides, and are placed almost between the eyes. Between the mandibles is a small denticulated organ, or "languette," which appears to be analogous to the piston-like organ (stylum) of the bee ; Bielet, Bull. Soc. Vaud. (2) xvii. p. vi.

Pulex, sp. on rabbit infested with numerous specimens of *Acarellus* ; two curious appendages resembling palpi situated just above pygidium, but not present in other species examined : Lewis, J. Quek. Club, vi. pp. 168 & 169.

Pulex parviceps, sp. n., Weyenbergh, Bol. Ac. Arg. iii. pp. 194–212, Argentine Republic.

Ceratophyllus rufulus and *isidori*, id. Period. Zool. Argent. iii. pp. 265 & 271, Argentine Republic ; spp. nn.

Pulex (*Hectopsylla* ?) *testudo*, p. 267, *P. nasuæ*, p. 272, *obscurus*, p. 273, *concoloris* and *cavicola*, p. 274, *id. l. c.*, spp. nn.

NEUROPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

ALBARDA, HERMAN. *Neuroptera* in P. J. Veth's "Midden-Sumatra," iv., 2de Aflevering. Natuurlijke Historie, 5de Afdeeling, pp. 1–22, pls. i.–vi. Leiden: 1881 [*suprà*, p. 235].

The portion treating on *Neuroptera* in the volume devoted to Natural History in this work; the species are not numerous, and are spread over various families.

HAGEN, H. A. The Devonian Insects of New Brunswick. Bull. Mus. C. Z. viii. pp. 275–284.

A critical analysis of Scudder's memoir of the same title [*cf.* Zool. Rec. xvii. *Ins.* p. 195]. The author states that "none of these fossils has any relation whatever to the *Ephemeridæ*." *Platephemera antiqua* (p. 276) is part of the apical half of the wing of a gigantic dragon-fly. *Gerephemera simplex* (p. 277) is also referred to the *Odonata*. *Lithentomum harti* (p. 278) is of the type of *Chauliodes*, and probably pertained to the *Sialina*. *Homothetus fossilis* (ibid.) belongs to the *Sialina*. *Xenoneura antiquorum* (p. 279) belongs to the true *Neuroptera*, but no particular position is suggested. *Dyscritus vetustus* (p. 281) may belong to *Orthoptera*, *Pseudo-Neuroptera*, or *Neuroptera*, but the fragment is too insignificant to be identified. The author concludes that none of the insects were synthetic types; all were probably aquatic in the early stages; no near allies are known from the American Carboniferous strata, all the insects from which were probably terrestrial. Nomenclature of vague fossils should be discontinued. The paper ends with remarks on a fern found in the same slab with *Platephemera*, as bearing upon the presumed Devonian position of the latter. *Cf.* also Nature, xxiii. pp. 483 & 484, and J. Micr. Soc. (2) i. p. 731.

MCLACHLAN, ROBERT. *Trichoptera* and *Neuroptera* of the Upper Engadine in August. Ent. M. M. xvii. pp. 217–222.

Enumerates the species captured on an excursion in August, 1880. The more prominent species will be alluded to under the special headings.

[McLachlan, Robert.] Trichoptères, Névroptères-Planipennes, et Pseudo-Névroptères, récoltés pendant une excursion en Belgique au mois de Juillet, 1881. CR. Ent. Belg. xxv. pp. cxxvi.-cxxxvi.

Enumerates 112 species, including 62 *Trichoptera*, 21 *Planipennia*, and 29 *Pseudo-Neuroptera* (without the *Odonata*).

Rostock, M. Verzeichniss der Neuropteren Deutschlands, Oesterreichs, und der Schweiz. Ent. Nachr. vii. pp. 217–228.

A name-list of 565 species of all families. At p. 285, the author gives additions and corrections.

A brief sketch of the Order (limited to *Trichoptera* and *Planipennia*) and of the larger divisions is given by McLachlan, article "Insects," in Encyc. Brit., 9th edition, xiii. p. 151.

Preliminary notes on the fossil *Neuroptera* of the tertiary lake-basin at Florissant, Colorado, are given by S. H. Scudder in Bull. U. S. Geol. Surv. vi. p. 293. They appear to be made up largely of *Trichoptera*, but there are many others. Some new generic terms are indicated, but they cannot be alluded to here until the descriptions appear.

S. H. Scudder's memoir on the Devonian Insects of New Brunswick, reviewed and abstracted in Arch. sci. nat. (3) v. pp. 291–293; Naturf. xiv. pp. 141–143; Am. J. Sci. (3) xxii. pp. 111–117; J. R. Micr. Soc. (2) i. p. 236; Ann. N. H. (5) vii. pp. 255–261. Eaton replies to Scudder's criticisms in this memoir; Nature, xxiii. p. 507.

Lithomantis carbonarius, Woodward, should be referred to the *Neuroptera*; Scudder, Geol. Mag. 1881, p. 296.

Archeoptilus, g. n., Scudder, *l. c.* 1881, pp. 295 & 296; type, *A. ingens*, *l. c.*, fossil in the Carboniferous of Chesterfield.

Lithosialis, g. n., *id. l. c.* p. 299. Proposed for the fossil *Corydalis brongniarti*, Mantell, which is considered of uncertain position.

Trichoptera.

Dewitz, H. Ueber die Flügelbildung bei Phryganiden und Lepidopteren. B. E. Z. xxv. pp. 53–60, pls. iv. & v.

Concerns the development of the wings as traceable in the larvæ. The author states that the place in the two groups is very similar, and tends to prove their near connection. The figures show the wing-rudiments in a greatly enlarged manner.

McLachlan, Robert. Finska *Trichoptera*. Medd. Soc. Fenn. vii. pp. 159–189.

A list of the species known to occur in Finland, with localities. Compiled in Finland from the Recorder's determinations, with introductory notes by J. A. Palmén.

——. See *Neuroptera* (The General Subject).

Weyenbergh, H. Over Argentijnsche *Trichoptera*, No. 1. Tijdschr. Ent. xxiv. pp. 132–140, pl. xiv. figs. 3–13.

An account of the habits and metamorphoses of a species given as *Rhiacophila* [sic] *primerana*, sp. n. [The Recorder is of opinion that the

insect cannot possibly be a *Rhyacophila*, and that the figures are too vague to enable anyone to suggest the true position of the species under consideration. The history of habits is full and interesting.]

A note by P. Mabille on *Trichoptera* in amber occurs in Bull. Soc. Ent. Fr. (6) i. p. lii. [He is evidently unaware of Pictet & Hagen's memoirs in Berendt's "Organische Reste im Bernstein."]

McLachlan's "Revision and Synopsis" of European species reviewed by Hagen in S. E. Z. xlii. pp. 118–120.

An abstract of Fritz Müller's memoir on the *Trichoptera* of Santa Catharina [*cf.* Zool. Rec. xvii. *Ins.* p. 197] is given in J. R. Micr. Soc. (2) i. p. 239.

Rhyacophila dorsalis, C., *Plectrocnemia conspersa*, C., *Limnophilus griseus*, L., and *L. sparsus*, C., recorded from the Färöe Islands; H. J. Hansen, Nat. Tids. xiii. p. 251.

Phryganeidæ.

Phryganea obsoleta (Hag.), McLach. Common in the Upper Engadine in August; McLachlan, Ent. M. M. xvii. p. 219.

Limnophilidæ.

Limnophilus despectus, Walker, occurs in the Upper Engadine at an elevation of about 6000 feet; McLachlan, Ent. M. M. xvii. p. 219.

Limnophilus subcentralis, Brauer, occurs in Scotland; J. J. King, Ent. M. M. xviii. p. 72.

Halesus ruficollis, Pict., abundant in the Upper Engadine; *id. l. c.* p. 220.

Apatania. A species of this genus (possibly *A. arctica*, Boh.) occurs in Novaya Zemlya; McLachlan, in A. H. Markham's "Polar Reconnaissance," p. 382.

Sericostomatidæ.

Œcismus monedula, Hag., in Belgium; McLachlan, CR. Ent. Belg. xxv. p. cxxviii.

Micrasema: an uncertain species of this genus found in Belgium; *id. l. c.* p. cxxix.

Leptoceridæ.

Molanna palpata, McLach., occurs abundantly in Inverness-shire, Scotland; J. J. King, Ent. M. M. xvii. p. 185; Scot. Nat. vi. p. 14; Ent. xiv. p. 20.

Leptocerus commutatus (Rostock), McLach., *Homilia leucophæa*, Ramb., *Adicella reducta*, McLach., *Œcetis testacea*, Curt., *Œ. tripunctata*, F., *Setodes argentipunctella*, McLach., and *S. punctata*, F., new to Belgium; McLachlan, CR. Ent. Belg. xxv. p. cxxxi.

Leptocerus interjectus, sp. n., *id. l. c.* p. cxxx., Belgium.

Asotocerus fuscipennis, sp. n., Albarda, Veth's Midden-Sumatra, iv. pt. 5, p. 17, Sumatra.

Hydropsychidæ.

Hydropsyche instabilis, Curt., *Philopotamus variegatus*, Scop., and *Tinodes unicolor*, Pict., new to Belgium ; McLachlan, CR. Ent. Belg. xxv. pp. cxxxi. & cxxxii.

Polycentropus kingi, sp. n., McLachlan, Ent. M. M. xvii. p. 254, woodcut, Scotland (England and Portugal).

Macronema fasciatum and *fenestratum*, spp. nn., Albarda, Veth's Midden-Sumatra, iv. pt. 5, pl. v. figs. 2 & 3, Sumatra and Java.

Dipseudopsis nebulosa, sp. n., *id. l. c.* p. 19, pl. v. fig. 4, Sumatra.

Hydromanicus flavo-guttatus, sp. n., *id. l. c.* p. 19, pl. vi. fig. 1, Sumatra, Borneo, and Java.

Stenopsyche ochripennis, sp. n., *id. l. c.* p. 20, pl. vi. fig. 2, Sumatra and Borneo.

Rhyacophilidæ.

Rhyacophila. Notes on the species occurring in the Upper Engadine ; McLachlan, Ent. M. M. xvii. p. 220.

Chimarrha marginata, L., *Rhyacophila tristis* and *pubescens*, Pict., and *Ptilocolepus granulatus*, Pict., new to Belgium; *id.*, CR. Ent. Belg. xxv. pp. cxxxii. & cxxxiii.

Rhyacophila primerana, sp. n., Weyenbergh, Tijdschr. Ent. xxiv. p. 138, pl. xiv., Cordova. [See *anteà*, p. 256.]

NEUROPTERA-PLANIPENNIA.

KILJANDER, LUDVIG. Bidrag till kännedom om Finlands *Neuroptera Planipennia*. Medd. Soc. Fenn., vii. pp. 153–156.

An enumeration of 19 species (of which 1 is given as new), with localities, &c.

Brodia, g. n., Scudder, Geol. Mag., 1881, pp. 293–295. "A Planipennian in a broad sense, refusing to affiliate closely with the restricted families of the present day." Type, *B. prisco-tincta*, sp. n., *l. c.*, with woodcut. Fossil in the Carboniferous of Dudley.

Panorpidæ.

Bittacus hageni, Brauer, discovered in Belgium; McLachlan, CR. Ent. Belg. xxv. p. cxxxiv.

The form of the stigmata in *Parnorpa communis* discussed by O. Krancher ; Z. wiss. Zool. xxxv. p. 553.

Bittacus chlorostigma, sp. n., McLachlan, Ent. M. M. xviii. p. 36, woodcut, South California.

Panorpodes oregonensis, sp. n., *id. l. c.* p. 37, woodcut, North Oregon.

Mantispidæ.

Mantispa decorata, Erichs., in the interior of the Argentine Republic ; C. Berg, S. E. Z. xlii. p. 40.

Osmylidæ.

Sisyra terminalis, Curt., occurs in Belgium, and the types of *S. fuscata*, Ramb., belong to this species, and not to *S. fuscata*, Fabr.; McLachlan, CR. Ent. Belg. xxv. p. cxxxiii.

Osmylus langi, McLach., figured in Waterhouse's Aid to Identification of Insects, i. pl. 71.

Hemerobiidæ.

Sartena, Hagen, 1864, = *Neurorthus*, Costa, 1863, and *S. amœna*, Hag., = *N. iridipennis*, Costa; probably Rambur's *Mucropalpus fallax* (1842), is also identical; McLachlan, Ent. M. M. xviii. p. 89. Hagen, *l. c.* p. 140, agrees, and is of opinion that *M. fallax*, is certainly identical, in which case the insect should be termed *Neurorthus fallax*, Rambur.

Dilar americanus, sp. n., McLachlan, Ent. M. M. xviii. p. 55, Kentucky.

Chrysopidæ.

A. Constant, Bull. Soc. Ent. Fr. (6) i. pp. xxi.–xxiii., relates that having a brood of larvæ of *Pempelia euphorbiella*, he was surprised to find amongst them larvæ of "Hémérobes" (probably *Chrysopa*) which devoured the larvæ of the moth. He placed them subsequently with the larvæ of various *Noctuidæ*, which, after violent contortions, succumbed to the attacks of their enemies. H. Lucas, *l. c.* p. xxx., follows up these observations by adding that on one occasion he found larvæ of "*Hemerobius*" devouring those of *Hylotoma rosæ*, and they produced "*Hemerobius perla*."

Chrysopa vulgaris found in quantity on the snow in December, when the temperature was as low as — 8° Réaumur. Spatzier, SB. Ver. Brünn, xix. p. 19. Discovered in the Island of Ascension; C. O. Waterhouse, Ann. N. H. (5) viii. p. 436.

Chrysopa minima, sp. n., Kiljander, Medd. Soc. Fenn., vii. p. 154, Finland.

Chrysopa ochracea, sp. n., Albarda, Veth's Midden-Sumatra, iv., pt. 5, p. 15, Sumatra.

Nothochrysa sumatrana, sp. n., *id. l. c.* p. 15, Sumatra.

Leucochrysa abnormis, sp. n., *id. l. c.* p. 16, Sumatra.

Ascalaphidæ.

Ascalaphus kolyvanensis, Laxm., common near Gallipoli, Turkey; G. F. Mathew, Ent. M. M. xviii. p. 11.

Helcopteryx rhodiogramma, Ramb., figured in Waterhouse's Aid to Identification of Insects, pl. lxvii.

Myrmeleonidæ.

Dewitz, H. Mundtheile der Larve von *Myrmeleon*. SB. nat. Fr. 1881, pp. 163–165.

Controverts the assertion that the larva of *Myrmeleon* has no true mouth. Followed by observations by Peters on the same subject, especially with regard to Meinert's published statements.

Pseudo-Neuroptera.

Thysanura.

Collan, Uno. Om förekomsten af en Podurid (*Isotoma*, sp.) i stor mängd på snön i Januari, 1880. Medd. Soc. Fenn. vii. pp. 127 & 128.

No further indication of species given; the temperature varied from 0° to — 4°–5° Centigrade.

Ridley, H. N. Notes on *Thysanura* collected in the Canaries and Madeira. Ent. M. M. xviii. p. 14.

Notices the species found by Eaton in those islands, at the end of 1880. They include *Lepisma saccharina*, L., from the Canaries, *L. mauritanica*, Lucas, from the same islands, and a new species.

Degeeria. Notes on the double use of this term, in *Thysanura* and in *Diptera*, are published in Ent. M. M. xviii. pp. 19 & 43, by R. H. Meade & R. McLachlan. The former points out that Rondani, in 1842, proposed to substitute the term *Entomobrya* for *Degeeria*, Nicolet, in consequence of Meigen having previously employed it in *Diptera*.

Sminthurus. 19 species are found in Finland; enumerated with notes. O. M. Reuter, Medd. Soc. Fenn. vi. pp. 203–205.

Tomocerus plumbeus, L., and a *Smynthurus*, in the Newmarket Cave, Virginia; Packard, Am. Nat. xv. p. 232.

Campodea staphylinus, Westw., in Finland; J. Sahlberg, *l. c.* p. 249.

Degeeria pulchella, sp. n., H. N. Ridley, Ent. M. M. xvii. p. 270, England.

Lepisma eatoni, sp. n., *id. op. cit.* xviii. p. 14, Teneriffe.

Mallophaga.

Piaget, E. Quatre nouvelles Pédiculines. Tijdschr. Ent. xxiv. pp. 1–6, pl. i.

The title is somewhat misleading. The four species consist of :—*Docophorus leucogaster*, Giebel, redescribed and figured (fig. 1), found on *Buteo jackal*, and apparently considered by the author as only a var. of *D. platyrrhynchus*; *Oncophorus cephalotes*, p. 2, fig. 2, given as sp. n., but said to = *Nirmus cephalotes*, Giebel, redescribed; *Lipurus* (?) *zonatus*, sp. n., p. 3, fig. 3, on *Buceros nepalensis*; *Menopon acuto-vulvatum*, sp. n., p. 5, fig. 4, on *Buceros malabaricus*.

Simonetta, Luigi. Elenco sistematico dei Pediculini appartenuti al Museo Zoologico della Università di Pavia. Resoconti Ent. Ital. 1881, pp. 10–12.

A list of about 50 species (including *Anoplura*), nearly all from the neighbourhood of Pavia.

Trinoton conspurcatum, Nitzsch, on *Anser segetum*, in Novaya Zemlya; McLachlan, in Markham's "Polar Reconnaissance," p. 352.

Trichodectes subrostratus found on a cat in Scotland; J. Lambert, Sci. Goss. xvii. p. 18, with woodcut.

THYSANOPTERA.

WESTWOOD, J. O. The Pea *Thrips*. Gard. Chron. (2) xiv. p. 206, woodcuts (1880).

Describes an apparently new species (*T. pisivora*) destructive to peas at Oxford, with full notes on its economy.

Phlœothrips oleæ destructive to olives in Italy; Bull. Ent. Ital. xiii. p. 210.

TERMITIDÆ.

DÖDERLEIN, L. Termiten in Japan. MT. Ges. Ostasien's, iii. pp. 211 & 212.

[Not seen by the Recorder.]

LEIDY, JOSEPH. The Parasites of the *Termites*. J. Ac. Philad. (2) viii. pp. 425–427, pls. li. & lii.

Concerns entozoic parasites, several of which appear to be new forms.

Termes lucifugus, Rossi, is sometimes destructive in the district of Odessa; Köppen, Beiträge z. Kenntniss Russ. Reich. (2) i. pp. 87 & 88.

Large, nearly spherical, nests, encircling branches of trees in British Guiana, are alluded to by E. A. Ormerod in P. E. S. 1881, pp. v. & vi., with remarks on specimens exhibited. F. P. Pascoe states that he once found a similar nest in the Organ Mountains in Brazil, where it was called the 'negro-head,' a name very suggestive of its appearance (p. vi.). McLachlan, *ibid.*, states that these are probably allied to *T. opacus*, Hagen, but the species is not determinable in the absence of the winged forms.

Termes gilvus, Hagen, described and figured in its various conditions by H. Albarda in Veth's Midden-Sumatra, iv. pt. 5, pp. 13 & 14, pl. iv. figs 1–14.

Mixotermes, g. n., Sterzel, Ber. Ges. Chemn. 1878–80. Type, *Termes* (*M.*) *lugauensis*, sp. n., fossil in the Carboniferous of Lugau (cf. *Blattidæ*, in *Orthoptera*, infrà).

EMBIDÆ.

Embia solieri, Rambur. Maurice Girard, Bull. Soc. Ent. Fr. (6) i. p. cxxxvi., notes the discovery of the larvæ of this species under stones in the Eastern Pyrenees by M. Xambeu, and arrives at the conclusion that it is really indigenous, notwithstanding the doubts he had previously held.

Oligotoma saundersi said to be doing much mischief in the Island of Ascension; C. O. Waterhouse, Ann. N. H. (5) viii. p. 436.

PSOCIDÆ.

HAGEN, H. A. Some *Psocina* of the United States. Psyche, iii. pp 195, 196, 207–210, 219–223.

This paper contains a few systematic and synonymic notes, but it is most valuable for the copious, and in many cases new, anatomical and physiological details given under various headings; below is a brief

analysis of it as a whole. Under the heading *Cœcilius (Pterodela) pedicularius*, L., the author states that *Psocus salicis*, Hag., and *geologus*, Walsh (and perhaps *pusillus*, Harris), are synonyms; the species is redescribed; Riley has bred it from leaf-galls, but Linné had long ago described a species from galls as a *Tenthredo*, and also as *Cynips salicis strobili*. Many *Psocina* have the claws toothed; in *C. pedicularius* and others there is a very curious structure at the base of the claw in the shape of a hose, which if dilated forms a long funnel. *Elipsocus* is a natural genus, and *Mesopsocus*, Kolbe, does not present sufficient differences for generic separation, more especially as *E. laticeps*, Kolbe, is perhaps not distinct from *M. unipunctatus*; *Ps. signatus*, Hag., is not distinct: details for the short-winged forms (doubted by Kolbe) are given. Under *Psocus venosus*, Burm., is a very detailed account in different sections: at the extreme base of the wings there is a chitinous space having the appearance of a sieve, but in each of the apparent holes is a small bristle, the whole neuration (with slight exception) forming a double net, not only of veins but also of tracheæ; the "pterostigma hook" forms the dark spot at the base of the pterostigma, its structure is fully described; the "lock" of the fore-wings, by which the wings are united during flight, is fully described; the mouth parts differ apparently from those of all other insects, inasmuch as the inner lobe of the maxillæ slides in the outer as in a sheath, and was long ago indicated by Latreille. *Amphigerontia*, Kolbe, cannot stand on the characters assigned to it. *Ps. variegatus*, Latr., is also American; *Ps. mœstus*, Hag., is allied, but perhaps distinct, and is redescribed; *P. lichenotus*, Walsh, is also allied and is likewise redescribed; these are the only North American species that can fall into *Amphigerontia*.

Kolbe, H. Ueber eine introducirte ‚Psociden species (*Cœcilius hirtellus*. McLach.). S. E. Z. xlii. pp. 77–79.

Observations on the occurrence of the insect in a palm-house at Cologne, chiefly on *Aspidistria elatior*, a Japanese plant; hence the author thinks Japan may be its native country. It was originally found in a palm-house in Belgium.

——. Differenzen in dem Vorkommen einiger Psociden-species. *L. c.* pp. 236 & 237.

On the variation in the numbers of certain species in different years.

——. Psocidologische Berichtigungen. Ent. Nachr. vii. pp. 254–256.

Corrections to the local information, &c., given in Rostock's "Verzeichniss" (*anteâ*, p. 256).

Clothilla picea, Mots., abundant in old neglected collections at Hastings; McLachlan, Ent. M. M. xvii. p. 185.

In Beiträge Kenntniss Russ. Reich. (2) i. p. 89 [1879], Köppen refers to a previous observation by Motschoulsky to the effect that a species of *Psocus* (*Ps. cerealis*, Motsch., without description) was destructive to rye in Russia, and doubts the accuracy of the observation. [The insect was probably *Cœcilius pedicularius*, L., and its food the mildew on the rye.—Rec.]

PERLIDÆ.

IMHOF, OTHMAR EMIL. Beiträge zur Anatomie der *Perla maxima*, Scopoli. Inaugural Dissertation, pp. 1–41, with two plates. Aarau: 1881.

A very original and apparently exhaustive essay on the anatomy of the nervous, digestive, and reproductive systems.

Dictyopteryx alpina, Pict. Notes on this species from observations in the Upper Engadine; McLachlan, Ent. M. M. xvii. p. 221.

Perla selysi, Pict. Male described; McLachlan, CR. Ent. Belg. xxv. p. cxviii.

EPHEMERIDÆ.

CIACCIO, G. V. Sopra la notomia minuta degli occhi della *Cloe diptera*, L., Rend. Acc. Bologn. 1881, pp. 79–81.

EATON, A. E. An announcement of new genera of the *Ephemeridæ*. Ent. M. M. xvii. pp. 191–197 & xviii. pp. 21–27.

VAYSSIÈRE, ALBERT. Étude sur l'état parfait du *Prosopistoma punctifrons*. Ann. Sci. Nat. (6) xi., No. 1, pp. 1–15, pl. i.

This memoir commences with a somewhat detailed account of the anatomy of the nymph, the special feature being the manner in which all the systems have their parts or conditions "concentrated," owing to the form of the animal; this is principally made in connection with the genera *Cænis* and *Tricorythus*. Then follows an account of the changes in the nymph when near the period of metamorphosis, and, finally, a full account, both general and anatomical, of the ♀ sub-imago, the only condition under which the winged insect is as yet known. The relationship to *Cænis* appears to be somewhat close. The plate illustrates the various stages, and figures of the nymphs of *Baetisca* and *Tricorythus* are introduced for comparison. Extr. in Arch. sci. Nat. (3) vi. pp. 101–102; J. R. Micr. Soc. (2) i. p. 596; Biol. Centralbl. i. pp. 372–374; Ann. N. H. (5) viii. pp. 73–85, pl. x.

Cænis maxima, Joly. Replying to Vayssière's remarks on the nymph upon which this species is founded, Eaton states his reasons for having considered that it is not that of a true *Cænis*; and he is of opinion that it would be safer to consider it as representing something allied to *Cænis*, perhaps a *Tricorythus*, or perhaps a new genus. Ent. M. M. xviii. p. 21.

A list of 18 species collected in Belgium in July, 1880, determined by Eaton, is given by McLachlan in CR. Ent. Belg. xxv. p. cxxxv. Four species were new to the country.

Exuviation in flight. Under this heading, C. V. Riley has a note on this subject from McLachlan's observations on *Oligoneuria*, and his own on *Polymitarcys alba*. He is of opinion that exuviation must be commenced on the surface of the water. Am. Nat. xv. p. 395.

Two species from Sumatra belonging to the genera *Rhoenanthus* and *Isonychia* noticed by Albarda in Veth's Midden-Sumatra, iv. pt. 5, p. 12.

A larva, said to be that of *Ephemera vulgata*, anatomically figured by C. F. Young, Sci. Goss. xvii. p. 84.

Drawings of nymphs of various genera exhibited, with notes; A. E. Eaton, P. E. Soc. 1881, p. xiv.

Euthyplocia, notes on nymph of; *id. l. c.* p. xxi.

Palingenia longicauda, recorded from Hamm; Von Rochl, SB. Ver. Rheinl. 1881, p. 164.

Asthenopus, Eaton, = *Campsurus*, Eaton; Eaton, Ent. M. M. xvii. p. 192.

Leptophlebia. Eaton, *l. c.* pp. 193–196, subdivides this genus into several genera, retaining the name for *Eph. marginata*, L., as type.

Bætis is restricted by Eaton, *l. c.* p. 196, to *Eph. binoculata*, L., and allies, and is redescribed.

Heptagenia is equally subdivided, and the characters reviewed; *l. c.* xviii. pp. 21 & 24.

Ametropus, Albarda, recharacterized; *id. l. c.* p. 22.

Ecdyurus (= *Ecdyoneurus*, olim), Eaton, is reviewed by him, and has for type *Eph. venosa*, F.; *id. l. c.* p. 25.

New genera:—

Elassoneuria, Eaton, Ent. M. M. xvii. p. 191. Allied to *Oligoneuria*, differing in neuration, &c.; type, *Oligoneuria trimeniana*, McLach.

Spaniophlebia, id. *ibid.* Allied to *Lachlania*; type, *S. trailiæ*, sp. n., *ibid.*, Amazons.

Homœoneuria, id. *l. c.* p. 192. Allied to *Lachlania* and *Spaniophlebia*; type, *H. salviniæ*, sp. n., *ibid.*, Guatemala.

Jolia, id. *ibid.* Allied to *Polymitarcys*; type, *Palingenia rœseli*, Joly.

Rhoenanthus, id. *ibid.* Allied to *Potamanthus*, differing in the length of the setæ; type, *Rh. speciosus*, sp. n., *ibid.*, Lahat.

Blasturus, id. *l. c.* p. 193, = *Leptophlebia*, ser. 4, Eaton, 1871; type, *Ephemera cupida*, Hag.

Atalophlebia, id. *ibid.* Allied to *Leptophlebia*; type, *Ephemera australis*, Walker.

Adenophlebia, id. *l. c.* p. 194, = *Leptophlebia*, ser. 1 (portion) and ser. 2, Eaton, 1871; type, *Eph. dislocans* (= *L. auriculata*, ♀, Eaton), Walker.

Choroterpes, id. *ibid.* Allied to *Leptophlebia*; type, *Ch. lusitanica*, sp. n., *ibid.*, Portugal (= *L. picteti*, Eaton, *cf.* CR. Ent. Belg. xxv. p. cxxxv.).

Thraulus, id. *l. c.* p. 195. Allied to *Leptophlebia*; type, *Th. bellus*, sp. n., *ibid.*, Portugal.

Habrophlebia, id. *ibid.*, = *Leptophlebia*, ser. 5, Eaton, 1871; type, *Eph. fusca*, Curtis.

Callibætis, id. *l. c.* p. 196. Allied to *Bætis*; type, *Bætis pictus*, Eaton.

Calliarcys, id. *l. c.* xviii. p. 21. Allied to *Habrophlebia* and *Thraulus*; type, *C. humilis*, sp. n., *ibid.*, Portugal.

Chirotonetes is substituted for *Isonychus*, Eaton, on account of prior usage; *id. ibid.*

Atopopus, id. *l. c.* p. 22. Allied to *Heptagenia*; type, *A. tarsalis*, sp. n., *ibid.*, Labuan.

Thalerosphyrus, id. *ibid.* Allied to *Heptagenia*; type, *Bætis determinatus*, Walker.

Pægniodes, id. *l. c.* p. 23. Allied to *Heptagenia*; type, *H. cupulatus*, Eaton.

Compsoneuria, id. *ibid.* Allied to *Heptagenia*; type, *C. spectabilis*, sp. n.; *ibid.*, Lahat.

Rhithrogena, id. *ibid.* Allied to *Heptagenia*; type, *Bætis semicolorata*, Curt.

Epeorus, id. *l. c.*, p. 26. Allied to *Heptagenia*; type, *E. torrentium*, sp. n., *ibid.*, South France.

Odonata.

Bergroth, E. Zur geographischen Verbreitung einiger Odonaten. Ent. Nachr. vii. pp. 85–88.

Interesting notes on the species occurring in Finland, especially with regard to their northern distribution.

Cabot, Louis. The immature state of the *Odonata*. Part ii., Subfamily *Æschnina* [which see]. Mem. Mus. C. Z. viii., No. 1, pp. 1–40, pls. i.–v.

Eimer, —. Eine Dipteren und Libellenwanderung beobachtet im September, 1880. Biol. Centralbl. i. pp. 549–557.

Contains a reference to a swarm of *Diplax scotica* as seen in the Engadine, with extracts from a letter from Klunzinger respecting an *Æschna* in Egypt.

Kemp-Welch, E. B. Chapters on British Dragon flies. Sci. Goss. xvii. pp. 35–38, 54, 55, 78 & 79.

A popular paper, based upon Hagen's synopsis in Ent. Ann. 1857, with rough woodcuts.

Kolbe, H. Uber den Zweck der Appendices anales und der entsprechenden vicariierenden Organe am Hinterleibsende der Libelluliden. JB. westf. Ver. 1881, pp. 52–56.

An attempt to correlate the form of the anal appendages of the ♂ with that of the margin of the pronotum in the ♀, in connection with the position of the sexes during the copulative act.

——. Weitere Beiträge zur Kenntniss der Odonaten-fauna Westfalens. *L. c.* pp. 56–58.

3 species (*Leucorrhinia rubicunda*, *Ophiogomphus serpentinus*, and *Agrion armatum*) added to the fauna, which now includes 47. Special and general geographical notes on other species are also given.

Lendenfeld, R. v. Ein Beitrag zur Anatomie und Physiologie der Flugorgane der Insecten. SB. Ak. Wien, lxxxiii. pp. 289–376, pls. i.–vii.

A most elaborate treatise, of which it is impossible to give a short abstract; it is worked out from both the anatomical and physical aspects of the movement, with copious figures, diagrams, and mathematical demonstrations. The subject is also treated upon in comparison with the

results derived from an investigation of the mechanism, &c., of flight in birds, and has a copious bibliography. An abstract, relating only to the thoracic muscles, is given by the author in Zool. Anz. iv. pp. 23 & 24.

McLachlan, Robert. Notes on *Odonata* of the subfamilies *Corduliina*, *Calopterygina*, and *Agrionina* (Légion *Pseudostigma*), collected by Mr. Buckley, in the district of the Rio Bobonaza, in Ecuador. Tr. E. Soc. 1881, pp. 25–34.

Supplementary to notes published in 1878 [*cf.* Zool. Rec. xv. *Ins.* p. 257], so far as Ecuador in general is concerned.

Polétajeff, N. Sur les muscles d'ailes chez les Odonates. Troudy Ent. Ross. xi. pp. 190–194.

——, Olga. Les Odonates de St. Pétersbourg. *L. c.* pp. 97–119. [1880: *cf.* Zool. Rec. xvi. *Ins.* p. 213.]

In Russian. Enumerates 8 *Libellulina*, 3 *Corduliina*, 2 *Gomphina*, 5 *Æschnina*, 1 *Calopterygina*, and 8 *Agrionina*, with notes on larvæ and habits.

——. Quelques mots sur les Organes respiratoires chez les Nymphes des Libellules. *L. c.* pp. 182-189.

Also in French in Hor. Ent. Ross. xv. pp. 436–451, pls. xii.–xx.

A list of 9 *Libellulidæ*, 1 *Æschnidæ*, and 6 *Agrionidæ*, collected in "La Cerdaña española," is given by Cuni in An. Soc. Esp. x. p. 375.

A sketch of the Odonate fauna of Algeria, by De Selys-Longchamps, appears in Rev. Montp. (3) i. pp. 183–185. Of 47 known species, 6 pertain to the fauna of tropical Africa or Asia, 4, although apparently purely Algerian, may perhaps be found in the South of Europe. The remaining 37 species are European, but 6 of them are known only in restricted localities on that continent. Some comparative notes on the African fauna in general are also given.

Notes on a few unimportant Belgian species are given by McLachlan and De Selys-Longchamps in CR. Ent. Belg. xxv. p. cxxxvi.

The form of the stigmata discussed by O. Krancher in Z. wiss. Zool. xxxv. pp. 551–553.

Libellulina.

Migration of *Libellula quadrimaculata*. G. Weidinger, Ent. Nachr. vii. p. 187, notices an immense swarm that passed over Dresden on May 28th from south to north; they were mostly males, and were followed by several species of birds which preyed upon them. At *l. c.* p. 216, is a note on swarms in the Neisse Valley, one of which took two hours to pass. F. Landwehr, *l. c.* p. 280, records a great swarm at Bielefeld on May 30th, going towards the north-west.

16 species (of which 1 is new) recorded from Sumatra by Albarda in Veth's Midden-Sumatra, iv. pt. 5, pp. 1–4.

Palpopleura fasciata, L., figured in Waterhouse's Aid to Identification of Insects, i. pl. xxxii.

Zyxomma obtusum (Hag.), sp. n., Albarda, *l. c.* p. 1, pl. i. figs. 1 & 2, Sumatra.

Corduliina.

P. de Borre gives notes on the larvæ of 3 Belgian species, viz.:—*Cordulia ænea* and *metallica*, and *Epitheca bimaculata*, with translations of Hagen's previous description of them; CR. Ent. Belg. xxv. pp. lxix. & lxx.

Gomphomacromia batesi, Selys, ♀ described from Ecuador; McLachlan, Tr. E. Soc. 1881, p. 26.

Neophya, g. n., De Selys-Longchamps, CR. Ent. Belg. xxv. p. xvi. Differs from all other genera of the subfamily (*Cordulephya* excepted) in the form of the triangles of the anterior wings; and also in its open reticulation, &c. Type, *N. rutherfordi*, sp. n. (McLachlan, MS.), *l. c.* p. xvii. (wings figured), Old Calabar.

Gomphomacromia fallax, sp. n., McLachlan, *l. c.* p. 141, Ecuador.

Æschnina.

Amans, P. Recherches anatomiques et physiologiques sur la larve de l'*Æschna grandis*. Rev. Montp. (3) i. pp. 63–74, pl. ii.

Treats briefly on the buccal system, alimentary canal, and respiratory apparatus; with new ideas on the mechanism of the 'mask.'

Æschna crenata, Hagen. E. Bergroth, Ent. Nachr. vii. p. 86, gives critical notes on this species, with which he considers *Æ. maxima*, Heikel, to be probably identical.

A larva of *Æschna*, when disturbed, sent out a fine stream of water from the caudal end of its body to the distance of two or three feet, and continued doing so indefinitely; Sarah P. Monks, Am. Nat. xv. p. 141.

Louis Cabot (cf. *Odonata*) gives detailed descriptions, with figures, of the earlier states of 24 species, preceded by a preface, bibliography, and general description for the subfamily. The species are:—*Gynacantha* (?), p. 12, pl. iii. fig. 2; *Anax formosus*, p. 13, pl. i. fig. 1, *A. mauricianus*, p. 14 (a little doubtful), *A. junius*, p. 15, pl. i. fig. 2, *A. julius*, p. 16, *A. guttatus*, ibid., *A. amazili*, p. 17, *A.* sp. ?, from India, ibid.; *Æschna rufescens*, p. 18, pl. v. fig. 4, *Æ. grandis*, p. 19, pl. ii. fig. 1, *Æ. cyanea*, p. 20, pl. iv. fig. 3, *Æ. juncea*, p. 21, pl. iv. fig. 1, *Æ. viridis*, ibid., pl. v. fig. 5, *Æ. mixta*, ibid., pl. v. fig. 2, *Æ. affinis*, p. 22, pl. v. fig. 2, *Æ. eremitica*, p. 23, pl. ii. fig. 2, *Æ. constricta*, p. 24, pl. iii. fig. 1, *Æ.* sp. ?, from the Himalayas, p. 25, pl. iv. fig. 2, *Æ.* sp. ?, from Brazil, ibid., pl. i. fig. 4; *Brachytron pratense*, p. 27, pl. v. fig. 3; *Gomphæschna furcillata* (a little doubtful), p. 28, pl. ii. fig. 4; *Neuræschna vinosa* (*quadriguttata*), a little doubtful, p. 29, pl. ii. 3; *Epiæschna heros*, p. 30, pl. i. fig. 3; *Æschna*, sp. ? ?, p. 32, pl iii. fig. 3, perhaps pertaining to *Petalia* in the *Gomphina*. The memoir ends with an analytical synopsis.

Gomphina.

Diastatomma tricolor, P. de Beauvois. Female described; McLachlan, CR. Ent. Belg. xxv. pp. lxiii.–lxv.

Calopterygina.

Observations on the plastic nature of many species of this sub-family, and their liability to local variation; McLachlan, Tr. E. Soc. 1881, p. 25.

The following from Sumatra are described and figured by Albarda in Veth's Midden-Sumatra, iv. pt. 5, viz. :—*Vestalis lugens* (Alb.), Selys, p. 5, pl. i. figs. 1 & 2; *Dysphæa dimidiata*, Selys (the ♀ described), p. 6, pl. ii. figs. 1 & 2; *Rhinocypha angusta*, Hag., p. 7, figs. 3 & 4 (wings of *R. biseriata* and *biforata*, Selys, figured for comparison, figs. 5 & 6); *Micromerus sumatranus* (Alb.), Selys, p. 9, pl. iii. figs. 1 & 2 (*M. aurantiacus*, Selys, figured for comparison, pl. iii. fig. 3); *M. snellemanni* (Alb.), Selys, p. 10, pl. iii. fig. 4. [*Cf.* Zool. Rec. *Ins.* xvi. pp. 214 & 215.]

Euthore mirabilis, McLach., figured in Waterhouse's Aid to Identification of Insects, pls. lxv. ♂, lxvi. ♀.

Lais devillii and *metallica*, Selys, from Ecuador, with notes; McLachlan, Tr. E. Soc. 1881, pp. 26 & 27.

Hetærina caia, Drury, from Ecuador; *id. l. c.* p. 27.

Thore derivata, id. *l. c.* p. 27, *concinna*, p. 28, and *mutata*, p. 29, Ecuador, spp. nn.

Cora jocosa, sp. n., *id. l. c.* p. 30, Ecuador.

Agrionina.

HAGEN, H. A. *Sympycna pædisca* (Eversmann), Brauer. S. E. Z. xlii. pp. 390-392.

Critical notes on Brauer's description [*cf.* Zool. Rec. xvii. *Ins.* p. 215], with remarks concerning other species described by Eversmann. The author states that typical examples of Eversmann's *Agrion pædisca* are identical with *Lestes virens*.

Six known species from Sumatra recorded by Albarda in Veth's Midden-Sumatra, iv. pt. 5, pp. 11 & 12.

Anomisma abnorme, McLachlan, partly redescribed from examples from Ecuador. *Mecistogaster terminatus*, McLach., is the ♀ of this species; McLachlan, Tr. E. Soc. 1881, pp. 31-32.

Mecistogaster jocaste, Hag., race *sincereus*, McLach., from Ecuador; *id. l. c.* p. 32.

Mecistogaster buckleyi, sp. n., *id. ibid.*, Ecuador.

ORTHOPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BORMANS, AUGUSTE DE. Liste des Orthoptères récoltés dans l'Afrique Australe, par M. de Selys-Fanson, et faisant partie du Musée Royal d'Histoire Naturelle de Bruxelles. Ann. Ent. Belg. xxv. pp. 20–25.

Probably all known species (one or two slightly doubtful). 9 *Blattidæ*, 6 *Mantidæ*, 7 *Acridiidæ*, 4 *Locustidæ*, and 2 *Gryllidæ* are enumerated.

——. Révision des types contenus dans la collection d'Orthoptères de M. Brisout de Barneville. *L. c.* pp. 26–28.

——. Spedizione Italiana nell' Africa equatoriale. Ortotteri. Ann. Mus. Genov. xvi. pp. 205–221.

Enumerates 37 species, viz., 7 *Blattidæ*, 7 *Mantidæ*, 1 *Phasmidæ*, 14, *Acridiidæ*, 4 *Locustiidæ*, and 4 *Gryllidæ*, from the Kingdom of Shoa, 7 of which are new.

BRUNNER VON WATTENWYL, C. Ueber die autochthone Orthopteren Fauna Oesterreichs. Verh. z.-b. Wien, xxxi. pp. 215–218.

Refers to the introduction of several species (especially South Russian) into the neighbourhood of Vienna through the making of new roads, &c.

FREY-GESSNER, E. Matériaux pour servir à la faune des Insectes du Valais. Bull. Soc. Murith., fasc. 10, pp. 67–88.

A local list, preceded by generalities. Includes 5 *Forficulidæ*, 8 *Blattidæ*, 1 *Mantidæ*, 9 *Gryllidæ*, 18 *Locustidæ*, and 31 *Acridiidæ*.

TARGIONI-TOZZETTI, A. Orthopterorum Italiæ species novæ in collectione R. Musei Florentini digestæ. Bull. Ent. Ital. xiii. pp. 180–186.

A sketch of the Order and its main divisions (including *Pseudo-Neuroptera*, but excluding *Collembola* and *Thysanura*) is given by McLachlan *in* the article "Insects," in Encyc. Brit., 9th edition, p. 152.

A list of 10 species collected during an excursion in "La Cerdaña Española," is given by Cuni in An. Soc. Esp. x. p. 375.

Five species (*Bacterius trophinus*, Westw., *Gryllus capensis*, F., *Meron-*

cidius specularis, F., and *Pachytes*, 2 spp. nn. ?) recorded from the Island of Ascension ; C. O. Waterhouse, Ann. N. H. (5) viii. p. 436.

The form of the stigmata in *Gryllotalpa vulgaris*, *Gryllus campestris*, *Gomphocerus*, and *Forficula auricularia* discussed by O. Krancher, Z. wiss. Zool. xxxv. pp. 548–551.

F. T. Köppen, in Beitr. Russ. Reiches (2) i. pp. 87–111 [1879], enters exhaustively into the subject of damages occasioned by insects of this Order, as regards Russia in particular, but treated also in a general manner.

A list of a few species of no special interest collected by De Borre and Becker in Provence and Germany in 1880 is given by De Bormans in CR. Ent. Belg. xxv. pp. xxv. & xxvi.

A list of 18 species from Turkistan, by A. Ostroumoff; Zool. Anz. iv. p. 597.

Two known species recorded from Angola ; A. Girard, J. Sci. Lisb. 1881, p. 239.

Sixty or seventy specimens of fossil *Orthoptera* have been discovered in the tertiary beds at Florissant, Colorado, of all families (excepting *Gryllidæ* and *Mantidæ*) ; the greater part of them pertain to 8 or 10 species of *Forficulidæ*. S. H. Scudder, Bull. U. S. Geol. Surv. vi. p. 293; abstr. in Ann. N. H. (5) viii. p. 458.

Forficulidæ.

Forficula yersini, Brisout. According to De Bormans, the type of this supposed species indicates a var. of *F. pubescens*, Géné, but with structural characters that appear to be constant. The forceps of both forms are minutely described and figured. Ann. Ent. Belg. xxv. pp. 26 & 27.

Forficula auricularia, L., recorded from the Färöe Islands; H. J. Hansen, Nat. Tidskr. xiii. p. 276.

Damages by earwigs to insects on setting-boards; H. J. Dobson, Ent. xiv. p. 239.

C. R. Osten-Sacken calls attention to an old notice by J. Williams, published in Zool. 1850, p. 2695, with regard to the use of the forceps in *Forficula* ; Canad. Ent. xiii. p. 80.

Blattidæ.

Breme, S. Recherches comparatives des organes génitaux du *Blatta germanica* et *Periplaneta orientalis*. Troudy Ent. Ross. xi. pp. 157–181. In Russian. Illustrated by numerous woodcuts.

Geinitz, F. E. Die Blattinen aus der unteren Dyas von Weissig bei Pillnitz. Nova Acta Ac. L.-C. Nat. cur. xli. pt. ii. pp. 424–442, pl. xxxix.

A review of the species in connection with the system adopted in Scudder's "Fossil Cockroaches." *Blattina didyma*, Germar, is considered at great length ; it is referred to the genus (or subgenus) *Anthracoblattina*

as *B.* (*A.*) *abnormis*, Geinitz, and *A. sopita*, Scudd., is considered a synonym. The author subsequently describes a variety of *B.* (*Etoblattina*) *flabellata* as var. *dyadica*, p. 437, and of *B.* (*E.*) *carbonaria* as *deichmuelleri*, p. 439, and refers to *B.* (*E.*) *elongata*, p. 440, *weissigensis*, p. 441, and *B.* (*A.*) *porrecta*, p. 441. The plate represents *B. abnormis*, figs. 1–3, *B. didyma*, figs. 4 & 5, *B. spectabilis*, fig. 7, *B. flabellata*, figs. 7 & 8, *B. carbonaria*, var. *deichmuelleri*, fig. 9, *B. elongata*, fig. 10, *B. weissigensis*, fig. 11, and *B. porrecta*, fig. 12. The author enters into a discussion of the confusion and errors likely to arise from the practice of forming a new species out of almost every fossil wing discovered.

Sterzel, T. Ueber zwei neue Insectenarten aus dem Carbon von Lugau. Ber. Ges. Chem. 1878-80, pp. 271–276.

[Not seen by the Recorder; *cf.* SB. Ges. Isis, 1882, p. 6. Concerns a fossil Cockroach and White Ant.]

Panchlora fervida, Saussure. Under the name *Gyna fervida*, Saussure, ♀, De Bormans gives a detailed description of a female insect from South Africa (the type was from Senegal), with figure of its egg-capsule. Ann. Ent. Belg. xxv. p. 21, pl. i. B.

Blatta (*Ectobia*) *niceensis*, Brisout, is quite distinct from *E. albicincta*, Brunner, but closely allied thereto; *id. l. c.* p. 28.

Deropeltis atra, Brun., ♀ described; *id.* Ann. Mus. Genov. xvi. pp. 207 & 208, woodcut of terminal segment.

The larva of a species found under bark of trees at Pernambuco, much resembles an isopod Crustacean; W. A. Forbes, P. E. S. 1881, p. i.

C. Berg, S. E. Z. xlii. p. 37, gives a list of 3 species found in the interior of the Argentine Republic.

Blatta germanica in Glasgow; J. W. H. Trail, Scot. Nat. vi. p. 14.

New genus :—

Oxycercus, Bolivar, An. Soc. Esp. x. p. 470. Allied to *Paraspharia* and *Cryptocercus*; type, *O. peruvianus*, sp. n., *l. c.* p. 471, pl. viii. fig. 2, details, Central Peru.

New species :—

Thyrsocera puiggarii, Bolivar, *l. c.* p. 351, Brazil.
Polyzosteria cabreræ, id. *l. c.* p. 355, pl. viii. fig. 3, details, Cuba.
Derocalymma trichoderma, id. *l. c.* p. 356, Abyssinia and Zanzibar.
Anaplecta pallida, id. *l. c.* p. 463, Palmal.
Temnopteryx dimorpha, id. *l. c.* p. 464, pl. viii. fig. 4, Central Peru.
Ischnoptera taczanowskii, id. *l. c.* p. 467, Peru.
Blatta nigrita, id. *l. c.* p. 477, Ecuador.
Zetobora martinezi, id. *l. c.* p. 478, Ecuador.
Blabera æquatoriana, id. *l. c.* p. 479, Ecuador.
Aphlebia algeria, id. *l. c.* p. 499, and *larrinaæ*, p. 500, Algeria.
Ectobia tridentina, Targioni-Tozzetti, Bull. Ent. Ital. xiii. p. 180, Tyrol.
Etoblattina lanceolata, Sterzel, Ber. Ges. Chem. 1878–80, fossil in the Carboniferous of Lugau.

Mantidæ.

Brongniart, Charles. Observations sur la manière dont les Mantes construisent leurs oothèques; sur la structure des oothèques; sur l'éclosion et la première mue des larves. Ann. Soc. Ent. Fr. (6) i. pp. 448–452, pl. xiii.

Observations based upon an Algerian species (not named). In order to construct its egg-case, the insect makes use of its abdomen and the extremities of its elytra. If a section be made in the direction of the grooves, the eggs are seen to be placed in a median circular chamber, each of the grooves corresponds to a 'stage,' and one case may contain twenty 'stages' Each 'stage' is separated into two cells ('loges'), and in each cell the eggs are deposited symmetrically in such a manner that the abdominal part of each egg is placed against the wall of the cell. Each central cell contains a dozen eggs, but they are less numerous in the end cells. The young larvæ emerge from the cells by the aid of spines on the cerci and legs, and they do not fall to the ground, but are sustained by two very long and slender threads fixed at the extremities of the cerci and to the walls of the cells, so that they may be likened to a bunch of grapes. They remain several days in that condition, and their first-moulted skins remain suspended to the case. (*Cf* also C. R. xciii. pp. 94–96; Le Nat. i. p. 450; J. R. Micr. Soc. (2) i. p. 884; Pop. Sci. Rev. v. p. 375; Ann. N. H. (5) viii. pp. 164–166.)

Perlamantis alliberti, Guérin, = *Ameles decolor*, Charp., Bormans, Ann. Ent. Belg. xxv. p. 28.

New species :—

Polyspilota saussurii, Bormans, Ann. Mus. Genov. xvi. p. 209, Equatorial Africa.

Miomantis meneliki, id. *ibid.* (with fig. of face, p. 210), Equatorial Africa.

Thespis bormanticlla (Saussure), *id. l. c.* p. 210, Equatorial Africa.

Hoplocorypha rapax (Saussure), *id. l. c.* p. 211, Equatorial Africa.

Phasmatidæ.

Lopaphus coccophagus, Newp., and *Phibalosoma apollonius*, Westwood, destructive to cocoa-nut trees in the Fiji Islands; J. Blyth & C. O. Waterhouse, P. E. Soc. 1881, p. xxviii.; D. R. Smith, Gard. Chron. (2) xvi. pp. 472 & 473.

Diapheromera femorata, Say. On the damage done to hickory by this insect, with reproduced figures; Packard, Bull. U. S. Ent. Com. vii. pp. 77 & 78.

Phasma perezi, sp. n., Bolivar, An. Soc. Esp. x. p. 479, Ecuador.

Gryllidæ.

Borman, E. Matériaux pour l'anatomie du *Gryllus domesticus*. Troudy Ent. Ross. xi. pp. 221–251, pls. viii. & ix. [1880: in Russian].

GOGORZA, JOSÉ. Revision del género *Platyblemmus*. An. Soc. Esp. x. pp. 509-521.

The author characterizes the genus at length, gives tables for ♂ & ♀ of the species, and describes 5 species and several varieties in detail.

Three species (*Gryllotalpa claraziana*, Sauss., *Gryllus nitidulus*, Stål, and *Gryllodes patagonus*, Sauss.) noticed from the interior of the Argentine Republic; C. Berg, S. E. Z. xlii. p. 40.

Œcanthus niveus, Serv. Notes on the damage occasioned to elm by this insect, with reproduced figures; Packard, Bull. U. S. Ent. Com. vii. p. 60.

Platyblemmus ramburi, Serv., is only a var. of the ♂ of *lusitanicus*, Serv.; Gogorza, *l. c.* p. 515.

Lissoblemmus, g. n., Bolivar, An. Soc. Esp. x. p. 351. Allied to *Loxoblemmus*, differs in the longitudinally sulcate front, and in the form and neuration of the wings; type, *L. mazarredoi*, sp. n., p. 352, Oran.

Cyrtoxiphus stolzmanni, sp. n., Bolivar, *l. c.* p. 475, Palmal.

Mogisoplistus argentatus, sp. n., *id. l. c.* p. 505, Algeria.

Phœophyllacris martinii, sp. n., Bormans, Ann. Mus. Genov. xvi. p. 220, woodcut of anal appendages, Equatorial Africa.

Platyblemmus luctuosus, sp. n., Gogorza, *l. c.* p. 518, Algeria; *P. umbraculatus*, Serv., varr. nn. *velatus*, l. c. p. 520, locality unknown, and *algiricus*, p. 521, Algeria.

Loxoblemmus donitzi, sp. n., Stein, B. E. Z. xxv. p. 94 (woodcuts, p. 95), Japan.

LOCUSTIDÆ.

Hetrodes. A species of this genus common in South Africa is in the habit of squirting a greenish liquid to a distance of four feet; R. Trimen, P. E. Soc. 1881, p. xxix.

Rhaphidophora palpata, Sulzer, found in a cave in the Eastern Pyrenees; Girard & Zambeu, Bull. Soc. Ent. Fr. (6) i. p. cxxvii.

Ceuthophilus maculatus, Harris, in Newmarket Cave, Virginia; Packard, Am. Nat. xv. p. 232.

Hadenœcus subterraneus, Scudder, in the Nickajack Cave, Tennessee; *id. l. c.* p. 882.

Conocephalus dissimilis, Serv., in the interior of the Argentine Republic; C. Berg, S. E. Z. xlii. p. 39.

Conocephalus acuminatus, Burm.? De Bormans thus indicates a species from South Africa, with description; Ann. Ent. Belg. xxv. p. 24.

New genera :—

Cratonotus, Bolivar, An. Soc. Esp. x. p. 486. Allied to *Liparoscelis*; types, *C. armatus*, p. 487, pl. viii. fig. 8, details, and *isernii*, p. 488, Ecuador, spp. nn.

Jimenezia, id. *l. c.* p. 492. Allied to *Leptotettix*; type, *J. elegans*, sp. n., p. 493, pl. ix. fig. 4, Napo.

Martinezia, id. *l. c.* p. 494. Near *Oxyprora*; type, *M. cuspidata*, sp. n., pl. viii. fig. 5, details, Ecuador.

New species :—

Barbitistes obtusus, Bolivar, *l. c.* p. 183, Sardinia.

Possidippus brunneri, id. *l. c.* p. 484, Ecuador.

Pycnogaster finoti, id. *l. c.* p. 503, pl. viii. fig. 1, Algeria.

Ephippigera cavannæ, Targioni-Tozzetti, Bull. Ent. Ital. xiii. p. 181, Calabria, and *E. annæ*, p. 182, Sardinia.

Acanthodis speculifera, Bolivar, *l. c.* p. 485, pl. ix. fig. 2, details, Ecuador.

Brisilis gladius, id. *l. c.* p. 486, pl. ix. fig. 3, details, Ecuador.

Cocconotus amorii, id. *l. c.* p. 489, South America, *differens*, id. *ibid.* pl. vii. fig. 6, details, Ecuador, *adustus*, p. 490, pl. viii. fig. 7, details, Ecuador.

Leptotettix pubiventris, id. *l. c.* p. 493, Ecuador.

Bucrates cocanus, id. *l. c.* p. 495, Ecuador.

Conocephalus rugosicollis, id. *l. c.* p. 496, Chili, *heteropus*, ibid., Brazil, *cocanus* and *scudderi*, p. 497, *subulatus* and *pichinchæ*, p. 498, *crassus*, p. 499, all from Ecuador.

Pœcilimon incertus, Targioni-Tozzetti, *l. c.* p. 182, Italy.

Thamnotrizon brunneri, id. *l. c.* p. 183, Italy.

Ctenodecticus bolivari, id. *l. c.* p. 186, Italy.

Leptohyphes antinorii, Bormans, Ann. Mus. Genov. xvi. p. 218, Equatorial Africa.

Dichopetala massaiæ, id. *l. c.* p. 218, Equatorial Africa.

Ceuthophilus ensifer, Packard, Am. Nat. xv. p. 882, pl. vii. fig. 4, Nickajack Cave, Tennessee.

Acridiidæ.

Packard, A. S., Jun. The Brain of the Locust. Am. Nat. xv. pp. 285–302, 372–379, plates i.–v.

Forms chap. xi. of the Second Report U. S. Entomological Commission [*cf.* Zool. Rec. xvii. *Ins.* p. 219]. "adapted" and reprinted.

Réchetine, N. Sur une forme mimique d' *Œdipoda cærulans*, L. Troudy Ent. Ross. xi. pp. 195–199 [1880].

In Russian.

"Locusts" in the Troad and in Cyprus. Two reports on this subject to the British Colonial Office (through the Entomological Society of London) appear in P. E. Soc. 1881, pp. xiv.–xix. & xxxviii.–xxxix, signed by S. S. Saunders, E. A. Fitch, and C. O. Waterhouse, with details on habits as observed by Vice-Consul Calvert. The "locust" proved to be *Stauronotus cruciatus* (not *Caloptenus italicus*, as was at first supposed), and its dipterous parasite is *Callostoma fuscipennis*, Macq. This parasite, with its larva and pupa, and an egg-tube of the "locust," are figured on pl. xiv. At pp. xxiii.–xxvi., S. S. Saunders gives additional information, and alludes to another dipterous parasite, given as *Sarcophaga linea* Troudy Fall., as destructive to the larvæ.

Locusts in Mexico in 1880; Packard, Am. Nat. xv. p. 578. Le

flights in Dakota; G. W. Hart, *l. c.* p. 749. Locusts in Nevada; *l. c.* p. 822. Locusts in the West; C. V. Riley, *l. c.* p. 1013.

Retarded development in *Caloptenus spretus*. J. D. Graham, Am. Nat. xv. p. 748, states that eggs buried in 1876, and afterwards covered by a path, hatched in 1881 upon being removed. *Cf.* also C. V. Riley, *l. c.* p. 1007, and Canad. Ent. xiii. pp. 180 & 203.

Stauronotus cruciatus injurious in Italy and Sicily; Bull. Ent. Ital. xiii. p. 210.

Caloptenus italicus. Notes on an invasion of this species in the Province of Siena, Italy; *l. c.* pp. 211 & 212.

A list of 8 known species found in the interior of the Argentine Republic is given by C. Berg. in S. E. Z. xlii. pp. 37–39.

Acridium (*Schistocerca*) *peregrinum*. Notes on the migrations and variations of this species (of which *A. paranense*, Burm., is considered a synonym) are given by C. Berg, *l. c.* p. 39.

Riley's notes on the habits of *Bombyliidæ* parasitic on the eggs of locusts [*cf.* Zool. Rec. xvii. *Ins.* p. 220], reprinted (with plate) in Am. Nat. xv. pp. 431–447.

Œdipoda aurifera, Walker, recorded from the Cape Verde Islands; *Epacromia collecta*, Walker, is a synonym; A. G. Butler, P. Z. S. 1881, p. 85.

Opsomala filiformis, Serv., figured in Waterhouse's Aid to Identification of Insects. i. pl. xxiii.

Thrasyderes, g. n., Bolivar, An. Soc. Esp. x. p. 481. Allied to *Titanacris* and *Lophacris*; type, *Th. leprosus*, sp. n., p. 482, pl. ix. fig. 1, Chili.

Mastax personata, id. *l. c.* p. 480, Rio Napo; *minuta*, id. *l. c.* p. 481, Ecuador: spp. nn.

Ommatolampis cingulatus, id. *l. c.* p. 483, Ecuador; *pazii*, id. *l. c.* p. 484, Baeza: spp. nn.

Omalota [sic] *apenninigena*, sp. n., Targioni-Tozzetti, Bull. Ent. Ital. xiii. p. 184, Florence.

Pezottetix costæ, sp. n., *id. l. c.* p. 185, Italy; *antisanæ*, Bolivar, An. Soc. Esp. x. p. 482, Antisana.

Chrysochraon clavatus, sp. n., Ostroumoff, Zool. Anz. iv. p. 597, Turkistan.

Phleoba (*Durbnia*) *lucasi*, Bolivar, An. Soc. Esp. x. p. 502, Algeria.

Ctypohippus arenivolans, sp. n., Butler, P. Z. S. 1881, p. 85, Cape Verdes.

RHYNCHOTA.

BY

W. F. Kirby, M.E.S., &c.

Berg, C. Sinonimia y descripcion de algunos Hemipteros de Chile del Brasil y de Bolivia. An. Soc. Arg. xii. pp. 259–272.

18 species noticed, some new.

Lethierry, L. Spedizione Italiana nell' Africa Equatoriale. Resultati Zoologici. Emitteri. Ann. Mus. Genov. xvi. pp. 277–298.

58 species from Shoa enumerated, including several new ones.

——. Liste des Hémiptères recueillis par M. Delaunay à la Guadeloupe, la Martinique, et Saint Barthélemy. Ann. Ent. Belg. xxv. pp. 8–19.

Most of the species enumerated are from the first locality.

Puton, A. Enumeration des Hémiptères recoltés en Syrie par Abeille de Perrin, avec la description des espèces nouvelles. MT. schw. ent. Ges. vi. pp. 119–131.

Reuter, O. M. Rättelser till Nya Bidrag till Åbo och Ålands skärgårds Hemipter-fauna. Medd. Soc. Fenn. vii. pp. 190 & 191.

Sahlberg, J. Bidrag til det Nordenfjeldske Norges insekt-fauna i *Hemiptera*. Forh. Selsk. Chr. 1880, No. 9, pp. 13.

Includes the description of a new *Salda*.

List of European *Hemiptera*, described from 1875–78; Horváth, Ent. Nachr. vii. pp. 173–186.

Captures of *Hemiptera* in Herts and Sussex; E. A. Butler & others, Ent. M. M. xvii. pp. 234 & 235, and xviii. pp. 40, 115 & 140.

Additions to the *Hemiptera* of Morayshire; Norman, Ent. M. M. xviii. p. 18.

Captures of *Hemiptera* in Germany, France, Belgium, and South Africa; Lethierry, CR. Ent. Belg. xxv. pp. vii.–x.

Localities of various *Hemiptera*; Puton, Bull. Soc. Ent. Fr. (6) i. pp. xxx., cxlvi. & cxlvii.

Notes on Hungarian *Hemiptera*, especially *Lygæidæ*; Horváth, Term. füzetek, iv. pp. 186–192.

List of Syrian *Hemiptera*; Frey-Gessner, MT. schw. ent. Ges. vi. pp. 130 & 131.

Captures of *Hemiptera* in Siberia; Reuter & Mäklin, Sv. Ak. Handl. (2) xviii. 4, p. 31.

Notes on the *Hemiptera* of Transcaucasia; Horváth, SB. Ges. Isis, 1879, pp. 93–97.

Singular eggs, called "golden shells," found among the sand at Kingston, Jamaica, and supposed to belong to one of the *Rhynchota*; Martens, SB. nat. Fr. 1881, pp. 161 & 162, figs.

HEMIPTERA-HETEROPTERA.

Distant, W. L. Biologia Centrali-Americana (*cf. Insecta*, General Subject, *sub* Godman & Salvin). *Rhynchota*, pp. 89–168, pls. ix.–xv.

Extends from *Edessa* to *Aufeius*. The synonymy is too extensive to be given here in full.

Killias, E. Beiträge zu einem Verzeichnisse der Insectenfauna Graubündens. i. Verzeichniss der Bündner Hemipteren. *Hemiptera-Heteroptera*. JB. Ges. Graub. xxii. pp. 42–94.

280 species enumerated, with localities, summary of vertical elevation, &c.

——. Synopsis des Hétéroptères de France (Extrait de Mém. Soc. Lille). 3e partie. *Reduvides, Saldides, Hydrocorises*. Remiremont: 1880, 8vo, pp. 161–245.

Completes the first volume. The classification employed is as follows:—*Reduviides*: *Emesini* (*Ploiaria, Gerascopus, Metapterus, Ischnonyctes*): *Reduviini*: *Saicaria* (*Acanthothorax*), *Stenopodaria* (*Pygolampis, Sastrapada, Oncocephalus*), *Reduviaria* (*Pirates, Holotrichus, Reduvius*), *Harpactoraria* (*Coranus, Harpactor*). *Nabini* (*Prostemma, Allæorrhynchus, Nabis*). *Saldides*: *Saldini* (*Salda*): *Leptopini* (*Leptopus, Erianotus*). *Hydrocorises*: *Pelegonides* (*Pelegonus*), *Naucorides* (*Aphelochirus, Naucoris*). *Nepides*: (*Nepa, Ranatra*), *Notonectides* (*Plea, Antipalocoris, Anisops, Notonecta*), *Corisides* (*Corisa, Sigara*).

——. 4me partie. Remiremont: 1881, 8vo, pp. 129.

Includes *Pentatomides, Coreides* and *Berytides*. The larger sections are split up into very numerous families and subfamilies; but very few new species are described. The divisions adopted are as follows:—*Pentatomides*: *Plataspidæ* (*Coptosoma*). *Scutelleridæ*: *Scutellerini, Corimelænaria* (*Eucoria, Corimelæna*), *Odontoscelaria* (*Arctocoris, Odontoscelis*), *Elvizuraria* (*Solenostethium*), *Odontotarsaria* (*Phimodera, Odontotarsus*), *Eurygastraria* (*Psacasta, Eurygaster*). *Graphosomini*: *Trigonosomaria* (*Trigonosoma, Vilpianus*), *Graphosomaria* (*Sternodontus, Ancyrosoma, Tholagmus, Graphosoma, Derula*), *Podoparia* (*Podops*). *Pentatomidæ*: *Cydnini*: *Cydnaria* (*Cephalocteus, Amblyottus, Cydnus, Macroscytus, Geotomus, Brachypelta*),

Schiraria (*Schirus*, *Gnathoconus*, *Crociştethus*, *Ochetostethus*: *Pentatomini*: *Sciocoraria* (*Menaccarus*, European species tabulated, *Sciocoris*, *Dorycleres*). *Ælia*: (*Ælia*, *Neottiglossa*): *Pentatomaria* (*Staria*, *Dalleria*, incl. *Onylia*, *Eusarcoris*, incl. *Analocus*, *Rubiconia*, *Holcostethus*, *Peribalus*, *Carpocoris*, *Palomena*, *Pentatoma*, *Brachynema*, *Nezara*, *Piezodorus*, *Rhaphigaster*, *Tropicoris*, *Holcogaster*). *Strachiaria* (*Strachia*), *Acanthosomini* (*Acanthosoma*, *Sastragala*, *Elasmostethus*, *Cyphostethus*), *Asopini* (*Platynopus*, *Picromerus*, *Podisus*, *Arma*, *Asopus*, *Jalla*, *Zicrona*), *Phyllocephalini* (*Schizops*). *Coreides*: *Prionotylini* (*Prionotylus*). *Corcini*: *Gonoceraria* (*Phyllomorpha*, *Centrocarenus*, *Spathocera*, *Enoplops*, *Syromastes*, *Verlusia*, *Gonocerus*), *Corearia* (*Pseudophlœus*, *Bathysolen*, *Arenocoris*, *Nemocoris*, *Ceraleptus*, *Bothrostethus*, *Loxocnemis*, *Coreus*, *Strobilotoma*), *Alydini* (*Micrelytra*, *Camptopus*, *Alydus*, *Megalotomus*). *Stenocephalini* (*Stenocephalus*). *Corizini*: (*Therapha*, *Corizus*, *Maccevethus*, *Agraphopus*, *Myrmus*, *Chorosoma*). *Berytides*: *Berytaria* (*Neides*, *Berytus*, *Apoplymus*), *Metacantharia* (*Cardopostethus*, *Megalomerium*, *Metacanthus*, *Metatropis*).

Puton, in Bull. Ent. Soc. Fr. (6) i. pl. lx., calls attention to the following synonymy in his Part 4:—*Menaccarus dohrnianus*, Muls., = *hirticornis*, Put., *Sciocoris conspurcatus*, Muls., = *macrocephalus*, Fieb.; *S. gravenhorsti*, Fieb., = *leprieuri*, Muls., = *maculatus*, Fieb., var.; *Neottiglossa lineolata*, Muls., = *inflexa*, Wolff, var.; *Dalleria consimilis*, Costa, & *grenieri*, Muls., = *pusilla*, Herr.-Schäff., var.; *Eusarcoris mayeti*, Muls., = *inconspicuus*, Herr.-Schäff., var.; *Carpocoris tarsata*, Muls., = *nigricornis*, var.; *Nezara millierii*, Muls., = *heegeri*, Fieb., var. *minor*; *Verlusia sinuata*, Fieb., = *rhombea*, Linn., var.; *Coreus spinolæ*, Costa, = *pilicornis*, Burm., var.; *Corizus abutilon*, Rossi, = *crassicornis*, Linn., var.; *Berytus pilicornis*, Flor, = *hirticornis*, Brullé, var.; *B. longicollis*, Muls., = *clavipes*, Fabr.; *B. gracilis*, Muls., = *signoreti*, Fieb., = *pygmæus*, Reut.; *Metacanthus meridionalis*, Muls., *nec* Costa, = *Cardopostethus annulosus*, Fieb.

Reuter, O. M. Finlands och den Skandinaviska halföns Hemiptera Heteroptera. Ent. Tidskr. ii. pp. 61–93.

Extends from *Chorosoma* to *Peritrechus*; no new genera or species described.

——. Analecta Hemipterologica. Zur Artenkenntniss, Synonymie, und geographischen Verbreitung palæarktischer Heteropteren. B. E. Z. xxv. pp. 155–196.

The following synonymy occurs:—*Trigonosoma lehmanni*, Fieb., = *fischeri*, Herr.-Schäff.; *Mustha dentata*, Jak., = *incana*, Stål; *Ælia obtusa*, Fieb., = *melanota*, Fieb., redescribed, p. 164; *Cimex dissimilis*, Fieb., = *Palomena prasina*, Linn., p. 165, and *C. prasinus*, Fieb., = *P. viridissima*, Poda; *Pentatoma porphyrea*, Fieb., = *juniperina*, Linn., var.; *Berytus vittatus*, pt., and *cognatus*, Fieb., = *minor*, Herr.-Schäff., p. 166, *B. vittatus*, pt., Fieb., = *clavipes*, Fabr., p. 167; *Ophthalmicus ulrichi* = *dispar*, Wagn.; *Plociomerus sylvestris*, auctt. rec., = *Ligyrocoris luchsi*,

Bär., p. 168, *P. annulipes*, Bär., = *Diplonotus calcaratus*, Put.; *Pachymerus staphyliniformis*, Hahn, *pallidipennis*, Herr.-Schäff., and *Ischnocoris sinuaticollis*, Reut., = *I. hemipterus*, Schill.; *Pachymerus oculatus*, Flor, and *Ischnocoris intermedius*, Horv., = *I. angustulus*, Boh., p. 169; *Emblethis arenarius*, Fieb., = *griseus*, Wolff: *Laccometopus clavicornis*, Fieb., = *Eurycera cornuta*, Thunb., p. 170; *Aradus armatus*, Kol., Fieb., = *erosus*, Fall., p. 171; *A. melancholicus*, Put., = *annulicornis*, Fabr.; *Teratocoris notatus*, Bär., = *antennatus*, Boh., p. 173; *Lopus rubro-striatus*, Herr.-Schäff., and *Capsus consanguineus*, Costa, = *L. lineolatus*, Brullé; *L. infuscatus*, Brullé, is distinct, p. 174; *Capsus fulvo-maculatus*, var., Herr.-Schäff., = *Calocoris vicinus*, Horv., *Cal. fuliginosus*, Reut., = *collaris*, Fieb., *C. melanocephalus*, Reut., and ? *biplagiatus*, Reut., = *angularis*, Fieb., p. 175; *Megacœlum ruficeps*, Reut., = *infusum*, Herr.-Schäff.; *Capsus artemisiæ* and *adspersus*, Schill., and *gemellatus*, Herr.-Schäff., = *pratensis*, Linn.; *Capsus cervinus*, Thoms., = *Lygus* (*Orthope*) *cervinus*, Schill.; *Capsus morio*, Boh., = *Deræocoris scutellaris*, Fabr., p. 176; *Phytocoris œtneus*, Costa, = *Allœtomus gothicus*, Fall.; *Camaronotus cinnamopterus*, Kirschb., and *Phytocoris clavatus*, Burm., = *Pilophones bifasciatus*, Fabr., p. 177; *Bothrocranum freyi*, Reut., = *Heterocordylus erythrophthalmum*, Herr.-Schäff., p. 178; *Astemma mercurialis*, Guér., = *Halticus erythrocephalus*, Herr.-Schäff.; *Orthocephalus panzeri*, Fieb., and *confinis*, Reut., = *Labops brevis*, Panz., p. 179, *O. signatus*, Fieb., = *L. flavo-marginata*, Costa; *Pachytoma jakovleffi*, Reut., = *L. freyi*, Fieb.; *Halticus albo-notatus*, Costa, = *L. nitidus*, Mey., p. 180; *Camponitidea fieberi*, Reut., = *saundersi*, Put., var.; *Camarocyphus nigro-gularis*, Reut., = *luteus*, Herr.-Schäff., p. 181; *Conostethus roseus*, Fieb., = *salinus*, Sahlb.; *Lygus decantiacus*, Voll., = *Phylus palliceps*, Fieb., p. 182; *Byrsoptera cylindricollis*, Costa, recharacterized; *Capsus mutabilis*, Thoms., = *Psallus varians*, Herr.-Schäff.; *Heterotoma crinicornis*, Klug, = *Atractotomus magnicornis*, Fall., *A. putoni*, Reut., = *validicornis*, Reut.; *Crinicoris tarsalis*, Reut., = *nigripes*, Fieb., p. 183; *Agalliastes lucidus* and *Campylomma viridula*, Jak., = *C. annulicornis*, Sign., p. 184; *Capsus artemisiæ*, Beck, = *Plagiognathus albipennis*, Fall.; *Salda costalis*, Thoms., and *marginalis*, Sahlb., = *marginalis*, Fall., varr., p. 185, *S. marginella*, Fieb., = *saltatoria*, Linn., *S. riparia*, Hahn, and *Acanthia nigricornis*, Reut., = *S. variabilis*, Herr.-Schäff., p. 186, *S. pilosella*, Thoms., = *pallipes*, Fabr.; and *Rhinocoris morio*, Kol., Fieb. (*nec* Germ.), is renamed *Reduvius kolenatii*, p. 187.

Sahlberg, J. Enumeratio Hemipterorum Gymnoceratorum Fenniæ. Medd. Soc. Fenn. vii. pp. 1–109 (separate pagination); *cf.* Douglas, Ent. M. M. xviii. pp. 41 & 42.

Includes remarks on the distribution, &c., of each species noticed; and descriptions of several larvæ. Full synonymy is given (much of which is probably new) and remarks on geographical distribution, and a summary of the number of species occurring in different parts of Europe, is prefixed to the paper.

Westcott, F. Verzeichniss bisher in Westfalen aufgefundener Arten aus der Gruppe *Hemiptera Heteroptera*. Zweiter Artikel. JB. Westf. Ver. ix. pp. 61–79.

142 species of the families *Hebridæ*, *Tingidæ*, *Capsidæ*, and *Anthocoridæ* are enumerated; the number of Dutch species recorded by Vollenhoven is only 122.

Preliminary list of the *Hemiptera-Heteroptera* of Dulwich; Wood & Pim, Rep. Dulwich Soc. iv. p. 44.

Pentatomidæ.

Signoret, V. Révision du groupe des Cydnides de la famille des Pentatomides. Ann. Soc. Ent. Fr. (6) i. pp. 25–52, 193–218, 319–332, 423–436, pls. i., ii., vi., vii., viii., x.–xii.

Preceded by a table of 43 genera, several of which are new. The portion of the paper already published extends only as far as the genus *Æthus* (No. 15). Known as well as new species are fully described, and details figured.

——. Revue des Cydnides contenus dans la Collection du Musée Civique d'Histoire Naturelle de Gênes. Ann. Soc. Genov. xvi. pp. 621–657.

The following known species are redescribed:—*Adrisa rugosa*, *punctata*, Dall., *sepulchralis*, Erichs., *flavomarginata*, Vollenh.; *Cyrtomenus teter*, Spin., *mirabilis*, Perty, *ciliatus*, Beauv., *indicus*, *capicola*, Hope, *flavicornis*, Fabr., *pilosulus*, Klug, *nigritus*, Fabr.; *Tominotus constrictus*, Berg; *Pangæus æthiops*, Fabr. (*nec* Spin., which = *Cyrtomenus teter*, Spin.), *bilineatus*, Spin., *piceatus*, Stål; *Macroscytus transversus*, Burm., *brunneus*, Fabr., *javanus*, Mayr, *australicus*, Erichs.; *Geotomus punctulatus*, Costa, *pygmæus*, Dall., *elongatus*, Herr.-Schäff. A table of *Schirides* is appended.

Distant (Biol. Centr. Am. *Rhynch.*) figures or specially notices the following known species:—*Edessa phœnicopus*, Dall., pl. ix. fig. 2, *leucogramma*, Perty (= *maculata*, Dall., p. 89, *reticulata*, Dall. (= *lineosa*, Walk.), fig. 17, *nigrispina*, Dall. (= *bos*, Stål, = *nigridens*, Walk.), fig. 18, *bonasia*, Stål, fig. 19, pl. viii. p. 90, *præcellens*, Stål, pl. ix. fig. 1, *quadridens*, Fabr. (= *luteicornis*, St. Farg & Serv., = *schæfferi*, Hahn, = *brunnipes*, Fabr.), p. 91, *jurgiosa*, Stål, fig. 7, *affinis*, Stål, fig. 17, *vinula*, Stål, fig. 13, pl. ix. *junix*, Stål, pl. viii. fig. 20, p. 92, *lepida*, Stål, fig. 12, *rixosa*, Stål, fig. 16 (var. *cortesi*, from Mexico, fig. 9), p. 93, *puncticornis*, Stål, fig. 11, *punctiventris*, Stål, fig. 15, *trifurca*, Walk., fig. 10, *pudica*, Stål, fig. 8, pl. ix., *patricia*, Stål, fig. 22, p. 94, *irrorata*, Dall., fig. 21, *collaris*, Dall. (= *lineigera*, Stål), fig. 23, *mexicana*, Stål, fig. 2, pl. viii., *picticornis*, Stål, fig. 18, *pudibunda*, Stål, fig. 20, *rufo-marginata*, De Geer (= *cruentus*, Fabr., = *furcata*, Pal. de B., = *discolor* and *marginalis*, Dall., = *albomarginatus*, *flavomarginatus*, *flavo-virens* and *rufo-marginatus*, Stål), p. 96, *cornuta*, Burm. (= *orculum*, Er.), fig. 22, *cordifera*, Walk. (= *albicors*, Stål), fig. 23, p. 97, *gillata*, Walk., fig. 24, pl. ix., *conspersa*, Stål, fig. 24, p. 98, *privata*, alk. (= *westringi*, Stål), fig. 25, pl. viii., *abdominalis*, Er., fig. 2, p. 99; *ia caprina*, Stål, fig. 4, p. 100; *Acanthosoma laterale*, Say (= *nebu-*

losa, Kirby), fig. 5, pl. x. p. 101; *Piezosternum subulatum*, Thunb. (= *vacca* and *gazella*, Fabr., = *mucronata*, Pal. de B.); *Pantochlora vivida* Stål, pl. viii. fig. 7, p. 102; and *Dinidor rufo-cinctus*, Stål, p. 103, pl. x. fig. 5.

Tropicoris rugosa, Motsch., *metallifer*, Motsch. (?), Stål (= *bassini*, Osch.), and *Compastes obtusa*, Walk., noticed from Tokei: Distant, Ann. N. H. (5) viii. p. 28.

Amphacus languida, Stål, p. 69, *Acanthosoma distinctum*, Dall., p. 75, and *Anaxandra rufescens*, Dall., p. 77, redescribed; *Tropicoris rufipes*, Linn., var. *mœsta* from Styria, and *Troilus luridus*, Fabr., var. *angusta*, from the Valais, described, p. 156: Reuter, B. E. Z. xxv.

Tarisa notoceras, Kol., var. from the Antilibanus described; *Menaccarus dohrnianus*, Muls. & Rey, = *hirticornis*, Put.; *Strachia rugulosa*, varieties (?) from the Antilibanus described: Puton, MT. schw. ent. Ges. vi. pp. 119 & 120.

Aplerotus maculatus, Dall., and *Tesseratoma æthiops*, Dist., figured by Waterhouse, Aid, i. pls. xvi. & xlix.

Graphosoma lineatum, Linn., var. *stæli*, from Asia Minor, described; Horvath, Term. füzetek, v. p. 39.

Eusarcoris inconspicuus, Herr.-Schäff., var. *simplex*, and *perlatus*, Fabr., var. *spinicollis*, from France, described; Puton, Hém. Hétér. France, ii. pp. 55 & 56.

Palomena viridissima, Poda, and *dissimilis*, Fabr., are distinct; Puton, Bull. Soc. Ent. Fr. (6) i. p. xli.

Cyrtomenus ciliatus, *constrictus*, and *Thyreocoris pamplanus*, Berg, noticed, and the first and last figured by him; Exped. Rio Negro, Zool. pp. 80 & 81, pl. i. figs. 1–3.

Macroscytus umbonatus, Berg, = *Cyrtomenus mutabilis* and *mirabilis*, Stål; Berg, S. E. Z. xlii. p. 41.

Strachia picta, Herr.-Schäff., var. *cruentata*, from Corsica, Sicily, and Algeria, described; Puton, Hém. Hétér. France, ii. p. 70.

Stenozygum persignatum, Walk. (= *Strachia cœlestes*, Voll.), var. from Queensland described; Distant, Tr. E. Soc. 1881, p. 213.

Asopus cruciatus, Sign., = *Jalla reichneri*, Phil.; Berg, An. Soc. Arg. xii. p. 259.

Schirus dubius, Scop., and *mel anopterus*, Herr.-Schäff., are distinct; Puton, Bull. Soc. Ent. Fr. (6) i. pp. xl. & xli.

New genera and species :—

The following new genera are included by Signoret in a table (Ann. Soc. Ent. Fr. 6, i.), but without indication of types:—*Stenocoris* [Burm., *Coreidæ*, 1835], p. 35, *Lenospa*, *Macrhymenus*, *Peltoxys*, and *Latervis*, p. 37.

Neoglypsus, Distant, Ann. N. H. (5) viii. p. 27. Differs from *Glypsus* by its unarmed femora; type, *N. viridicatus*, sp. n., *l. c.*, Tokei.

Parurochela, Reuter, B. E. Z. xxv. p. 83. Distinguished from all other genera of *Urolabidina* by the head not being transverse; type, *P. quadrinotata*, sp. n., *l. c.*, Amur.

Eurhynchiocoris, Reuter, *l. c.* p. 84. Placed after *Parurochela*; type, *E. sparsipunctatus*, sp. n., *l. c.* p. 85, Silhet.

Schiodtella [*Schiødtella*], Signoret, Bull. Soc. Ent. Fr. (6) i. p. clvii. *Stibaropus*, with only 4 joints to the antennæ; to include *S. molginus*, *tabulatus*, and *callidus*, Schiödte.

Gampsotes, id. *l. c.* p. xxix. Allied to *Stenocoris*; type, *G. parallelus*, sp. n., *l. c.*, East Indies.

Cydnopeltus, id. *l. c.* p. xxviii. Allied to *Brachypeltus*; type, *C. horvathi*, sp. n., *l. c.*, Java.

Onalips, id. Ann. Soc. Ent. Fr. (6) i. p. 323. Allied to *Syllobus*; types, *S. nigerrimus*, Dall., and *O. cribratus*, sp. n., *l. c.* p. 324, pl. x. fig. 44, Senegal.

Plonisa, id. *l. c.* p. 326. Allied to *Cyrtomenus*; to include *C. tartareus*, Stål, and *P. plagiatus*, sp. n., *l. c.* p. 327, pl. xi. fig. 52, Chinchoxo.

Alonips, id. Ann. Mus. Genov. xvi. p. 653. Allied to *Geotomus*; but the metasternal plate consists only of a small triangular surface between the coxæ and the mesosternal suture; thorax and abdomen strongly pectinated: types, *A. obsoletus* and *pilitylus*, spp. nn., *l. c.* pp. 653 & 654.

Artiazontes, Distant, Tr. E. Soc. 1881, p. 105. Allied to *Phricodes*, but with simple, 5-jointed antennæ; type, *A. alatus*, sp. n., *l. c.* pl. iii. fig. 2, Fianarantsoa.

Delocephalus, id. *l. c.* Allied to *Oncoscelis*: head large, subquadrate: type, *D. miniatus*, sp. n., *l. c.* p. 106, pl. iii. figs. 3 & 3*a*, Madagascar.

Pachygrontha, Reuter, B. E. Z. xxv. p. 157. Allied to *Agatarchus*, Stål; type, *P. nigriventris*, sp. n., *l. c.* p. 157, Amur.

Coleotichus blackburniæ, F. B. White, Ann. N. H. (5) vii. p. 52, Honolulu.

Coptosoma [illegible]*dahli*, Reuter, B. E. Z. xxv. p. 155, Egypt; *C. chi*[illegible]*rides* Signoret, Bull. Soc. [illegible]t. Fr. (6) i. p. xli., China.

Homœocerus distinctu[illegible]*l. l. c.* p. xlii., China.

Eurygaster integriceps, [illegible]on, MT. schw. ent. Ges. vi. p. 119, Syria, Caucasus, Tashkend.

Psacasta cypria, id. *ibid.*, note, Cyprus.

Trigonosoma stali, Reuter, *l. c.* 155, North Persia.

Urochela luteo-varia, Distant, An. N. H. (5) viii. p. 28, Tokei.

Stibaropus flavidus, Signoret, Ann. Ent. Fr. (6) i. p. 47, pl. ii. fig. 6, North India.

Lactistes vicinus, fig. 9, p. 50, *truncatus*, fig. 10, North India, *protumidus*, fig. 11, p. 51, *incertus*, fig. 12, [illegible]ia, *obesipes*, fig. 13, Australia, p. 52, *id. l. c.* pl. ii.

Lobostoma gigas, id. *l. c.* p. 195, pl. vi. fig. 15, Santa Fe [illegible]

Cyrtomenus marginalis, id. *l. c.* p. 201, pl. vi. fig. 21, locality not s.

Scoparipes latipes, pl. vi. fig. 22, Java, Borneo, p. 203, and *S.* (?) *longirostris*, pl. vii fig. 24, East Indies (?), p. 205, *id. l. c.*

Adrisa angusta, pl. vii. fig. 27, King George's Sound, p. 208, *distincta*, pl. viii. fig. 31, New South Wales, p. 211, *expansa*, pl. viii. fig. 35, p. 214, and *A.* (?) *mayri*, pl. x. fig. 39, Australia, p. 218, *id.* l. c.; *A. similis*, id. Ann. Mus. Genov. xvi. p. 624, New Guinea.

Ectinopus rugoscutum [!], id. Ann. Soc. Ent. Fr. (6) i. p. 319, pl. x. fig. 41, Amazons.

Homaloporus pangæiformis, Mexico, and *subtilius*, Cordoba, *id. l. c.* p. 331, pl. xi. figs. 48 & 49.

Æthus (*Tominotus*) *brevis*, Brazil, New Granada, pl. xi. fig. 55, p. 426, *hogenhoferi*, Guatemala, Mexico, pl. xii. fig. 58, p. 429, *ostiolatus*, Kordofan, fig. 62, p. 433, *vicinus*, Senaar, fig. 63, pl. xii. p. 434, *id. l. c.*

Cydnus perplexus, Lethierry, Ann. Mus. Genov. xvi. p. 277, Shoa; *C. vollenhoveni*, Java, Sumatra, p. 630, *dilatatus*, Australia, p. 631, *C.* (?) *perpunctatus*, Bombay, p. 634, *gestroi*, Australia, p. 638, Signoret, *op. cit.*

Pangæus confusus (= *margo*, Stål, *nec* Dall.), *id. l. c.* p. 642, Mexico.

Macroscytus lævipennis, Cayenne, *subparallelus*, Rio Grande do Sul, *id. l. c.* pp. 643 & 646.

Geotomus oceanicus, Australia, *ciliatitylus*, Teheran, *id. l. c.* pp. 651 & 652.

Sehirus impressus, Horváth, Term. füzetek, iv. p. 184, Carinthia.

Sciocoris fumipennis, Puton, Hém. Hétér. France, ii. p. 41, note, Dalmatia, Istria, North Italy; *S. odiosus*, Butler, P. Z. S. 1881, p. 86, Monte Video.

Pentatoma rubro-marginata, Reuter, *l. c.* p. 156, Spain.

Barbiger jakovleffi, id. *l. c.* p. 157, locality not stated.

Strachia conspicua, Jakovleff, Bull. Mosc. lvi. 1, p. 206, Kirghis Steppes.

Tropicoris armandi, Fallou, Le Nat. iii. p. 340, Peking.

Dalpada subflava, Antananarivo, and *capitata*, Fianarantsoa, pl. iii. fig. 1, Distant, Tr. E. Soc. 1881, pp. 103 & 104.

Niarius illuminatus, id. *l. c.* p. 211, Gayndah.

Cephaloplatys fasciatus, id. *l. c.* p. 212, Queensland.

Stollia trimaculata, id. *l. c.* p. 213, Sidney.

Stenozygum australis[*-le*], id. *l. c.* p. 214, Queensland.

Catacanthus viridicatus, id. *l. c.* p. 215, Tonga Islands.

Menida consignata, p. 215, *plebeia*, p. 216, *purpuraria* and *personata*, p. 217, *id. l. c.*, Queensland.

Bagrada abeillii, Puton, MT. schw. ent. Ges. vi. p. 121, Lebanon.

Pycnopterna (?) *blanda*, id. *l. c.* p. 124, Nazareth.

Edessa salvini, Costa Rica, fig. 4, p. 89, *montezuma*, fig. 6, *lindstromi*, Mexico, fig. 5, p. 91, *stælii*, Costa Rica, p. 93, pl. ix. fig. 14, *unicolor*, pl. x. fig. 3, p. 93, *godmani*, Guatemala, pl. ix. fig. 19, p. 96, *championi*, Guatemala, fig. 21, *petersi* (? = *discors*, Er.), Mexico, Guatemala, p. 98, pl. ix. fig. 25, Distant, Biol. Cent. Am. Rhynch.; *E. fuscidorsata*, Reuter, Ent. M. M. xvii. p. 234, Distant, *l. c.* p. 89, pl. ix. fig. 3, Mexico to Colombia; *E. tauriformis*, Chontales, and *nigro-marginata*, Jamaica, *id.* Tr. E. Soc. 1881, pp. 391 & 392.

Andriscus bifasciculatus and *angularis*, Reuter, B. E. Z. xxv. pp. 67 & 68, Australia.

Amphaces marginata, p. 68, *angularis*, p. 70, *maculicollis*, p. 71, *angustula* and *v-album*, p. 72, *id. l. c.* Australia.

Acanthosoma frater, p. 73, *virens*, Amur, *serratula*, Siberia, Amur, p. 74, *forcipatum*, Tarbagatai, p. 76, *id. l. c.*

Anaxandra nigro-cornuta and *hamata*, Reuter, *l. c.* pp. 77 & 78, Darjiling.

Stictocarenus obtusus, *nigro-punctatus*, p. 79, *taniola*, p. 80, *id. l. c.*, Australia.

Clinocoris cruciger, Darjiling, *prominula*, White Nile, and *scotti*, Japan, *id. l. c.* pp. 80–82.

Urostylis nigro-marginalis, id. *l. c.* p. 85, Darjiling.

Arma chinensis, Fallou, Le Nat. iii. p. 340, Peking.

Veterna abyssinica, Lethierry, *l. c.* p. 280, Shoa.

Tropicorypha formosa, Distant, P. Z. S. 1881, p. 270, Calabar.

Halyomorpha versicolor, id. *l. c.* p. 271, pl. xxxi. fig. 1, Nyassa.

Tyoma porrecta, id. *l. c.* fig. 2, Cameroons.

Aspavia grandiuscula, id. *l. c.* p. 272, pl. xxxi. fig. 3, Cameroons; *A. vittiventris*, Lethierry, *l. c.* p. 281, Shoa.

Aspongopus prolixus, id. *l. c.* p. 283, Shoa; *A. nigro-æneus*, Reuter, Ent. M. M. xvii. p. 234, Siam.

Carbula amurensis, Amur, and *obtusangula*, China, *id. l. c.* p. 233.

Coreidæ.

Distant (Biol. Centr. Am. *Rhynch.*) figures or specially notices the following known species:—*Flavius lineaticornis*, Stål (= *pinguis*, Stål), figs. 7 & 8, p. 103, *Hirilcus alternatus*, Stål, figs. 9 & 10, pl. x. p. 104, *Lycambes varicolor*, Stål (= *acutiusculus*, *guttiventris*, and *collaris*, Walk.), figs. 1–3, p. 105, *Pachylia pharaonis*, Herbst, pl. x. fig. 11, *hector*, Stål, figs. 12 & 13, *Thasus gigas*, figs. 18 & 19, *acutangulus*, figs. 16 & 17, pl. x., *Mozena nestor*, Stål, fig. 5, *scrupulosa*, Stål, fig. 4, pl. xi. *affinis*, Dall., fig. 2, *lurida*, Dall., fig. 1, pl. xii., *Capaneus multispinus*, Stål, fig. 6, *achilles*, Stål, fig. 7, *auriculatus*, Stål, fig. 8, *rubro-notatus*, Stål, fig. 9, pl. xi., *vates*, Stål, fig. 12, *tetricus*, Stål, fig. 6, *spurcus*, fig. 3, pl. xii., *odiosus*, Stål, figs. 11 & 12, *Archimerus scutellaris*, Stål, figs. 13 & 14, pl. xi., *indecorus*, Walk., figs. 4 & 5, *Mamurius mopsus*, Stål, fig. 15, *Nematopus nigro-annulatus*, Stål, fig. 14, pl. xii., *lepidus*, Stål, fig. 10, *Machtima mexicana*, Stål, fig. 15, *Acanthocephala declivis*, Say, figs. 19, 21, & 24, var. *panamensis*, figs. 22 & 23, pl. xi., and var. *guatemalena*, pl. x. figs. 14 & 15, p. 119, *granulosa*, Dall., pl. xi. fig. 18, & pl. xii. fig. 9, *luctuosa*, Stål, fig. 10, pl. xii., *bicoloripes*, Stål, pl. xi. figs. 16 & 17, *Stenoscelidea anescens*, Stål, fig. 13, *Leptoglossus zonatus*, Dall., fig. 16, *lineosus*, Stål, fig. 17, pl. xii., *Narnia femorata*, Stål, fig. 4, *Leptoscelis tricolor*, Hope, fig. 5, *Spartocera granulata*, Stål, fig. 6, pl. xiii., *Sephina limbata*, Stål, fig. 22, *vinula*, Stål, fig. 23, pl. xii., *dorsalis*, White, fig. 8, *Chariesterus albiventris*, Burm., fig. 11, *inæstus*, fig. 8, *Plapigus circumcinctus*, fig. 14, *Staluptus marginalis*, Burm., fig. 15, *Madura perfida*, Stål, fig. 16, *Chelinidea tabulata*, Burm., fig. 17, pl. xiii., *Acidomeria rustica*, Stål, pl. xii. fig. 11, *Margus inornatus*, Stål, pl. xiii. fig. 18, *Namacus annulicornis*, pl. xiv. fig. 8, *Catorhintha mendica*, Stål, fig. 21, *selector*, Stål, fig. 19, pl. xiii., *Ficana apicalis*, Dall., pl. xiv. fig. 1, *Cimolus vitticeps*, Stål, fig. 22, *Anasa uhleri*, fig. 23, pl. xiii., *litigiosa*, Stål, fig. 2, *maculipes*, Stål, fig. 4, *conspersa*, Stål, fig. 5, pl. xiv., *capaneodes*, Stål, pl. xiii. fig. 20, *costalis*, Stål, fig. 21, *impictipes*, Stål, fig. 20, *nigripes*, Stål, fig. 19, pl. xii., *denticulata*, Stål, fig. 11, *Zicca taniola*, Dall., fig. 13, *Collatia emarginata*,

Stål, fig. 14, *Nirovecus claviger*, Stål, fig. 18, *Cebrenis centro-lineata*, Hope, fig. 22, *robusta*, Stål, fig. 20, *Hypselonotus punctiventris*, Stål, fig. 23, *lineatus*, Stål, fig. 24, *concinnus*, Dall., figs. 25 & 26, pl. xiv., *interruptus*, Hahn, pl. xvi. fig. 1, *Sphictyrtus pretiosus*, Stål, fig. 1, *intermedius*, Stål, fig. 3, *Paryphes flavo-cinctus*, Stål, fig. 4, *imperialis*, Stål, fig. 5, *Savius dilectus*, Stål, fig. 6, *jurgiosus*, Stål, fig. 7, *Hyalymenus pulcher*, Stål, fig. 8, *Darmistus subvittatus*, Stål, fig. 10, *Dasycoris nigricornis*, Stål, fig. 12, *Harmostes serratus*, Fabr., fig. 13, *nebulosus*, Stål, fig. 14, and *fraterculus*, Say, fig. 18, pl. xv.

Enoplops, Am. & Serv. Table of species; Jakovleff, Bull. Mosc. lvi. 1, p. 205.

Stenocephalus agilis, Scop., var. *marginicollis* from Gavarnie (p. 107), *Therapha hyoscyami*, Linn., varr. *flavicans* from Corsica, and *nigridorsum* from Algeria and Portugal (p. 111), and *Corizus hyalinus*, Fabr., var. *nigrinus* from France, described (p. 117); Puton, Hém. Hétér. France, ii.

Alydus tangiricus, Saund., figured; Waterhouse, Aid, i. pl. xxxiii.

Corizus capitatus, Fabr., var. and larva described; Sahlberg, Medd. Soc. Fenn. vii. p. 21.

Centrocarenus volxemi, Put., = *coroniceps*, Jak.; Puton, Bull. Soc. Ent. Fr. (6) i. p. xxix.

New genera and species:—

Parajalysus, Distant, Biol. Centr. Am. *Rhynch.* p. 163. Allied to *Jalysus*, but with the lateral angles of the pronotum strongly spinous; type, *P. spinosus*, sp. n., *l. c.* pl. xvi. fig. 5, Mexico, Guatemala.

Aurivilliana, id. P. Z. S. 1881, p. 272. Allied to *Petillia* and *Petascelisca*; type, *A. lurida*, sp. n., *l. c.* p. 273, pl. xxxi. figs. 6 & 7, Natal, Delagoa Bay.

Petascelisca, id. *l. c.* p. 273. Between *Petillia* and *Petascelis*; type, *P. velutina*, figs. 8, 8 *a*, *b*, & 9, and *foliacipes*, figs. 10, 10 *a*, *b*, & 11, spp. nn., *l. c.* pp. 273 & 274, pl. xxxi., Calabar.

Heegeria, Reuter, Verh. z.-b. Wien, xxxi. p. 211. Allied to *Tenosius*, Stål (*Alydidæ*); type, *H. adspersa*, sp. n., *l. c.* p. 212, pl. xiv., Sicily.

Mygdonia antinorii, Lethierry, Ann. Mus. Genov. xvi. p. 284, Shoa.

Anoplocnemis sericeiventris, id. *l. c.* p. 285, Shoa.

Cypia rubra, id. *l. c.* p. 286, Shoa.

Serinetha lanuginosa, id. *l. c.* p. 288, Shoa.

Enoplops eversmanni, Jakovleff, Bull. Mosc. lvi. 1, p. 203, Songaria.

Pachylis serus, Berg, An. Soc. Arg. xii. p. 260, Rio de Janeiro.

Archimerus thoracicus, Distant, Biol. Centr. Am. *Rhynch.* p. 114, pl. xii. figs. 7 & 8, Guatemala.

Acanthocephala subalata, id. *l. c.* p. 119, pl. xi. fig. 20, Guatemala.

Anisoscelis gradadia, id. *l. c.* p. 122, pl. xiii. figs. 1 & 2, Guatemala.

Leptoglossus subauratus, id. *l. c.* p. 126, pl. xii. fig. 18, Guatemala and Chontales.

Petalops inermibus, id. Tr. E. Soc. 1881, p. 392, Ega.

Evagona juno, id. *l. c.* p. 394, & Waterhouse, Aid, pl. lxxxii., Peru.

Paryphes splendidus, Distant, *l. c.* p. 395, Ecuador.

Sephina pantomima, id. *l. c.* p. 393, Medellin; *S. bicornis*, Guatemala, fig. 7, p. 131, *geniculata*, fig. 10, *rogersi*, Costa Rica, fig. 9, p. 132, *id.* Biol. Centr. Am. *Rhynch.*

Chariesterus alternatus, id. *l. c.* p. 133, pl. xiii. fig. 13, Mexico.

Anasa tauriformis, Costa Rica, pl. xiv. fig. 6, p. 142, *lita*, Guatemala, pl. xiii. fig. 25, *madida*, Costa Rica, pl. xiv. fig. 3, p. 143, *subobscura*, Mexico, Guatemala, p. 144, *flavo-vittata*, fig. 7, *peregrina*, Costa Rica, *mucronata*, fig. 9, Mexico, p. 145, *tenebricosa*, fig. 12, Costa Rica, p. 146; *id. l. c.* pl. xiv.

Zicca commaculata, pl. xiv. fig. 19, and *recurva*, id. *l. c.* pp. 146 & 147, Guatemala.

Vilga dallasi, id. *l. c.* p. 147, pl. xiv. fig. 16, Guatemala.

Collatia jubata and *divergens*, id. *l. c.* p. 148, pl. xiv. figs. 15 & 17, Mexico.

Cebrenis modesta, id. *l. c.* p. 150, pl. xiv. fig. 21, Guatemala.

Hypselonotus intermedius, Guatemala, p. 151, *atratus*, pl. xvi. fig. 27, Costa Rica, p. 152, *proximus*, Costa Rica, Amazons, p. 153, *id. l. c.*

Sphictyrtus longirostris, id. *l. c.* p. 154, pl. xv. fig. 2, Guatemala.

Alydus femoralis, id. *l. c.* p. 158, pl. xv. fig. 9, Guatemala.

Trachelium albo-apicatum, id. *l. c.* p. 159, pl. xvi. fig. 2, Guatemala.

Cydamus borealis, id. *l. c.* p. 159, pl. xv. fig. 11, Guatemala.

Protenor tropicalis, id. *l. c.* p. 160, pl. xvi. fig. 3, Guatemala.

Jalysus mollitus, id. *l. c.* p. 163, pl. xvi. fig. 4, Guatemala.

Scolopocerus uhleri, id. *l. c.* p. 164, pl. xvi. fig. 6, Mexico.

Harmostes formosus, fig. 15, Mexico, *subrufus*, fig. 16, Guatemala, *bicolor*, fig. 17, Mexico, p. 167, *propinquus*, fig. 19, Mexico, Guatemala, p. 168, *id. l. c.* pl. xv.; *H. incisuratus*, id. Tr. E. Soc. 1881, p. 395, Colombia, Cauca.

Berytidæ.

Metatropis rufescens, Herr.-Schäff.: larva described; Sahlberg, Medd. Soc. Fenn. vii. p. 23.

Lygæidæ.

Ischnocoris intermedius, Horv. Amended description: *I. hemipterus*, var. *nigricans*, Put., is a variety of this species; Horváth, Bull. Soc. Ent. Fr. (6) i. p. xxxiii.

Scolopostethus lethierrii, Jak., and *pilosus*, Reut., differentiated; *id.* SB. Ges. Isis, 1879, p. 95. *S. pictus*, Schill., var. *antennalis* from Hungary described; *id.* Term. füzetek, v. p. 41.

Plinthisus convexus, Fieb.: macropterous form described; *id. l. c.* iv. p. 185. *P. ptilioides*, Put.: macropterous form from Dalmatia described; *id. l. c.* v. p. 39.

Lygæus picturatus, Blanch., = *Phytocoris gayi*, Spin.; Berg, An. Soc. Arg. xii. p. 262.

Pachymerus rolandri, var. *morio* from Egerland described; Gradl, Ent.

Nachr. vii. pp. 308 & 309. *P. polychroma*, Spin., belongs to *Pamera*, Say ; Berg, *l. c.* p. 261.

Heterogaster, Schill.: table of species; Jakovleff, Bull. Mosc. lvi. 1, pp. 201 & 202.

New species :—

Cynus calvus and *criniger*, F. B. White, Ann. N. H. (5) vii. pp. 56 & 57, Hawaiian Islands.

Rhyparochromus lederi, Horváth, Term. füzetek, iv. p. 184, Transcaucasia.

Microtoma morio and *angustula*, Reuter, Œfv. Fin. Soc. xxii. p. 10, Greece.

Scolopostethus grandis, Horváth, *l. c.* p. 185, Hungary; *S. maderensis*, Reuter, B. E. Z. xxv. p. 158, Madeira.

Ischnocoris sinuaticollis, id. Œfv. Fin. Soc. xxii. p. 9, Greece.

Germatus [sic] *violaceus*, Signoret, Bull. Soc. Ent. Fr. (6) i. p. l., Madagascar.

Geocoris erythrophthalmus, Reuter, *l. c.* p. 9, Balkans; *G. acuticeps*, Signoret, *l. c.* p. l., Egypt ; *G. deficiens*, Lethierry, Ann. Ent. Belg. xxv. p. 9, Guadeloupe.

Salacia sericea, id. *l. c.* p. 9, Guadeloupe.

Heterogaster distincta, Jakovleff, Bull. Mosc. lvi. 1, p. 202, Persia.

Arocatus maculifrons, id. *l. c.* p. 208, Vladivostok.

Eremocoris angusticollis, id. *l. c.* p. 211, Vladivostok.

Dimorphopterus thoracicus, id. *l. c.* p. 210, Vladivostok.

Drymus parvulus, id. *l. c.* p. 211, Vladivostok ; *D. confusus* (= *Rhyparachromus pilicornis*, Horv., *nec* Muls.), Horváth, Term. füzetek, v. p. 41, Hungary.

Plinthisus subtilis, Syria, and *mehadiensis*, Hungary, *id. l. c.* pp. 39 & 40.

Lethæus picipes (Herr.-Schäff., MS.), Turkey, and *dalmatinus*, Dalmatia, *id. l. c.* p. 40.

Nysius blackburni, *nitidus*, p. 53, *nemorivagus*, p. 54, *rubescens*, *pteridicola*, p. 55, *vulcan*, p. 56, F. B. White, *l. c.*, Hawaiian Islands.

Lygæus (*Microspilus*) *ruficornis*, Lethierry, Ann. Mus. Genov. xvi. p. 290, Shoa.

Dieuches scioensis, id. *l. c.* p. 291, Shoa.

Pyrrhocoridæ.

Dysdercus suturellus, Herr.-Schäff. Habits, &c., discussed ; Comstock, Rep. Dep. Agric. 1879, pp. 203–205.

Roscius circumdatus, sp. n., Distant, P. Z. S. 1881, p. 275, pl. xxxi. fig. 4, Calabar.

Dysdercus antennatus, id. *l. c.* p. 275, pl. xxxi. fig. 5, Calabar ; *D. delauneyi*, Lethierry, Ann. Ent. Belg. xxv. p. 10, Guadeloupe, Martinique: spp. nn.

Dermatinus reticulatus, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. xlii., China.

Tingididæ.

Corythucha arcuata, Say, var. Habits and transformations described; Comstock, Rep. Dep. Agric. 1879, pp. 221 & 222, pl. iv. figs. 2 & 3.

Monanthia ciliaris and *kiesenwetteri*, var. *pauperata*, Put., = *balanogloi* and *angustipennis*, Jak., respectively, Puton, Bull. Soc. Ent. Fr. (6) i. p. xxx. *M. humuli*, Fabr.: larva described; Sahlberg, Medd. Soc. Fenn. vii. p. 40. *M. brachycera*, Fieb., = *angustata*, Herr.-Schäff., *nec* Fieb.; *M. ragusana*, Fieb., redescribed: Horváth, *op. cit.* pp. xxxiv. & xxxv. *M. angustata*, Herr.-Schäff., var. *sympathetica* from Hungary, described; *id.* Term. füzetek, v. p. 41.

Agramma nigriceps, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. l., New Caledonia.

Monanthia (*Catoplatus*) *krueperi*, Smyrna, and *M.* (*C.*) *antica*, Greece, Reuter, Œfv. Fin. Soc. xxii. p. 11, spp. nn.

Campylostira pilifera, sp. n., *id. l. c.* p. 12, Greece.

Aradidæ.

Aradus compressicornis, Stål, noted as occurring both in New Granada and Valdivia; Berg, An. Soc. Arg. xii. p. 262.

Dacerta, g. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. clvii. Myodochaires: differs from section 4 of Stål by the hinder lobe of the pronotum being narrower than the front lobe, and spined in the middle, ocelli not distinct; type, *M. medio-spina*, sp. n., *l. c.*, California.

Daerlac, g. n., *id. l. c.* p. clviii. Allied to *Erlaçda*, head ferruginous, truncated behind the eyes; type, *D. araphœoides*, sp. n., *l. c.*, Australia.

Joppeicus, g. n., Puton, MT. schw. ent. Ges. vi. p. 123. *Aradides*, but with a superficial resemblance to *Notochilus ferrugineus*; type, *J. paradoxus*, sp. n., *l. c.* p. 124, Jaffa.

Aradus megerlii, sp. n. (= *crenaticollis*, Fieb., *nec* Sahlb.), Reuter, B. E. Z. xxv. p. 172, Austria.

Capsidæ.

Sahlberg (Medd. Soc. Fenn. vii. pp. 44–78) notices *Teratocoris antennatus*, Boh., var., *T. paludum*, Sahlb., ♀; *Lygus limbatus*, Fall., var., *L. pabulinus*, Linn., var.; *Charagochilus gyllenhali*, Fall., ♀; *Pithanus mærkeli*, Herr.-Schäff., var.; and *Agalliastes pulicarius*, Fall., var., &c.

Lopus vittatus, Horv., = *hieroglyphicus*, Muls. & Rey, and *Capsus melanaspis* and *maculicollis*, M. & R., = *Hadrodema pinastri*, Fall.; Puton, Bull. Soc. Ent. Fr. (6) i. p. cxlvii.

Amblytylus delicatulus, Perr., ♀, and *Phylus plagiatus*, Herr.-Schäff., var. from Austria described, p. 160; *Calocaris bimaculatus*, Herr.-Schäff. (*nec* Fabr.), = *schmidti*, Fieb., p. 190; Reuter, B. E. Z. xxv.

Capsus (*Deræocoris*) *fratruelis* and *Resthenia pallida* and *univittata*, Berg, redescribed, and the first two figured by him, Exped. Rio Negro, Zool. pp. 82 & 83, pl. ii. figs. 3 & 4.

Phytocoris. Table of Spanish species, short notes on known ones, and descriptions of 4 new; Bolivar, An. Soc. Esp. x. pp. 359–365.

Myrmecoris saundersi, Puton, figured by Waterhouse, Aid, i. pl. xxv.

New genera and species :—

Horwathia, Reuter, B. E. Z. xxv. p. 174. Allied to *Lopus*; type, *L. vittatus*, Horv.

Myrmicomimus, id. *l. c.* p. 178. Allied to *Globiceps*; type, *G. variegatus*, Costa.

Utopnia, id. *l. c.* p. 185. Allied to *Plagiognathus*; type, *Macrotylus torquatus*, Put.

Ischnoscelis, id. Œfv. Fin. Soc. xxii. p. 15. Allied to *Phytocoris*, rostrum shorter, joints of antennæ thicker, the first shorter, and without stiff bristles; type, *I. rubrinervis*, sp. n., *l. c.*, Algeria.

Cremnorrhinus, id. *l. c.* p. 18. Allied to *Orthocephalus*, first joint of the rostrum shorter and less dilated, head much narrower, eyes oval, tarsi scarcely spined; type, *C. basalis*, sp. n., *l. c.* p. 19, Greece.

Camarocyphus, id. *l. c.* p. 21. Allied to *Odontoplatys*; type, *C. nigrogularis*, sp. n., *l. c.* p. 22, Attica.

Brachynotocoris, id. *l. c.* p. 22. Allied to *Reuteria*, eyes much less diverging, rostrum shorter and thicker; type, *B. puncticornis*, sp. n., *l. c.*, Madrid.

Hemicerocoris, Lethierry, Ann. Ent. Belg. xxv. p. 11. Allied to *Capsus*; type, *H. nigritarsis*, sp. n., *l. c.* p. 12, Guadeloupe.

Camptotylus reuteri, Astrakan, Sarepta, *aphidoides*, Petrovsk, Caucasus, Jakovleff, Bull. Mosc. lvi. 1, pp. 196 & 199.

Leptopterna pilosa, Reuter, Œfv. Fin. Soc. xxii. p. 13, Spain.

Phytocoris pilifer, Greece, Asia Minor, p. 13, *parvulus*, p. 14, and *unicolor*, Greece, p. 15, *id. l. c.*; *P. fieberi*, p. 361, *chicotei*, p. 362, *citrinus*, p. 363, *delicatulus*, p. 364, Bolivar, An. Soc. Esp. x., Spain.

Malacocoris sulphuripennis, Westhoff, JB. westf. Ver. ix. p. 79, Westphalia.

Calocoris isabellinus, id. *l. c.* p. 80, Westphalia; *C. princeps* and *kruegeri*, Reuter, *l. c.* p. 16, Greece; *C. albo-notatus*, Jakovleff, *l. c.* p. 194, Persia.

Pœciloscytus (*Charagochilus*) *irroratus*, Lethierry, Ann. Ent. Belg. xxv. p. 10, Guadeloupe.

Eroticoris albiceps, id. *l. c.* p. 12, Guadeloupe.

Megacœlum ruficeps, Greece, and *pulchricorne*, Spain, Reuter, *l. c.* pp. 17 & 18; *M. pellucens*, Puton, MT. schw. ent. Ges. vi. p. 125, Jaffa; *M. elongatum*, Lethierry, Ann. Mus. Genov. xvi. p. 293, Shoa.

Camptobrochis parvulus, Reuter, B. E. Z. xxv. p. 158, Madeira.

Heterocordylus parvulus, id. *ibid.*, South France.

Megalobasis linæ, Puton, Bull. Soc. Ent. Fr. (6) i. p. lxv., Caïffa (incorrectly described as *M. bipunctatus*, Reut.; *id.* MT. schw. ent. Ges. vi. p. 126.)

Byrsoptera syriaca, id. MT. schw. ent. Ges. vi. p. 127, Caïffa.

Orthocephalus funestus, Jakovleff, *l. c.* p. 195, Vladivostok; *O. bolivari*, Spain, *debilis*, Greece, Reuter, Œfv. Fin. Soc. xxii. pp. 19 & 20.

Labops (*Orthocephalus*) *punctatipennis*, Trieste, and *L.* (*Pachytoma*) *pachymerus*, Spain, Reuter, B. E. Z. xxv. p. 159.

Pachytoma tauricus [*-ca*], Tauria, iv. p. 185, & v. p. 41, and *punctigera*, Syria, v. p. 42, Horváth, Term. füzetek.

Orthotylus eleagni, Jakovleff, *l. c.* p. 200, Caucasus.

Macrotylus colon, Reuter, Œfv. Fin. Soc. xxii. p. 23, Spain; *M. torquatus*, Puton, *l. c.* p. 126, Beyrut.

Plagiognathus olivaceus, Reuter, *l. c.* p. 23, Spain.

Psallus pallidus, id. *l. c.* p. 24, Pyrenees.

Anthocoridæ.

Dilasia (?) *denigrata*, *D.* (?) *decolor*, and *Lilia dilecta*, F. B. White, noticed by him; Ann. N. H. (5) vii. p. 58.

Microphysa elegantula, Bär., noticed; Fokker, Tijdschr. Ent. xxiv. p. xix.

Microphysa nigritula, sp. n., Puton, MT. schw. ent. Ges. vi. p. 127, Caïffa.

Saldidæ.

Salda opacula, Zett., varr. *setulosa*, from Beziers, and *nitidula*, from Corsica and Hyères, described, p. 197; *S. lateralis*, var. *concolor*, from France, described, p. 203: Puton, Hém. Hétér. France, iii. *S. saltatoria*, Linn., varr. *conjuncta*, *vittata* and *irregularis*, from Westphalia, described; Westhoff, JB. westf. Ver. viii. p. 62. *S. opacula*, Zett., and *riparia*, Fall.: varr. described; Sahlberg, Medd. Soc. Fenn. vii. pp. 88 & 90. *S. argentina*, Berg, redescribed by him; Exped. Rio Negro, Zool. p. 83.

Salda apicola, Sahlberg, Forh. Selsk. Chr. 1880, No. 9, p. 8, Norway; *S. lapponica*, id. Medd. Soc. Fenn. vii. p. 85, Lapland; *S. luctuosa*, Westhoff, JB. westf. Ver. viii. p. 65, Westphalia; *S. ornatula*, Reuter, B. E. Z. xxv. p. 160, Nubia: spp. nn.

Leptopus niloticus, sp. n., *id. l. c.* p. 161, Ambukohl.

Nabidæ.

Nabis brevipennis, Hahn: macropterous form noticed; Horváth, Term. füzetek, iv. p. 186.

Prostemma laterale, Fieb., = *æneicolle*, Stein, nymph; *id.* Bull. Soc. Ent. Fr. (6) i. p. xxxv.

Nabis reuterianus, sp. n., Puton, Hém. Hétér. France, iii. p. 190, South France.

Reduviidæ.

Reuter, O. M. Ad cognitionem Reduvidarum mundi antiqui. Act. Fenn. xii. pp. 1–71 (sep. pagination).

Consists almost entirely of descriptions of new genera and species. The following known species are noticed, or varieties described:—*Polididus*

armatissimus, Stål, from Tranquebar, p. 4 ; *Pristhesancus dorycus*, Boisd., variation, p. 5 ; *Rihirbus trochantericus*, Stål, var. *testaceus*, from East Indies, p. 11 ; *Endochus consors*, Stål, structure noticed, *nigricornis*, Stål, ♂ described, p. 12, *inornatus*, Stål, var. from Bengal ; *Evagoras atripes*, Stål, var. *discifer* from Amboina, p. 13 ; *Gminatus australis*, Er., var. from Australia, p. 14 ; *Hagia discophora*, Stål, var. from New Guinea, p. 15 ; *Yolinus fuliginosus*, Stål, var. from Borneo, p. 17 ; *Pantolinus princeps* and *dux*, Stål, differentiated, p. 20 ; *Velinus crassiorus*, var. from New Guinea, p. 21 ; *Sphedanolestes nanus*, Stål, varr. from Australia and Natal (eadem?) p. 22 ; *Havinthus pentatoma*, Herr.-Schäff., and *longiceps*, Stål, varr. from Australia, p. 23 ; *Reduvius* (*Diphynus*) *morio*, noticed, *R.* (*Chirillus*) *violentus*, Germ., from South Africa, p. 24, *R.* (*C.*) *marginatus*, Fabr., varr. from East Indies, *R. costalis*, Stål, = *fuscipes*, Fabr., var. ; *R. interruptus*, Stål, structure noticed, p. 25, *R.* (*Oncauchenius*) *leucospilus*, Stål, varr. from Siberia and the Amur, p. 27 ; *Physorrhynchus* (*Hæmatorrhophus*) *linnæi*, and *P.* (*H.*) *tuberculatus* (?) Stål, redescribed, p. 32 ; *Labidocoris elegans*, Mayr, noticed from Tranquebar ; *Mendis semirufa*, Stål, var. from Pulo Penang, p. 36, and *fuscipennis*, Stål, var. from Java ; *Cleptria oculata*, Stål, var. from Damara Land, p. 37, *C. rufipes*, Stål, var. from Cape of Good Hope, p. 38 ; *Sphinctocoris corallinus*, Mayr, recorded from Borneo, p. 39 ; *Hæmatolæcha nigro-rufa*, Stål, var. from Japan, p. 40 ; *Pirates mundulus*, Stål, ♀, p. 43 ; *Eumerus ochropterus*, var. from East Indies, p. 46 ; *Durganda rubra*, Lap., var. from Morty Island ; *Acanthaspis* (*Tetroxia*) *spinifera*, amended description, p. 56, *A. flavipes*, Stål, var., *geminata* from the Himalayas, p. 57, *A. bistillata*, Stål, redescribed, p. 59, *A.* (*Mardania*) *uncinata*, Stål, redescribed, *A.* (*M.*) *sellata*, var. from the Cape of Good Hope, p. 61 ; *Petalochirus malayus*, Stål, redescribed ; *Lisarda annulosa* and *spurca*, Stål, noticed, p. 68, and *L. rhypara*, Stål, redescribed, p. 69.

Coriscus lineatus, Dahlb., discussed ; Reuter, Œfv. Fin. Soc. xxii. pp. 25–32.

Harpactor lividigaster, Muls. & Rey, var. *atripes*, from Algeria, described ; Puton, Hém. Hétér. France, iii. p. 180.

New genera and species :—

Polemistes, Reuter, Act. Fenn. xii. p. 8. Allied to *Vestula* and *Vadimon*, Stål ; types, *P. bicoloripes* and *fulvicornis*, spp. nn., *l. c.*, Philippines.

Macracanthopsis, id. *l. c.* p. 14. Allied to *Cydnocoris*, head longer, spines behind the antennæ much longer and hardly curved forward ; type, *M. nodipes*, sp. n., *l. c.* p. 15, Darjiling.

Colpochilocoris, id. *l. c.* p. 15. Allied to *Agriolestes*, Stål, head much longer behind the eyes, ocellar tubercles a little higher, scutellum less transverse, &c. ; type, *C. fasciativentris*, sp. n., *l. c.* p. 16, Borneo, Malacca.

Coranideus, id. *l. c.* p. 28. Section of *Reduvius* ; type, *Harpactor calviventris*, Germ. (redescribed, *l. c.*).

Hexamerocerus, id. *l. c.* p. 38. Allied to *Labidocoris*, *Mennis*, and *Cleptria* ; type, *H. nobilis*, sp. n., *l. c.* p. 39, Zanzibar.

Bathysmataspis, Reuter, *l. c.* p. 40. Allied to *Sphinctocoris*; type, *B. rufipes*, sp. n., *l. c.*, Guinea.

Calistocoris, id. *l. c.* p. 50. Placed after *Eumerus*; type, *C. cæsareus*, sp n., *l. c.*, Borneo.

Apechtia, id. *l. c.* p. 52. Allied to *Sminthus*; type, *A. mesopyrrha*, sp. n., *l. c* p. 53, Ceylon.

Paralenæus, id. *l. c.* p. 53. Allied to *Lenæus*; type, *P. pyrrhomelas*, sp. n., *l. c.* p. 54, Darjiling.

Mastacocerus, id. *l. c.* p. 55. Placed after *Phonergates*; type, *M. humeralis*, sp. n., *l. c.* p. 56.

Pasiropsis, id. *l. c.* p. 61. Allied to *Acanthaspis*; type, *P. bipustulata*, sp. n., *l. c.* p. 62, Borneo.

Allæocranum, id. *l. c.* p. 64. Subgenus of *Microcleptes*, Stål; type, *M.* (*A.*) *quadrisignatus*, sp. n., *l. c.* p. 65, Darjiling.

Myiophanes, id. *l. c.* p. 69 (*Emesina*); type, *M. tipulina*, sp. n., *l. c.* p. 70, Japan.

Arachnocoris, Scott. Ent. M. M. xvii. p. 272. Allied to *Allæorhynchus*; pronotum not constricted beyond the middle; second pair of thighs incrassated; elytra constricted before the middle: types, *A. albo-maculatus*, Rio Janeiro, and *dispar*, Para, spp. nn., *l. c.* pp. 273 & 274.

Ploiariodes, F. B. White, Ann. N. H. (5) vii. p. 58. Differs from *Ploiaria* in the unreflexed side margins, and tuberculate hind margin of the pronotum; type, *P. whitei* (Blackb., MS.), sp. n., *l. c.*, p. 59, Hawaii.

Ptilocnemis minutus, Melbourne, and *quadrinotatus*, Adelaide, Reuter, Act. Fenn. xii. p. 3.

Holoptilus fasciatus, id. *l. c.* p. 4, Calcutta.

Scipinia spinigera, id. *ibid.*, Java.

Pristhesancus fasciatus, id. *l. c.* p. 5, New Holland.

Harpactor rubrogularis, Horváth, SB. Ges. Isis, 1879, p. 96, Suram, Transcaucasia; *H. abeillii*, Puton, MT. schw. ent. Ges. vi. p. 128, Jerusalem.

Coranus rubripennis, Madagascar, *australicus*, Australia, p. 6, *spiniscutis*, Tranquebar, *fuscipennis*, Sumatra, p. 7, *pallidus*, Chinchoxo, p. 8, Reuter, l. c.; *C. contrarius*, Sarepta, and *tuberculifer*, Brussa, *id.* B. E. Z. xxv. pp. 161 & 162; *C. ventralis*, Lethierry, Ann. Mus. Genov. xvi. p. 294, Shoa.

Opsicœtus annulipes, Tangiers, and *minutus*, Sicily, Egypt, Reuter, *l. c.* p. 163.

Panthous nigriceps, Banka, and *limbo-guttatus*, Borneo, *id.* Act. Fenn. xii. p. 10.

Isyndus pilosipes, id. *l. c.* p. 11, Darjiling.

Endochus (*Pairsus*) *pallidipes*, id. *l. c.* p. 13, Pulo-Penang.

Cydnocoris fasciatus, id. *l. c.* p. 14, Pulo-Penang.

Sycanus curvatofurcatus, Borneo, *affinis*, Darjiling, p. 17, *tuberculatus*, Borneo, p. 18, *parvulus*, Pulo-Penang, p. 19, and *limbifer*, Philippine Islands, p. 20, *id. l. c.*

Sphedanolestes pubinotum, Darjiling, *indicus*, East Indies, p. 21, *S.* (*Graptosphodrus*) *dromedarius*, New Guinea, and *S.* (*G.*) *discifer*, Pulo-Penang, p. 22, *id. l. c.*

Reduvius variegatus, id. Öfv. Fin. Soc. xxii. p. 12, Attica; *R. bicoloripes*, Distant, Tr. E. Soc. 1881, p. 106, Antananarivo; *R.* (*Diphymus*?) *tristicolor*, East Indies, p. 23, *R.* (*Lamphrius*) *sericans*, Sumatra, p. 25, *R.* (*Harpiscus*) *discoidalis*, South Africa, *R.* (*H.*) *nigripes*, Madagascar, p. 26, and *R.* (*H.*) *nigro-nitens*, Tarbagatai, p. 27, Reuter, Act. Fenn. xii.

Amphibolus beduinus, Puton, Bull. Soc. Ent. Fr. (6) i. p. lxvi., Géryville; *A. obscurus*, Reuter, *l. c.* p. 28, South Africa.

Lopodytes spiniger, Ovampo Land, and *dolichomerus*, Zanzibar, *id. l. c.* pp. 28 & 29.

Raphidosoma linea, Ovampo Land, and *pallidum*, Damara Land, *id. l. c.* pp. 29 & 30.

Diaspidius ungeri, id. *l. c.* p. 30, Quita, West Africa.

Vilius schlicki, Sumatra, and *cornutus*, Borneo, *id. l. c.* p. 31.

Physorrhynchus (*Hæmatorrhophus*) *marginatus*, Bengal, p. 33, *P.* (*H.*) *nigro-violaceus*, Tranquebar, and *P.* (*Glymmatophora*) *nigripes*, Zanzibar, p. 34, *id. l. c.*

Ectrychotes cupreus, Bantam, *abbreviatus*, p. 35, and *dispar*, Calcutta, p. 36, *id. l. c.*

Mendis maculipennis, id. *l. c.* p. 37, Pulo-Penang.

Cleptria similis, id. *l. c.* p. 38, South Africa.

Scadra annulipes, Calcutta, and *annulicornis*, Ceylon, *id. l. c.* p. 41.

Santosia vitticollis, Chinchoxo, and *annulicornis*, Borneo, *id. l. c.* pp. 41 & 42.

Apiomerus oberthu[*e*]*ri*, Distant, Ent. M. M. xvii. p. 222, Amazons.

Pirates concolor, Jakovleff, Bull. Mosc. lvi. (1) p. 213, Vladivostok; *P.* (*Fusius*) *h-flavum*, Gaboon, p. 42, *P. frater*, Caratraca, *P.* (*Cleptocoris*) *mœstus*, Amur, Japan, p. 43, *P.* (*C.*) *vittatus*, Sumatra, *P.* (*C.*) *nitidicollis*, Chinchoxo, p. 44, *P.* (*Brachysandalus*) *rogenhoferi*, Malacca, *P.* (*B.*) *crassifemur*, p. 45, *P.* (*B.*) *alutaceus*, and *P.* (*B.*) *limbatus*, Australia, p. 46, Reuter, Act. Fenn. xii.

Lestomerus glabratus and *parvulus*, Signoret, Bull. Soc. Ent. Fr. (6) i. p. xlii., China.

Horcinia transversa, id. *ibid.*, China.

Eumerus flavipennis, Caffraria, *fasciola*, Australia, *steini*, Caffraria, p. 47, *sansibaricus*, Zanzibar, *australicus*, New Holland, p. 48, *discoloripes*, Madagascar, and *insignis*, Ceylon, p. 49, Reuter, *l. c.*

Tiarodes rufithorax, Pulo-Penang, Borneo, *xanthusi*, Borneo, p. 51, and *dubius*, Philippines, p. 52, *id. l. c.*

Velitra fuscinervis, id. *l. c.* p. 54, New Guinea.

Phonergates concoloripes, Damara Land, p. 54, *P.* (*Clopophora*) *stæli* and *P.* (*C.*) *rubro-maculata*, Guinea, p. 55, *id. l. c.*

Acanthaspis pernobilis, Darjiling, p. 57, *vitticollis*, Guinea, p. 58, *dubia*, Angola, Chinchoxo, p. 59, *lineatipes*, Darjiling, and *westermanni*, Hong Kong, p. 60, *id. l. c.*

Edocla quadrimaculata, id. *l. c.* p. 62, Namaqua Land.

Opsicœtus maculosus, Chinchoxo, and *octo-maculatus*, Adafoa (Africa), *id. l. c.* pp. 63 & 64.

Centrocnemis stæli, id. *l. c.* p. 65, Darjiling.

Syberna annulata, id. *l. c.* p. 66, Pulo-Penang.

Lisarda (*Œnusa*) *guttulifera*, Chinchoxo, and *L.* (*Œ.*) *schweinfurthi*, Libya, *id. l. c.* pp. 67 & 68.

Plœaria oculata, id. *l. c.* p. 70, Ceylon.

Hydrometridæ.

Aepophilus bonnairii, Sign., recorded as new to Britain; Waterhouse, P. E. Soc. 1881, p. xxx., & Ent. M. M. xviii. p. 145.

Halobates, sp. found far from land in the China Sea; Semper, Natural Conditions of Existence, p. 144, fig. 35.

Hebrus ruficeps, Thoms., *Heterocordylus erythrophthalmus*, Herr.-Schäff. (= *Bothrocranum poeyi*), and *Piezostethus maculipennis*, Baer, recorded as new to France; Puton, Bull. Soc. Ent. Fr. (6) i. pp. lxvi. & lxvii.

Velia rivulorum, Fabr., var. *ventralis* from Beyrut noticed; *id.* MT. schw. ent. Ges. vi. p. 128.

Limnotrechus chilensis, sp. n., Berg, An. Soc. Arg. xii. p. 263, Chili.

Corisidæ.

Corisa præusta, Fieb., var. *bistriata* from Westphalia described; Westhoff, JB. westf. Ver. viii. p. 57. *C. selecta*, Fieb.: characters discussed; Puton, Bull. Soc. Ent. Fr. (6) i. p. cxlvii.

Corisa jakowleffi, sp. n, Horváth, SB. Ges. Isis, 1879, p. 96, Caucasus.

Sigara sahlbergi, sp. n., Jakovleff, Bull. Mosc. lvi. 1, p. 213, Amur.

HEMIPTERA-HOMOPTERA.

Ashmead, W. H. On the *Aphididæ* of Florida, with description of new species. Canad. Ent. xiii. pp. 154–156, 220–225.

13 species of *Aphididæ* and 12 of *Psyllidæ* are enumerated. The writer questions the accuracy of Kollar's observations on the habits of the *Psyllidæ*.

Fieber, F. X. Les Cicadines d'Europe, traduit par F. Reiber. R. Z. (3) vii. pp. 81–160.

Continues the work first mentioned in Zool. Rec. xii. p. 508; and extends from *Liburnia* to *Stiroma*. A few apparently new species are included.

Cholera attributed to the puncture of some Homopterous insect [!]; Beauperthuy, New Medical Record, Dec. 12, 1881, and Bull. Soc. Ent. Fr. (6) i. p. clx.

Cicadidæ.

Distant, W. L. Biologia Centrali-Americana (cf. *Insecta*, General Subject, *sub* Godman & Salvin). *Rhynchota*: *Hemiptera-Homoptera*, pp. 1–16, pls. i. & ii.

Includes *Cicadidæ* from *Zammara* to *Fidicina*. The following known species are figured or specially noticed:—*Zammara smaragdina*, Walk. (= *angulosa*, Walk.), figs. 1, 1 *a* & 1 *b*, *calochroma*, Walk. (= *smaragdula*,

Walk., = *callichroma*, Stål), figs. 5, 5 *a* & 5 *b*, p. 3; *Odopœa imbellis*, Walk., figs. 3, 3 *a* & 3 *b*, *signoreti*, Stål, figs. 10, 10 *a* & 10 *b*, *medea*, Stål, figs. 2, 2 *a* & 2 *b*, pl. i., and *montezuma*, Walk., pl. iii. figs. 5, 5 *a* & 5 *b*, pp. 4 & 5; *Cicada transversa*, Walk. (= *alacris*, Stål), pl. ii. figs. 1, 1 *a* & 1 *b*, *ornea*, Walk., figs. 3, 3 *a* & 3 *b*, *bicosta*, Walk., figs. 1, 1 *a* & 1 *b*, pl. iii. p. 7, *rudis*, Walk., figs. 20, 20 *a* & 20 *b*, p. 8, *nigriventris*, Walk., figs. 6, 6 *a* & 6 *b*, *psophis*, Walk., figs. 11, 11 *a* & 11 *b*, pl. ii., *crucifera*, Walk., figs. 6, 6 *a* & 6 *b*, p. 9; *Tettigia hieroglyphica*, Say (= *johannis* and *sexguttata*, Walk.), figs. 2, 2 *a* & 2 *b*; *Proarna albida*, Oliv., figs. 9, 9 *a* & 9 *b*, pl. iii., and var. *insignis* from Nicaragua and Panama, *sallæi*, Stål, pl. i. figs. 8, 8 *a* & 8 *b*, p. 12, *signifera*, Walk., pl. ii. figs. 21, 21 *a* & 21 *b*, p. 13; *Tympanoterpes gigas*, Oliv. (*trihypsilon* and *sonans*, Walk.), figs. 9, 9 *a* & 9 *b*, p. 14; *Fidicina picea*, Walk. (= *determinata*, Walk., = *pectinata*, Stål), figs. 7, 7 *a* & 7 *b*, and *pronoe*, Walk. (= *vinula*, Stål, = *compacta*, Walk.), figs. 6, 6 *a* & 6 *b*, pl. i. p. 16.

Mayr, P. M. *Rhynchota Tirolensia*. ii. *Hemiptera-Homoptera* (Cicadinen). Ber. Ver. Innsbrück, x. pp. 79–101.

Exclusively of local interest.

Platypleura, sp. from Madagascar noticed; Distant, P. E. Soc. 1881, p. ii.

Cicada. The sound-producing apparatus is confined to the males; but may possibly serve for protective as well as sexual purposes, as appears to be the case in *Dundubia imperatoria*; Distant, P. E. Soc. 1881, pp. ii. & iii. A species from Borneo with very large opercula noticed; *id. l. c.* pp. xxxii. & xxxiii. *C. septemdecim* and *tredecim* noticed, and the former figured; Riley, Am Nat. xv. pp. 497–482; *cf.* also Riley, Index to Reports, pp. 58 & 59.

New species:—

Zammara columbia, Distant, Tr. E. Soc. 1881, p. 628, Colombia.

Odopœa jamaicensis, id. *l. c.* p. 629, Jamaica; *O. azteca*, pl. i. figs. 4, 4 *a* & 4 *b*, Mexico, and *diriangani*, pl. iii. figs. 10, 10 *a* & 10 *b*, Chontales, *id.* Biol. Centr. Am. *Rhynch. Hom.* pp. 4 & 5.

Tettigades mexicana, id. *l. c.* p. 6, pl. ii. figs. 9, 9 *a* & 9 *b*, Mexico.

Pœcilopsaltria leopardina, id. Tr. E. Soc. 1881, p. 630, Zanzibar.

Platypleura gigas, Madagascar, pl. iii. figs. 4 & 4 *a*, p. 117; *P. inquinata*, Nyassa, and *cerea*, Calabar, pp. 631 & 632, *id. l. c.*; *P. antinorii* and *beccarii*, Lethierry, Ann. Mus. Genov. xvi. pp. 296 & 297, Shoa; *P. hyalinolimbata*, Signoret, Bull. Soc. Ent. Fr. (6) i. p. xlii., China.

Leptopsaltria pryeri, Distant, *l. c.* p. 633, North Borneo.

Dundubia radha, Masuri, p. 634, *tripurasura*, Assam, and *nagarasingna*, North-west Burma, p. 635, *id. l. c.*

Cosmopsaltria sita, South India or Bombay, *durga*, Assam, *mongolica*, North China, *abdulla*, Singapore, Penang, *oopaga*, Burma, and *operculissima*, North Borneo, *id. l. c.* pp. 636–641.

Pomponia bindusara, Tenasserim, *kama*, Darjiling, and *madhava*, Assam, *id. l. c.* pp. 642–644.

Psaltoda aurora, id. *l. c.* p. 644, Rockhampton, Australia.

Cicada kuruduadua, Distant, *l. c.* p. 645, Fiji ; *C. montezuma* (*rudis*, var. figs. 2, 2 *a* & 2 *b*), *pallida*, figs. 7, 7 *a* & 7 *b*, p. 8, *hilaris* (= *alacris*, figs. 10, 10 *a* & 10 *b*), p. 9, *intermedia*, *robusta* (= *alacris*, var., figs. 3, 3 *a* & 3 *b*), and *dissimilis*, p. 10, *id.* Biol. Centr. Am. *Rhynch. Hom.* pl. ii., Mexico.

Tibicen aurengzebe, id. Tr. E. Soc. 1881, p. 646, Bombay Presidency.

Carineta oberthueri, id. *l. c.* p. 647, Ega.

Tettigia pennata, id. Biol. Centr. Am. *Rhynch. Hom.* p. 11, pl. ii. figs. 12, 12 *a* & 12 *b*, Guatemala.

Proarna championi, figs. 14, 14 *a* & 14 *b*, Mexico, Guatemala, Costa Rica, p. 12, *maura*, figs. 5, 5 *a* & 5 *b*, *longirostris*, figs. 4, 4 *a* & 4 *b*, Mexico, p. 13, *id. l. c.* pl. ii. ; *P. prægracilis*, Berg, An. Soc. Arg. xii. p. 264, Bolivia.

Selymbria modesta, Distant, *l. c.* p. 14, pl. iii. figs. 8, 8 *a* & 8 *b*, Mexico, Nicaragua.

Cercopidæ.

Tomaspis nyassæ and *Cosmoscarta andamana*, Dist., figured by Waterhouse, Aid, i. pls. xxiv. & lviii.

Triecphora fasciata, Kirby, var. *geniculata* described from Syria ; Horváth, Term. füzetek, v. p. 42.

Fulgoridæ.

Luminosity of *Fulgoridæ* not confirmed ; Pryer, Ent. M. M. xvii. pp. 214 & 215.

Polydictya maculata, *Aphana novemmaculata*, Dist., and *Pœciloptera consociata*, Walk., figured by Waterhouse ; Aid, i. pls. xli., l. & lxxxiii.

Hysteropterum grylloides, Fabr. : note on larva ; Signoret, Bull. Soc. Ent. Fr. (6) i. p. xlii.

Liburnia cognata, Berg, *nec* Fieb., renamed *bergi* ; Scott, Ent. M. M. xviii. p. 156. *L. exigua*, Boh., var. *lugubrina*, described ; Fieber & Reiber, R. Z. (3) vii. p. 110. *L. fusco-irrorata*, Blanch., redescribed ; Berg, An. Soc. Arg. xii. p. 246.

Achorotile, Fieb., characterized (as *Achorotyle*) ; Fieber & Reiber, R. Z. (3) vii. p. 152.

New genera and species :—

Bergia, Scott, Ent. M. M. xviii. p. 155. Appears to connect the *Delphacidæ* and the *Cixiidæ* ; type, *Liburnia nimbata*, Berg.

Taracticus, Berg, An. Soc. Arg. xii. p. 265. Allied to *Faventia*, Stål ; type, *Cixius chilensis*, Spin. (redescribed, *l. c.*).

Liburnia albifrons, South Germany, p. 85, *flavifrons*, France, p. 92, *melanocephala*, Bavaria, p. 101, *latifrons*, locality not stated, p. 115, Fieber & Reiber, R. Z. (3) vii. ; *L. v-flava*, Scott, Ent. M. M. xviii. p. 104, Britain.

Diacira substigmatica, Lethierry, Ann. Ent. Belg. xxv. p. 13, Guadeloupe.

Alcestis longiceps and *triangulator*, id. *l. c.* pp. 13 & 14, Guadeloupe.

Carthæa viriditerminata and *simillima*, id. *l. c.* pp. 14 & 15, Guadeloupe.

Ormenis nivea and *nigra*, id. *l. c.* p. 15, Guadeloupe.

Lystra cerifera, Alas, Independencia Medica; quoted by Villada, Nat. Mex. v. Rivista, p. 2, Mexico.

Evides fusco-vittata, Scott, *l. c.* p. 155, Argentine Republic.

Flatoides dealbatus, Distant, Tr. E. Soc. 1881, p. 107, pl. iii. figs. 5 & 5*a*, Madagascar.

Membracidæ.

Smilia unicolor, Sign., = *Hemiptycha rubro-costata*, Spin.; Berg, An. Soc. Arg. xii. p. 267.

Methille, g. n., Butler, P. Z. S. 1881, p. 86. Allied to *Hille*, Stål, and *Melicoderes*, Spin.; type, *M. cuneata*, sp. n., *l. c.* p. 87, Straits of Magellan.

Delauneya, g. n., Lethierry, Ann. Ent. Belg. xxv. p. 17. Belongs to the *Centrotidæ*, but with a superficial resemblance to *Darnoides*, &c., in the *Membracidæ*. Type, *D. fasciata*, sp. n., *l. c.*, Guadeloupe.

Darnoides (?) *carinata*, sp. n., Lethierry, Ann. Ent. Belg. xxv. p. 15, Guadeloupe.

Triquetra intermedia, sp. n. (? = *inermis*, Fairm., var.), Distant, Ent. M. M. xvii. p. 223.

Iassidæ.

Edwards, J. Notes on the British *Bythoscopidæ*. Ent. M. M. xviii. pp. 51–54.

Includes general observations, and tables of genera and species.

Spångberg, J. Species novæ vel minus cognitæ Gyponæ, generis Homopterorum. Ent. Tidskr. ii. pp. 23–38.

The known species redescribed are *Gypona cana*, Burm., *flaviliniata*, Fitch, *verticalis*, *pectoralis*, *vinula*, and *irrorata*, Stål.

Tettigonia dæringi, *capitanea*, *Athysanus desertorum*, *Deltocephalus variegatus*, *gentilis*, *venosulus*, and *Typhlocyba salinarum*, Berg, redescribed and (except the last) figured by him; Exped. Rio Negro, Zool. pp. 85–87, pl. ii. figs. 5–10.

Thamnotettix fenestrata, Herr.-Schäff., var. *transversalis*, from Syria noticed; Puton, MT. schw. ent. Ges. vi. p. 129.

Cicadula exitiosa, Uhler, redescribed and figured; Comstock, Rep. Dep. Agric. 1879, pp. 191–193, pl. i. fig. 4.

Deltocephalus flori and *repletus*, Fieb., and *distinguendus*, Flor, recorded as new to Britain, and redescribed; Scott, Ent. M. M. xviii. pp. 66 & 67.

D. immaculipennis and *glaucus*, Blanch., redescribed; Berg, An. Soc. Arg. xii. pp. 268 & 269.

Agallia obscuripennis, Blanch., redescribed; *id. l. c.* p. 270.

New species:—

Gypona olivacea, North America, p. 24, *sobrina*, p. 25, *verecunda*, p. 26, *versuta*, Brazil, p. 27, *crassa*, Bahia, p. 28, *vernicosa*, Brazil, p. 29, *turpis*, Bahia, *melanocephala*, Cayenne, p. 30, *lobata* (Stål, MS.), Quito, p. 31, *chilensis*, Chili, *pudica*, Brazil, p. 32, *pauperata*, North America, p. 33, *breviceps*, Cayenne, p. 34, *annulipes* (Sign., MS.), Cuba, p. 35, *trivialis*, *fastuosa*, Brazil, p. 36, *funebris*, Mexico, p. 37, Spångberg, Ent. Tidskr. ii.

Tettigonia guadalpensis and *prolixa*, Lethierry, Ann. Ent. Belg. xxv. pp. 17 & 18, Guadeloupe.

Colidia semiflava, id. *l. c.* p. 18, Guadeloupe.

Acocephalus pelas, Reiber & Puton, Bull. Soc. Colmar, xx. & xxi. p. 62, Lorraine.

Thamnotettix picta, iid. *l. c.* p. 64, Lyons.

Deltocephalus normani, Morayshire, and *i-album*, Norwich, Scott, Ent. M. M. xviii. pp. 105 & 137.

Athysanus ocellaris, Metz, Austria, p. 65, *erythrostictus*, France, p. 66, *lævis*, Alsace, Algeria, p. 67, *pellucida*, North France, p. 68, Reiber & Puton, l. c.; *A. gestroi*, Lethierry, Ann. Mus. Genov. xvi. p. 298, Shoa; *A. araucanus*, Berg, An. Soc. Arg. xii. p. 267, Chili.

Agallia valdiviana, id. *l. c.* p. 271, Valdivia.

Chlorita aurantiaca, Reiber & Puton, *l. c.* p. 72, Lyons, &c.

Zygina frauenfeldi, iid. *l. c.* p. 74, Germany.

Psyllidæ.

Löw, F. Beiträge zur Biologie und Synonymie der Psylloden. Verh. z.-b. Wien, xxxi. pp. 157–170.

Includes life-histories of *Livia juncorum*, Latr., *Rhinocola succincta*, Heer (= *targionii*, Licht.), *R. speciosa*, Flor, *Allæoneura radiata*, Först., and *Psylla buxi*, Linn.

Reuter, O. M. Till kännedomen om Sveriges Psylloder. Ent. Tidskr. ii. pp. 145–172, 175 & 176, woodcuts.

The Swedish species (none new) are described, and a list of their various food-plants appended.

Trioza urticæ. Nymph described; Scott, Ent. M. M. xvii. p. 278.

Psylla buxi. Earlier stages noticed; *id. l. c.* p. 18.

New species:—

Typhlocyba lethierrii, J. Edwards, Ent. M. M. xvii. p. 224, England.

Aphalara aliena, Löw, Verh. z.-b. Wien, xxxi. p. 255, pl. xv. figs. 1 & 2, Egypt.

Psyllopsis meliphila, id. *l. c.* p. 257, pl. xv. figs. 3 & 4, Carniola.

Amblyrrhina cognata, id. *l. c.* p. 258, pl. xv. figs. 5 & 6, Austria.

Psylla euchlora, id. *l. c.* p. 259, pl. xv. figs. 7 & 8, South France; *P. diospyri*, fig. 12, p. 222, *magnoliæ*, p. 224, and *ilicis*, p. 225, Ashmead, Canad. Ent. xiii., Florida.

Floria adusta, Spain, *variegata*, Herzegovina, and *syriaca*, Syria, Löw, *l. c.* pp. 260–262, pl. xv. fig. 9–11.

Trioza horvathi, Hungary, figs. 12 & 13, p. 263, *cirsii*, Austria, figs. 14 & 15, p. 264, *alpestris*, Switzerland, figs. 16 & 17, p. 266, *id. l. c.* pl. xv.

APHIDIDÆ.

BUCKTON, G. B. Monograph of the British Aphides, vol. iii. (Ray Soc.). London: 1881, 8vo, pp. ii. & 142, pls. lxxxvii.–cxiv. (*Cf.* Ent. M. M. xvii. pp. 279 & 280.)

After a short introduction, alluding rather to the descent of insects generally than to *Aphides* in particular, the genus *Callipterus*, 8 genera of *Lachninæ*, and the genera *Schizoneura*, *Pemphigus*, and *Tetraneura*, are discussed, and the British species fully described and figured. The following synonyms occur:—*Callipterus betularius*, Kalt. (= *betulæ*, Walk., = ? *tuberculata*, Heyd., = ? *antennata*, Kalt.); *C. betulicola*, Kalt. (?), Walk. (= *betulæ*, Koch); *C. carpini*, Koch (? = *coryli*, Kalt., *nec* Goetze), *Lachnus viminalis*, Fonsc. (= ? *salicis*, Shaw, Curt., = *saligna*, Walk.); *L. piceæ*, Panz. (= *grossus*, Kalt.); *L. longipes*, Duf. (= *roboris*, Fonsc.); *Trama troglodytes*, Heyd. (= *radicis*, Kalt., = *flavescens* and *pubescens*, Koch, = *radicum*, Gour., = *helianthemi*, Westw.); *Dryobius roboris*, L. (= ? *fasciatus*, Burm.); *D. croaticus*, Koch (= *roboris*, Walk.); *Schizoneura lanigera*, Hausm. (= *mali*, Leach), *ulmi*, L. (= *foliorum*, De Geer, = ? *americana*, Riley), *lanuginosa*, Hart. (= *ulmi*, Rond.), *corni*, Fabr. (= *vagans*, Koch), *Pemphigus fuscifrons*, Koch (= *royeri*, Fonsc., = ? *zeæmaidis*, Löw, = ? *radicum*, Fonsc.); *P. bursaria*, L. (= *populi*, Mosl.), *spirothecæ*, Koch (= *affinis*, Koch), *lactucarius*, Pass. (= *fusicornis*, Koch), *pallidus*, Hal. (= *albus*, Licht., = ? *ulmi*, Licht.), *filaginis*, Fonsc. (= *gnaphalii*, Kalt.).

[La] Filossera in Italia dal' Agosto, 1879, al Giugno, 1881. Roma: 1881, 8vo, pp. 144 & 617, and 8 pls.

[Not seen by the Recorder.]

KESSLER, H. F. Die auf *Populus nigra*, Linn., and *P. dilatata*, Alt., vorkommenden Aphiden-Arten, und die von denselben bewirkten Missbildungen. Ber. Ver. Cass. xxviii. pp. 36–76, pls. i.–iv.

Contains elaborate descriptions of the various stages of *Pemphigus bursarius*, Linn. (pp. 37–43, pl. i.), *spirothecæ*, Pass. (pp. 43–53, pl. ii.), *affinis*, Kalt. (pp. 53–61, pl. iii., figs. 1–8), *Pachypappa marsupialis*, Koch (pp. 66–71, pl. iii. figs. 13–16), *Chætophorus leucomelas*, Koch (pp. 72–74), and 3 new species.

SELETTI, P. Monografia sulla Phylloxera, sulle viti americane, e sulla loro moltiplicazione. Novara: 1880, 8vo, pp. 100, and 8 pls.

[Not seen by the Recorder.]

Migration of *Aphides* from one plant to another; Riley & Lichtenstein, Am. Nat. xv. pp. 819 & 820.

Macchiati, L. Altro contributo agli Affidi di Sardegna, con la descrizione di una specie nuova. Riv. scient. industr. di G. Vimercati.

[Not seen by the Recorder.]

Courchet, L. Etude sur les galles produites par les Aphidiens. Montpellier: 1879.

Phylloxera and *Schizoneura lanigera* in Russia, discussed; Portchinsky (in Russian; St. Petersburg: 1881, 8vo, pp. 41).

Siphonophora, sp.: destroyed by a species of *Botrytis*; Lichtenstein, C. R. xcii. pp. 1193 & 1194. *S. citrifolii*, Ashmead, noticed; Comstock, Rep. Dep. Agric. 1880, pp. 248 & 249.

Tetraneura rubra subject to the attacks of a fungus; Cornu & Brongniart, C. R. xcii. pp. 910–912. *Thelaxes ulmicola*, Walsh (= *Colopha u.*, Monell) = *T. ulmi*; Thomas & Hagen, P. Bost. Soc. xx. p. 409.

Aphis, sp. injurious to wheat near Marseilles; Vayssière, Bull. Agric. Vaucluse, Oct., 1880.

Myzus asclepiadis, Passerini, = *Aphis nerii*, Fonsc., *nec* Kalt.; Lichtenstein, Bull. Soc. Ent. Fr. (6) i. pl. lxxvi.

Vacuna alni. Apterous pupiferous form described, completing its life-history, which exhibits a curious parallelism with that of *Phylloxera*; Lichtenstein, C. R. xciii. pp. 425–427; Ann. N. H. (5) viii. pp. 323 & 324; SB. z. b. Wien, xxxi. p. 30.

Schizoneura lanigera, Hausm., discussed: Comstock, Rep. Dep. Agric. 1879, pp. 258–260.

Pemphigus bursarius. Notes on habits, transformations, migrations, &c.; *P. filaginis* is only the gemmiparous and pupiferous form of the species; Lichtenstein, C. R. xcii. pp. 1063–1065, and Ann. N. H. (5) viii. pp. 162 & 163.

Phylloxera florentina, Targ., described and figured; Macchiati, Bull. Ent. Ital. xiii. pp. 188–190, fig.

Phylloxera vastatrix. Remedies, &c.; C. R. xcii. pp. 109–114, 218–224, 343–345, 678–683, 850–853, 1001–1003, 1487–1489, xciii. pp. 503–508, 556 & 557, 689–691, 1037 & 1038. On the winter egg; *op. cit.* xcii. pp. 783–785, 849 & 850, 1000 & 1001, xciii. pp. 828–831, 881, 943–946. Parasites; Gayon, *op. cit.* xciii. pp. 997–999. Various notes; Nature, xxiv. pp. 340, 386 & 590, Targioni-Tozzetti, Bull. Ent. Ital. xiii. pp. 309–317. Observed at Valmadrera; *id.* Atti Soc. Ital. xxiii. pp. 97–101. Ravages in the Canton of Neufchâtel; Huller, MT. Ges. Bern, 1881, SB. pp. 24–27. Habits and transformations described; Henrich, Verh. siebenb. Ver. xxxi. pp. 24–39, woodcuts. Habits, &c., noticed, it can only be carried from one district to another with live grape-vines, pp. 238–241; *P. vastatrix*, its larval hibernation corresponds with that of *P. rileyi*, pp. 482 & 483; sandy soil injurious to the insect, because of its mechanical action in adhering to the body, its mobility, and the absence of cracks, pp. 1022 & 1023; Riley & others, Am. Nat. xv. Attacked by *Tyroglyphus longior* in California; Savignon, C. R. xcii. pp. 66–68. Report of Committee of Entomological Society on its supposed occurrence in Australia; its occurrence in that country not proved: P. E. Soc. 1881, pp. xi. & xii., *cf.* also Le Nat. iii. p. 373.

New genera and species :—

Ptychodes, Buckton, Mon. Brit. Aph. iii. p. 39. *Lachninæ*; placed after *Phyllaphis*; type, *Aphis juglandis*, Frisch.

Stomaphis (Walk., MS.), *id. l. c.* p. 61. Allied to *Lachnus*; type, *Aphis quercus*, L. (? = *longirostris*, Fabr.).

Pemphigus glandiformis and *tortuosus*, p. 53, note, and *ovato-oblongus*, pp. 61-66, pl. iv. Kessler, Ber. Ver. Cass. xxviii., on *Populus nigra* and *dilatata* in Germany.

Siphonophora lilii, Monell, Rep. Dep. Agric. 1879, p. 221, New York, probably introduced from Japan.

Phyllaphis niger, Ashmead, Canad. Ent. xiii. p. 155, Florida.

Myzus roseus, Macchiati, *ibid.*, Sardinia, on *Yucca*.

Callipterus castaneæ (Fitch ?), Buckton, Mon. Brit. Aph. iii. p. 26, pl. xci. figs. 5-9, Haslemere.

Lachnus macrocephalus (? = *hyalinus*, Koch), *id. l. c.* p. 48, pl. xcvii., England; *L. australis* and *quercicolens*, Ashmead, *l. c.* pp. 68 & 155, Florida.

Dryobius costatus (Walk., MS.), Buckton, *l. c.* p. 78, Southgate.

Schizoneura fodiens and *fuliginosa*, id. *l. c.* pp. 94 & 96, pl. cvi. figs. 6-12, and pl. cvii., Haslemere; *S. cerealium*, Szaniszlo, Term. füzetek, iv. pp. 192-196 & 233, Hungary (= *S. venusta*, Pass., Horváth, *op. cit.* pp. 275, 276 & 331).

Coccidæ.

Colvée, P. Essayo sobre una nueva enfermedad del Olivo (*Aspidiotus oleæ*). Madrid : 1880, 8vo, pp. 43, and 2 pls.

Comstock, J. H. Report on Scale Insects. Rep. Dep. Agric. 1880 (part ii.), pp. 276-349.

After an Introduction dealing with the characters of the *Coccidæ*, their subfamilies, metamorphoses, and characters, the means of destroying them, and the useful products obtained from them, the author proceeds to describe a great number of both known and new species. Their parasites are dealt with in a separate section of the Report (part iii. pp. 350-371). The following are the known species discussed :—*Aspidiotus ancylus*, Putn., pls. xiv. fig. 3, xxi. fig. 4, p. 292, *aurantii*, Mask. (= *citri*, Comst.), pls. iii. figs. 1 & 1 *a*-1 *c*, xii. fig. 1, xiv. fig. 1, p. 293, *nerii*, Bouché (= *bouchei*, Targ.-Tozz.), pls. iv. fig. 1, xv. fig. 1, p. 301; *Diaspis carueli*, Targ.-Tozz., pls. v. fig. 2, xv. fig. 3, xx. fig. 6, p. 310, *ostreiformis*, Curt. (= *circularis*, Fitch), pl. xv. fig. 4, p. 311, *rosæ*, Sandb., pls. v. figs. 1 & 1 *a*, *b*, xvii. fig. 1, xxi. fig. 3; *Chionaspis furfurus*, Fitch (= *cerasi*, Fitch, = *harrisi*, Walsh), pls. vi. fig. 1, xvi. fig. 3, xvii. fig. 3, p. 315, *pinifoliæ*, Fitch, pls. vi. fig. 2, xvi. fig. 4, xviii. fig. 1, p. 318, *salicis*, Linn. (= *fraxini*, Sign.), pl. xvi. fig. 5, p. 320; *Mytilaspis citricola*, Pack., pls. vii. fig. 1, xx. fig. 2, xviii. fig. 3, p. 321, *gloveri*, Pack., pls. vii. fig. 2, xviii. fig. 4, xxi. fig. 1, p. 323, *pomorum*, Bouché (= *conchiformis*, auct., *nec* Gmel., *pyrus-malus*, Rob., *pomicorticis*, Riley), pl. xix. fig. 2, p. 325; *Asterodiaspis quercicola*, Sign., p. 330; *Pulvinaria innumerabilis*, Ruthv., pl. xi. fig. 6;

Lecanium hemisphæricum, Targ.-Tozz., pl. viii. figs. 3 & 3 *a*, p. 334, *hesperidum*, Linn., pl. viii. fig. 2, p. 335, *oleæ*, Bern., pl. viii. fig. 1, p. 336; *Kermes* sp., pl. ix. fig. 1, p. 337; *Rhizococcus araucariæ*, Mask., pl. x. figs. 1 *a–q*, p. 339; *Dactylopius adonidum*, (Linn.), Sign., pl. xi. figs. 1, 1 *a–d*, p. 341; *Pseudococcus aceris*, Geoffr., p. 345; *Coccus cacti*, Linn., p. 346; *Icerya purchasi*, Mask., pl. ix. fig. 2, p. 347, and *Orthezia americana*, Walk. (?), pl. ix. fig. 3, p. 149.

Douglas, J. W. Observations on the species of the Homopterous genus *Orthezia*, with a description of a new species. Tr. E. Soc. 1881, pp. 297–303, pl. xv. (*Cf.* also P. E. Soc. 1881, pp. ix. & x.)

Relates to *Orthezia urticæ*, L., *cataphracta*, Shaw, and *normani*, sp. n.

——. On the species of the genus *Orthezia*. Ent. M. M. xvii. pp. 172–174 & 203–205.

O. cataphracta, Shaw (= *chiton*, Zett., = *signoreti*, White), is distinct from *urticæ*, L. (= *floccosus*, De Geer, = *characias*, Bosc., = *dubius*, Fabr., = *urticæ*, Burm.). Much information is given concerning the forms and habits of both species. Several doubtful references are also noticed.

Cocci destroyed by the larvæ of *Brachytarsus scabrosus*, Fabr.; Lichtenstein, Bull. Soc. Ent. Fr. (6) i. pl. lxxv.

Pediaspis sorbi, Tischb., and *Bathyaspis aceris*, Först., are probably dimorphous forms; Mayr, SB. z.-b. Wien, xxxi. p. 4.

Spondyliaspis, Sign., = *Inglina*, Mask.; Signoret, Bull. Soc. Ent. Fr. (6) i. p. clviii.

Philippia oleæ, ♂ described, and *Coccus rubi*, Schrank, noticed; Lichtenstein, *op. cit.* pp. cxiv.–cxvi.

Ceroplastes rusci: ♂ described; Colvée, *op. cit.* p. xii.

Chermes laricis, Hart: habits; Kessler, Ber. Ver. Cass. xxviii. pp. 29 & 30.

Coccus, sp. resembling lichen, on *Ulmus montana*; Unander, Ent. Tidskr. ii. pp. 4, 5 & 56.

Diaspis harrisi, Walsh: mode of diffusion; Riley, Am. Nat. xv. p. 487.

Aspiodiotus harrisi, Walsh, ? = *Diaspis ostreiformis*, Curt.; *id.* Index to Reports, p. 60.

Chrysomphalus ficus (Riley), Ashmead, belongs to *Aspidiotus*; Comstock, Canad. Ent. xiii. p. 9.

Oudablis, g. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. clvii. New name for *Boisduvalia*, Sign. (1875, *nec* Sign. 1868); types, *B. lauri* and *4-caudata*, Sign.; add *B. parietariæ*, sp. n., Lichtenstein, *op. cit.* p. cxv., South France.

New species:—

Diaspis pyri, Colvée, Bull. Soc. Ent. Fr. (6) i. p. li., Spain.

Aspidiotus pyri, Lichtenstein (previously confounded with *Diaspis ostreiformis*, Curt., which is described for comparison), Bull. Soc. Ent. Fr. (6) i. p. lii.; *A. juglandis*, Colvée, *op. cit.* p. clxv., Catalonia; *A. coccineus*, Gennadius, Ann. Soc. Ent. Fr. (6) i. p. 189, destructive to oranges

at Chios; *A. citri*, Comstock, Canad. Ent. xiii. p. 8, California; *A. convexus*, pl. xii. fig. 8, California, *cydoniæ*, pl xiv. fig. 1, Florida, p. 295, *ficus* (Riley, MS.), pl. iii. fig. 2, Florida, Cuba, p. 296, *juglans-regiæ*, pl. xiv. fig. 2, California, p. 300, *obscurus*, pls. xii. fig. 4, xiii. fig. 4, Washington, p. 303, *perniciosus*, pl. xii. fig. 7, California, p. 304, *perseæ*, pls. xii. fig. 3, xiii. fig. 3, Florida, p. 305, *A.* (?) *pini*, pls. xv. fig. 2, xvi. fig. 2, xxi. fig. 7, New York, Georgia, p. 306, *A. rapax*, pl. xii. fig. 6, California, Florida, p. 307, *tenebricosus*, pls. xii. fig. 5, xiii. fig. 5, Washington, p. 308, *uvæ*, pls. xiv. fig. 4, xvi. fig. 1, Indiana, p. 309, *id.* Rep. Dep. Agric. 1880.

Chionaspis evonymi, pls. v. fig. 3, xvii. fig. 2, Louisiana, Virginia, Havana, p. 313, *nyssæ*, pl. xvii. fig. 4, New York, p. 316, *ortholobis*, pls. xvi. fig. 6, xix. fig. 1, p. 317, *quercus*, pl. xviii. fig. 2, California, p. 319, *id. l. c.*

Mytilaspis (?) *pandanni*, id. *l. c.* p. 324, pl. xx. figs. 1 & 2, Massachusetts.

Parlatoria pergandii, id. *l. c.* p. 327, pls. xi. fig. 4, & xx. fig. 5, Florida.

Fiorinia camelliæ, id. *l. c.* p. 329, pls. xi. fig. 7, xix. fig. 4, Washington.

Ceroplastes floridensis (= *rusci*, Ashm., *nec* Linn.) and *cirripediformis*, id. *l.* c. pp. 331 & 333, pl. iv. figs. 2 & 3, Florida.

Eriococcus azaleæ, id. *l. c.* p. 338, Washington.

Rhizococcus quercus, id. *l. c.* p. 340, pl. x. figs. 2, 2 *a*, & 2 *b*, Florida.

Dactylopius destructor, pls. xi. fig. 3, pl. xxii. fig. 2, Florida, and *longifilis*, pls. xi. fig. 2, xxii. fig. 1, Washington, *id. l. c.* pp. 342 & 344.

Kermes galliformis, Riley, Am. Nat. xv. p. 482, Southern and Western States.

Orthezia normani, Douglas, Tr. E. Soc. 1881, p. 300, pl. xv. figs. 12–15, Pitlochry (probably = *Coccus floccosus*, De Geer, *id. l. c.* pp. 447 & 448).

Aleurodidæ.

Aleurodes lauri, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. clviii, Athens.

(ANOPLURA.)

Pediculidæ.

Pedicinus piageti, sp. n., Strœbelt, JB. westf. Ver. ix. p. 82, pl. i. B. Parasitic on *Macacus erythræus*.

Lecanium hemisphæricum, Targ.-Tozz., pl. viii. figs. 3 & 3 *a*, p. 334, *hesperidum*, Linn., pl. viii. fig. 2, p. 335, *oleæ*, Bern., pl. viii. fig. 1, p. 336; *Kermes* sp., pl. ix. fig. 1, p. 337; *Rhizococcus araucariæ*, Mask., pl. x. figs. 1 *a–q*, p. 339; *Dactylopius adonidum*, (Linn.), Sign., pl. xi. figs. 1, 1 *a–d*, p. 341; *Pseudococcus aceris*, Geoffr., p. 345; *Coccus cacti*, Linn., p. 346; *Icerya purchasi*, Mask., pl. ix. fig. 2, p. 347, and *Orthezia americana*, Walk. (?), pl. ix. fig. 3, p. 149.

Douglas, J. W. Observations on the species of the Homopterous genus *Orthezia*, with a description of a new species. Tr. E. Soc. 1881, pp. 297–303, pl. xv. (*Cf.* also P. E. Soc. 1881, pp. ix. & x.)

Relates to *Orthezia urticæ*, L., *cataphracta*, Shaw, and *normani*, sp. n.

——. On the species of the genus *Orthezia*. Ent. M. M. xvii. pp. 172–174 & 203–205.

O. cataphracta, Shaw (= *chiton*, Zett., = *signoreti*, White), is distinct from *urticæ*, L. (= *floccosus*, De Geer, = *characias*, Bosc., = *dubius*, Fabr., = *urticæ*, Burm.). Much information is given concerning the forms and habits of both species. Several doubtful references are also noticed.

Cocci destroyed by the larvæ of *Brachytarsus scabrosus*, Fabr.; Lichtenstein, Bull. Soc. Ent. Fr. (6) i. pl. lxxv.

Pediaspis sorbi, Tischb., and *Bathyaspis aceris*, Först., are probably dimorphous forms; Mayr, SB. z.-b. Wien, xxxi. p. 4.

Spondyliaspis, Sign., = *Inglina*, Mask.; Signoret, Bull. Soc. Ent. Fr. (6) i. p. clviii.

Philippia oleæ, ♂ described, and *Coccus rubi*, Schrank, noticed; Lichtenstein, *op. cit.* pp. cxiv.–cxvi.

Ceroplastes rusci: ♂ described; Colvée, *op. cit.* p. xii.

Chermes laricis, Hart: habits; Kessler, Ber. Ver. Cass. xxviii. pp. 29 & 30.

Coccus, sp. resembling lichen, on *Ulmus montana*; Unander, Ent. Tidskr. ii. pp. 4, 5 & 56.

Diaspis harrisi, Walsh: mode of diffusion; Riley, Am. Nat. xv. p. 487.

Aspiodiotus harrisi, Walsh, ? = *Diaspis ostreiformis*, Curt.; *id.* Index to Reports, p. 60.

Chrysomphalus ficus (Riley), Ashmead, belongs to *Aspidiotus*; Comstock, Canad. Ent. xiii. p. 9.

Oudablis, g. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. clvii. New name for *Boisduvalia*, Sign. (1875, *nec* Sign. 1868); types, *B. lauri* and *4-caudata*, Sign.; add *B. pariteariæ*, sp. n., Lichtenstein, *op. cit.* p. cxv., South France.

New species:—

Diaspis pyri, Colvée, Bull. Soc. Ent. Fr. (6) i. p. li., Spain.

Aspidiotus pyri, Lichtenstein (previously confounded with *Diaspis ostreiformis*, Curt., which is described for comparison), Bull. Soc. Ent. Fr. (6) i. p. lii.; *A. juglandis*, Colvée, *op. cit.* p. clxv., Catalonia; *A. coccineus*, Gennadius, Ann. Soc. Ent. Fr. (6) i. p. 189, destructive to oranges

at Chios; *A. citri*, Comstock, Canad. Ent. xiii. p. 8, California; *A. convexus*, pl. xii. fig. 8, California, *cydoniæ*, pl xiv. fig. 1, Florida, p. 295, *ficus* (Riley, MS.), pl. iii. fig. 2, Florida, Cuba, p. 296, *juglans-regiæ*, pl. xiv. fig. 2, California, p. 300, *obscurus*, pls. xii. fig. 4, xiii. fig. 4, Washington, p. 303, *perniciosus*, pl. xii. fig. 7, California, p. 304, *perseæ*, pls. xii. fig. 3, xiii. fig. 3, Florida, p. 305, *A.* (?) *pini*, pls. xv. fig. 2, xvi. fig. 2, xxi. fig. 7, New York, Georgia, p. 306, *A. rapax*, pl. xii. fig. 6, California, Florida, p. 307, *tenebricosus*, pls. xii. fig. 5, xiii. fig. 5, Washington, p. 308, *uvæ*, pls. xiv. fig. 4, xvi. fig. 1, Indiana, p. 309, *id.* Rep. Dep. Agric. 1880.

Chionaspis evonymi, pls. v. fig. 3, xvii. fig. 2, Louisiana, Virginia, Havana, p. 313, *nyssæ*, pl. xvii. fig. 4, New York, p. 316, *ortholobis*, pls. xvi. fig. 6, xix. fig. 1, p. 317, *quercus*, pl. xviii. fig. 2, California, p. 319, *id. l. c.*

Mytilaspis (?) *pandanni*, id. *l. c.* p. 324, pl. xx. figs. 1 & 2, Massachusetts.

Parlatoria pergandii, id. *l. c.* p. 327, pls. xi. fig. 4, & xx. fig. 5, Florida.

Fiorinia camelliæ, id. *l. c.* p. 329, pls. xi. fig. 7, xix. fig. 4, Washington.

Ceroplastes floridensis (= *rusci*, Ashm., *nec* Linn.) and *cirripediformis*, id. *l.* c. pp. 331 & 333, pl. iv. figs. 2 & 3, Florida.

Eriococcus azaleæ, id. *l. c.* p. 338, Washington.

Rhizococcus quercus, id. *l. c.* p. 340, pl. x. figs. 2, 2 *a*, & 2 *b*, Florida.

Dactylopius destructor, pls. xi. fig. 3, pl. xxii. fig. 2, Florida, and *longifilis*, pls. xi. fig. 2, xxii. fig. 1, Washington, *id. l. c.* pp. 342 & 344.

Kermes galliformis, Riley, Am. Nat. xv. p. 482, Southern and Western States.

Orthezia normani, Douglas, Tr. E. Soc. 1881, p. 300, pl. xv. figs. 12–15, Pitlochry (probably = *Coccus floccosus*, De Geer, *id. l. c.* pp. 447 & 448).

Aleurodidæ.

Aleurodes lauri, sp. n., Signoret, Bull. Soc. Ent. Fr. (6) i. p. clviii, Athens.

(ANOPLURA.)

Pediculidæ.

Pedicinus piageti, sp. n., Strœbelt, JB. westf. Ver. ix. p. 82, pl. i. B. Parasitic on *Macacus erythræus*.

3. [Braun, M.] Zur Frage des Zwischenwirthes von *Bothriocephalus latus*, Brems. Zool. Anz. iv. pp. 593–597.

4. Czerniavsky, V. Materialia ad Zoographiam Ponticam comparatam, iii. *Vermes*. Bull. Mosc. lv. pp. 211–363, pls. iii.–v.

5. Fraipont, J. Recherches sur l'appareil excréteur des Trematodes et des Cestodes (2me partie). Arch. Biol. ii. pp. 1–40, pls. i. & ii.

6. Francotte, P. Sur l'appareil excréteur des Turbellariés rhabdocœles. Bull. Ac. Belg. (3) i. pp. 30–34, 1 pl., and ii. pp. 88–98, 1 pl.; Arch. Biol. ii. pp. 145–151, pl. x. and pp. 636–645, pl. xxxiii.

7. Goette, A. Zur Entwickelungsgeschichte der Würmer. Zool. Anz. iv. pp. 189–191.

8. Gruber, A. Zur Kenntniss des *Archigetes sieboldi*. Zool. Anz. iv. pp. 89–91.

9. Hubrecht, A. A. W. Het peripherisch zenuwstelstel der Nemertinen. Tijdschr. Nederl. Dierk. Ver. 1881, pp. 131–137.

10. Jourdan, E. Note sur l'anatomie du *Distomum clavatum*. Rev. Sci. Nat. (2) ii. pp. 438–448, pls. vii. & viii.

11. Kerbert, C. Beitrag zur Kenntniss der Trematoden. Arch. mikr. Anat. xix. pp. 529–578, pls. xxvi. & xxvii.

12. Lang, A. Untersuchungen zur vergleichenden Anatomie und Histologie des Nervensystems der Plathelminthen. iii. Das Nervensystem der Cestoden im Allgemeinen und dasjenige der Tetrarhynchen im Besondern. MT. z. Stat. Neap. ii. pp. 372–400, pls. xv. & xvi.

13. ——. iv. Das Nervensystem der Tricladen. *Op. cit.* iii. pp. 53–75, pls. v. & vi.

14. ——. v. Vergleichende Anatomie des Nervensystems der Plathelminthen. *Tom. cit.* pp. 76–96.

15. ——. Der Bau von *Gunda segmentata* und die Verwandschaft der Plathelminthen mit Cœlenteraten und Hirudineen. *Tom. cit.* pp. 187–251, pls. xii.–xiv.

16. ——. Sur les relations des Platyelmes avec les Cœlentérés d'un côté et les Hirudinées de l'autre. Arch. Biol. ii. pp. 533–552, 8 woodcuts.

17. Lankester, E. R. On the body-cavity (cœlom) and nephridia of Platyhelmia. Zool. Anz. iv. pp. 308–310, 572–575.

See also E. van Beneden. *Tom. cit.* pp. 455–459.

18. Leuckart, R. Zur Entwickelungsgeschichte des Leberegels. Zool. Anz. iv. pp. 641–646.

19. Levinsen, G. M. R. Bidrag til Kunskab om Grønlands Trematodfauna. Overs. Dan. Selsk. 1881, pp. 52–84, pls. ii. & iii.

20. Macé, E. Sur une nouvelle forme d'organe segmentaire chez les Trématodes. C. R. xcii. pp. 420 & 421; Ann. N. H. (5) vii. p. 354.

21. Mégnin, P. Sur le développement du *Tricuspidaria nodulosa* ou *Triænophorus nodolosus* de Rudolphi et sur son Cysticerque. C. R. xcii. pp. 924–926; J. de l'Anat. Phys. xvii. pp. 419–426, pl. xxv.

22. Moniez, R. Mémoires sur les Cestodes. 1ère partie. Paris: 1881, sm. 4to, pp. 238, 12 pls.

23. Riehm, G. Studien an Cestoden. Z. ges. Naturw. liv. pp. 545–610, pls. v. & vi.

24. Selenka, E. Zur Entwickelungsgeschichte der Seeplanarien. Zool. Studien, ii. Leipzig: 1881, 4to, pp. 44, 7 pls. See also Biol. Clblatt. i. pp. 229–239, and Bull. Soc. Nord. iv. 165–169.

25. Thomas, A. P. Report of Experiments on the Development of the Liver-fluke (*Fasciola hepatica*). J. R. Agric. Soc. (2) xvii. pp. 1–30.

26. Villot, A. Sur une nouvelle larve de Cestoïde, appartenant au type du Cysticerque de l'Arion. C. R. xcii. pp. 418–420.

27. Zaddach, G. Ueber die in Flusskrebse vorkommenden *Distomum cirrigerum*, v. Baer, und *D. isostomum*, Rud. Zool. Anz. iv. pp. 398–404; 426–431.

Anatomy and Development.

Lang (15, 16) insists very strongly on the relations of the *Platyhelminthes* to the *Cœlenterata* on the one hand, and the *Hirudinea* on the other, and points out in detail the resemblances which exist. Instead of the term *Turbellaria*, he proposes to adopt three orders, equivalent in value to the *Trematoda*, *Cestoda*, and *Nemertinea*, to be called respectively *Polyclades*, *Triclades*, and *Rhabdocœla*. The fresh-water *Triclades* are nearest the *Polyclades*; these last are either degenerated and parasitic, or free-swimming and elevated. The central nervous system has a brain, or point at which all the nerve-trunks meet, and this is largest when the nerve-trunks are best developed; the longitudinal trunks may or may not unite posteriorly. *Gunda segmentata*, g. & sp. nn., is dealt with in detail; and the enteric system is here called the cœlenteric apparatus, as it is believed to be the homologue of the same part in the *Cœlenterata* and the homologue of the cœlom and enteron of the higher forms; in this connection, attention is directed to the characters of the *Hirudinea*. The trochosphere is regarded as being comparable merely to the cephalic portion of *Gunda*, the anal segment being a new formation.

Francotte (6) finds in *Derostomum*, sp., that there is connected with the canals of the water vascular system a glomerulus containing about thirty vibratile processes; a system of finer vessels communicates with the longitudinal canals, but no cilia were to be detected in their terminable infundibula. Indications of a rudimentary cœlom are to be seen in lymph-spaces.

In continuation of his studies Fraipont (5) has examined *Distomum divergens*, *Scolex trygonis pastinacæ*, and *Tænia echinococcus*; in young

VERMES.

BY

F. JEFFREY BELL, M.A., F.R.M.S., F.Z.S.

Consult O. & R. HERTWIG, "Die Coelomtheorie," Jen. Z. Nat. xv. pp. 1-150.

For the origin of the Germinal Layers, and the significance of Larval Forms; see the late F. M. BALFOUR'S "Comparative Embryology," (London: 1881), ii. cap. xiii.

For excretory organs, H. A. PAGENSTECHER, "Allgemeine Zoologie," iv. (Berlin: 1881), pp. 18–61; external coverings, pp. 277–336.

A second edition of Küchenmeister & Zurn's "Die Parasiten des Menschen" (no date) has appeared; *Platyelmia*, pp. 19-374; *Nematelmia*, pp. 374–478.

LEUCKART has published the second part of the first volume of the second edition of his work, "Die Parasiten des Menschen."

7 Planarians, 5 Earthworms, 2 Leeches known in India; W. T. Blanford, J. A. S. B. l. pt. 2, p. 271 (in "Census of Indian Land Fauna").

In the "Zoologia Danica," edited by Schiödte (Copenhagen: 1881, fo.), H. KRABBE gives an account of the *Entozoa*: 34 pp., 3 pls.

On the *Vermes* of Mauritius, see MÖBIUS, Beiträge zur Meeresfauna der Insel Mauritius und Seychellen (Berlin: 1880, 4to, pp. 43 & 44).

On the *Vermes* of Rhenish Prussia, see LEYDIG, Verh. Ver. Rheinl. xxxviii. pp. 144–150.

On the *Vermes* of the Firth of Forth, see LESLIE & HERDMAN, P. Phys. Soc. Edinb. vi. pp. 272–277.

Annelids in captivity; observations by NOLL, in Zool. Gart. xxii. pp. 71-76.

PLATYHELMINTHES.

1. BENEDEN, E. VAN. Recherches sur le développement embryonaire de quelques Ténias. Arch. Biol. ii. pp. 183–210, pls. xii. & xiii.

2. BRAUN, M. Beiträge zur Kenntniss der Fauna Baltica. 1. Ueber Dorpater Brunnenplanarien. Arch. Nat. Liv. ix. (4) pp. 289-313, 1 pl. [SB. Ges. Dorp. vi. (1) pp. 175 & 176.]

VERMES.

BY

F. JEFFREY BELL, M.A., F.R.M.S., F.Z.S.

Consult O. & R. HERTWIG, "Die Coelomtheorie," Jen. Z. Nat. xv. pp. 1-150.

For the origin of the Germinal Layers, and the significance of Larval Forms; see the late F. M. BALFOUR'S "Comparative Embryology," (London: 1881), ii. cap. xiii.

For excretory organs, H. A. PAGENSTECHER, "Allgemeine Zoologie," iv. (Berlin: 1881), pp. 18–61; external coverings, pp. 277–336.

A second edition of Küchenmeister & Zurn's "Die Parasiten des Menschen" (no date) has appeared; *Platyelmia*, pp. 19-374; *Nematelmia*, pp. 374–478.

LEUCKART has published the second part of the first volume of the second edition of his work, "Die Parasiten des Menschen."

7 Planarians, 5 Earthworms, 2 Leeches known in India; W. T. Blanford, J. A. S. B. l. pt. 2, p. 271 (in "Census of Indian Land Fauna").

In the "Zoologia Danica," edited by Schiödte (Copenhagen: 1881, fo.), H. KRABBE gives an account of the *Entozoa*: 34 pp., 3 pls.

On the *Vermes* of Mauritius, see MÖBIUS, Beiträge zur Meeresfauna der Insel Mauritius und Seychellen (Berlin: 1880, 4to, pp. 43 & 44).

On the *Vermes* of Rhenish Prussia, see LEYDIG, Verh. Ver. Rheinl. xxxviii. pp. 144–150.

On the *Vermes* of the Firth of Forth, see LESLIE & HERDMAN, P. Phys. Soc. Edinb. vi. pp. 272–277.

Annelids in captivity; observations by NOLL, in Zool. Gart. xxii. pp. 71-76.

PLATYHELMINTHES.

1. BENEDEN, E. VAN. Recherches sur le développement embryonaire de quelques Ténias. Arch. Biol. ii. pp. 183–210, pls. xii. & xiii.

2. BRAUN, M. Beiträge zur Kenntniss der Fauna Baltica. 1. Ueber Dorpater Brunnenplanarien. Arch. Nat. Liv. ix. (4) pp. 289-313, 1 pl. [SB. Ges. Dorp. vi. (1) pp. 175 & 176.]

3. [Braun, M.] Zur Frage des Zwischenwirthes von *Bothriocephalus latus*, Brems. Zool. Anz. iv. pp. 593–597.

4. Czerniavsky, V. Materialia ad Zoographiam Ponticam comparatam, iii. *Vermes*. Bull. Mosc. lv. pp. 211–363, pls. iii.–v.

5. Fraipont, J. Recherches sur l'appareil excréteur des Trematodes et des Cestodes (2me partie). Arch. Biol. ii. pp. 1–40, pls. i. & ii.

6. Francotte, P. Sur l'appareil excréteur des Turbellariés rhabdocœles. Bull. Ac. Belg. (3) i. pp. 30–34, 1 pl., and ii. pp. 88–98, 1 pl.; Arch. Biol. ii. pp. 145–151, pl. x. and pp. 636–645, pl. xxxiii.

7. Goette, A. Zur Entwickelungsgeschichte der Würmer. Zool. Anz. iv. pp. 189–191.

8. Gruber, A. Zur Kenntniss des *Archigetes sieboldi*. Zool. Anz. iv. pp. 89–91.

9. Hubrecht, A. A. W. Het peripherisch zenuwstelstel der Nemertinen. Tijdschr. Nederl. Dierk. Ver. 1881, pp. 131–137.

10. Jourdan, E. Note sur l'anatomie du *Distomum clavatum*. Rev. Sci. Nat. (2) ii. pp. 438–448, pls. vii. & viii.

11. Kerbert, C. Beitrag zur Kenntniss der Trematoden. Arch. mikr. Anat. xix. pp. 529–578, pls. xxvi. & xxvii.

12. Lang, A. Untersuchungen zur vergleichenden Anatomie und Histologie des Nervensystems der Plathelminthen. iii. Das Nervensystem der Cestoden im Allgemeinen und dasjenige der Tetrarhynchen im Besondern. MT. z. Stat. Neap. ii. pp. 372–400, pls. xv. & xvi.

13. ——. iv. Das Nervensystem der Tricladen. *Op. cit.* iii. pp. 53–75, pls. v. & vi.

14. ——. v. Vergleichende Anatomie des Nervensystems der Plathelminthen. *Tom. cit.* pp. 76–96.

15. ——. Der Bau von *Gunda segmentata* und die Verwandschaft der Plathelminthen mit Cœlenteraten und Hirudineen. *Tom. cit.* pp. 187–251, pls. xii.–xiv.

16. ——. Sur les relations des Platyelmes avec les Cœlentérés d'un côté et les Hirudinées de l'autre. Arch. Biol. ii. pp. 533–552, 8 woodcuts.

17. Lankester, E. R. On the body-cavity (cœlom) and nephridia of Platyhelmia. Zool. Anz. iv. pp. 308–310, 572–575.

See also E. van Beneden. *Tom. cit.* pp. 455–459.

18. Leuckart, R. Zur Entwickelungsgeschichte des Leberegels. Zool. Anz. iv. pp. 641–646.

19. Levinsen, G. M. R. Bidrag til Kunskab om Grønlands Trematodfauna. Overs. Dan. Selsk. 1881, pp. 52–84, pls. ii. & iii.

20. Macé, E. Sur une nouvelle forme d'organe segmentaire chez les Trématodes. C. R. xcii. pp. 420 & 421; Ann. N. H. (5) vii. p. 354.

21. Mégnin, P. Sur le développement du *Tricuspidaria nodulosa* ou *Triænophorus nodolosus* de Rudolphi et sur son Cysticerque. C. R. xcii. pp. 924–926; J. de l'Anat. Phys. xvii. pp. 419–426, pl. xxv.

22. Moniez, R. Mémoires sur les Cestodes. 1ère partie. Paris: 1881, sm. 4to, pp. 238, 12 pls.

23. Riehm, G. Studien an Cestoden. Z. ges. Naturw. liv. pp. 545–610, pls. v. & vi.

24. Selenka, E. Zur Entwickelungsgeschichte der Seeplanarien. Zool. Studien, ii. Leipzig: 1881, 4to, pp. 44, 7 pls. See also Biol. Clblatt. i. pp. 229–239, and Bull. Soc. Nord. iv. 165–169.

25. Thomas, A. P. Report of Experiments on the Development of the Liver-fluke (*Fasciola hepatica*). J. R. Agric. Soc. (2) xvii. pp. 1–30.

26. Villot, A. Sur une nouvelle larve de Cestoïde, appartenant au type du Cysticerque de l'Arion. C. R. xcii. pp. 418–420.

27. Zaddach, G. Ueber die in Flusskrebse vorkommenden *Distomum cirrigerum*, v. Baer, und *D. isostomum*, Rud. Zool. Anz. iv. pp. 398–404; 426–431.

Anatomy and Development.

Lang (15, 16) insists very strongly on the relations of the *Platyhelminthes* to the *Cœlenterata* on the one hand, and the *Hirudinea* on the other, and points out in detail the resemblances which exist. Instead of the term *Turbellaria*, he proposes to adopt three orders, equivalent in value to the *Trematoda*, *Cestoda*, and *Nemertinea*, to be called respectively *Polyclades*, *Triclades*, and *Rhabdocœla*. The fresh-water *Triclades* are nearest the *Polyclades*; these last are either degenerated and parasitic, or free-swimming and elevated. The central nervous system has a brain, or point at which all the nerve-trunks meet, and this is largest when the nerve-trunks are best developed; the longitudinal trunks may or may not unite posteriorly. *Gunda segmentata*, g. & sp. nn., is dealt with in detail; and the enteric system is here called the cœlenteric apparatus, as it is believed to be the homologue of the same part in the *Cœlenterata* and the homologue of the cœlom and enteron of the higher forms; in this connection, attention is directed to the characters of the *Hirudinea*. The trochosphere is regarded as being comparable merely to the cephalic portion of *Gunda*, the anal segment being a new formation.

Francotte (6) finds in *Derostomum*, sp., that there is connected with the canals of the water vascular system a glomerulus containing about thirty vibratile processes; a system of finer vessels communicates with the longitudinal canals, but no cilia were to be detected in their terminable infundibula. Indications of a rudimentary cœlom are to be seen in lymph-spaces.

In continuation of his studies Fraipont (5) has examined *Distomum divergens*, *Scolex trygonis pastinacæ*, and *Tænia echinococcus*; in young

forms of the last, he has found a complicated system of fine canaliculi arising from small ciliated infundibula. The author now sees that secondary foramina may become developed, and that the terminal vesicle may disappear. Regarding a complete Cestode as equivalent to a Trematode, he looks upon the presence of secondary foramina as due to the development of the proglottids; as they come more and more into use, the vesicle atrophies. He does not, however, regard the "segmental organs" of a Cestode as comparable to those of an Annelid, but as the homologue of the head-kidney of Annelids, *Gephyrea*, and *Mollusca*.

His views on the body-cavity are criticised by E. Ray Lankester (Zool. Anz. iv. pp. 308–310), who points out that he had always believed, what Fraipont and Bütschli have demonstrated, that the ultimate ramifications of the canal system are comparable to a cœlom; see also E. von Beneden, Zool. Anz. iv. pp. 455–459, and Lankester, pp. 572–575.

Van Beneden (1) describes the development of *Tænia serrata*, *T. saginata*, and *T. porosa*; the albuminigenous layer is regarded as being the final remnant of a primitive ciliated covering membrane; and he raises the question whether the two layers of cells found in the hexacanth embryo are or are not homologous with the primitive layers of the *Gastrula*.

Mégnin (21) finds that *Tricuspidaria nodulosa* may go through all its stages within the same host; those without hooks found in the peritonæum are the *Ligula nodosa* of earlier writers and the embryo (Bertolus) of *Bothriocephalus latus*. He looks upon the scolex of some forms as being a transitory structure, and describes the life-history of *Tænia lanceolata*, *T. infundibuliformis*, and *T. echinobothrida*, sp. n.

On the life-history of *Bothriocephalus latus*; Braun (3).

Moniez (22) discusses the development and the spermatozoa of the Cestodes; *Leuckartia*: *Ligula simplicissima*; *Bothriocephalus latus*; *Abothrium gadi*; *Schistocephalus dimorphus*; and the species of the type of *Tænia serrata*. The author himself gives a summary of his conclusions.

The discovery by Villot of *Cysticercus glomeridis*, sp. n., (26) shows that the Arion-type is not, as Krabbe thought, confined to the *Mollusca*.

Riehm (23, pp. 590–607) discusses the nature of the Cestoid individual, and upholds its monozoic nature.

Thomas (25) has not yet succeeded in detecting the sporosac, or the Molluscan host, which contains it, of *Distomum hepaticum*; he describes the characters and development of the embryo, and gives an account of his visits to, and his observations on infested pastures.

Ercolani (see J. de l'Anat. Phys. xvii pp. 434–436) finds that the same *Cercaria*, if developed in different animals, has different specific characters; see also H. A. Pagenstecher, Verh. Ver. Heidelberg (n.s.), ii. pp. 33–56, and C. Emery, Biol. Clblatt. i. pp. 104–106.

Zaddach (27) is of opinion that in *Distomum isostomum* two sexually mature forms succeed one another; the cysts of *D. cirrigerum* may be abundantly present in a crayfish without affecting its general health.

Jourdan (10) details the Trematode characters of *D. clavatum*, which is remarkable for being at times free-living.

On the eyes of *Planaria polychroa* and *P. nigra*, see J. Carrière, Arch. mikr. Anat. xx. pp. 169–173, pl. ix.

Genera and Species.

W. A. Silliman (C. R. xciv. pp. 1087–1089) describes a new type of Turbellarian—*Syndesmis*—intermediate between the *Turbellaria* and *Trematoda*, and provided with the ciliated epidermis, digestive and generative organs of the former, together with the vagina and arrangement of the pseudo-vitelligenous gland which is characteristic of the latter. It was found at Roscoff, parasitic on a large green Nematoid, which was parasitic on *Echinus sphæra*.

Bothrioplana, g. n., for *B. semperi* and *B. dorpatensis*, spp. nn. (Dorpat): M. Braun (2).

Czerniavsky (4) describes as new:—
Centrostomum jaltense.
Stylochus argus.
Synhaga auriculata, g. & sp. nn.
Proteola hyalina, g. & sp. nn.
Convoluta schmidti.
Monocelis anguilla var. *suchumica*.
Polia aurita, forma *suchumica*.
Borlasia melanocephala, forma *suchumica*.
B. splendida, forma *suchumica*.
B. maslovskii, and var.
Tetrastemma schultzii, and var.
Oerstedia pallida, var. *suchumica*.
Nemertes geniculata, forma *pontica*.
Pararhynchoscolex lacustris, g. & sp. nn.

Riehm (23) describes as new:—
Tænia rhopaliocephala, from *Lepus cuniculus*, forms the species *T. rhopalocephala* for *Alyseminthus pectinatus*, and forms the three species:—
Dipylidium leuckarti, *pectinatum*, *latissimum*, out of *Tænia pectinata*. (See also *tom. cit.* p. 200, for *Cittotænia latissima*, g. & sp. nn.)
Distomum echiuri, sp. n. (seminal vesicles of *Echiurus pallasi*). Greef, Nova Acta Ac. L.-C. Nat. cur., xli. ii. p. 130.
Nemertoscolex parasiticus, g. & sp. nn. (cœlom of *Echiurus pallasi*); id. ibid.
Distomum muelleri, *D. mollissimum*, *D. oculatum*, *D. sobrinum*, *D. somateriæ*, *D. pygmæum*, spp. nn., Levinsen (19).
Distomum robustum, sp. n. (African elephant), Lorenz, Verh. z.-b. Wien, xxx. pp. 583–586, pl. xix.
Distomum westermanni, sp. n., Kerbert (11), with a full description of its anatomy.
Gyrodactylus grœnlandicus, sp. n., Levinsen (19).
Bucephalus crux, sp. n., Levinsen (19).
Tænia botrioplites, sp. n., Piana [*cf.* Zool. Anz. iv. p. 632].

NEMATOHELMINTHES.

28. Chatin, J. Observations sur le développement et l'organisation du Proscolex de la *Bilharzia haematobia*. Ann. Sci. Nat. (6) xi. Art. 5, pp. 11, pl. vi.

29. ——. Observations sur l'enkystement dela Trichine spirale. *Tom. cit.* Art. 10.

30. ——. Sur la présence de la Trichine dans le tissu adipeux. C. R. xcii. pp. 737–739.

31. ——. Trichines enkystées dans les parois intestinales du porc. *Tom. cit.* pp. 1065–1066.

32. ——. Sur la formation du Kyste dans la trichinose musculaire. *Tom. cit.* pp. 1528–1530.

33. De Man, J. G. Ueber einige neue oder noch unvollstandig bekannte Arten von frei in der reinen Erde lebenden Nematoden. Tijdschr. Nederl. Dierk. Ver. 1881, pp. 138–143.

34. Mégnin, P. Sur de petits Helminthes agames enkystées qui peuvent être confondus et qui l'ont été avec la *Trichina spiralis*. Bull. Soc. Zool. vi. pp. 189–198, pls. vi.–viii.

35. Örley, L. On Hair-worms in the Collection of the British Museum. Ann. N. H. (5) viii. pp. 327–332, pl. xviii.

36. Perroncito, E. Observations sur le développement de l'Anguillula stercoralis (Bavay), Pseudo-rhabditis stercoralis (*mihi*), hors de l'organisme humain. J. de l'Anat. Phys. xvii. pp. 499–519, pl. xxix. [ibique citatum].

37. Reinhard, W. Ueber Echinoderes und Desmoscolex der Umgegend von Odessa. Zool. Anz. iv. pp. 588–592.

38. Villot, A. Nouvelles recherches sur l'organisation et le développement des Gordiens. Ann. Sci. Nat. (6) xi. No. 3, pp. 44, pls. iv. & v.

Villot (38) suppresses the order *Gordiacea* (von Siebold), places *Mermis* and *Sphærularia* with the Nematoids, and forms the new sub-order *Gordii* for *Gordius*, which he places at the head of the Nematohelminthes.

Chatin (32) finds that in muscular trichinosis the sarcolemma takes no part in the formation of the cyst, which is rather formed from the interfascicular connective tissue.

Chatin (28) would regard the larval form of *Bilharzia hæmatobia* as being more of a scolex than a proscolex; the amœbiform bodies or sarcode spherules are looked upon as young gemmæ.

Attention is directed to Mégnin's paper on *Trichina* (34).

On *Chætosoma*, see Levinsen, Vid. Medd. 1881, pp. 132–133.

For a general account of '*Anchylostoma duodenale*' see E. Bugnion, "L'Ankylostome duodénal et l'Anémie de Saint-Gothard" (Rev. Med. Suisse romande, 1881; also separately, Genève, 1881, 8vo, pp. 62, 1 pl.); and especially the bibliography for medical papers, not here cited. See also Long, Trans. Int. Med. Congr. 1881, i. pp. 437–440.

Trichina spiralis; see Mém. Sci. Nat. Mosc. 1880, pp. 25, 1 pl., and Mauler, Quelques mots sur les muscles trichinés, Bull. Soc. Nouch. xii. pp. 295–303.

The Recorder has not been able to see the note by B. Grassi on *Oxyuris* and *Ascaris* in Gaz. degli Ospedali, ii. No. 10; Kuhn's Researches into the *Nematoda* (see Zool. Anz. iv. p. 202); or Rosa on a new species of *Gordius* (see *tom. cit.* p. 444).

Genera and Species.

De Man (33) describes:—

Monohystera paludicola, sp. n.

Chromadora orleyi, sp. n.

Aphelenchus agricola, sp. n. (= *A. avenæ*, Bütschli, De M.).

Trilobus gracilis, Bast., = *T. gracilis*, Bütschli, = *T. gracilis*, De M., = *T. pellucidus*, De M.

Trilobus pellucidus, Bast., = *T. pellucidus*, Bütschli, = *T. leptosoma*, De M.

Echinoderes dentatus, *E. ponticus*, *E. pellucidus*, *E. parvulus*, and *E. spinosus*, spp. nn., Reinhard (38).

Desmoscolex greeffi and *D. medius*, id. ibid.

Perroncito (36) proposes the new generic term of *Pseudorhabditis* for *Anguillula stercoralis*.

Gordius diblastus, *G. pachydermus*, spp. nn., Örley (35).

"Synchytrium und Anguillula auf Dryas"; F. Thomas, Botan. Clblatt, 1880, pp. 761–764.

Filaria attenuata in Peregrine Falcon; Zool. xxxix. p. 309.

ACANTHOCEPHALI.

39. Mégnin, P. Note sur quelques points encore obscurs de l'organisation et du développement des Echinorhynques. C. R. xciii. pp. 1034–1036.

The author finds that in *E. brevicollis* the menisci are replaced by two long cylindrical tubes, which open into a groove at the base of the proboscis, and extend to the hinder extremity of the body. These organs are regarded as representing the intestine, and, in consequence of their resemblance to the intestines of some *Trematoda*, he thinks that there is some affinity between these Orders; the *Acanthocephali* ought therefore to be separated from the Nematodes.

ROTATORIA.

40. Hudson. On *Œcistes janus* and *Floscularia trifolium*, two new species of Rotifers. J. R. Micr. Soc. (2) i. pp. 1–6, pls. i. & ii.

Joliet (C. R. xciii. pp. 748–750, 856–858) gives an account of his observations on *Melicerta ringens*.

Brachionus conium, sp. n., Attwood, J. R. Micr. Soc. (2) i. p. 893.

Levinsen (Vid. Medd. 1881, pp. 131 & 132) has some short notes on the *Rotatoria* of Greenland.

GEPHYREA.

41. Andreæ, J. Zur Anatomie und Histologie des *Sipunculus nudus*, L. Z. wiss. Zool. xxxvi. pp. 201–258, pls. xii. & xiii. Zool. Anz. iv. pp. 477–481.

42. Danielssen, D. C., & Koren, J. Den Norske Nordhavs-Expedition, 1876–1878. III. Zoologi. *Gephyrea*. Christiania: 1881, large 4to, pp. 60, 6 pls., 1 map. [Norwegian and English in parallel columns.]

43. Drasche, R. Ueber eine neue Echiurus-Art aus Japan, nebst Bemerkungen über *Thalassema erythrogrammon*, Leuckart, von der Insel Bourbon. Verh. z.-b. Wien, xxx. pp. 621–628, pl. xx.

44. Horst, R. *Hamingia glacialis*, sp. n., eine borstenlose Echiure. Zool. Anz. iv. pp. 448–450; and Niederl. Arch. Zool. Suppl. i. 2, pp. 12, 1 pl.

45. Lankester, E. R. On *Thalassema neptuni*, Gaertner. Zool. Anz. iv. pp. 350–356.

46. Rietsch, M. Études sur quelques points de l'anatomie du *Sternaspis scutata*. C. R. xcii. pp. 926–929, 1066–1069; Ann. N. H. (5) vii. pp. 426–428, 493–495.

47. Sluiter, C. Ueber die Segmentalorgane und Geschlechtsdrusen einiger Sipunculiden des Malay'schen Archipels. Zool. Anz. iv. pp. 523–527.

48. Vejdovsky, F. Untersuchungen über die Anatomie, Physiologie, und Entwickelung von *Sternaspis*. Denk. Ak. Wien, xviii. pp. 33–90, 10 pls. (also separately).

49. Wilson, E. B. The Origin and Significance of the Metamorphosis of *Actinotrocha*. Q. J. Micr. Sci. xxi. pp. 202–218, pls. xiv. & xv.

Danielssen & Koren (42) give a full account of their new genera and species [see Zool. Rec. xvii. *Verm.* p. 9].

Horst describes (44) the homologue of the secondary gut of *Echiurus* as being represented by a canal which is developed from the outer wall of the body, and connected posteriorly with the hind gut. He is unable to accept Greef's view of the structure and function of the anal tubes; as is also Lankester (45), who has detected very minute pores. The latter describes the liquid of the cœlom as containing corpuscles impregnated with hæmoglobin, and the genital pouches of forms sexually mature as extending over three-fourths of the length of the body.

Vejdovsky (48) gives a very full account of *Sternaspis*, describing the habits; the fore- and hind-body; and the dorsal pre-anal tufts of spirally coiled gill-filaments. There are no integumentary unicellular glands, and the setæ exhibit a peculiar arrangement. The brain presents distinct bi-lateral symmetry, and the nervous system generally is intermediate between that of other *Gephyrea* and that of *Chætopoda*. There would appear to be a pair of lateral vessels for each segment of the body. The gene-

rative ducts do not seem to be modified segmental organs. There are four natural orders of the Annelides: (1) *Hirudinea*, (2) *Oligochæta*, (3) *Polychæta*, (4) *Gephyrea*. The two former are derived from the *Discodrilida*, and the two latter from *Sternaspis*; the common ancestor of all is to be found in the *Turbellaria*. The larvæ of *Chætopoda* and *Gephyrea* are formed on the same type.

Rietsch's (46) papers are preliminary to a complete monograph.

Andreæ (41) describes the tegumentary glands of *Sipunculus nudus* as being bi- or multi-cellular; the large space connected with the ventral nerve-cord is an essential part of the same, and is not a blood-vessel.

Sluiter (47) was usually able to find in fresh forms that there was an opening into the cœlom just beside the posterior end of the brown tube; in only one case was the orifice anterior. In forms in which the longitudinal musculature was not differentiated, no internal orifice could be made out. There appears to be an essential resemblance between the male and female organs.

Andreæ (41), like Greef [see Zool. Rec. xvii. *Verm.* p. 9], divides the *Gephyrea* into the *Echiurida* and *Sipunculida*; on the other hand, Danielssen & Koren (42) do not regard as satisfactory the division of the order into *G. armata* and *G. inermia*; they refer to the former three asetal genera, which agree with the *G. armata* in all the essential points of their anatomy.

Echiurus unicinctus, sp. n., Drasche (43).

Hamingia glacialis, sp. n., Horst (44).

Aspidosiphon fuscus, sp. n., Sluiter (see Zool. Anz. iv. p. 444).

ANNULATA.

50. Darwin, C. The Formation of Vegetable Mould through the Action of Worms, with observations on their habits. London: 1881, 8vo, 326 pp.

On part of this subject see M. Braun, SB. Ges. Dorp. vi. i. pp. 186–188.

51. Eisig, H. Über das Vorkommen eines schwimmblasenähnlichen Organs bei Anneliden. MT. z. Stat. Neap. ii. pp. 255–301, pls. xii.–xiv.

52. Horst, R. Sur la fécondation et le développement de l' *Hermella alveolata*. Bull. Sci. Nord. iv. pp. 1–4; see also Versl. Ak. Amst. (2) xvi. pp. 207–214, 1 pl.

53. ——. Die Anneliden gesammelt während der Fahrten des "Willem Barents." Niederl. Arch. Zool. Suppl. i. 1, pp. 1–26, 1 pl.

54. ——. Bijdrage tot de Kennis der Anneliden van onze Kust. Tijdschr. Nederl. Dierk. Ver. 1881, pp. 120–130, pl. ii. (*Arenicola piscatorum*).

55. Mau, W. Ueber *Scoloplos armiger*, O. F. Müller. Beitrag zur Kenntniss der Anatomie und Histologie der Anneliden. Z. wiss. Zool. xxxvi. pp. 389–432, pls. xxvi. & xxvii.

56. Örley, L. Beiträge zur Lumbricinen-Fauna der Balearen. Zool. Anz. iv. pp. 284–287.

57. Perrier, E. Études sur l'Organisation des Lombriciens terrestres. Arch. Z. expér. ix. pp. 175–248, pls. xiii.–xviii.

58. Repiachoff, W. Zur Entwickelungsgeschichte des *Polygordius flavocapitatus*, Uljanin, und *Saccocirrus papillocercus*, Bobr. Zool. Anz. iv. pp. 518–520.

59. Spengel, J. W. *Oligognathus bonelliæ*, eine schmarotzende Eunicée. MT. z. Stat. Neap. iii. pp. 15–52, pl. ii.–iv.

60. Stewart, C. On a supposed New Boring Annelid. J. R. Micr. Soc. (2) i. pp. 717–719, pl. ix.

Anatomy and Development.

Repiachoff (58) finds that the cleavage of the egg is total in *Polygordius* and *Saccocirrus*; the gastrula is formed by invagination; the mesoblast of the former appears to be derived from the hypoblast, while in the latter "primitive mesodermal cells" arise in the cleavage-cavity. *P. flavo-capitatus* never passes throgh the Lovénian-larva stage.

On the prefecundation of *Spio*; A. Giard, C. R. xciii. pp. 600–602.

Horst (52) describes the shrinking of the vitellus, the protrusion of a pseudopodium-like process to meet the spermatozoon, the formation of an amphiblastula, the great development of the pre-oral region and the presence of four pairs of temporary setæ.

Perrier (57) believes that the ciliated infundibula of the excretory organs are completely independent of the generative system in many if not all *Oligochæta*, as well as in *Hirudinea*, *Mollusca*, and *Vertebrata*. *Pontodrilus*, by the absence of a muscular gizzard, of a typhlosole, and of sub-neural vessel, as well as in other points, approaches the *Naidina*; but shows clearly that the distinctions between that group and the terricolous *Lumbricida* has been too much insisted on.

Eisig's studies (51) have resulted in the discovery of an aerating apparatus connected with the fore-gut in some Annelids, which appears to come into function during some stages of digestion; attention is directed to the analogies between these forms and the *Vertebrata*.

Mau (55) finds in *Scoloplos* that the posterior portion of the walls of the cœca are specially modified, but that the cœca never contain gas, and that their walls are not contractile. Some evidence was obtained as to the presence of a central canal in the ventral medulla. The ova are confined to the segments in which they are developed, and do not float freely in the cœlom.

The parasitic Eunicid described by Spengel (59) has well-marked tubular sheaths in connection with the ventral medulla; their homologies are carefully discussed.

On the nerves in the voluntary muscles of the Leech, see A. Hansen, Arch. Biol. ii. pp. 342–344.

Blomfield & Bourne (Q. J. Micr. Sci. xxi. pp. 500 & 501) find corpuscles in the red vascular fluid of *Eunice* and *Nereis*.

Genera and Species.

Grube (SB. nat. Fr. 1881, pp. 110–117) describes as new:—
Nereis larentukana.
(*Marphysa*) *Eunice januarii.*
Nephthys laciniosa.
Sabella rufo-vittata.
Serpula (*Pomatoceros*) *tricornis, luzonica.*

Eisen (Œfv. Ak. Förh., Bihang v. No. 16, 26 pp. 1 pl.) has a preliminary notice of the results of his researches into the *Tubificidæ*; he establishes a new sub-family, *Telmatodrilini*, in which the atrium has a number of prostate glands; there is no distinct pulsating heart, but five pairs of indistinctly pulsating ones in segments 6–10. The ventral vessel is pushed to one side of the body, and is near the dorsal. The receptacle opens in the 9th, and the efferent duct in the 10th setigerous segment.

Telmatodrilus, g. n. for *T. vejdovskii*, sp. n.

The second sub-family is that of the *Tubificini*. A key to the genera is given, including

Spirosperma, g. n., for *S. feroz*, sp. n.
Ilyodrilus, g. n. for *I. perrieri, sodalis*, and *fragilis*, spp. nn.
Hemitubifex, g. n. for *H. insignis*, sp. n.
Tubifex campanulatus, sp. n.
Limnodrilus ornatus, steigerwaldi, monticola, alpestris, silvani, spp. nn.
Camptodrilus, g. n. for *C. spiralis, igneus, corallinus*, and *californicus*, spp. nn.

Notostomum lævе, g. (*Hirudinea*) & sp. nn.; Levinsen, Vid. Medd. 1881, pp. 133–136 (Greenland), with figures.

Pisicola rectangulata, sp. n. (gills of *Gadus* sp.), *id. tom. cit.* pp. 137–139, pl. ii., Amurland.

Czerniavsky (4) makes the new order *Achæta*, and defines it as—

"Corpus sæpissime annulatum, chætis et appendicibus lateralibus destitutum. Caput vel appendiculatum, vel antennis 2-bus vel branchiis instructis. Disci suctorii nulli."

Rhamphogordidæ, fam. n.
Protodrilidæ, fam. n.
Protodrilus mirabilis, g. & sp. nn.
Polygordidæ, fam. n.
Phoronidæ, fam. n.
Gymnosomidæ, fam. n.
Pterostylarides, g. n. for *Stylaria parasita*, O. Schmidt.
Paranais, g. n. for *Nais littoralis*, Oersted.
Branchinaididæ, fam. n.
Pachydrilus gracilis, P. proximus, P. affinis, P. similis, P. lacustris, P. charkowiensis, P. opacus, spp. nn.
Clitellio (?) *dubius, C. suchumicus, C. hetero-setosus*, spp. nn.
Sænuris taurica, peculiarilis, diversisetosa, spp. nn.

Pododrilus, g. n. for *Sænuris neurosoma*, Frey & Leuck.
Archæoryctes, g. n. for *Sænuris batillifera*, Schmankewicz.
Lumbriculus lacustris, sp. n.
Archæodrilus cavaticus and *maloticus*, g. & spp. nn.

L. Örley (Term. Közl. Pest, xvi. pp. 563–609, 3 pls.) gives a list of the terricolous *Oligochæta* of Hungary, and describes as new :—
Lumbricus terrestris, var. *platyurus*; *L. terrestris*, var. *lacteus*; *Criodrilus dubiosus*.
Örley (50) describes as new *Allolobophora fraissii* and *mediterranea*.
Pontodrilus marionis, sp. n.; Perrier (57).
Titanus forguesi, sp. n. *id.* (57) p. 217, note.
Aulastoma heluo; Templeton, Ann. N. H. (5) viii. pp. 137–139, pl. viii.
Lithognatha worslei, g. (*Eunicidæ*) & sp. nn., Stewart (60).
The Recorder has not been able to see the essay of Eisen on *Eclipidrilidæ* and their Anatomy,—a new family of the limicolide *Oligochæta*, Upsala, 1881, 4to, 10 pp. 2 pls. (Zool. Anz. iv. p. 632).

ENTEROPNEUSTI.

61. Metschnikoff, E. Ueber die systematische Stellung von *Balanoglossus*. Zool. Anz. iv. pp. 139–143, 153–157.

The author believes that there is a very close connection between *Balanoglossus* and the *Echinodermata*; he proposes to recognise a type *Ambulacraria*, divisible into the *Bilateralia* and the *Radiata*; in the former, bilateral symmetry is retained, there are no calcareous deposits, and the water-vascular system, which is represented by the proboscis sac, develops no radial prolongations. The gills are regarded as rudimentary water-vessels, which undergo no further development, but present vegetative repetition. The resemblance in details of the histological structure of the two groups is insisted upon.

ORTHONECTIDA.

62. Metschnikoff, E. Untersuchungen über Orthonectiden. Z. wiss. Zool. xxxv. pp. 282–303, pl. xv.

Metschnikoff here describes a species which he found in *Nemertes lacteus*. The *Orthonectida* generally exhibit a radiate structure; the dermal layer is ciliated and segmented, and there is a well-marked sexual dimorphism. Their simplicity of structure is ascribed to degeneration, and it is possible that their nearest ally is to be found in the Turbellarian *Dinophilus*. Rabl's theory that the radial movements of an animal within a confined space determine its radiate character is not supported by the linear course taken, and the radiate structure exhibited, by the forms of this group.

Metschnikoff's paper is translated in Bull. Sci. Nord. iv. pp. 361–371.

where there is (pp. 372–378) a note by A. Giard, pointing out that there are certain peculiarities in *Tornaria* which require further study for a complete knowledge of their significance, and directing attention to the peculiarities of the genital organs of the *Echinoidea*, as affording support to Metschnikoff's doctrine. Giard has no sympathy with those who would associate *Balanoglossus* with the *Tunicata*.

A preliminary notice by C. Julin, on the development and organisation of the *Orthonectida*; Bull. Ac. Belg. (3) i. pp. 504–513.

ECHINODERMATA.

BY

F. Jeffrey Bell, M.A., F.R.M.S., F.Z.S.

---

1. Agassiz, A. Voyage of H.M.S. 'Challenger.' Report on the *Echinoidea* dredged by H.M.S. 'Challenger' during the years 1873–76. London : 1881, 4to. pp. 321, pls. i.–xlv.
2. Apostolidès, N. Recherches sur la circulation et la respiration des Ophiures. C. R. xcii. pp. 421–424 ; Ann. N. H. (5) vii. pp. 535 & 356.
3. ——. Système nerveux des Ophiures. *Tom. cit.* pp. 1424–1426.
4. Bell, F. J. Account of the Zoological Collections made during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. ix. *Echinodermata.* P. Z. S. 1881, pp. 87–101, pls. viii. & ix.
5. ——. Observations on the Characters of the *Echinoidea.* iv. The *Echinometridæ* ; their affinities and systematic position. *Tom. cit.* pp. 410–433, 2 woodcuts.
6. ——. Contributions to the Systematic Arrangement of the *Asteroidea.* i. The species of the genus *Asterias.* Tom. cit. pp. 492–515, pls. xlvii. & xlviii.
7. ——. A Note on the Characters of the genus *Crossaster*, with the description of a new species. Ann. N. H. (5) viii. pp. 140–142.
8. ——. On the apparent retention of a sur-anal plate by a young *Echinometra.* J. L. S. xv. pp. 318–320.
9. Carpenter, P. H. The Minute Anatomy of the Brachiate Echinoderms. Q. J. Micr. Sci. xxi. pp. 169–193, pls. xi. & xii.
10. ——. *Comatulæ* of the Leyden Museum. Not. Leyd. Mus. iii. pp. 173–217.
11. ——. Preliminary Report on the *Comatulæ* (Reports on the results of dredging under the supervision of A. Agassiz, &c., No. xvi.). Bull. Mus. C. Z. ix. No. iv. pp. 1–19, pl. i.
12. ——. Note on the European *Comatulæ.* Zool. Anz. iv. pp. 520–522.

13. Danielssen, D. C., & Koren, T. Fra den norske Nordhavs-expedition. N. Mag. Naturv. xxvi. pp. 177–195, pls. i. & ii.

14. Duncan, P. M., & Sladen, W. P. A Memoir on the *Echinodermata* of the Arctic Sea to the West of Greenland. London: 1881, royal 4to, 82 pp. 6 pls.

15. Fewkes, J. W. On the Development of the Pluteus of Arbacia. Mem. Peab. Acad. i. vi. pp. 10, 1 pl.

16. Foettinger, A. Sur la structure des Pédicellaires gemmiformes de *Sphærechinus granularis* et d'autres Échinides. Arch. Biol. ii. pp. 455–496, pls. xxvi.-xxviii.; Bull. Ac. Belg. (3) i. 493–504; Zool. Anz. iv. pp. 548–552.

17. Geddes, P., & Beddard, F. E. Sur l'histologie des pédicellaires et des muscles de l'Oursin. C. R. xcii. pp. 308–310; Ann. N. H. (5) vii. pp. 275–277.

18. Kingsley, J. S. Contributions to the Anatomy of the Holothurians. Mem. Peab. Acad. i. 5, pp. 14, 2 pls.

19. Ludwig, H. Uber eine lebendiggebärende Synaptide und zwei andere Holothurienarten des Brasilianischen Küste. Arch. Biol. ii. pp. 41–58, pl. iii.

20. ——. Revision der Mertens-Brandts'chen Holothurien. Z. wiss. Zool. xxxv. pp. 575–599.

21. ——. Zur Entwicklungsgeschichte des Ophiuren-skelettes. Z. wiss. Zool. xxxvi. pp. 181–200, pls. x. & xi.

22. Lyman, T. The Stomach and Genital Organs of *Astrophytidæ*. Bull. Mus. C. Z. viii. No. 6, pp. 117–125, 2 pls.

23. Neumayr, M. Morphologische Studien über fossile Echinodermen. SB. Ak. Wien, lxxxiv. pp. 143–176, 2 pls.

24. Perrier, E. Sur les Étoiles de Mer draguées dans les regions profondes du golfe du Mexique et de la mer des Antilles par le navire *The Blake* de la Marine des États-Unis. C. R. xcii. pp. 59–61; Ann. N. H. (5) vii. pp. 272 & 273.

25. ——. Description sommaire des espèces nouvelles d'Astéries. (Reports on the Results of Dredging, &c.) Bull. Mus. C. Z. ix. No. 1, pp. 1–31.

26. Pfeffer, G. Die Clypeastriden des Hamburger Museums. Verh. Ver. Hamb. (2) v. pp. 56–70, 1 photographic plate.

27. Romanes, G. J., & Ewart, J. C. Observations on the Locomotive System of *Echinodermata*. P. R. Soc. xxxii. pp. 1–12 (Abstract). [Published in full, Phil. Tr. clxxii. pp. 829–885, pls. lxxix.-lxxxv.]

28. Sladen, W. P. On Traces of Ancestral Relations in the Structure of the *Asteroidea*. P. York Geol. & Polyt. Soc. (n.s.) vii. 10 pp. pl. xv.

29. Sluiter, C. P. Ueber einige neue Holothurien von der West-Küste Java's. Tijd. Nederl. Ind. xi. pp. 332–358, pls. i.–vii. Preliminary notice in Versl. Ak. Amst. (2) xvi. pp. 282–285.

General Morphology of the Group.

See F. M. Balfour, Comparative Embryology, vol. ii., especially chap. xiii. H. A. Pagenstecher, Allg. Zoologie, iv. (Berlin: 1881) pp. 15–18, 275–277.

The most noticeable work done on Echinoderms is probably that of Romanes & Ewart (27), but it is more of physiological than of morphological importance.

W. Flemming (Arch. mikr. Anat. xx. pp. 1–40, pls. i. & ii.) takes the ovum of the *Echinodermata* as a text for observations on cell-structure.

Carpenter (9) gives an account of what appear to be well established discoveries in the anatomy and physiology of the nervous, vascular, and generative systems of Star-fishes, Ophiurids, and Crinoids, and urges that Leuckart's separation of the stalked Echinoderms (*Pelmatozoa*) might be more generally adopted with advantage.

Sladen (28) is of opinion that the present *Asteroidea* and *Ophiuroidea* had their common ancestor in an Ophiurid-like stock.

Agassiz (1) would regard the *Palæchinoidea* as one of the four sub-orders of the *Echinoidea*; he finds that the antique characters of many of the new deep-sea genera are very plain, discusses some of the structural characters, the relations of the present to the extinct forms, the changes in the relations of land and sea, and gives tables of the distribution in depth and breadth of the various members of the order.

Bell (5) divides the regular *Echinoidea* into (*a*) *Entobranchiata*. Fam. 1, *Cidaridæ*: and *Ectobranchiata*, in which the *Salenidæ* form the palæoproctous series; all the rest are neoproctous, and are either (*a*) polylepid (*Echinothuridæ*), or decalepid, as the *Arbaciidæ*, *Diadematidæ*, and *Echinidæ*. The *Echinidæ* either have the body circular (*Echininæ*), when the secondary plates are formed of three, or more than three primary pore-plates, or the morphological axis is set obliquely to the long axis of the test (*Echinometrinæ*), or at right angles (*Heterocentrinæ*). The generic value of the characters of *Sphærechinus* is insisted upon, and the radula figured.

Apostolidès (2) describes the so-called heart of the *Ophiuroidea* as being independent of the water-system, and as a gland, provided with an excretory canal. The body-cavity, which consists of an enlarged portion, which surrounds the digestive tube, and of a flattened portion which is found in the dorsal region of the anus, is entirely closed. The bursæ ought to be regarded as respiratory sacs, and they may be seen to alternately contract and dilate. The nervous system (3) has its circum-oral nerve-ring contained in a "perineural" space formed from part of the body-cavity; in minute structure the nerve-band presents a ventral tissue of brown cells with large nuclei, which have some resemblance to the pigment-cells of the *Vertebrata*, and of a dorsal, or true nervous tissue, in which

are delicate fibrils, with pale bi-polar cells, which are scattered and not collected into ganglia.

Lyman (22) finds that a number of membranous pouches are connected with the stomach of the *Astrophytidæ*, and that the space between the ten radiating compartments and the "stomach-sphincter" differs only [illegible] he perihæmal canal of the *Ophiurida* in not being closed. The [illegible] ould seem to be impregnated in the body-cavity. Differences in various forms and approachments to the *Ophiurida* are pointed out.

A study of *Amphiura squamata* has convinced Ludwig (21) of the truth of the doctrine that the arm-ossicles of the *Ophiurida* are originally double; the first rudiment consists of two calcareous pieces symmetrically placed on either side of the middle line of the arm; of the three rays of each triangular piece, one is directed ab-orally, and two ad-orally; the first increases considerably in length, and the two ad-oral pieces gradually become connected. Lateral and mesial growth only gradually leads to complete fusion, and, till a late stage, there is a space with concave sides in the middle of the ossicle. The radial water-vessel is not, at first, covered over by the ossicle. The lateral plates of the arm of an Ophiurid may certainly be regarded as homologous with the ad-ambulacral plates of the arm of a star-fish; the ventral and dorsal plates are primarily unpaired. There is a striking similarity in the position of the primary madreporic pore of *Amphiura* and of the larval *Antedon*.

Geddes & Beddard (17) find that in the ophiocephalous pedicellariæ the muscles uniting the head to the stem mostly terminate in a series of loops outside the calcareous parts; the muscles only present striæ when the fibres are constricted.

Perrier (24) notes the characters of the pedicellariæ of deep-sea *Asteroidea*; *Archaster mirabilis* sometimes has a "comb" of spines; some *Luidiæ* have four branches to their pedicellariæ.

Fœttinger (16) describes in detail the minute structure of the pedicellariæ of *Sphærechinus granulosus*, where the head and the glands are equally developed; in *Echinometra* the head, and in *Diadema* the glands, are better developed. In *Mespilia globulus* these organs are excessively small and very numerous; *Strongylocentrotus lividus* and *S. drobachiensis* have a stalk which is very similar to that of the ophiocephalous and tridactyle pedicellariæ.

The viviparous *Chirodota* described by Ludwig (19) had sixteen young lying freely in its cœlom; the calcareous wheels have at first the form of a six-rayed star, the circumference of the wheel being formed later on by the union of the adjacent processes. The stone-canal presents an intermediate character between those in which all connection is lost, and those in which connection is retained with the exterior. Indications of auditory vesicles were detected.

On the Morphology of the Palæozoic Crinoids, see Carpenter & [illegible]eridge, Ann. N. H. (5) vii. pp. 281–298; and consult the second part of the important Revision of the *Palæocrinoidea*, by Wachsmuth & Springer, P. Ac. Philad. 1881, pp. 177–414, pls. xvii.–xix. The value of a study of fossil forms is illustrated by the essay of Neumayr (23).

On the circulatory system of *Spatangus purpureus*, see R. Kœhler, C. R. xciii. pp. 651–653, Ann. N. H. (5) viii. pp. 451 & 452.

Distribution, &c.

Graeffe (Arb. z. Inst. Wien, iii. pp. 333–344) points out that developing Echinoderms have many enemies, while adult forms have none; in addition to their spines, large forms have a peculiarly disagreeable smell. Owing to their defensive characters, Echinoderms exhibit no mimicry, and are often brightly coloured.

Bell, Ann. N. H. (5) viii. p. 441, points out that the strength of the spines appears to be, for littoral species of *Asteroidea*, inversely proportional to the solidity and compactness of the skeletal plates.

For notes on deep-sea Echinoderms, see Studer, MT. Ges. Bern, 1881, pp. 13 & 14.

For notes on and a list of the *Echinodermata* of Mauritius, see Möbius, Beiträge zur Meeresfauna der Insel Mauritius und der Seychellen (Berlin : 1880, 4to, pp. 46–50).

E. Graeffe gives (Claus, Arb. iii. pp. 333–344) a list of the *Echinodermata* of the Gulf of Trieste, with notes on their habits, time of appearance, reproduction, &c.

Arctic *Echinodermata*; Duncan & Sladen (14); and Bell in A. H. Markham's "Polar Reconnaissance" (London : 1881, 8vo), pp. 345 & 346.

Echinodermata of Ascension Island; Bell, Ann. N. H. (5) viii. pp. 436 & 437.

Echinodermata of the Straits of Magellan; Bell (4).

Echinodermata of the Firth of Forth; Leslie & Herdman, Pr. Phys. Soc. Edinb. vi. pp. 85–95.

Poisonous qualities of the Starfish (*Solaster papposus*); Zool. 1881, p. 214.

Observations on Echinoids in captivity; Noll, Zool. Gart. xxii. pp. 137–147: on Holothurians; *id. tom. cit.* pp. 168–173.

ECHINOIDEA.

Agassiz (1) describes as new :—

Asthenosoma gracile, pp. 89–91.

Phormosoma bursarium, p. 99, *P. asterias*, *P. rigidum*, p. 104.

Paleopneustes murrayi altered to *Linopneustes* (subg. n.) *murrayi*, pp. 167 & 168.

Schizaster moseleyi, p. 203.

Moiropsis, g. n. Intermediate between *Moira* and *Schizaster*, but the generic differences not pointed out. For *Schizaster claudicans*, A. Ag., p. 205.

Strongylocentrotus bullatus, sp. n., Bell (4); young specimen also described and figured.

Mespilia whitmæi (Samoa), Bell, P. Z. S. 1881, pp. 434–436.

Temnopleurus cavernosa, sp. n. (young), J. E. T. Woods, P. Linn. Soc. N. S. W. v. pp. 493 & 494, pl. xv.

Pfeffer (26) describes—

Peronella decagonalis, f. n. *pallida*; *P. ludwigi*, *P. elegans*, spp. nn.

Alexandria, g. n. (*Scutellidæ*). Ambulacral grooves straight, anus marginal, small ab-actinal area, and large and distinct ocular pores. For *A. magnifica*, sp. n.

Echinarachnius pacificus, sp. n.

Encope pacifica, sp. n.; with notes of localities, &c., of some other Clypeastrids.

Neumayr (23) forms the new genera *Tiarechinus* for *Hauería princeps*, Laube (MSS.), and *Perischocidaris* for *P. harti*, sp. n.

Loriolia, g. n., for an example of "*Pseudodiadema bourgueti*"; id. Z. geol. Ges. xxxiii. pp. 570–573.

Cotteau has published a "Catalogue des Échinides jurassiques de Normandie," and livr. 44 of the Paléontologie française (containing *Pseudocidaris* and *Hemicidaris*); see Bull. Soc. Géol. (3) ix. p. 107.

For a summary of the contents of the 7th fascicle of the "Échinides de l'Algerie," see Péron, *tom. cit.* pp. 436–438; of the 36 species described, 24 are new.

For a summary of Cotteau on the "Échinides des terrains tertiaires de la Belgique," see Cotteau, *tom. cit.* pp. 214–219; of the 31 species, 22 are peculiar to Belgium.

Wright has continued his account of Cretaceous Echinids; Pal. Soc. xxxv. pp. 24, 6 pls.

ASTEROIDEA.

Bell (6) proposes an arrangement of the species of *Asterias*, and suggests a method of formulation, by means of which their leading characters may be rapidly recognized; a brief method of referring to the descriptions of known species is also adopted.

Asterias spitsbergensis, sp. n., Danielssen & Koren (13).

Asterias brandti, *alba*, *obtusispinosa*, *neglecta*, spp. nn., Straits of Magellan; Bell (4) pp. 91–94, pl. ix. figs. 1–4.

Asterias philippii (South America), *A. inermis* (Ecuador), *A. verrilli* (St. Martin's Cove, Straits of Magellan), *A. spirabilis* (Falkland Islands), *A. rollestoni* (Japanese Seas), spp. nn.; Bell (6) pp. 511–515, pl. xlvii. & pl. xlviii. figs. 4 & 5.

Asterias japonica, Stimpson (? MSS.); *id. l. c.* p. 515, pl. xlviii. 6, 6*a*, 6*b*

Crossaster neptuni, sp. n., Bell (7) pp. 140–142 (Ecuador).

Solaster glacialis, sp. n., Danielssen & Koren (13).

Calliderma grayi, sp. n.; Bell (4) pp. 95 & 96 (pl. viii. fig. 5) (Straits of Magellan),

Cycethra, g. n. "The ambulacral grooves are narrow, the actinostome small, not widely open, the modified spines of the mouth-organs generally Goniasterine in arrangement; the ventral intermediate plates continuous, but not imbricated, bearing short spines, which in character and arrangement recall the same parts in *Asterina*. Marginal plates almost completely confined to the sides of the arm and disk; . . . the whole of the ab-actinal surface is covered with closely packed small ossicles, among

which there are no pore-areas. Central disc large, arms rather short and slender. No pedicellariæ." *Id. l. c.* pp. 96 & 97, pl. ix. figs. 5 & 6, for *C. simplex*, sp. n. (Straits of Magellan).

Asterina tumida for *Solaster tumidus*, Danielssen & Koren (13).

Tylaster, g. n. (*Asterinidæ*) for *T. willii*, sp. n., *iid. ibid.*

Archaster magnificus, sp. n.; Bell, Ann. N. H. (5) viii. pp. 440 & 44 (St. Helena).

Perrier (26) describes from the Gulf of Mexico:—

Asterias contorta, fascicularis, linearis, angulosa, gracilis, spp. nn.

Zoroaster sigsbeei, ackleyi, spp. nn.

Pedicellaster pourtalesi, sp. n.

Echinaster modestus, sp. n.

Cribrella antillarum, sex-radiata, spp. nn.

Ophidiaster floridæ, agassizi, spp. nn.

Korethraster palmatus, radians, spp. nn.

Pteraster caribbæus, sp. n.

Fromia japonica (Japan), sp. n.

Asterina lymani, pilosa, sp. n.

Marginaster, g. n. (without diagnosis), *M. pectinatus, echinulatus*, spp. nn.

Radiaster, g. n. (without diagnosis), *R. elegans*, sp. n.

Ctenaster, g. n. (without diagnosis), *C. spectabilis*, sp. n.

Pentagonaster (*Tosia*) *parvus, P. grenadensis, P. ternalis, P. subspinosus, P. arcuatus*, spp. nn.

Goniodiscus pedicellaris, sp. n.

Anthenoides, g. n. (without diagnosis), *A. peircii*, sp. n.

Goniopecten, g. n. (without diagnosis), *G. demonstrans, intermedius, subtilis*, spp. nn.

Archaster[illegible] *alcher, mirabilis, simplex*, spp. nn.

Blakiaster, [illegible] g. (without diagnosis), *B. conicus*, sp. n.

Luidia barbadensis, convexiuscula, spp. nn.

Astropecten alligator, sp. n.

The list of stations for these species "will be given in the final report." Some account of the genera is given by Perrier (24).

Solaster earlii, sp. n., Verrill, Am. J. Sci. (3) xvii. [1879], p. 473.

Asterias mollis, Studer, *nec* Hutton, renamed *studeri*; Bell (6) p. 91.

OPHIUROIDEA.

Ophioscolex coppingeri, sp. n., Bell (4), p. 98.

Astrophyton lymani, sp. n., *id. l. c.* p. 99. [Lyman has informed the Recorder that this is an immature example of *A. pourtalesi* (Lyman)].

HOLOTHUROIDEA.

Ludwig (20) finds that *Oncinolabes*, *Liosoma*, and *Aspidochir* are unsatisfactory genera, and destroys Semper's family *Oncinolabidæ*.

Oncinolabes fuscescens, Br., = *Synapta beseli*, Jäger.

O. mollis, Br., = ? *Synapta glabra*, Semper.
C. rufescens, Br., = *C. variabilis*, Semper.
Aspidochir mertensi, Br., = *Chirodota* sive *Synapta*, sp.
Liosoma sitchaense, Br., = *Chirodota discolor*, Eschsch.
Cladodactyla miniata, Br., = *Cucumaria fallax*, Ludwig.
Cladodactyla nigricans, Br., = *Cucumaria nigricans*, Sel.
Cladodactyla albida, Br., = *Cucumaria albida*, Ludwig (*nec* Selenka).
Cuvieria sitchaensis, Br., = *Psolus fabricii*, Lütken.
Cladolabes limaconotos, Br., = *Orcula limaconotus*, Ludwig.
Diploperideris sitchaensis, Br., = *Stichopus sitchaensis*, Ludwig.
Holothuria grandis, Br., = *Stichopus ananas*, Semper.
Holothuria dubia, Br., = *Muelleria lecanora*, Jäger.
H. maculata, Br., = *M. nobilis*, Sel.
Sporadipus ualenensis, Br., = *Holothuria marmorata*, Semper.
Sporadipus maculatus, Br., = *H. arenicola*, Semper.
Stichopus leucospilota, Br., = *H. vagabunda*, Sel.
Holothuria affinis, Br., = *H. atra*, Jäger.
H. æthiops, Br., = *H. pulla*, Sel.
Stichopus cinerascens, Br., = *H. pulchella*, Sel.
Thyonidium parvum, sp. n., Ludwig (19) p. 54.
Synapta benedeni, sp. n. *id. l. c.* p. 55.

Sluiter (29) describes as new, and figures :—
Ananus holothuroides, g. & sp. nn.
Ocnus javanicus, sp. n.
Haplodactyla hualoides, sp. n.
Microdactyla caudata, g. & sp. nn.
Chirodota variabilis (?) Semper, is figured, and there is a note on the wheels of *Chirodota*.

Chirodota dunedinensis, sp. n., T. J. Parker, Tr. N. Z. Inst. xiii. p. 418.
Molpadia turgida, sp. n., Verrill, Am. J. Sci. (3) xvii. [1879] p. 473.

Haacke describes as new (Möbius, Beiträge zur Meeresfauna der Insel Mauritius, &c., pp. 47 & 48) :—
Chirodota eximia.
Colochirus colloradiatus, propinquus.
Phyllophorus tenuis.
Stichopus cylindricus.
Cystipus pleuripus.
Labidodemas leucopus, punctulatum, neglectum.
Holothuria lagœna, utrimque-stigmosa, collaris, monosticha, mammiculata. (Brief diagnoses only.)

CRINOIDEA.

Carpenter (11) gives a useful table of the differences between *Antedon* and *Actinometra*; describes a new genus *Atelecrinus* (which retains several larval characters) for *Ant. cubensis* and *A. balanoides*, sp. n.

Antedon spinifera, sp. n.; *Actin. pulchella*, Pourtales, described more fully.

Antedon prolixa, sp. n., Sladen, (14) p. 77.

Carpenter describes as new (10):—

Antedon perspinosa, *A. pinniformis*, *A. serripinna*, *A. bimaculata*, *A. brevicuneata*, *A. lævicirra*, and *A. spicata*.

Actinometra robustipinna, *A. alternans*, *A. schlegeli*, and *A. peroni*.

He redescribes or gives the synonymy of:—

Antedon carinata, *A. flagellata*, *A. elongata*.

Actinometra nova-guineæ, *A. typica*, *A. japonica*, *A. parvicirra*, and *A. bennetti*.

Carpenter (12) having had the opportunity of examining an original specimen of *A. celtica*, Barrett, which was found in the British Museum by F. J. Bell [under the name of *A. woodwardi*], has been able to show that Sladen's (14) *A. celtica* is a different form; at the same time he shows that *A. celtica* (Barrett) is only a dwarfed and less robust variety of *A. phalangium*. *Antedon milleri*, Norman, = *Comatula fimbriata*, Miller.

On new fossil Crinoids, see P. H. Carpenter, J. Geol. Soc. xxxvii. pp. 128–130, pl. vi.; Ann. N. H. (5) viii. p. 157.

Symphocrinus cornutus, g. & sp. nn., H. Trautschold, Bull. Mosc. lv. pp. 390–396, pl. v.

CŒLENTERATA.

Hydrozoa and Ctenophora, by Alfred Gibbs Bourne, B.Sc. (Lond.), &c.

Anthozoa, by Sydney J. Hickson, B.Sc. (Lond.), B.A., &c.

HYDROZOA AND CTENOPHORA.

1. Allman, G. R. On the Development of the *Ctenophora*. Abstr. in Zool. (3) v. pp. 342–342.

A review of the work of Agassiz and Chun.

2. Bedot, M. Sur la faune des Siphonophores du Golfe de Naples. MT. z. Stat. Neap. iii. pp. 121–123.

The Bay of Naples presents 19 species of *Siphonophora*, representing all the families of the Order.

3. Blaschka, R. Ueber Hydroidquallen oder Craspedoten. SB. Ges. Isis, 1880, pp. 45–49.

4. Brass, A. Untersuchungen der Histologie von *Hydra* (*viridis*). Z. ges. Naturw. liii. [1880] p. 911.

5. Chun, C. Die Natur und Wirkungweise, der Nesselzellen bei Cœlenteraten. Zool. Anz. iv. pp. 649 & 650.

The author shows that the nematocysts (thread-cells) have muscles connected with them, and that it is the contraction of these muscles which, increasing the fluid pressure within the sac, causes the extension of the filament. These muscles are most obvious in *Physalia*, where they are perfectly regularly arranged, and in this genus small unipolar and bipolar ganglion cells have been seen, and sensory hairs (palpocils) are found in large numbers in the neighbourhood of the groups of nematocysts. The author considers the nematocysts to represent morphologically epithelio-muscular cells.

6. ——. Das Nervensystem der Siphonophoren. *L. c.* pp. 107–111.

The author adds to our knowledge of the nervous system in the *Cœlenterata* by describing that of the *Velellidæ*.

7. Claus, C. Beiträge zur Kentniss des Geryonopsiden- und Eucopiden Entwickelung. Arb. z. Inst. Wien, iv. pp. 89–120, 4 pls.

8. [Claus, C.] Ueber *Æquorea forskalea*, Esch., als Aequoride des Adriatischen Meeres, zugleich eine Kritik von E. Hæckel's Æquoridensystem. *L. c.* pp. 282–312.

9. ——. Ueber einige bislang noch unbekannte Larvenstadien von *Rhizostoma*. Zool. Anz. iv. pp. 79–85.

The author was enabled to keep alive and trace the development of larva of *Rhizostoma cuvieri*.

10. ——. Zur Kentniss der Aufnahme körperlichen Elemente von Entodermzellen der Cœlenteraten. *L. c.* pp. 116 & 117.

Claims priority for T. J. Parker, Metschnikoff, and Ray Lankester in the discovery of the absorption of solid particles on the part of the endoderm cells by certain Cœlenterates.

11. Davidoff, M. Ueber Theilungsvorgänge bei *Phialidium variabile*, Hck. Zool. Anz. iv. pp. 620–622.

At an early stage, a second stomogastrium is observed forming as a bud, a new mouth breaks through at the ab-oral pole, and fission takes place in a plane at right angles to the axis passing through these two mouths.

12. Du Plessis, G. *Cassiopea borbonica*. Bull. Soc. Vaud. (2) xvii. pp. 633–639.

The author has traced ova developing into *Ephyræ* passing through well-marked planula, scyphistoma, and strobila stages.

13. ——. Sur les Métamorphoses de la *Cassiopea borbonica*, D. Ch. Arch. Sci. Nat. (3) vi. pp. 312–314.

14. Fewkes, J. W. Report on the *Acalephæ*. Reports on the Results of Dredging under the Supervision of A. Agassiz in the Caribbean Sea in 1878–79 and along the Atlantic Coast of the United States during the summer of 1880 by the U. S. Coast Survey Steamer 'Blake,' Comm. J. R. Bartlett. Bull. Mus. C. Z. viii. pp. 127–140.

Two genera of gymnoblastic hydroids were collected:—*Eudendrium* and *Tubularia*. The majority of the remaining forms belong to the *Plumulariidæ*.

15. ——. Budding in free *Medusæ*. Am. Nat. xv. pp. 59 & 60.

16. ——. Studies of the Jelly Fish of Narragansett Bay. Bull. Mus. C. Z. viii. pp. 141–182.

See *infrà*, New Genera and Species.

17. ——. The Siphonophores. II. The Anatomy and Development of *Agalma* (continued). Am. Nat. xv. pp. 186–195.

18. ——. The Siphonophores. III. *Physophoridæ* (animals closely allied to *Agalma*). L. c. pp. 772–782.

19. Greef, R. Ueber *Crambessa tagi*, Hck. Zool. Anz. iv. pp. 564–570.

The author describes at length certain special points in the anatomy, and points out that the species is capable of living in brackish water, and is chiefly found in the mouths of rivers.

20. Guerne, J. de. Méduses d'eau douce et d'eau saumâtre. Bull. Sci. Nord. (2) ii. [1880], pp. 417–424.

21. Hæckel, E. Metagenesis und Hypogenesis von *Aurelia aurita*. Ein Beitrag zur Entwickelungsgeschichte und zur Teratologie der Medusen. Jena: 1881, 4to, 36 pp. 2 pls.

It appears that under certain conditions the normal developmental history may be much shortened, resulting even in the elimination of the Scyphistoma- and Strobila-stages.

22. ——. Ein neuer Fall von abgekürzter Entwickelung. Kosmos, v. pp. 29–44, 9 woodcuts.

23. ——. Radiolarien und Tiefsee-Medusen der Challenger-Expedition, SB. nat. Fr. 1881, pp. 67 & 68.

24. ——. Monographie der Medusen. 2 Th. Die Tiefsee-Medusen der Challenger-Reise. Der Organismus der Medusen. Jena: 1881, 4to, 32 pls., 8 woodcuts.

This is a German edition of the work which appears in English in the Report on the Scientific Results of the Voyage of H.M.S. 'Challenger' (Zoology, iv., 1882), but which, through some irregularity, was published in Jena in the previous year. The report deals partly with the general anatomy of the *Medusæ*, partly with the special characters of the eighteen species which were diagnosed by the author in 1879 (System der Medusen: *cf.* Zool. Rec. xvi. *Cœl.* pp. 8–16), and described as deep-sea forms. It must be borne in mind that there is very little evidence that these are really deep-sea forms; and, moreover, some of the 'Challenger' specimens were mere fragments, and the plates relating to these have been prepared from specimens in the Copenhagen Museum. The author, however, considers that some of them, notably *Pectyllis*, *Pectis*, and *Pectanthis*, among the *Craspedotæ*, and *Tesserantha*, *Periphylla*, *Periphema*, *Nauphanta*, and *Atolla*, point by their primitive structure to a remote phylogenetic origin, and so may probably be regarded as permanent and characteristic inhabitants of the deep sea. The 18 species represent 13 of the 32 families of the system. 7 species are reported to have been taken in depths from 80–600 fath., 6 species in depths from 1100–1600 fath., and 5 species in depths from 2000–2200 fath. The author gives a complete glossary of the terms used in describing *Medusæ*, in Latin, English, and German.

25. Hamann, Otto. Die Mundarme der Rhizostomen und ihre Anhangsorgane. Jen. Z. Nat. xv. pp. 243–285.

The mouth-arms do not, as is generally supposed, act as suckers. The variations in their structure are traced.

26. Hartog, M. M. On the Means by which Hydra swallows its Prey. P. Manch. Soc. xix. pp. 29–40. [*Cf.* Zool. Rec. xvii. *Cœl.* p. 4.]

27. Hertwig, R. Ueber den Bau der Ctenophoren. Jen. Z. Nat. xiv. [1880] Suppl. Heft i. pp. 11–16, 29–31.

The author deals at great length with the minute anatomy of very numerous representatives of the group.

28. Holm, G. Bidrag till Kännedomen om Scandinaviens Graptoliter. Œfv. Ak. Förh. xxxviii. No. 4, pp. 71–83.

1 new genus, *Pterograptus*.

30. Jullien, J. Description d'une espèce nouvelle du genre *Filellum*. Bull. Soc. Z. Fr. v. pp. 291 & 292.

31. Kleinenberg, N. Ueber die Entstehung der Eier bei *Eudendrium*. Z. wiss. Zool. xxxv. pp. 326–332.

The author insists on the ectodermal origin of the ova in *Eudendrium*, and suggests the possibility of ectodermal cells wandering and appearing to lie in the endoderm.

34. Krukenberg, C. F. W. Zur Kritik der Schriften ueber eine sogenannte intracelluläre Verdauung bei Coelenteraten. Vergl. physiol. Stud. Adria, pp. 139–142.

Referring to his earlier researches upon the subject.

35. ——. Ueber den Einfluss der Kohlensäure auf die Muskeln der Actinien und Medusen. *L. c.* pp. 172–174.

36. Lankester, E. Ray. On the Intro-cellular Digestion and Endoderm of *Limnocodium*. Q. J. Micr. Sci. xxi. pp. 119–131, 3 pls.

37. ——. On Young Stages of *Limnocodium* and *Geryonia*. L. c. pp. 194–201, 1 pl.

The few stages found present a striking resemblance to certain stages of *Geryonia*, and show that the sub-umbrellar cavity develops a closed sac lined with ectoderm. Hæckel's observations, which were dismissed by Fol and Metschnikoff, show that the same thing occurs in *Geryonia*. This tends to show that the sub-umbral space corresponds with the so-called stomach of *Ctenophora*.

38. Lapworth, C. On the *Cladophora*, Hopk., or Dendroid *Graptolites*, collected by Prof. H. Keeping in the Llandovery Rocks of Mid-Wales. J. Geol. Soc. xxxvii. pp. 171–177.

Although allied to the well-known dendroid species of the Quebec and Arenig formation, the forms of *Cladophora* collected by Prof. Keeping differ in minor features, and form a type almost new to British palæontology. The genera represented are *Dictyonema*, Hall, *Calyptograptus*, Spencer, *Acanthograptus*, Spencer, and *Odontocaulis*, Lapworth. *Dictyonema* is a well-known British genus; the remainder are new to British palæontology. *Calyptograptus* and *Acanthograptus* have been already briefly noticed from American strata by Mr. Spencer, but have not hitherto been figured. *Odontocaulis* is a new genus of a peculiar type.

39. MacKendrick, J. G. Colouring Matter of Medusæ, in J. Anat. Phys. xv. pp. 261–264.

The colouring matter exists in a granular form in the protoplasm, and it is only when the protoplasm has become acid and is disintegrating that the colouring matter diffuses out. Spectroscopic examination in the case of *Chrysaora*, gives no very definite result. With weak solutions, the violet end of the spectrum is cut off, and, on concentrating, the rest

becomes very dim. Infusion of *Cyanea*, on the other hand, gives nearly the same bands as the blue of *Stentor cæruleus*.

40. Metschnikoff, E. Vergleichend-Embryologische Studien. Z. wiss. Zool. xxxvi. pp. 433–444.

The author has previously shown (Z. wiss. Zool. 1874, p. 17) that the endoderm in the *Geryonida* forms by a process of delamination, and now confirms this, giving a fuller series of figures; but he adds nothing to our knowledge of the later development. The somewhat degenerate development of *Cunina*, which is found parasitic in the marginal canal of *Carmarina*, is also described.

41. Moseley, H. N. Report on certain Hydroid, Alcyonarian, and Madreporarian Corals procured during the Voyage of H.M.S. 'Challenger.' Rep. Sci. Results Challenger, Zool. ii. 248 pp., 32 pls.

[See Zool. Rec. xv. *Cœl.* pp. 17–19.]

42. Nathorst, A. G. Om Aftryck of Medusor i Sveriges Kambriska Lager. Sv. Ak. Handl. xix.

43. Ridley, S. O. *Cœlenterata* from the Straits of Magellan, &c. P. Z. S. 1881, pp. 101–107.

7 species of Hydroids are described:—*Lafoëa dumosa*, *Eudendrium arbusculum*, *Halecium delicatulum*, *Sertularella johnstoni*, *S. polyzonias*, *Sertularia trispinosa*, *S. fusiformis*. The genus *Labiopora*, hitherto known by a single dried specimen, *L. antarctica*, receives a new species, *L. moseleyi*.

44. Romanes, G. J. *Medusæ* and Hydroid Polyps living in Fresh Water. Q. J. Micr. Sci. xxi. pp. 162 & 163.

45. ——. Concluding Remarks on the Locomotor System of *Medusæ*. Phil. Tr. clxxi. [1880], pp. 161–202.

Artificial rhythm may be brought about in various species of both covered-eyed and naked-eyed *Medusæ*, but in some electrical and in others chemical stimulation is most effective, though in all cases the stimulation must be constant and only of minimal, or very slightly more than minimal, intensity. Eventually exhaustion produces irregularity and cessation of the rhythm, and prolonged rest is required before any rhythm is again obtained. Increasing the strength of the current within certain limits, increases the rate of the rhythm. A theory of the part played by exhaustion in the production of artificial rhythm is put forward, and conclusions drawn thence as to the part it may play in the production of a natural rhythm. The other experiments are based upon the method of "sections."

46. Varenne, A. de. Sur l'origine des spermatozoïdes chez les Hydraires. C. R. xciii. pp. 1032–1034.

The types studied are *Campanularia flexuosa*, *Gonothyræa loveni*, and *Podocoryne carnea*. The sperm mother-cells arise in these cases in the cœnosarc, and the gonophore is subsequently formed. The sperm mother-cells form a mass of smaller cells, and the appearance of these

lying outside the continuous endodermal wall has led observers to suppose that the testis was ectodermic in origin.

47. [Varenne, A. de.] De l'origine de l'œuf chez les Hydraires. *L. c.* pp. 345–347; Ann. N. H. (5) viii. pp. 321–323.

In the types examined *Campanularia flexuosa*, *Plumularia echinata*, *Sertularia pumila*, *Gonothyræa loveni*, *Podocoryne carnea*, and *Obelia geniculata*. Whatever may be the later history of the gonophore, the ova do not originate within it, but can be distinctly traced as developments of ordinary ectodermal cells.

48. Weismann, A. Beobachtungen an Hydroid-Polypen. Zool. Anz. iv. pp. 61–64.

I. Pulsiren des Körperschlauchs.
II. Selbständige Bewegungen des Ectoderms.

From observations first made on *Coryne pusilla*, it appears that distinct rhythmical waves of contraction pass down the body-walls, which would assist the action of the cilia of the endoderm in causing a movement in the contained fluid. The ectoderm appears moreover to be capable of pseudopodial movement altering the relation of the body-wall to its tube.

49. ——. Beobachtungen an Hydroid-Polypen. III. Die Entstehung der Eizellen in dar Gattung *Eudendrium*. L. c. pp. 111–114.

50. ——. Observations sur les cellules sexuelles des Hydroides. Bibliothèque de l'école des Hautes Études, Section des Sciences Naturelles, xxiv., No. 3, 4 pls. Ann. Sci. Nat. (6) ii.

The question as to the place of origin of the sexual products of Hydroids is one upon which very various opinions have of late years been adduced. The ectoderm and endoderm have, in turn, been put forward as giving rise to both eggs and spermatozoa. Kleinenberg, in speaking of *Hydra*, and F. E. Schultze of *Cordylophora*, state that both products are derived from the ectoderm, a result which the author confirms. Grobben has observed the same origin in *Podocoryne carnea*, and F. E. Schultze in *Sarsia tubulosa*. The Hertwigs have shown the same ectodermal origin of both elements in numerous *Medusæ*; and lastly, Ciamician has shown the same origin in Tubularians, the author having arrived at the same conclusions even before Ciamician's publication. On the other hand, the author has clearly demonstrated both products to have an endodermic origin in *Plumularia*, *Sertularella*, and *Eudendrium*. The spermatozoa may be derived from the ectoderm, and the ova from the endoderm. E. van Beneden has shown this to be the case in *Hydractinia*, Fraipont in *Campanularia*, and the author in *Gonothyræa*. These various methods of origin may exist in the same family. The author shows that there are a large number of species, of genera, and even of entire families, in which the sexual elements do not originate in the reproductive individuals, but in the parenchyma of the colony, the *cœnenchyme* of Milne-Edwards and Haime, the *cœnosarc* of Allman. Such an origin the author terms *cœnosarcal*, in contradistinction to a *blastoidal* origin; and he would recognize two types of Hydroids—cœnogenous (cœnosarcogenous), and blastogenous. To the latter group, belong

all the true free-swimming *Medusæ*, and probably numerous fixed *Medusæ*; to the former, in respect of their ova, a large number of forms, but in respect of both products, the author only recognizes at present the genus *Plumularia*. Making a special study of this genus and of the *Sertulariidæ* and *Campanulariidæ*, the author shows that sexual cells do take origin in the cœnosarc; that this is a normal mode of origin of considerable importance, and at any rate in the case of the female products, widespread occurrence; and that such cœnosarcal cells afterwards migrate to the gonophores.

51. ——. Ueber eigenthumliche Organe bei *Eudendrium racemosum*, Cuv. MT. z. Stat. Neap. iii. pp. 1–14, 1 pl.

Certain peculiar organs, processes of the body wall, comprising both its layers, are found below the hydranths. They are muscular, and possess a very large number of nematocysts; they are probably special organs of defence, comparable to the nematophores of *Plumulariidæ*.

52. Taramelli, T. Scoperta di Graptoliti nella Carina. Bull. Com. Geol. Ital. 1881, p. 360.

Evidently *Graptolites monograptus*.

New genera and species:—

Sub-Class HYDROMEDUSÆ.

Order i., Gymnoblastea-Anthomedusæ.

Thamnostylus dinema, Hæckel, 1879, System der Medusen, p. 85, No. 95, and (24) pp. 2–5, pl. i.

Mabella, g. n. Resembles *Dysmorphosa* very closely, with the exception that it has eight radial chymiferous tubes; for *M. gracilis*, sp. n.: Fewkes, (16) p. 146, pl. vi. figs. 2 & 3, Narragansett Bay. May be the same as *D. fulgurans*, A. Ag.

Modeeria, g. n., for *M. multitentacula*; Fewkes, (16) p. 149, pl. iii. figs. 7–9, Buzzard's Bay, A. Ag.

Dinematella, g. n. Allied to *Stomatoca*, for *D. cavosa*; Fewkes, (16) p. 151, pl ii. figs. 2 & 3, and pl. iv. fig. 3, Laboratory Cove, Newport, R.I.

Eutima gracilis, sp. n., Fewkes, (16) p. 158, pl. v. figs. 1–4, Newport. May be the adult of *E. mira*, *variabilis*, or *limpida*.

Order ii., Calyptoblastea-Leptomedusæ.

Ptychogena pinnulata, Hæckel, 1879, *l. c.* p. 148, No. 150, and (24) pp. 7–9, pl. ii.

Filellum bouvieri, sp. n., Jullien, (30) p. 291, with fig., Cape Verde Islands. Allied to *F. serpens*, Hassell.

Fewkes (14) describes the following:—

Lafoea elegans, sp. n., p. 129, Barbados, 180 fath. and 120 fath. Differs from *L. fruticosa* in having pinnately arranged ultimate branches. Closely resembles *L. helicioides*, All., but larger.

Campanularia insignis, sp. n., p. 129, 32° 7′ N., 78° 31′ 30″ W., 229 fath. Resembles *C. macroscypha*.

Sertularella formosa, sp. n., p. 130, Grenada, 170 fath., Martinique, 357 fath. Resembles *S. gayi*, var. *robusta*, All.

Plumularia caulitheca, sp. n., p. 130, Grenada, 416 fath. Resembles *P. attenuata*.

Aglaophenia insignis, sp. n., p. 131, pl. i. figs. 4 & 6, Grenada, 262 fath.; *A. gracillima*, sp. n., p. 131, Martinique, 96 fath.; *A. minuta*, sp. n., p. 132, pl. iii. fig. 7, 32° 43′ 25″ N., 77° 20′ 30″ W., 233 fath.; *A. robusta*, sp. n., p. 132, Montserrat, 88 fath.

Aglaophenopsis, g. n., resembles Kirchenpauer's subgenus *Macrorhynchia* and Allman's *Halicornaria*. Unlike the former, the pinnæ retain their normal form, and do not bear gonophores; for *A. hirsuta*, sp. n., p. 133, pl. i. fig. 2, 32° 7′ N., 78° 37′ 30″ W., 229 fath.

Antennopsis ramosa, sp. n., p. 133, 32° 7′ N., 78° 37′ 30″ W., 229 fath.

Callicarpa, g. n. The gonosome is remarkable; it resembles closely a spike of wheat, and springs by a short peduncle immediately from the main stem: for *C. gracilis*, sp. n., p. 134, pl. ii. figs. 1 & 2, 6 & 7, locality unknown.

Cladocarpus compressus, sp. n., p. 135, pl. i. fig. 9, and pl. iii. fig. 1, St. Vincent, 114 fath.

Pleurocarpa, g. n. Gonosome formed from the proximal portion of a branch, while the distal end of the same retains the true character of the branch, and bears pinnæ. Gonosome a corbula; for *P. ramosa*, sp. n., p. 136, pl. iii. figs. 2 & 5, St. Vincent, 95 fath.

Order iii., Trachomedusæ.

Pectyllis arctica, Hæckel, 1879, *l. c.* p. 266, No. 287, and (24) pp. 11–14, pls. iii. & iv.

Pectis antarctica, id. 1879, *l. c.* p. 266, No. 288, and (24) pp. 15–19, pls. v. & vi.

Pectanthis asteroides, id. 1879, *l. c.* p. 267, No. 289, and (24) pp. 20–23, pls. vii. & viii.

Sphærula, g. n. Allied to *Eurybiopsis*; for *S. formosa*, sp. n., Fewkes, (16) p. 160, pl. i. fig. 13, Newport.

Order iv., Narcomedusæ.

Cunarcha æginoides, Hæckel, 1879, *l. c.* p. 315, No. 329, and (24) pp. 24–30, pl. ix.

Polycolpa forskali, id. 1879, *l. c.* p. 328, No. 350, and (24) pp. 31–36, pl. x.

Pegantha pantheon, id. 1879, *l. c.* p. 332, No. 359, and (24) pp. 37–40, pls. xi. & xii.

Æginura myosura, id. 1879, *l. c.* p. 343, taj. xix. figs. 8 & 9, and (24) pp. 41–48, pls. xiii. & xiv.

Cunina discoides, sp. n., Fewkes, (16) p. 161, pl. ii. fig. 8, and pl. iv. figs. 1 & 2, Narragansett Bay.

Order v., HYDROCORALLINÆ.

Labiopora moseleyi, sp. n., Ridley, (43) pl. vi. fig. 11, Port Rosaria, S.W. Chili (on the north side of the chief island of Madre-di-Dios Archipelago), 2–10 fath. On a piece of calcareous rock.

GRAPTOLITES.

Pterograptus, g. n. Fam. *Dichograptidæ*, Lapw., near *Didymograptus*, for *Pterograptus elegans*, sp. n., = *Graptolithus gracilis*, Kjerulf, 1865; Holm, (28) p. 77, figs. 1–4. Also includes *P.* (?) *acutus*, Hopk., 1875, = *Ptilograptus acutus*, Hopk., 1875; J. Hopkinson & C. Lapworth, "Descriptions of the Graptolites of the Arenig and Llandeilo Rocks of St. David's," J. Geol. Soc. xxxi. [1875], p. 662, pl. xxxvii. figs. 1 *a* & 1 *b*.

Dictyonema venustum, sp. n., Lapworth, (38) p. 171, pl. vii. figs. 1 *a*–1 *c*, Aberystwyth; *D. delicatulum*, sp. n., *id. l. c.* p. 172, pl. vii. figs. 2 *a* & 2 *b*, Aberystwyth; *D. corrugatellum*, sp. n., *id. ibid.* pl. vii. figs. 3 *a* & 3 *b*.

Calyptograptus (?) *plumosus*, sp. n., *id. l. c.* p. 173, pl. vii. fig. 4, and *C. digitatus*, sp. n., p. 174, pl. vii. figs. 6 *a* & 6 *b*, Aberystwyth.

Acanthograptus ramosus, sp. n., *id. l. c.* p. 174, pl. vii. fig. 5.

Odontocaulis, g. n. Polypary cyathiform, composed of numerous independent and frequently bifurcating polypiferous branches, originating from the distal extremity of a short stem, which is likewise polypiferous, and is terminated proximally in an irregular corneous expansion; hydrothecæ of the type of those of *Dictyonema*, biserial, subalternate. For *O. keepingi*, sp. n., Lapworth, *l. c.* p. 176, pl. vii. figs. 7 *a* & 7 *b*.

Sub-Class SCYPHOMEDUSÆ.

Order i., STAUROMEDUSÆ.

Tesserantha connectens, Hæckel, *l. c.* p. 375, No. 402, and (24) pp. 50–53, pl. xv.

Lucernaria bathyphila, id., 1879, *l. c.* p. 640, No. 597, = *Lucernosa bathyphila*, id., 1880 (MS.), and (24) pp. 54–62, pls. xvi. & xvii.

Order ii., PEROMEDUSÆ.

Periphylla mirabilis, Hæckel, *l. c.* p. 422, No. 424, and (24) pp. 64–84, pls. xviii.–xxiii.

Periphema regina, id. *l. c.* p. 421, No. 423, and (24) pp. 85–91, pls. xxiv. & xxv.

Order iii., CUBOMEDUSÆ.

Charybdea murrayana, Hæckel, *l. c.* p. 442, No. 426, and (24) pp. 93–101, pl. xxvi.

Campanularia insignis, sp. n., p. 129, 32° 7′ N., 78° 31′ 30″ W., 229 fath. Resembles *C. macroscypha*.

Sertularella formosa, sp. n., p. 130, Grenada, 170 fath., Martinique, 357 fath. Resembles *S. gayi*, var. *robusta*, All.

Plumularia caulitheca, sp. n., p. 130, Grenada, 416 fath. Resembles *P. attenuata*.

Aglaophenia insignis, sp. n., p. 131, pl. i. figs. 4 & 6, Grenada, 262 fath.; *A. gracillima*, sp. n., p. 131, Martinique, 96 fath.; *A. minuta*, sp. n., p. 132, pl. iii. fig. 7, 32° 43′ 25″ N., 77° 20′ 30″ W., 233 fath.; *A. robusta*, sp. n., p. 132, Montserrat, 88 fath.

Aglaophenopsis, g. n., resembles Kirchenpauer's subgenus *Macrorhynchia* and Allman's *Halicornaria*. Unlike the former, the pinnæ retain their normal form, and do not bear gonophores; for *A. hirsuta*, sp. n., p. 133, pl. i. fig. 2, 32° 7′ N., 78° 37′ 30″ W., 229 fath.

Antennopsis ramosa, sp. n., p. 133, 32° 7′ N., 78° 37′ 30″ W., 229 fath.

Callicarpa, g. n. The gonosome is remarkable; it resembles closely a spike of wheat, and springs by a short peduncle immediately from the main stem: for *C. gracilis*, sp. n., p. 134, pl. ii. figs. 1 & 2, 6 & 7, locality unknown.

Cladocarpus compressus, sp. n., p. 135, pl. i. fig. 9, and pl. iii. fig. 1, St. Vincent, 114 fath.

Pleurocarpa, g. n. Gonosome formed from the proximal portion of a branch, while the distal end of the same retains the true character of the branch, and bears pinnæ. Gonosome a corbula; for *P. ramosa*, sp. n., p. 136, pl. iii. figs. 2 & 5, St. Vincent, 95 fath.

Order iii., Trachomedusæ.

Pectyllis arctica, Hæckel, 1879, *l. c.* p. 266, No. 287, and (24) pp. 11–14, pls. iii. & iv.

Pectis antarctica, id. 1879, *l. c.* p. 266, No. 288, and (24) pp. 15–19, pls. v. & vi.

Pectanthis asteroides, id. 1879, *l. c.* p. 267, No. 289, and (24) pp. 20–23, pls. vii. & viii.

Sphærula, g. n. Allied to *Eurybiopsis*; for *S. formosa*, sp. n., Fewkes, (16) p. 160, pl. i. fig. 13, Newport.

Order iv., Narcomedusæ.

Cunarcha æginoides, Hæckel, 1879, *l. c.* p. 315, No. 329, and (24) pp. 24–30, pl. ix.

Polycolpa forskali, id. 1879, *l. c.* p. 328, No. 350, and (24) pp. 31–36, pl. x.

Pegantha pantheon, id. 1879, *l. c.* p. 332, No. 359, and (24) pp. 37–40, pls. xi. & xii.

Æginura myosura, id. 1879, *l. c.* p. 343, taj. xix. figs. 8 & 9, and (24) pp. 41–48, pls. xiii. & xiv.

Cunina discoides, sp. n., Fewkes, (16) p. 161, pl. ii. fig. 8, and pl. iv. figs. 1 & 2, Narragansett Bay.

Order v., Hydrocorallinæ.

Labiopora moseleyi, sp. n., Ridley, (43) pl. vi. fig. 11, Port Rosaria, S.W. Chili (on the north side of the chief island of Madre-di-Dios Archipelago), 2-10 fath. On a piece of calcareous rock.

GRAPTOLITES.

Pterograptus, g. n. Fam. *Dichograptidæ*, Lapw., near *Didymograptus*, for *Pterograptus elegans*, sp. n., = *Graptolithus gracilis*, Kjerulf, 1865; Holm, (28) p. 77, figs. 1–4. Also includes *P.* (?) *acutus*, Hopk., 1875, = *Ptilograptus acutus*, Hopk., 1875; J. Hopkinson & C. Lapworth, "Descriptions of the Graptolites of the Arenig and Llandeilo Rocks of St. David's," J. Geol. Soc. xxxi. [1875], p. 662, pl. xxxvii. figs. 1 *a* & 1 *b*.

Dictyonema venustum, sp. n., Lapworth, (38) p. 171, pl. vii. figs. 1 *a*–1 *c*, Aberystwyth; *D. delicatulum*, sp. n., *id. l. c.* p. 172, pl. vii. figs. 2 *a* & 2 *b*, Aberystwyth; *D. corrugatellum*, sp. n., *id. ibid.* pl. vii. figs. 3 *a* & 3 *b*.

Calyptograptus (?) *plumosus*, sp. n., *id. l. c.* p. 173, pl. vii. fig. 4, and *C. digitatus*, sp. n., p. 174, pl. vii. figs. 6 *a* & 6 *b*, Aberystwyth.

Acanthograptus ramosus, sp. n., *id. l. c.* p. 174, pl. vii. fig. 5.

Odontocaulis, g. n. Polypary cyathiform, composed of numerous independent and frequently bifurcating polypiferous branches, originating from the distal extremity of a short stem, which is likewise polypiferous, and is terminated proximally in an irregular corneous expansion; hydrothecæ of the type of those of *Dictyonema*, biserial, subalternate. For *O. keepingi*, sp. n., Lapworth, *l. c.* p. 176, pl. vii. figs. 7 *a* & 7 *b*.

Sub-Class SCYPHOMEDUSÆ.

Order i., Stauromedusæ.

Tesserantha connectens, Hæckel, *l. c.* p. 375, No. 402, and (24) pp. 50–53, pl. xv.

Lucernaria bathyphila, id., 1879, *l. c.* p. 640, No. 597, = *Lucernosa bathyphila*, id., 1880 (MS.), and (24) pp. 54–62, pls. xvi. & xvii.

Order ii., Peromedusæ.

Periphylla mirabilis, Hæckel, *l. c.* p. 422, No. 424, and (24) pp. 64–84, pls. xviii.–xxiii.

Periphema regina, id. *l. c.* p. 421, No. 423, and (24) pp. 85–91, pls. xxiv. & xxv.

Order iii., Cubomedusæ.

Charybdea murrayana, Hæckel, *l. c.* p. 442, No. 426, and (24) pp. 93–101, pl. xxvi.

Order iv., Discomedusæ.

Nauphanta challengeri, Hæckel, *l. c.* p. 487, No. 452, and (24) pp. 103–111, pls. xxvi. & xxvii.

Atolla wyvillii, id. *l. c.* pp. 113–123, pl. xxi.

Dymonema victoria, Hæck., = *D. dalmatina*, Hæck., *l. c.* p. 642, No. 606, and (24) pp. 125–132, pls. xxx. & xxxi.

Leonura terminalis, Hæckel, *l. c.* p. 646, No. 616, and (24) pp. 133–140, pl. xxxii.

ANTHOZOA.

1. Duncan, P. M. On *Asterosmilia reedi*, a New Species of Coral from the Oligocene of Brockenhurst, Hants. Rep. Brit. Ass. li. [1882] p. 618.

2. Krukenberg, C. F. W. Das Antheagrün Vergl. physiol. Stud. Adria, v. p. 38.

The green colour of *Anthea cereus* is when concentrated emerald green, when diluted of a yellowish green colour. It is soluble in chloroform, benzin, alcohol, &c., and slightly in water. It has a rich and characteristic spectrum of four bands, which are unaltered by acetic acid but altered by solution of soda. It does not reduce CO_2 under the influence of light.

3. Moseley, H. N. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger,' during the years 1873–76, i. Part iii. Report on certain Hydroid, Alcyonarian, and Madreporarian Corals. 237 pp. 31 pls.

This report is divided into three parts, of which Part i. deals with certain Hydroids and is recorded above. Part ii., on *Helioporidæ* and its allies, mainly consists of the paper which was read before the Royal Society in 1876, and has been already recorded; it should be noticed, however, that the terms 'autozooids' and 'siphonozooids' are introduced in place of 'polypes' and 'zooids' which are used in the dimorphic Alcyonarians. There is a new section on the tabular cœnenchym of *Heliopora* and its homologies. In the section on the fossil allies of the *Helioporidæ*, the author expresses an opinion that the septa of *Favosites* are probably pseudo-septa, and he considers *Heliolites* to be a form intermediate between *F. forbesi* and *Heliopora*. *Syringopora*, considered to be allied to *Tubipora* and *Syringolites*, is shown to possess mural pores as in *Favosites*, and infundibular tabulæ and even axial tubes. Of Part iii., on the deep-sea *Madreporaria*, there was a preliminary report in P. R. S. 1876. In addition to the description of many new species, there are accounts of the soft parts of *Flabellum*, *Bathyactis*, and *Stephanophyllia formosissima*.

4. Nicholson, H. A. The Structure and Affinities of the Genus *Monticulipora* and its Subgenera. Edinburgh: 1881, 8vo, 240 pp. 6 pls.

This work contains an account of what is known of the anatomy and

growth of the genus *Monticulipora*. The author defends the Cœlenterate position of the genus against the Polyzoan position urged by Dr. Lindström. The presence of mural pores, as in *Favosites*, a dimorphism of corallites and the presence of tabulæ, as in *Heliopora*, point to the *Monticuliporidæ* being an ancient group of Alcyonarians allied to the *Helioporidæ*. The relations of *Monticulipora* with *Chætetes*, *Stomopora*, *Tetradium*, *Ceramopora*, and *Heterodictya* are discussed, and the following subgenera described: *Heterotrypa*, *Diplotrypa*, *Monotrypa*, *Prasopora*, and *Peronopora*.

5. ——. On some new or imperfectly known species of Corals from the Devonian Rocks of France. Ann. N. H. (5) vii. pp. 14–22, with 1 pl.

6. ——. On the structure of the skeleton of *Tubipora musica*, and of the relation of the genus *Tubipora* to *Syringopora*. P. R. Soc. Edinb. 1880-81, pp. 219–229.

The author disputes the relationship of these two genera, and places *Syringopora* amongst the *Zoantharia perforata*.

7. ——, & Etheridge, J., Junr. Monograph of the Silurian Fossils of the Girvan district of Ayrshire. Anthozoa, Fasc. i. pp. 25–97, pls. i.–iv.; Fasc. iii. pp. 241–282, pls. xvi.–xviii.

8. Ridley, S. O. *Cœlenterata*: in Account of the Zoological Collections made during the Survey of H.M.S. 'Alert,' in the Straits of Magellan, and on the coast of Patagonia. P. Z. S. 1881, pp. 101–107.

9. Studer, T. Beitrag zur Fauna der Steinkorallen von Singapore. MT. Ges. Bern. 1880 [1881], pp. 15–53, 18 woodcuts.

10. Tomes, K. F. Description of a new species of Coral (*Thamnastræa walfordi*), from the middle Lias of Oxfordshire. From the Proceedings of the Geological Society. Ann. N. H. (5) viii. p. 156.

11. Verrill, A. E. On the Zoological Affinities of *Halysites*. Am. J. Sci. (3) xxi. p. 508. Also in Ann. N. H. (5) viii. p. 72, and Zool. Anz. iv. p. 342.

In a fragment of *Halysites*, several inches across the large tubes contained twelve well-developed and regular septa, extending to the centre. This genus is therefore Madreporarian.

12. Wilson, E. B. The early stages of *Renilla*. Am. J. Sci. (3) xx. pp. 446–449.

The young polype of *Renilla* is ciliated, and at first swims actively. Two slight dentations in the middle represent the first two polypes. The two upper mesenteries are the longest, reaching as far as the zooids. A median zooid appears later, which becomes the central zooid, by which the water is discharged. Each rudimentary zooid, except this one, multiplies to form a group. The colony is bilaterally symmetrical up to a late stage.

New genera and species :—

HEXACTINIÆ.

Turbinolidæ.

Caryophyllia paucipalata (p. 138), Culebra Island, 390 fath. ; *C. profunda* (p. 138), Nightingale Island, 100–150 fath. ; *C. lamellifera* (p. 140), Kermadec Islands, 630 fath. ; *C. rugosa* (p. 141), Ki Islands, 126 fath. Moseley (3).

Acanthocyathus spinicarens (p. 143), Philippine Islands, 375 fath. Moseley (3).

Odontocyathus, g. n. Corallum with a fascicular columella and three crowns of pali free, but with a minute scar of former attachment in the form of a deep saucer, with straight sloping sides, and a broad flat base composed of fused radiating tuberculate spines, which project like the spokes of a wheel all round the base of the wall. *O. coronatus* (p. 148), St. Thomas, 390 fath. Moseley (3).

Stephanotrochus, g. n. In this genus, the corallum is cup or saucer-shaped, the costæ usually well-developed, the septa extremely exsert, and the columella absent, or but little prominent. *S. diadema* = *Ceratotrochus diadema*, *S. discoides* = *C. discoides*, *S. platypus* = *C. platypus*, and *S. nobilis* = *C. nobilis* (p. 152). Moseley (3).

Cyathoceras, g. n. The corallum is conical and elongate, without an epitheca, or with a partial one only, fixed by a short pedicle, with a well-developed columella. *C. cornu* (p. 156), Rio de la Plata, 600 fath., and Twofold Bay, 200 fath. Moseley (3).

Pleurocyathus, g. n. The corallum is conical, and attached by its side. It is entirely covered by a thin epitheca, which rises higher than the margin of the calicle. The lower part of the Coral is devoid of stereoplasma or other filling. The columella is composed of several flattened pillars. *P. brunneus* (p. 159), Banda Island, 60 fath. Moseley (3).

Desmophyllium ingens (p. 160), Saumarez Island, 147 fath., *D. eburneum* (p. 162), Middle Island, Patagonia, 345 fath., Moseley (3).

Flabellum conuis (p. 165), Admiralty Islands, 1090 fath. ; *F. patagonichum* (p. 166), Penguin Island, 120 fath. ; *F. japonicum* (p. 168), Enosima, 345 fath. ; *F. australe* (p. 173), Twofold Bay, 120 fath. ; *F. transversale*, (p. 174), Bass Straits, 38 fath. ; *F. curvatum* (p. 174), Rio de la Plata, 600 fath. : Moseley (3).

Oculinidæ.

Neohelia, g. n. Corallum with a very abundant and diffuse cœnenchym, encrusting the stems of Gorgonoids with very short branches only. Calicles with the septa arranged in five systems, which are fused together often by the cœnenchym. Gemmation irregularly dichotomous. *N. porcellana* (p. 176), Api Island, 63 fath. Moseley (3).

Bathelia, g. n. In this genus, the corallum is arborescent and massive. The calicles are deep, with four circles of septa, and there is only a single

crown of pali. Columella large, and composed of numerous trabeculæ. *B. candida* (p. 177), Rio de la Plata, 600 fath. Moseley (3).

Lophohelia candida (p. 180), Sombrero Island, 450 fath.; *L. tenuis*, (p. 181), Philippine Islands, 375 fath.: Moseley (3).

Axohelia brueggmanni (p. 102), Straits of Brazil, Ridley (8).

Astræidæ.

Astræa abyssorum (p. 184), Arafura Sea, 49 fath., and Ki Islands, 129 fath., Moseley (3).

Thamnastræa walfordi, Spinatus beds of the Marlstone, Ashton-le-Wells, Tomes (10).

Goniastræa capitata (p. 40), Singapore, Studer (9).

Prionastræa coronata (p. 42), Singapore, Studer (9).

Favia schneideri (p. 38), Singapore, Studer (9).

Stephanophyllia, g. n. This genus is allied to *Antillia*. The septa and costæ are highly denticulate, rendering the corallum extremely rough. There is a scanty epitheca, no endotheca nor exotheca, and the columella is well developed and lamellar. *S. flabellum* (p. 182), locality unknown. Moseley (3).

Tridacophyllia cervicornis (p. 83), locality unknown, Moseley (3).

Cladocera conferta (p. 185), Samboangan, 30 fath., Moseley (3).

Asterosmilia reedi, Oligocene of Brockenhurst, Duncan (1).

Fungidæ.

Bathyactis, g. n. Corallum free, discoid, not attached or cup-shaped in the young condition; thin and fragile primary septa free, the others united forming deltas. Septa usually coalescent over the apices of the deltas. Septa deeply toothed, synapticulæ in a series of concentric circles. *B. symmetrica* = *Fungia symmetrica* (Pourtales). This genus has a wider range than any deep-sea Coral. Found in from 30–2900 fath. in North and South Atlantic, South Indian Ocean, Malay Archipelago, and East Pacific Ocean. Moseley (3).

Eupsammidæ.

Balanophyllia cornu (p. 192), Ki Islands, 129 fath.; *B. reticiva*, (p. 193), Ki Islands, 129 fath.; *B. parvula*, (p. 191), Basilan Strait, 102 fath.: Moseley (3).

Thecopsammia gemma (p. 195), Basilan Strait, 102 fath., Moseley (3).

Heteropsammia multilobata (p. 196), Samboangan, 10 fath., Moseley (3).

Leptopenus, g. n. Corallum discoid, thin, and fragile, with the wall so completely covered by perforations as to resemble lace-work, being built up of a network of delicate radiating and circumferentially-directed trabeculæ. The columella is large and spinous, and the animal is provided with knob-like tentacles. *L. discus* (p. 205), Hoy Island, 1600 fath., and *L. hypocælus* (p. 208), Valparaiso, 2160 fath. Moseley (3).

Calostylis lindstromi (p. 65), Girvan, Nicholson & Etheridge (7).

Madreporidæ.

Madrepora tenuispicata (p. 20), Singapore, Studer (9).
Montipora monticulosa (p. 23), Singapore, Studer (9).

OCTACTINIÆ.

Heliolitidæ.

Heliolites parasitica (p. 259), *H. foliacea* (p. 261), Nicholson & Etheridge (7).
Pinacopora grayi, g. & sp. nn. (p. 54), Girvan, Nicholson & Etheridge (7).

Favositidæ.

Favosites girvanensis (p. 34), *F. mullochensis* (p. 36), Girvan, Nicholson & Etheridge (6); *F.* ? *mosculans* (p. 20), Chalonnes, Nicholson (5).
Thecostegites (?) *scoticus* (p. 50), Girvan, Nicholson & Etheridge (7).
Striatopora pachystroma (p. 17), La Baconnière, Nicholson (5).
Pachypora œhlerti (p. 18), La Baconnière, Nicholson (5).

Rugosa.

Streptelasma aggregatum (p. 71), Girvan, Nicholson & Etheridge (7).
Lindstromia lævis (p. 90), Girvan, Nicholson & Etheridge (7).

SPONGIIDA.

BY

STUART O. RIDLEY, M.A., F.L.S., F.R.M.S.

CHIEF WORKS ON RECENT SPONGES.

1. CARTER, H. J. (A) History and Classification of the known Species of *Spongilla*. Ann. N. H. (5) vii. p. 77, pls. v. & vi. (B) On *Spongilla cinerea*; tom. cit. p. 263.

The first paper contains a descriptive account of all the fresh-water Sponges known to the author; the old genus *Spongilla* is divided into a number of genera, mainly by the characters of the reproductive gemmule ('statoblast' of the author).

2. ——. Supplementary Report on Specimens dredged up from the Gulf of Manaar, together with others from the Sea in the vicinity of the Basse Rocks and Bass's Straits respectively, presented to the Liverpool Free Museum by Captain H. Cawne Warren. *Tom. cit.* p. 361, pl. xviii. figs. 1–9.

Relates chiefly to Sponges from the above localities, in Ceylon and Australia, describes 16 new species from various families, and gives a list of the species described by him altogether from these localities [see Zool. Rec. xvii. *Spong.* p. 1].

3. ——. Contributions to our Knowledge of the *Spongida*. Order ii. *Ceratina*. Op. cit. (5) viii. p. 101, pl. ix. (part).

Notes on some of the families and genera.

4. ——. On the Development of the Fibre in the *Spongida*. Tom. cit. p. 112, pl. ix. (part).

5. ——. A. Contributions to our Knowledge of the *Spongida*. Order iii. *Carnosa*. Tom. cit. p. 241. B. Addendum to our Knowledge of the *Carnosa*; tom. cit. p. 450.

A review of the Order and described species, with addition of a new one. The group is divided into *Halisarcida* and *Gummínida*.

6. DUNCAN, P. M. On some Remarkable Enlargements of the Axial Canals of Sponge Spicules and their Causes. J. R. Micr. Soc. (2) i. p. 557, pls. vii. & viii.

7. [Duncan, P. M.] On an Organism which Penetrates and Excavates Silicious Sponge-spicula (*Spongiophagus carteri*). Ann. N. H. (5) viii. p. 120.

8. ——. On a Radiolarian and some Microspongida from considerable depths in the Atlantic Ocean. J. R. Micr. Soc. (2) i. p. 173, pl. iii.

9. Nassonow, N. Ueber das aushöhlende Kraft und zum feinere Bau der Clione. Zool. Anz. iv. p. 459.

10. Potts, E. Some new Genera of Fresh-water Sponges. P. Ac. Philad. 1881, p. 149.

11. ——. The genus *Carterella* vs. *Spongiophaga pottsi*; P. Ac. Philad. 1881, p. 460.

12. Ridley, S. O. *Spongida*: in Account of the Zoological Collections made during the Survey of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. P. Z. S. 1881, pp. 107–137, pls. x. & xi.

Several new species are described and notes are given on species of Lamarck, Bowerbank, &c.; also tables of distribution, and of variation.

13. ——. On the genus *Plocamia*, Schmidt, and on some other Sponges of the Order *Echinonemata*, with Descriptions of two additional new Species of *Dirrhopalum* by P. M. Duncan. J. L. S. xv. p. 476, pls. xxviii. & xxix.

14. Schulze, F. E. Untersuchungen über den Bau und die Entwickelung der Spongien. X^te^ Mittheilung. *Corticium candelabrum*, O. Schmidt. Z. wiss. Zool. xxxv. p. 410, pl. xxii.

15. Vosmaer, G. C. J. Aanteekeningen over *Leucandra aspera*, H. Bijdrage tot de kennis der Kalksponzen. Leyden: 1880, 8vo, 2 plates.

An Inaugural Dissertation in Dutch. After a review of the chief works on the *Calcarea*, gives a detailed account of the anatomy and histology of *Leucandra aspera*, concluding with a discussion on the relationship of the *Leucones* to the other *Calcarea*, and of the different groups of Sponges *inter se*, in which the characters of the canal system are strongly insisted upon. A German version by the author embodies the greater part of the above, under the title, Ueber *Leucandra aspera*, H., nebst allgemeinen Bemerkungen über das Canalsystem der Spongien: Tijdschr. Nederl. Dierk. Ver. v. p. 144, pls. iii. & iv. [The references below are to the German version.]

16. Wright, E. P. On a new Genus and Species of Sponge (*Alemo seychellensis*) with supposed heteromorphic Zooids. P. R. Irish Ac. xxviii. p. 13, pl. i.

Schulze, F. E. Ueber den Badeschwaum. MT. Ver. Steierm., 1881, p. xlviii.

[Not seen by the Recorder.]

W. H. Carpenter. The Microscope and its Revelations. Edition vi. London : 8vo. Some additions have been made in this edition to the part devoted to Sponges.

H. A. Pagenstecher. Allgemeine Zoologie. Berlin: 8vo, pt. iv. 1881, *Spongida*, pp. 9 & 227.

O. Schmidt, in Brehm's "Thierleben," 4to, vol. x. 1878, gives a general account of the structure, development, and natural history of Sponges, well illustrated by woodcuts.

K. Semper. Die natürlichen Existenzbedingungen der Thiere (Leipzig: 1880); and English version in Internat. Scient. Series (London: 1881, 8vo). Figures *Spongia cartilaginea*, Esper., and *Euplectella aspergillum* in illustration of his remarks on the above subject.

In "Versuch einer spongiologischen Stenographie," Tijdschr. Nederl. Dierk. Ver. v. p. 197, pl. vi., G. C. J. Vosmaer supplements that system of symbols for describing shortly the spicules of Sponges which he introduced in a former paper [see Zool. Rec. xvii. *Spong.* p. 2]. He deals with the spicules under the separate headings, Monaxial, Triaxial, Tetraxial, and Polyaxial.

Faunæ.

Great Britain. Six specimens of Sponges attached to British specimens of the Crab *Pisa gibbsi*, described; Zool. (3) v. pp. 363 & 364, two of them, viz., *Dysidea fragilis* and *Isodictya*, sp., being figured at p. 361.

Firth of Forth. List of 12 species of Sponges from, by G. Leslie & W. A. Herdman, in their Invertebrate Fauna of the Firth of Forth; P. Phys. Soc. Edinb. 1880–1, p. 268.

Mediterranean (deep sea). H. Giglioli, in a paper entitled "La Scoperta di una Fauna abissale nel Mediterraneo," Atti iii. Congresso Geograph. Internaz. (Rome: 1881), records the capture of Sponges at various depths, by the expedition sent with the Italian government vessel 'Washington.'

A. Milne-Edwards. Compte-rendu sommaire d'une exploration zoologique faite dans la Mediterranée à bord du navire de l'Etat, 'Le Travailleur." C. R. xciii. pp. 876 & 931. In 600–2660 mètres, were taken *Tetilla* and *Holtenia carpenteri* (the latter also in 307 mètres, near Toulon, with *Polymastia mamillaris* and *Tethya lyncurium*).

Atlantic (deep), off Spain and Portugal. A. Milne-Edwards records, C. R. xciii. p. 936, the capture, in 1881, by the 'Travailleur,' of *Farrea*, *Aphrocallistes*, *Sympagella*, *Pheronema*, *Hyalonema*, *Asconema*, that of *Euplectella suberea* in 3307 mètres, and of a representative of a new genus, *Parafieldingia*.

S. E. Brazil. 7 sponges, including 3 new Calcisponges, and 1 new Siliceous sponge, described by Ridley (12), from banks lying off this coast.

Straits of Magellan and S. Chili. 13 sponges, of which 10 are new species, described by the same author, *l. c.* The general character of the fauna is Atlantic.

Classification.

Sponges classified by G. Cattaneo, in his morphological study of the Animal Kingdom, entitled, "Le individualiti animali," Atti Soc. Ital. xxii. p. 223, as follows :—

Cœlenterates.

Lower sponges = Syngastreids.
Upper sponges and *Acalephæ* = Prothypergastreids.

Genera, Species, &c., referred to.

CARNOSA (auctt.).

Order *Carnosa* defined by Carter, (5) p. 255. "Surface slimy, glutinous, without evident skeleton, more or less composed of elastic tissue"; therefore he is inclined to refer *Tethya lyncurium*, *Axos spinipoculum*, *Dercitus niger*, and all Sponges agreeing with his definition of the Order, to the *Carnosa*.

Halisarca, (5) p. 244.

Halisarca lobularis. M. Braun, Zool. Anz. iv. p. 232, finds examples from Trieste to be hermaphrodite, and not dicœcious as stated by F. E. Schulze; he considers that the species is probably variable in this respect.

Chondrilla sacciformis, (5) p. 254. The fibrils of its interior described as elastic tissue by Carter.

CERATOSA (Schmidt).

Great destruction of officinal Sponges by some cause which destroys fish, in Gulf of Mexico, off Florida; E. Ingersoll, P. U. S. Nat. Mus. iv. p. 75.

Family *Luffarida* defined, and distribution given by Carter, (3) p. 102.

Aplysina purpurea and *fusca*: amended descriptions by Carter, (3) pp. 103, 107, pl. ix. figs. 1, 2 & 11, S. W. Australia as well as Ceylon. *A. fusca*: amended description, *l. c.* p. 107, pl. ix. fig. 11.

The horny fibres of *Darwinella aurea* have no homology with spicules, according to Carter, (4).

Ianthella: definition modified by Carter, (3) p. 112.

Spongia hispida, Lamarck, = *Hircinia*, (12) p. 109. Described fully from S. W. Chili.

Hircinia. Method of preparation for isolating the fibres of *Spongiophaga* in infested specimens, described by H. J. Carter, Ann. N. H. (5) viii. p. 360, pl. xvii. fig. 9. He considers that the genus *Spongiophaga* must be removed from the Vegetable Kingdom.

Family *Pseudoceratida*. Definition modified by Carter, (3) p. 109.

Aplysina chalinoides withdrawn by Carter, *l. c.*, as based on a *Chalina* with its spicules absorbed.

Dysidea kirki, Bowerbank: (2) p. 374. Carter redescribes it; he finds

it to differ but slightly from *D. fragilis*, Montagu, which appears to him to be *Spongelia pallescens*; it is recorded from whole south coast of Australia and from Mauritius and Cape of Good Hope.

SILICEA.

Monactinellida (Zittel).

Chalinidæ (Carter).

Cladochalina armigera, Schmidt. A new var. described by Ridley, (12) p. 112, pl. x. fig. 2, from Hotspur Bank, off E. Brazil, as var. *pergamentacea*.

Echinonemata (Carter).

Plocamia, (13) p. 477. Name altered by Ridley to *Dirrhopalum*; closely allied to *Clathria*. Generic characters and species revised. Probably exists fossil as early as Greensand.

D. (*Plocamia*) *gymnazum*, p. 478, pl. xxix. figs. 1 & 2.

Isodictya coriacea, Bowerbank, (13) p. 481, pl. xxix. figs. 3–7, and *Hymeraphia microcionides*, Carter, *Dictyocylindrus manaarensis*, id., all referred by Ridley, *l. c.*, to the genus *Dirrhopalum*.

Isodictya beani, Bowerbank, = *Clathria*, (3) p. 485.

Renieridæ (Carter).

Reniera fortior, Schmidt ?, (12) p. 126, pl. xi. fig. 3, Straits of Magellan.

Schmidtia aulopora, Schmidt, (12) p. 127; a var. described from S. W. Chili.

Spongillidæ (Bowerbank).

Spongilla. The chlorophyll which gives it its colour is due to the presence of a unicellular alga, termed by K. Brandt, SB. nat. Fr. 1881, p. 143, *Zoochlorella parasitica*, and probably identical with a form which occurs in fresh-water Planarians.

Spongilla, (1). Name retained by Carter only for the species with acerate gemmule-spicules. The tendril-like appendages of the gemmule of some N. American species (see below) are described by H. J. Carter, Ann. N. H. (5) viii. p. 222, as a parasite, allied to the fibrils found in some *Hircinia*; he names it *Spongiophaga pottsi*, and figures and more fully describes it, *tom. cit.* p. 356, pl. xvii. figs. 1–8, and discusses its probable mode of action on the Sponge.

Spongilla crinaceus, *leidii*, *gregaria*, *fluviatilis*, *meyeni*, *capewelli*, *plumosa*, *baileyi*, referred by Carter (1) to new genus *Meyenia*; *S. paulula*, *reticulata*, and *recurvata* to new genus *Tubella*; *S. batesi*, *browni*, to new genus *Parmula*; *S. coralloides* to provisional new genus *Uruguaya*, and recorded from Paraguay.

Spongilla lacustris, recorded from Italy by P. Pavesi, Rend. Ist. Lomb. xiv. vi. [cited from Zool. Anz. iv. p. 200.]

Spongilla fragilis, Leidy; Potts, (11) p. 462.

Spongilla fluviatilis recorded by F. Leydig, among the fauna of the

Rhine. Verh. Ver. Rheinl. xxxviii. p. 150; by H. PETERSEN, Verh. Ver. Hamb. iv. p. 248, from the water-pipes of Hamburg.

Spongilla tenosperma, Potts (*tentasperma*, olim), referred to *Carterella*; Potts, (10) p. 150.

Spongilla lacustris, var., H. MILLS, in Am. Micr. J. vi. p. 30. [Not seen by the Recorder.]

Carterella latitenta, Potts, P. Ac. Philad. 1881, p. 176, Chester Creek. The tendril-like tubes are broad and ribbon-like.

Lubomirskia baicalensis. An account of its variations in form and size, and of the relations of its form to the depth of the water and other physical conditions, with enumeration of its known Crustacean parasites, comprising two species and one variety of *Gammarus*, given by. W. DYBOWSKI, Bull. Pétersb. xxvii. p. 45. The normal maximum height is about 60 centimètres, but a bushy specimen has been found sufficiently large to fill the bag of the dredge.

Gemmule or statoblast of *Spongillidæ* (1), p. 82, stated by CARTER to consist of an external "crust," granular or rarely cellular in structure, charged with the proper spicules of the gemmule; next to this a homogeneous "chitinous coat," then a delicate transparent membrane, enclosing the germinal cells: the chitinous coat projects through the hilum.

SUBERITIDÆ (Schmidt).

Suberites fistulatus, Carter (2), p. 370; additional characters given.

Alectona higgini, perhaps identical with *Thoosa socialis*, according to CARTER (2), p. 37.

Hymeniacidon dujardini, Bowerbank, *nec* Johnston, is referable to *Hymedesmia*; id. (5), p. 243.

Cliona. NASSONOW (9) has studied the structure and growth in fine lamellæ of oyster-shells upon which embryos had settled. The first step on the part of the Sponge after attachment is to send into the shell fine flattened processes, arranged like rosettes; at a certain depth in the shell these unite, and the intervening semicircular pieces of shell become detached, and are then ejected. An osculum then appears at the point at which the rosette is formed, and histological and general development progresses. The ectoderm consists of flattened cells united by processes; the mesoderm is mostly made up of laminate masses of yellow cells. The ciliated chambers are globular, and lie in the walls of the excretory canals.

Cliona celata. Its ravages among the oysters of the French coast described by H. GIARD, Bull. Sci. Nord. xiii. p. 71. In J. Quek. Club, vi. p. 251, pl. x. figs. 1, 2, 4, &c., and pl. xxi. figs. 1-7, J. G. WALLER argues against the agency of the Sponge in forming the passages which it inhabits, citing the resemblance of the markings in their walls to those made by some boring beetles in wood, and the occurrence of an Annelid Worm in connection with them. Borings in *Haliotis* shell referred to action of this Sponge by B. W. PRIEST, J. Quek. Club, vi. p. 235, pl. xvii. fig. 6; the boring action of the Sponge further supported by the same writer, *tom. cit.* p. 269.

Axona, new group formed by CARTER (2), p. 381, for *Axos* and its allies.

Tetractinellida (Sollas).

Corticium candelabrum, Schmidt (14), p. 416, pl. xxii. Recorded by Schulze from the Adriatic, Naples, and the islands Cebu and Ponapé. The colour appears to be dependent to some extent upon locality. The hyaline cortical substance is not usually so much developed as represented by Schmidt and Kölliker; it descends into the central substance at certain points. The inhalent canal system commences partly by large tubes with trumpet-shaped openings, leading from the surface, partly by fine canals, leading directly to the superficial ciliated chambers, which lie in the opaque substance. The latter are bean-shaped, and measure about ·045 mm. in diameter: a single inhalent canal enters and a single exhalent one leaves each; the different exhalent canals unite, and form tubes of increasing size, which anastomose freely in the basal hyaline substance, opening finally by slit-like vents in the lateral margin or lower surface of the Sponge. This condition of the internal cavities appears from study of a young specimen to be derived from that of a simple sac in the way described [see Zool. Rec. xvii.] in *Placina monolopha*. The ectoderm is composed of a continuous unicellular epithelium, and is continued over the internal surface of the inhalent canals. The opacity of part of the mesoderm is due to the presence of the ciliated chambers, and to small, strongly refractive granules, which occur abundantly throughout the ground substance. The ground substance of the transparent outer part is refractive and homogeneous, and contains spaces which enclose cells. The spicules vary much in the closeness with which they are aggregated. The candelabra-spicules are very variable, and show forms of transition to the simple quadriradiate, and are probably derived from it. The quadriradiates develop each within a single cell. The sexes are united in the same individual. The nucleus of the mature ovum is generally concealed by abundant yelk-globules. The structure of the ovum and sperm-masses, and the earlier stages of the development of the former, agree essentially with those observed in other Siliceous Sponges.

A Tetracladine Lithistid fully described and figured, without name, by P. M. Duncan, J. L. S. xv. p. 320, pl. xxiv., from 1095 fath. off S.W. Coast of Spain.

Hexactinellida (Schmidt).

Aphrocallistes sp. fully described and figured by P. M. Duncan, J. L. S. xv. p. 324, pl. xxv., from 1095 fath. off S.W. Coast of Spain.

A form is described by Duncan, (8) p. 175, pl. iii. figs. 4–6, as perhaps a Dictyonine Hexactinellid, attached to dead coral from deep water off Portugal.

Another form is described by the same author, *l. c.* p. 176, pl. iii. figs. 7–10, from the calix of a coral from the North Atlantic, as a Lissakine Hexactinellid.

Hyalonema, differing slightly from *H. lusitanicum*, obtained by the

Italian dredging expedition in 623–1600 mètres, off Sardinia; H. H. Gigliоli, Nature, xxiv. p. 382.

CALCAREA.

Vosmaer (15) discusses the homologies of the canal system in different groups, illustrating his views by diagrammatic figures, pl. iv. He considers the whole *Sycon*-Sponge, and not merely the individual radial tube, to be homologous with the *Ascon* form. The inter-canals of *Sycon* probably represent the pit-canals of *Ascon*. The Leucones have probably arisen from the Sycones by production of lateral cœca from the radial tubes, and limitation of the collar-cells to small tracts of the canal system. Vosmaer associates the Leucones with non-calcareous Sponges in the relations of its canal-system.

Clathrina coriacea, recorded from South-west Chili by Ridley (12), and from south coast of Franz-Josef Land, *id.* Ann. N. H. (5) viii. p. 455.

Leucandra aspera (15), p. 145, pl. iii. Vosmaer's study of this form demonstrates the existence of an extensive inhalent canal-system leading from the pores by wide vessels to the ciliated chambers, into which these canals open by small pores. The chambers are grouped round large excretory canals, into which they open directly by wide openings. Three body-layers of different characters make up the Sponge. The middle layer is a true connective tissue, consisting of nucleated, fusiform or stellate cells, embedded in an abundant ground-substance; the fusiform cells are the most abundant, but are small. The spicules have distinct sheaths.

Leucandra caminus = *Aphroceras*, (12) p. 155, from off South-east Brazil; a new var., *crassior*, described from the same locality.

Lacinia stellifica, Selenka, (5) p. 249; its Sponge nature requires confirmation, in Carter's view.

New Genera and Species.

CARNOSA.

Oscaria, Vosmaer, (15) p. 163, note. Formed to contain *Halisarca lobularis*, as differing from *H. dujardini* in the ciliated chambers being connected with the excretory canals by fine tubules, instead of opening directly into them.

Halisarca cruenta, Carter, (5) p. 247. Laminar, spreading on sea-bottom, Gulf of Suez; no fibrous structure.

Halisarca bassangustiarum, Carter, (2) p. 373, described with doubt, Bass's Straits.

CERATOSA.

Aplysina purpurea, Carter, (3) p. 108, Freemantle, Australia; *compacta*, id. *l. c.* p. 109, South-west Australia; *capensis*, id. *l. c.* p. 110, Port Elizabeth, Cape of Good Hope.

Aplysina ? regularis, Ridley, (12) p. 108, pl. x. fig. 1, Straits of Magellan.

Hircinia rubitingens, Gulf of Manaar, *clathrata*, Gulf of Manaar and Red Sea, Carter, (2) p. 366.

SILICEA.

Monactinellida.

Chalinidæ.

Tubulodigitus, Carter (2). Based on *T. communis*, id. p. 367, Gulf of Manaar; forming tubular repent masses.

Chalina coppingeri, Ridley, (12) p. 110, pl. x. fig. 2, Victoria Bank, off South-east Brazil.

Siphonochalina fortis, id. *l. c.* p. 111, pl. x. fig. 3, Southern Chili.

Echinonemata.

Echinodictyum, Ridley, (13) p. 403. Differs from *Dictyocylindrus* chiefly in the absence of smooth acuate spicules. Based on *Spongia bilamellata*, Lamarck, pl. xxviii. figs. 1–6, now recorded from North-west Australia, and *E. nervosum*, sp. n., p. 496, pl. xxviii. figs. 7–10, South-east Coast of Arabia, perhaps = *Spongia nervosa*, Lamarck.

Dictyocylindrus reticulatus, Carter, (2) p. 377, pl. xviii. fig. 7, Bass's Straits.

Acanthella stipitata, Carter, (2) p. 380, Bass's Straits.

Echinonema, Carter, (2) p. 378. Based on *E. typicum* and *anchoratum*, id. *ibid.*, from South, and the former also from South-west, Coast of Australia. The spiculation consists of a smooth skeleton acuate and a clavate spined echinating spicule, and in the latter of an equianchorate as well. The former was mentioned in 1875 by name only.

Phacellia egregia, Ridley, (12) p. 114, pl. x. fig. 6, Straits of Magellan.

Dirrhopalum, Ridley, (13) p. 477, = *Plocamia*, Schmidt.

Dirrhopalum novizelanicum, Ridley, *l. c.* p. 483, pl. xxix. figs. 8–16, Bay of Islands, New Zealand.

Dirrhopalum carteri, Duncan, (13) p. 488, pl. xxix. figs. 8–17, deep water, North Atlantic; *D. hystrix*, id. *l. c.* p. 491, pl. xxix. figs. 31–39, 1095 fath. off Coast of Portugal.

Desmacidinidæ (Schmidt, *ex parte*).

Esperia magellanica, Ridley, (12) p. 117, pl. x. fig. 5, Straits of Magellan and Otter Island, Patagonia. Abundantly pigmented, the colouring matter contained in cells.

Alebion proximum, id. *l. c.* p. 119, pl. x. fig. 8, Straits of Magellan.

Hymedesmia polita, id. *l. c.* p. 121, pl. x. fig. 9, Straits of Magellan.

Axos anchorata, Carter, (2) p. 382, pl. xviii. fig. 3, *A. fibulata*, id, *l. c.* p. 383, pl. xviii. fig. 4, Bass's Straits.

Halichondria infrequens, Carter, (2) p. 369, pl. xviii. fig. 9, Gulf of Manaar. Has the spiculation of a Desmacidine.

Renieridæ.

Amorphina megalorrhaphis, Carter, (2) p. 368, Basse Rocks, Ceylon.

Differs from *Halichondria panicea* by the spicules being twice as large as in that species.

Trachytedania, Ridley, (12) p. 122. Differs from *Tedania* in spination of some of the acuate skeleton spicules. *T. spinata*, id. *l. c.* pl. x. fig. 10, S.W. Chili.

Tedania tenuicapitata, id. *l. c.* p. 124, pl. xi. fig. 1, S.W. Chili.

Ciocalypta calva, Ridley, (12) p. 115, pl. x. fig. 7, Straits of Magellan.

SPONGILLIDÆ.

Spongilla navicella, Carter, (1) p. 87, pl. v. fig. 4, River Amazon; *S. multiforis*, id. *l. c.* p. 88, pl. v. fig. 5, Chiluk-weyuk Lake, British Columbia; *S. nitens*, id. *l. c.* p. 89, pl. v. fig. 3, pl. vi. fig. 18, habitat ?.

Meyenia, Carter, (1) p. 90. Formed for those species of *Spongilla* the crust of whose gemmules is composed of birotulate spicules. *M. anonyma*, id. *l. c.* p. 95, pl. vi. fig. 12, River Amazon.

Tubella, Carter, (1) p. 96. Formed for those species of *Spongilla* the crust of whose gemmules is composed of birotulate spicules with a larger external and smaller internal head.

Parmula, Carter, (1) p. 98. Formed for species of *Spongilla* the crust of whose gemmules is composed of acerate and shield-shaped spicules.

Uruguaya, Carter, (1) p. 100. Provisional genus formed for *Spongilla coralloides*, Bowerbank.

Heteromeyenia, Potts, (10) p. 149. The birotulate spicules are of two different sizes in the same gemmules, the largest being fewer in number than the shorter ones. Based on *H. argyrosperma* and *H. repens*, which perhaps = *Spongilla baileyi*, Bowerbank, spp. nn., *id. ibid.*

Carterella, Potts, (10) p. 150. The tube forming the opening of the gemmule is elongated and divides into two or more tendrils which serve to attach the gemmule during winter. Based on *Spongilla tenosperma* and *C. tubisperma*, sp. n., *id. ibid.* The author (11) combats the opinion of Carter that the tendril-like filaments of the gemmule of *Carterella* are of parasitic nature, maintaining that they are tubular prolongations of the chitinous coat of the gemmule, their presence being constant, and growth being apparently unaffected by them. He compares them in structure and functions to hooks in the statoblasts of gelatinous fresh-water *Polyzoa*, as being like these, and as he finds that they increase in importance with the decreasing fitness of the Sponge to protect the gemmules by the firmness of its own substance.

SUBERITIDÆ.

Latrunculia purpurea, Carter, (2) p. 380, pl. xviii. fig. 5, Bass's Straits.

Cliona warreni, Carter, (2) p. 370, pl. xviii. fig. 6. Under *Melobesia*, Gulf of Manaar.

Vioa carteri, Ridley, (12) p. 129, pl. xi. fig. 2, Victoria Bank, off S.E. Brazil; colour crimson.

Polymastia biclavata, J. Priest, J. Quek. Club, vi. p. 302, pl. xxiii. Belize, British Honduras.

Alemo, Wright, (16) p. 15. Allied to *Tethya*, but provided with two kinds of stalked mamillary projections occurring side by side, the one

pear-shaped, the other fan-like; based on *A. seychellensis*, id. *l. c.* p. 16, pl. i., Seychelles Islands.

Tetractinellida.

Stelletta crassiuscula, Carter, (2) p. 371, Basse Rocks, Ceylon.

Discodermia sinuosa, Carter, (2) p. 372, pl. xviii. fig. 1, Gulf of Manaar and Basse Rocks, Ceylon. *D. sceptrellifera*, id. *l. c.* pl. xviii. fig. 2, Gulf of Manaar.

Hexactinellida.

Parafieldingia (L. Vaillant, MS.), A. Milne-Edwards, C. R. xciii. p. 936, and note. Based on *P. socialis*, Vaillant, sp. n., *l. c.*, dredged from the deep Atlantic a little to the north of the Berlengas islands, by the 'Travailleur' Expedition of 1881. Differs from *Fieldingia* in having the spherical masses of spicula enclosed in a loosely-felted aggregation of long acicular spicules.

CALCAREA.

Clathrina poterium = *Ascetta primordialis*, var. *poterium*, Häckel, described as distinct species by Ridley, (12) p. 133, from S.W. Chili.

Nardoa pelagica, Ridley, (12) p. 133, pl. xi. fig. 4;

Aphroceras sericatum, id. *l. c.* p. 134, pl. xi. fig. 5;

Grantia atlantica, id. *l. c.* p. 136, pl. xi. fig. 8; all from Victoria Bank, off S.E. Brazil.

Incertæ sedis.

Cameraphysema obscura. Under this name is described, P. U. S. Nat. Mus. iii. p. 269, figs. 1–7, by J. A. Ryder, as a Sponge, a clavate mass which in life protrudes a number of funnel-shaped tubes from its surface, and appears to consist of a congeries of irregular chambers, from which the funnels open: both funnels and chambers are lined by a unilaminar membrane made up of very distinct cells; segmented ova were observed. No fibres, spicules, or cilia were found. [The form can hardly be a Sponge, the description rather suggests one of the soft compound *Polyzoa*.—Recorder.]

General Anatomy and Physiology.

F. M. Balfour, Comparative Embryology (London: 1880, 8vo), gives, at p. 113, a summary, with figures copied from F. E. Schulze, of the chief facts which have been determined with regard to the development of Sponges. He considers that according to our present knowledge, Sponge-larvæ may be divided into two groups: (1) In form of blastosphere, or else of a solid morula; (2) In form of amphiblastula (in *Calcarea* and possibly in some others). The later stages of the development are stated

to be dissimilar from those of all other groups. Balfour thinks it might be possible to regard Sponges as degraded from *Actinozoa*, such as *Alcyonium*, but prefers, in default of sufficient evidence, to consider them as an independent group of the *Metazoa*.

Vosmaer, (15) enumerates four main types of canal system in Sponges, viz., 1. *Ascon*, with collar-cell area opening directly to exterior. 2. *Sycon*, with collar-cell area opening to gastral cavity. 3. Represented by *Aplysilla*, *Spongelia*, *Halisarca dujardini*, *Leucandra aspera*, most *Renierida*, some *Suberitida*, and probably the *Hexactinellida*; the collar-cell areas open into wide canals, which open directly or by larger canals. 4. Represented by *Aphysina*, *Euspongia*, *Cacospongia*, *Hircinia*, *Oligoceras*, *Placortis*, *Plannastrella*; with *Halisarca lobularis*, *Chondrosia*, *Chondrilla*, *Corticium candelabrum*, showing a higher grade. The collar-cell areas lead into usually fine canals, which end ultimately by way of two (secondary and primary) degrees of canals, in the gastral chamber. Vide *suprà*, Calcarea, for special application of views to that group.

Kerasine. Term applied by Carter to the horny material contained in the fibres of many Sponges, (4).

The horny fibres, according to Carter, *l. c.*, in some cases contain cells, but are all formed round a central granular core.

Keratose, (13) p. 480, distinguished by Ridley, by means of its power of polarizing light, from a similar substance, also occurring in Sponges, to be termed pseudo-keratose.

Elastic tissue said by Carter, (5) p. 255, to be found in *Carnosa* and in many other Sponges.

Pigment-cells in *Luffaria* and *Aplysina*, *Ianthella*, *Spongia*, *Stelletta*, *Dercitus*, *Chondrilla*, *Dysidea*, described by Carter, (4) p. 105, pl. ix. figs. 3–9; they may either be globular or elliptical, or stellate, or composed of irregular aggregations of granules.

Carter, (4) states that the ornamental parts of a Sponge-spicule are added after the rest of the spicule has been formed.

Tibiella. Term applied by Carter, (2) p. 369, to the "biclavated cylindrical" spicule of Bowerbank.

Spongia cartilaginea, Esper. Specimens of what he considers to be this species, described and figured by K. Semper in The Natural Conditions of Existence as they affect Animal Life: London, 1881, 8vo (Internat. Scient. Series), p. 343, figs. 92 & 93, as showing commingling of sponge-tissues with those of algæ.

Heteromorphic zooids in Sponges. The two kinds of processes described by him on the surface of *Alemo seychellensis*, E. P. Wright, g. & sp. nn. (16) p. 15 (see above), are thus described by that author; in a note added subsequently, p. 17, he compares this phenomenon with the budding exhibited by *Tethya* and *Rinalda*, as being possibly of the same nature.

A large number of different forms of enlargement of the axial canal in siliceous Sponge-spicules are described and figured by Duncan, (6); the most common is a symmetrical tear- (or pear-) shaped cavity, which may be repeated several times in the same spicule; the cavity usually appears to be closed to the exterior. However, cases occur in which the axial

canal opens at one end or both ends of the spicule, or by perforating tubules reaching it from the sides; in this case the walls of the cavity present the unusual character of a ragged outline. Part of the canal may also be simply enlarged without becoming bulbiform. In his communication, (7), the author describes the perforations as of two sizes, and as produced by probably vegetable organisms, in the form of cell-like bodies, with greenish protoplasm, and names this organism, which he did not detect in the spicules mentioned above, (6), *Spongiophagus carteri*. The curves of the enlargements of the canal do not correspond to those of the deposit of the silica. Each of the chief types of spicules found may have different forms of enlargement. The tubules which perforate the spicule from the exterior are cylindrical, narrow, straight, and usually perpendicular to the long axis of the axial canal; they often penetrate only part of the way to the canal, or the surface of the spicule may be merely roughened by incipient erosion. In some of the various cavities described, greenish cells and minute bodies resembling the zoospores of *Achlya*, and greenish, minutely granular plasmatic material, have been found. On the whole, the author is disposed to regard these phenomena as produced by the parasitic organisms, rather than by the action of carbonic acid in solution aided by pressure. The spicules were contained in samples of sea-bottom from the deepest spot in the Pacific Ocean, off Japan.

Tetronerythrin. This red colouring matter has been discovered in Sponges by C. De Merejkowsky, C. R. xciii. p. 1029, viz., in *Suberites*, *Axinella*, *Chalina*, *Reniera*. Its object is to promote oxygenation at the surface of the body.

The green particles occurring in *Spongillidæ* are interpreted by K. Brandt, SB. nat. Fr. 1881, p. 143, as unicellular *Algæ*, and referred to a new genus, *Zoochlorella*.

Fossil Sponges, Chief Works on.

17. Manzoni, A. Spugne silicei della Molassa Miocenica del Bolognese. Atti Soc. Tosc. v. p. 173, pl. viii.

18. Whitfield, R. P. Remarks on *Dictyophyton*, and descriptions of new species of allied forms from the Keokuk Beds at Crawfordsville, Ind. Bull. Am. Mus. Nat. Hist. i. p. 10, plates iii. & iv.

Contains, at p. 12, a note by J. W. Dawson on the Structure of a specimen of *Uphantænia*, from the collection of the American Museum of Natural History, New York City.

F. Römer. Lethæa Geognostica. i. Stuttgart: 1880, 8vo, p. 305.

The palæozoic Sponges, their genera and species, are fully described. *Aulocopium aurantium* and other Sponges are well figured.

M. Ronault. Sur les Amorphozoaires du Silurien inférieur. Paris: 1881 (from CR. Internat. Geol. Congr. 1878.) [Not seen by Recorder.]

Aulocopium gotlandicum, sp. n., Römer, *l. c.* p. 313, Upper Silurian.

Hyalostelia smithi, Young, figured and described by G. Steinmann, Z. geol. Ges. xxxii. p. 395, pl. xix. fig. 5, from carboniferous limestone.

Craticularia, sp. figured by Manzoni (17), from Miocene of Bologna.

Astroconia granti, g. & sp. nn., W. J. Sollas, J. Geol. Soc. xxxviii. p. 254, figs. 1–11, Niagara Limestone (Silurian), Canada. Belongs to the Lyssakine section of *Hexactinellida*.

Uphantænia, from Keokuk Beds, Indiana, determined by Dawson (18) to be probably a Sponge near *Euplectella*; it contains cylindrical spicules.

U. dawsoni, Whitfield, described and figured, (13) p. 16, pl. iv. figs. 1 & 2.

Dictyophyton catilliforme and *cylindricum*, id. spp. nn., pp. 18 & 19, pls. iii. & iv. fig. 3, Keokuk Beds, Indiana. Long cylindrical spicules were observed in *cylindricum*.

R. P. Whitfield, Am. J. Sci. (3) xxii. p. 53, also calls attention to the close resemblance borne by the structure of *Dictyophyton* to that of *Euplectella*, and expresses his opinion that it is "of the nature of Sponges," and not of that of plants. At *tom. cit.* p. 132, in conjunction with J. W. Dawson, he describes the structure of a species of *Uphantænia*. The latter finds it not to be identical with that of any plant known to him, but, as above mentioned, to resemble *Euplectella* more closely. He discusses the conditions produced in Sponges by fossilization.

Cyathophycus: specimens described by C. D. Walcott, Am. J. Sci. (3) xxii. p. 394, and stated to strongly resemble *Euplectella*.

Sponge-spicules, 3- and 6- rayed, in Upper Silurian beds in Shropshire; J. Smith, Geol. Mag. (n. s.) viii. p. 73.

W. J. Sollas, Ann. N. H. (5) vii. p. 141, fig. 1, records the identification of Sponge-spicules in chert from the Upper Carboniferous Limestone of Ireland; they have an acerate form, and show the existence of a central canal.

G. C. Wallich, in a paper entitled, "On the Origin and Formation of the Flints of the Upper or White Chalk, with Observations upon Prof. Sollas's paper in 'The Annals and Magazine of Natural History' for December, 1880,'" in Ann. N. H. (5) vii. p. 162, pl xi., rebuts Sollas's arguments against his views [see Zool. Rec. xvii. *Spong.* p. 21]. He regards flints as formed chiefly of silex derived from Sponge-skeletons and spicules, which has first assumed a gelatinous colloid form. See also *id. tom. cit.* p. 261, on Siliceous Sponge-growth in the Cretaceous Ocean.

The same writer, *op. cit.* (5) viii. p. 46, in Supplementary Notes on the Flints and on the Lithological identity of the Chalk and Recent Calcareous Deposits, finds the above opinions supported by the large proportion (31¼ to 64 per cent.) of silica contained in the material contained by hermetically closed flints. See also H. J. Carter, Ann. N. H. (5) vii. p. 308, on the Kunker Formation of the Alluvium in India compared with the Flint Formation in the Chalk of England.

List of Fossil Sponges, with localities, given in Arch. Mus. Teyl. (2) i. p. 231, by T. C. Winkler, as part of the Catalogue Systématique of the Teyler Museum; the nomenclature is pre-Zittelian.

PROTOZOA.

BY

STUART O. RIDLEY, M.A., F.L.S., F.R.M.S.

THE GENERAL SUBJECT.

CHIEF WORKS.

1. MAGGI, L. Esame protistologico delle acque di alcuni laghi italiani Bol. scient. ii. [1880] p. 33.

Gives classified lists of the *Protista* (including *Bacteria* and *Diatomaceæ*, up to *Ciliata*) of the Italian Lakes Brinzio, Varese, Como, Pusiano, Annone, Garda, Idro, Candia; and discusses the general aspects of the fauna and the geological causes which have brought *Ceratium furca* and *Peridinium spiniferum* into the lakes.

2. ——. Primo esame protistologico dell' acqua del Lago di Loppio (Trentino). *Op. cit.* iii. p. 57.

Enumerates the leading species of *Flagellata*, *Diatomaceæ*, and *Ciliofla gellata* of the Lake of Loppio in Trent, and mentions the occurrence of *Oxytricha* there. The marine form, *Ceratium furca*, = *Peridinium lineatum*, occurs here as in other fresh-waters.

3. ——. Intorno ai Protisti ed alla lora classificazione. *Op. cit.* ii. p. 107, and iii. pp. 16 & 48.

Distinguishes the *Monera* from *Bacteria* by the non-homogeneous character of their protoplasm, terming the ultimate elements composing the one class of organism 'metaplasson,' and 'hetero-' or 'alloplasson,' and those composing the other (*Bacteria*) 'protoplasson' or 'homœoplasson'; an 'ectoplasson' and 'endoplasson,' corresponding to 'ecto-' and 'endoplasm,' occur in the former. These two forms of life are termed, morphologically, 'plastidules,' in opposition to cells and cytodes. The various developments of these elements are made the subject of a philosophical discussion on the homologies of the Animal Kingdom in connection with the plastidule theory.

4. ——. I Protisti e le acque potabili. *Op. cit.* iii. p. 79.

Described as a preface to a course of lectures on the study of the *Protista* as connected with surgery and medicine. The author discusses

the connection of goître with microrganisms, and supports Klebs's observations by recording certain *Infusoria* and *Monads* from water of districts in Italy where this disease prevails. He also discusses the presence of microrganisms in potable water.

5. Parona, C. Prime recherche intorno ai Protisti del Lago d'Orta, con cenno della loro corologia italiana. *Op. cit.* ii. [1880] p. 17.

Gives a classified list of the 38 different species of *Protista* (including *Bacteria* and *Ciliata*) found in the Lake of Orta, and discusses the group *Monera*, Häckel; 5 true *Protozoa* are new to the Italian fauna.

6. Ryder, J. A. The *Protozoa* and Protophytes considered as the primary or indirect source of the Food of Fishes. Bull. U. S. Fish Comm. 1881, p. 236.

Protozoa largely consumed by *Crustacea*, which in turn serve as food for fishes. Individual species of *Protozoa* enumerated from various localities on the coast of the United States.

Cattaneo, G. Le individualiti animali. Atti Soc. Ital. xxii. [1880] p. 223.

Constructs a morphological classification of the Animal Kingdom based on the combinations of the ultimate elements, into plastidules, plastids, gastreids, hypergastreids, cormi, which it exhibits. (See Classification.)

A. Certes gives accounts of processes for staining, preparing and preserving microscopic organisms, C. R. xcii. p. 424, and Bull. Soc. Z Fr. vi. pp. 21, 36, 226 & 228, in which he recommends the use of dyes which stain the protoplasm during life. Weak solutions of cyanin blue or Bismarck-brown stain *Infusoria* without killing them; the former reagent colours the general protoplasm, and especially fatty granules, not the nucleus, and produces a kind of intoxication. Certain Paris violet dyes colour the nucleus in the living state, and most of them stain the cilia and liquid of the contractile vacuole.

J. B. Haycraft, in "Theory to account for certain movements exhibited by low forms of Animal Life, and termed Amœboid," P. R. Soc. Edinb. xi. p. 29, holds that the movements are perhaps produced by contractions of the stroma, as distinguished from the interstromal matter; the latter probably composes the pseudopodia, and the extrusion of these organs is perhaps caused by the contraction of the stroma which surrounds them. The theory is supported by experiments made with an india-rubber ball half-full of coloured egg-albumen, pierced with holes, and immersed in a strong solution of sugar; pressure of the finger on one of the holes causes coloured pseudopodia to issue from the others.

W. S. Kent. "The Myxomycetes or Mycetozoa; Animals or Plants?" Pop. Sci. Rev. (n.s.) v. p. 97, pls. iii. & iv. Advocates the animal hypothesis of the nature of the *Myxomycetes*, as supported by observation of genesis of monadiform flagellate germs which assume an amœboid condition, from spores of *Physarum*. The stellate calcareous bodies of the

outer wall of the sporangium are compared to the stellate spicules of the Tethyid Sponges.

F. KRASAN. "Bericht in Betreff neuer Untersuchungen über die Entwickelung und den Ursprung der niedrigsten Organismen." Verh. z.-b. Wien, xxx. p. 251, pl. vii. Supports energetically the hypothesis of *archebiosis*, and enforces his argument by actual instances of evolution of *Infusoria* and Monads from non-living matter stated to have been observed by him.

L. MAGGI. "Gl' invisibili del Varesotto." Boll. scient. iii. p. 91. A popular sketch of the *Protista* of recent and fossil times.

K. ROSER. "Beiträge zur Biologie niederster Organismen." Marburg: 1881, 8vo, 1 pl. Cited from abstracts in Kosmos, ix. p. 475, and J. R. Micr. Soc. (2) i. p. 901. Records experiments on the adaptability of fresh-water *Infusoria* to solutions containing salts. Roser employed milk, urine, and blood, and experimented chiefly on *Polytoma uvella*. Sudden addition of a large proportion of saline liquid causes temporary contraction of the protoplasm and cessation of ciliary movement, which can be revived by addition of fresh water. By gradually increasing the proportion of saline elements in the liquid, the Flagellate is fitted for life and reproduction in undiluted blood. From these experiments Roser believes that it is the saline, rather than the alkaline, compounds of the body which affect septic organisms introduced into it.

O. SCHMIDT gives a general account of the structure and habits of the *Protozoa*, well illustrated by woodcuts, in BREHM'S Thierleben, vol. x. Leipzig: 1878, 8vo.

K. SEMPER. "Die natürlichen Existenzbedingungen der Thiere." Leipzig: 1880. Figures several common *Protozoa* in illustration of his remarks on this. Translated into English as "The Natural Conditions of Existence as they affect Animal Life." London: 1881, 8vo (Internat. Scient. Series).

The green particles occurring in many *Protozoa*, Sponges, *Hydrozoa* and *Turbellaria* are described as a genus of unicellular *Algæ*, *Zoochlorella*, BRANDT, (18) *infrâ*, with the species *conductrix* and *parasitica*.

E. G. BALBIANI. Les Organismes Unicellulaires. Les Protozoaires. J. Microgr. v. pp. 63, 116, &c.

A. SEIP. Parasites of White Ants. Am. Micr. J. ii. p. 288.

[Not seen by the Recorder.]

FAUNÆ.

ITALY, see MAGGI & PARONA, above.

CLASSIFICATION.

H. BURMEISTER. "Description physique de la République Argentine." Buenos Aires: 1879 (from the German) iii. pt. i. 24, divides *Protozoa* into the four Orders—*Infusoria*, *Rhizopoda*, *Flagellata*, and *Monera*.

Protozoa are classified by CATTANEO (*suprà*), as follows:—

Lower *Monera* (*Bacteria*)	= Autoplastidules.
Upper and Lower *Rhizopoda*	= Protoplastidules.
Upper *Rhizopoda* and *Infusoria*	= Autoplastidules.
Compound *Rhizopoda*	= Symplastidules.

MAGGI (3) enumerates Häckel's various classifications of the *Protista*, and, after discussing different views as to relations of *Gregarinidæ*, &c., proposes the following classification:—

Type I. Plastidular *Protista*.
- Class I. *Bacteria*.

„ II. Cytodular *Protista*.
- Class I. *Monera* (*Lobomonera* and *Rhizomonera*, Häckel).
- „ II. *Fungi*.

„ III. Unicellular *Protista*.
- Class I. *Flagellata*.
- „ II. *Lobosa* (= *Amœbina*).
- „ III. *Diatomeæ*.
- „ IV. *Myxomycetes*.
- „ V. *Gregarinæ*.
- „ VI. *Thalamophora* (Hertwig).
- Class VII. *Heliozoa*.
- „ VIII. *Radiolaria* (J. Müller).
- „ IX. *Ciliata*.
- „ X. *Acinetæ*.
- „ XI. *Labyrinthuleæ*.
- „ XII. *Catallacta*.

INFUSORIA.

CHIEF WORKS:—

7. FOETTINGER, A. Recherches sur quelques Infusoires nouveaux; parasites des Céphalopodes. Arch. Biol. ii. p. 344, pl. xix.–xxii.

8. FOL, H. [Contributions to the Knowledge of the Family *Tintinnodea*.] Arch. Sci. Nat. v. p. 5. Reported from translation in Ann. N. H. (5) vii. p. 237, pl. xvii. figs. 1–6.

9. GRUBER, A. Kleine Beiträge zur Kenntniss der Protozoen. Ber. Ges. Freib. vii. [1880] p. 533, pl. x.

Notes on *Infusoria*.

10. KENT, W. S. Manual of the *Infusoria*, including a description, &c. [see Zool. Rec. xvii.]. London: 1881, 4to, pts. iv. & v. pp. 433–720, pls. xxv.–xl.

Continues the systematic description of the genera and species commenced in 1880, concluding the *Flagellata*, and describing a large proportion of the *Ciliata*. To the account of the former group, is added an appendix, further enforcing the claims of the *Myxomycetes* to a place in the Animal Kingdom.

11. MAGGI, L. Intorno alle Cothurnie parassiti della branchie dei gamberi nostrali. Rend. Ist. Lomb. (2) xii. p. 439.

12. MAUPAS, E. Contribution à l'étude des Acinétiens. Arch. Z. expér. ix. p. 299, pls. xix. & xx.

Contains descriptions of several species, including 8 new, from Roscoff

and Algiers; the anatomy of the group is somewhat fully discussed, and the various opinions on this subject very carefully weighed.

13. Mereschkowsky, C. On some new or little-known *Infusoria*. Ann. N. H. (5) vii. p. 209, pl. xii.

14. Parona, C. Delle Acinetine in generale ed in particolare di una nuova forma (*Acineta dibdalteria*, n. sp.). Boll. scient. ii. [1880] p. 79, fig. [*Cf.* also Arch. sci. nat. 1881, p. 181, and Ann. N. H. (5) vii. p. 279.]

Gives a review of the chief points hitherto discovered as to the anatomy and physiology of the *Acinetidæ*.

15. Rees, J. v. Zur Kenntniss der Bewimperung der Hypotrichen Infusorien, nach Beobachtungen an *Styloplotes grandis*, n. sp., und *Euplotes longipes*, Clap., Lachm., 1 pl. Amsterdam: 1881. Cited from Niederl. Arch. Zool. v. p xxviii.

S. O. Glason. The Study of *Infusoria*. Am. Micr. J. ii. p. 109.

C. M. Vorce. Is it *Tintinnus*? Tom. cit. p. 223.

[Not seen by the Recorder.]

Faunæ, see General Subject.

Classification.

Affinities of the *Infusoria Ciliata* discussed by Kent, (10) p. 473. The general parallelism between the differentiation of organs and functions which is found in them on the one hand, and in the *Metazoa* on the other, is dwelt upon. A hypothetical phylogeny of the different groups of these animals is constructed, chiefly by comparing some leading Infusorian types with larval forms of different *Metazoa*, e.g., *Opalina* with the Cœlenterate *planula*; *Paramœcium* with aproctous larva of Turbellarians; *Melodinum* with the Nemertian larva *Cephalothrix*; the Peritrochous form *Telotrochidium* with a similar Annelid larva; *Didinium* with a 4-banded Echinoderm larva; *Vorticella* with a larval Polyzoon. Kent also appeals to the multinucleate condition of *Opalina* as evidence in favour of an evolution of multicellular from unicellular types.

Genera, Species, &c., Referred to.

The families, genera, and species of the orders *Holotricha*, *Heterotricha*, and part of *Peritricha* are characterized and described by Kent, (10) pp. 482–720, pls. xxvi.–xl. Of the genera and species, only those described as new can be noticed below:—

Peritricha.

Kent (10) recognizes 8 families in this Order, viz., *Dictyocystidæ*, Häckel; *Halteriidæ*, Clap. & Lachmann; *Urceolariidæ*, Stein; *Ophryoscolecidæ*, Stein; *Vorticellidæ*, Ehrenberg, and the newly-established

families, *Torquatellidæ*, *Actinobolidæ*. He transfers many forms to *Heterotricha* [see below].

Tintinnodea, (8) p. 246. Family defined and provisionally arranged by FOL. See KENT, (10) *Heterotricha*.

Tintinnus, (8) p. 247. List of known species.

T. campanula, *helix*, *annulatus*, *ventricosus*, referred by FOL (8) to *Coniocylis*, g. n., to which probably belongs *Tintinnopsis*, Stein. *T. fluviatilis* is removed from the genus.

The cilia of the disk of the *Tintinnodea* are described by FOL, *l. c.*, as arranged in numerous paraliel lines extending from the margin of the peristome, some—the shortest—to the mouth itself, the remainder to within a certain distance from the mouth; the whole form about twenty spiral lines, each lying opposite to one of the marginal teeth of the peristome. The test is composed of chitin. Conjugation occurs by union of individuals, at a point near the mouths.

Dictyocysta, Ehrenberg, (8) pp. 245 & 247. Restricted by FOL. *D. mitra*, Häckel, = *D. elegans*, Ehrenberg. *D. cassis* is no *Dictyocysta*, pp. 245 & 246, but = *Cyttarocylis*, g. n. It is redescribed and figured, pl. xvii. fig. 6.

Cothurnia socialis, Gruber, (13) p. 210, pl. xii. fig. 3, from White Sea.

Licnophora cohni. A European form now recorded from Chesapeake River, U. S., by J. A. RYDER, P. Ac. Philad. 1881, p. 443.

Vorticella. J. LIMBACH, "Kilka awag o zbiomiku kurczliwym wiregyka (*Vorticella*)," [= Einige Bemerkungen über den contractilen Behalter von *Vorticella*]," Kosmos, Z. polu. naturf. Ges. Kopernicus, Lemberg: 1880, p. 213 [cited from Zool. Anz.]

Vaginicola pancerii, Ninni, (11) p. 446. Referred to *Cothurnia* by MAGGI, and described from branchiæ of *Astacus*, on which occur also *C. sieboldi*, *curva*, and *astaci*, Stein.

Trichodina mitra, Siebold, is the name assigned by F. VEJDOVSKY, SB. böhm. Ges. 1881, p. 115, to a form figured without name from a Planarian by Hallez in his recent work on *Turbellaria*, pl. v. fig. 23.

Trichodina steini, Clap. & Lachm., is fully described by Vejdovsky, *l. c.* p. 116, pl., from *Planaria gonocephala*. The lower end is invested by a stout cuticle, in which the grasping-hooks are fastened; the nucleus is horse-shoe shaped, and very long.

Trichodina pediculus recorded on *Gastrosteus*, N. H. [should be W. H.] Poole, Nature, xxiv. p. 485; on larva of *Triton cristatus*, by W. S. Kent, *tom. cit.* p. 557.

HYPOTRICHA.

Euplotes longipes, Clap. & Lachm. (15). Described by REES.

Chilodon cucullus, (9) p. 543, pl. x. figs. 19-26. Swallows *Oscillatoria* by extending the œsophagus, which grasps the filament. The way in which this leaves the body, shows that no distinction exists between the main mass of the body and its cortical layer.

Gyrocyrus, Stein, described by GRUBER (9) as *Calcaria contorta*, g. & sp. nn., p. 549, pl. x. figs. 29 & 30. The latter names are withdrawn in note, p. 552.

HETEROTRICHA.

KENT (10) recognizes 7 Families in this Order, viz., *Bursariidæ*, Stein, *Stentoridæ*, id., *Tintinnodæ*, Claparède & Lachmann, *Spirostomidæ*, and the newly-established Families, *Trichodinopsidæ*, *Codonellidæ*, *Calceolidæ*.

Trichonympha agilis, Leidy, figured by J. LEIDY, J.. Ac. Philad. viii. pl. li. A careful study of its structure, pp. 429–436, leads to the conclusion that it is intermediate between the *Gregarinida* and *Infusoria*, but most nearly related to the former.

Pyrsonympha vertens, Leidy, figured, *id. l. c.* pl. lii. figs. 1–17. Full account of its structure and life-history, pp. 436–439.

Dinenympha gracilis, Leidy, figured, *id. l. c.* pl. lii. figs. 18–26. Probably allied to *Opalina*.

HOLOTRICHA.

KENT (10) recognizes 13 Families in this Order, viz., *Colepidæ*, Ehrenberg, *Tracheliidæ*, id., *Opalinidæ*, Stein, and the newly-established *Paramœciidæ*, *Prorodontidæ*, *Trachelophyllidæ*, *Enchelyidæ*, *Trachelocercidæ*, *Ichthyophthiriidæ*, *Ophryoglenidæ*, *Pleuronemidæ*, *Lembidæ*, *Trichonymphidæ*.

Paramœcium aurelia. The general protoplasm is coloured deeply during life by the aniline colour, Bismarck-brown; the nucleus generally remains uncoloured; L. F. HENNEGUY, Bull. Soc. Philom. iv. p. 52.

Urceolus alenizini, Mereschkowsky, (13) p. 219, pl. xii. fig. 13.

Phialonema, Stein, = *Urceolus*, Mereschkowsky, according to the latter author, (13) p. 219. The mouth is situated at the bottom of the fossa in the neck.

SUCTORIA.

Probable mode of action of tentacles of Acinetines described by MAUPAS, (12) p. 302, in connection with *Sphærophrya magna*, sp. n. The animal attacked probably has its integument perforated by the tentacle, and the axial substance of the latter penetrates into it, and sets up a current which sweeps the contents of the tentacle of the Acinetine. The existence of Acinetines devoid of a true cuticle is proved by observations on *Podophrya libera* and *Sphærophrya magna*.

MAUPAS, (12) p. 346, concludes that the integument of *Hemiophrya*, *Podophrya*, *Dendrocometes*, *Dendrosoma*, *Ophryodendrum*, and *Trichophrya* corresponds morphologically to the cell-membrane, but that the capsule of *Acineta* and *Solenophrya* is skeletal, and of totally different affinities. There is no true division of the protoplasm in Acinetines into endosarc and ectosarc. The suckers of the Acinetinæ are tubular; in some species they are simple prolongations of the integument, while in others they arise from the deeper parts of the body; in *Hemiophrya microsoma* the prehensile tentacles arise in the one way, and the sucking ones in the other. The tentacles are homologous with the pseudopodia of *Rhizopoda*, being precisely like them in structure and mode of origin. A nucleolus external to the nucleus occurs in *Acineta fœtida* and *Podophrya limbata*. The nucleus may differ from the ordinary type in being

either vacuolated or reticulated. The group appears to present more affinities to *Heliozoa* than to any other *Protozoa*.

Podophrya, sp. indet., (12) p. 303, pl. xx. fig. 5.

Podophrya fixa, var. *algirensis*, l. c. p. 308, = *P. libera*, Perty.

Hemiophrya, Kent. Defined by MAUPAS, (12) p. 323. It should contain *Podophrya gemmipara*, and five other species.

Hemiophrya gemmipara, l. c. pl. xx. figs. 16 & 17. Maupas confirms Hertwig's statement of the penetration of the tentacles into the body. This is the species described by Robin as *P. lyngbii*.

Acineta mystacina, (9) p. 533, pl. ix. figs. 1–18, figured as *A. mystacina*, var. *carchesii*. In destroying the Vorticellids, it attaches itself to their stems, and will kill individuals of twice its own size. Fission begins by the nucleus dividing into halves, and producing two vacuoles; the protoplasm then itself divides, and the halves separate; one half and one vacuole are generally larger than the others, and appear usually to divide again into two. Suckers are emitted by the fission-products before they separate.

Acineta saifulæ, Mereschkowsky, (13) p. 215, pl. xii. fig. 11. *A. divisa*, Fraipont, is perhaps only a variety of this species.

Acineta, (13) p. 217, list of the described marine species.

NEW GENERA AND SPECIES.

PERITRICHA.

The following genera and species are described as new by KENT, (10) pp. 621–720, pls. xxxi.–xl., with references to pl. xlix. in pt. 6 (1882).—[KENT deals with some accepted Peritrichous genera, as *Heterotricha*, below]:—

Petalotricha, p. 627. Based on *Tintinnus ampulla* and *spiralis*, Fol. Differs from *Tintinnus* in restriction of cilia to distal area, and their abnormal arrangement in two heterogeneous series, the one upon lappet-like projections of the peristome.

Arachnidium, p. 637. Differs from *Mesodinium* in the absence of the supplementary leaping setæ, and in having the oral circle of cilia developed into long tentacular processes. Found in salt and freshwater. Includes *A. globosum*, *convolutum*, spp. nn., and *Halteria bipartitum*, Fromentel.

Telotrochidium, p. 643. Based on *Vorticella crateriformis*, Müller. Free-swimming; two circles of cilia; mouth-opening behind anterior circle; arms posterior; increasing by longitudinal fission. Freshwater.

Scyphidia fromentelli.

Spirochona tintinnabulum.

Stylochona, p. 662. Differs from *Spirochona* in possession of distinct, rigid pedicles. Marine, *S. nebalina*, *coronata*.

Rhabdostyla, p. 664. Differs from *Vorticella* in rigidity and non-contractile character of the pedicle. Freshwater, *R. sertularium*, *longipes*, spp. nn., and *Epistylis brevipes*, Claparède & Lachmann, &c.

Pyxidium, p. 666. Differs from *Opercularia* in having the individuals solitary. Freshwater. Based on *P. cothurnoidea*, sp. n., and *Scyphidia inclinans*, Müller.

Vorticella crassicaulis, longifilum, telescopica, cratera (= *patellina*, Ehrenberg, *nec* Müller), *quadrangularis, spectabilis.*

Carchesium lachmanni = *spectabile*, Claparède & Lachmann, pt.

Zoothamnium simplex.

Thuricola, p. 719. Based on *Vaginicola valvata*, Strethill Wright, &c. Differs from *Vaginicola* in having the lorica closed by a valvular apparatus. Marine and freshwater.

Planicola pancerii, Maggi, (11) p. 445. Branchiæ of *Astacus*, Valcuvia, Italy.

Cothurnia patellæ, Hutton, Tr. N. Z. Inst. xi. p. 330. Branchiæ of *Patella argentea*, New Zealand.

Cothurnia pontica, Mereschkowsky, (13) p. 210, pl. xii. figs. 4–6, Livadia, Crimea.

Tintinnus mediterraneus, Mereschkowsky, (13) p. 211, pl. xii. figs. 1 & 2, Mediterranean, Crimea, Bay of Naples.

Tintinnus ampulla, Fol, (8) p. 247, pl. xvii. figs. 1–3, *T. spiralis*, id. *ibid.* pl. xvii. fig. 4, both from Villefranche-sur-Mer.

Coniocylis, Fol, (8) p. 248. Based on *Tintinnus campanula*, Ehrenberg, and distinguished chiefly by a transversely striated test with foreign particles attached to it.

Cyttarocylis, Fol, (8) p. 248. Based on *Dictyocysta cassis*, Häckel. Differs from *Dictyocysta* in having the test only pitted, not perforated.

Tintinnus fergusoni, Ryder, (6) p. 241, on Maryland Coast, U.S.

Hypotricha.

Styloplotes grandis, Rees, (15). Has two rows of cilia on the margin of the peristome in addition to the usual oral set.

Trochilia marina, Mereschkowsky, (13) p. 213, pl. xii. figs. 7–9, Livadia, Crimea.

Heterotricha.

The following genera and species are described by Kent as new, (10) pp. 595–614, pls. xxix.–xxxi. :—

Stentor auricula.

Folliculina hirundo, boltoni.

Tintinnidium, p. 611. Based on *Tintinnus inquilinus*, Ehrenberg, *T. fluviatilis*, Stein, and *T. semiciliatus*, Sterki. Differs from *Tintinnus* in excreting a lorica by which it is attached to foreign bodies.

Strombidinopsis, p. 613. Resembles *Strombidium* of the *Peritricha*, but differs in minute ciliation of entire general surface of body. *S. gyrans*, fresh-water.

Calcaria, Gruber (9). Based on *C. contorta*, id. *l. c.* pl. x. figs. 29 & 30. The genus and species are subsequently withdrawn by the author, p. 552, note, as being identical with *Gyrocyrus*, Stein.

Holotricha.

The following genera and species are described as new by Kent, (10) pp. 488–549, pls. xxvi.–xxxii. :—

Paramæcium marinum.

Loxocephalus granulosus.

Holophrya lateralis.

Otostoma carteri.

Lacrymaria cohni.

Plagiopyla ? carteri.

Meniscostomum, p. 539. Based on *Paramœcium stomioptycha*, Eckhard. Differs from *Ophryoglena* in cup-like form of oral depression, and from *Plagiopyla* by absence of tubular pharynx.

Pleuronema coronata.

Lembus subulatus.

Proboscella, p. 549. Based on *Vibrio verminus*, O. F. Müller. Differs from *Lembus* in possessing a slender finger-like anterior process and one or more caudal setæ.

Tiarina, Bergh, Vid. Medd. 1879–80, p. 266. With skeleton consisting of simple needle-like spicules, arranged parallel to surface of body in several layers ; cilia more developed at the posterior pole than elsewhere. Based on *Coleps fusus*, Clap. & Lachm., *l. c.* figs. 1–3, now recorded from the Little Belt, Denmark.

Opalinopsis, Foettinger, (7) p. 367. Based on *O. sepiolæ*, id. *l. c.* pl. xxi. figs. 2, 3, 5, 8–15, pl. xxii. figs. 4, 5, 10–12, from liver of *Sepiola rondoletii*, Naples. Holotrichous ; no digestive cavity ; shape oval ; cuticle underlaid by spiral fibrils ; the nuclei are sometimes aggregated into a network ; the general structure closely resembles that of *Benedenia* [infrà] ; reproduction takes place by transverse fission ; a case of conjugation has been observed ; sea-water is not fatal to it. *O. octopi*, id. *l. c.* p. 372, pl. xxii. fig. 3, liver of *Octopus tetracirrhus*, Naples.

Benedenia, Foettinger, (7) p. 364. Based on *B. elegans*, id. *l. c.* pl. xix., pl. xx. figs. 1–7, pl. xxi. fig. 4, pl. xxii. figs. 6–9, from kidneys of *Sepia elegans*, Naples. It sometimes occurs in very great numbers. A cephalic enlargement is distinguishable ; the body is elongated and cylindrical, the largest specimen being 1·4 mm. long ; the body is entirely covered by cilia of one kind ; muscular fibrils exist immediately below the cuticle, arranged spirally round the body when the latter is extended ; the protoplasm is granular and contains non-contractile vacuoles ; there are from one to many small granular nuclei, sometimes connected by bands, sometimes round, sometimes ribbon-shaped ; no digestive cavity ; fission of the nucleus occurs ; reproduction takes place by transverse fission ; sea-water is fatal to life. *Benedenia coronata*, id. *l. c.* p. 364, pl. xx. figs. 8–11, pl. xxi. figs. 1 & 7, pl. xxii. figs. 1 & 2, kidneys of *Octopus vulgaris*, Naples. Agrees with *B. elegans* in all the more important particulars.

SUCTORIA.

Sphærophrya magna, Maupas, (12) p. 299, pl. xix. figs. 1–4 ; freshwater, Algiers. The tentacles often exhibit temporary dilatations below the terminal enlargement ; these are perhaps formed by the axial substance. *Infusoria* seized are rapidly killed ; suction of contents of prey observed ; a current is set up within the tentacle, whose external layer is thrown into constantly-changing folds. Reproduction is fissiparous.

Podophrya limbata, Maupas, (12) p. 306, pl. xx. figs. 7–9 ; marine, Algiers. Body and peduncle invested by a gelatinous covering.

Acineta pusilla, Maupas, (12) p. 310, pl. xx. figs. 10 & 11 ; marine,

Algiers. *A. jolii*, id. *l. c.* p. 311, pl. xx. figs. 1 & 2; marine, Algiers. When suitably prepared, the suckers may be seen to extend as delicate rods into the central region of the body. When killed with osmic acid, its nucleus has a vacuolated appearance. *A. emaciata*, id. *l. c.* p. 313, pl. xix. figs. 23–26; marine, Algiers. Exhibits great variation in its proportions, viz. from .008–.062 mm. in the vertical, and from .016–.057 in the horizontal diagonals. *A. fœtida*, id. *l. c.* p. 315, pl. xix. figs. 6–22; marine, often in putrefying water, Brittany and Algiers. Exhibits extensive variation in form and size. Nucleus vacuolated. Formation of endogenous embryos occurs in this and the preceding species. In *A. fœtida*, the embryo bears five annular ciliated grooves at the time of birth. When they become attached, the cilia are absorbed, after forming pearl-like drops of protoplasm.

Acineta livadiana, Mereschkowsky, (13) p. 214, pl. xii. fig. 10, Black Sea, near Livadia.

Acineta dibdalteria, Parona, (14) p. 84, fig.; sea-water, Gulf of Genoa.

Hemiophrya thouleti and *microsoma*, Maupas, (12) pp. 330 & 333, pl. xx. figs. 12, 13, & 3–6; marine, Algiers.

General Anatomy and Physiology.

Absorption of carbonic acid by *Infusoria*, possibly indicated by some experiments made by K. Semper, Die natürlichen Existenzbedingungen, &c. (see General Subject), p. 416 of English edition.

Ciliate *Infusoria* inhabited by a unicellular Alga identical with that which furnishes the green colour of *Hydra*, and now named by Brandt, (18) p. 143, *Zoochlorella conductrix*.

RHIZOPODA.

Chief Works.

16. Brady, H. B. Notes on some of the Reticularian *Rhizopoda* of the 'Challenger' Expedition. Q. J. Micr. Sci. xxi. p. 31.

Gives a classification of the *Foraminifera*, and short diagnoses of 101 new species, besides varieties, and a note on *Biloculina* mud.

17. ——. A. On some Arctic *Foraminifera* from Soundings obtained on the Austro-Hungarian North-Polar Expedition of 1872–74. Ann. N. H. (5) viii. p. 393, pl. xxi. B. Supplementary Note on some *Foraminifera* from soundings obtained by Capt. A. H. Markham, R.N., on the shores of Novaya Zemlya in 1879, *tom. cit.* p. 415.

A includes 71 species, 4 being new (for synonyms, see the paper itself). A German account has been published in 1882, in Denk. Ak. Wien, xliii., with plate.

18. Brandt, K. Ueber das Zusammenleben von Thieren und Algen. SB. Nat. Fr. 1881, p. 143.

19. [Brandt, K.] Untersuchungen an Radiolarien. MB. Ak. Berl., 1881, p. 388, 2 plates.

Studies on the synonymy, morphology, development, and pathology, chiefly of the *Sphæroideæ*. The "yellow cells" are especially dealt with.

20. Bütschli, O. *Protozoa* in H. G. Bronn's Klassen und Ordnungen des Thier-reichs. Leipzig & Heidelberg [see Zool. Rec. xvii.]: parts 8 & 9, pp. 225–320 [plates xiii. to xvi., published in 1880, refer to these sections].

Completes the account of the *Rhizopoda*, s. str., with an account of their geographical distribution, and of the chief fossil forms [the latter subject undertaken by C. Schwager], and commences the consideration of the *Heliozoa* with a description of their general structure and physiology as determined up to the present time.

21. ——. Beiträge zur Kenntniss der Radiolarienskelette, insbesondere der der Cyrtida. Z. wiss. Zool. xxxvi. p. 485, pls. xxxi.–xxxiii.

Chiefly the result of study of fossil forms from the Barbados Tripoli deposits. The systematic relations of the genera and families are considered, and many species figured in illustration.

22. Gruber, A. Der Theilungsvorgang bei *Euglypha alveolata*. Z. wiss. Zool. xxxv. p. 431, pl. xxiii.

23. ——. Die Theilung der monothalamen Rhizopoden. Z. wiss. Zool. xxxvi. p. 104, pls. iv. & v.

Argues in favour of the wide-spread occurrence of the fission method of reproduction in these forms, contending that it has been mistaken for copulation, and endeavours to show how the difficulties attending the process are overcome in forms which have a test, *i.e.*, by various modifications of the simple process. He concludes fission, in the form of cell-division, to be the only manner in which the *Thalamophora* are reproduced.

24. ——. *Dimorpha mutans*. Eine Mischforme von Flagellaten und Heliozoen. Z. wiss. Zool. xxxvi. p. 445, pl. xxix.

25. ——. Beiträge zur Kenntniss der Amœben. Z. wiss. Zool. xxxvi. p. 459, pl. xxx.

26. Häckel, E. Entwurf eines Radiolarien-Systems auf Grund von Studien der 'Challenger'-Radiolarien. Jen. Z. Nat. xv. pp. 418–472.

This paper, giving Latin diagnoses of the Orders, Families, Subfamilies, and minor divisions down to genera, of the *Radiolaria*, is a prodromus of a new classification arising out of the results of the 'Challenger' Expedition, and cannot be fully abstracted here. See below for the outlines. Häckel finds the same mixture of constant and variable species here as in other classes of the Animal Kingdom.

27. Vejdovsky, F. Ueber die Rhizopoden der Brunnenwässer Prag's. SB. böhm. Ges. 1880, p. 136.

Gives a list of 16 named species, describing 1 new and an alleged new genus.

28. Parona, C. Intorno alla corologia dei Rizopodi. Boll. scient. ii. [1880], p. 43.

A comparison of the Rhizopodan fauna of America with those of Europe and Italy. 40 species (enumerated) are common to Europe (exclusive of Italy) and America; 15 are common to America and Italy. This extensive agreement between the two continents is due to similar conditions causing the development of similar species.

J. Leidy, P. Ac. Philad. 1881, p. 9, under the heading, "Rhizopods as Food for Young Fishes," gives the results of the examination of the contents of the intestines of two species of *Catastomidæ*; *Myxostoma macrolepidotum*, from Macinaw Creek, North America, produced *Difflugia globulosa* and *acuminata*; *Eremyzon succetta* produced *Difflugia*, 3 spp., *Arcella*, 2 spp., and a doubtful form.

Nunn. On production of *Amœbæ* from yelk of egg; Am. J. Micr. vi. p. 24. Cited from J. R. Micr. Soc. (2) i. p. 473. (From infusion of egg in Pasteur's solution.)

B. Grassi. Contribuzione allo studio delle Amibe. Rend. Ist. Lomb. (2) xiv.

R. Hitchcock. Synopsis of the Fresh-water Rhizopods. New York: 1881, 8vo. A condensed account of the systematic part of Leidy's Fresh-water Rhizopods of North America [see Zool. Rec. xvi.], with the diagnoses (sometimes condensed or slightly amplified).

K. Möbius. "Ueber die Bedeutung der Foraminiferen für die Abstammungs-lehre." TB. Vers. Naturf. 1881, p. 81. [Not seen by the Recorder.]

Geographical Distribution.

Bütschli (20) gives tables of the distribution of the genera of the *Rhizopoda*, s. str., which show that in spite of the limited extent to which the subject has been studied, most of the fresh-water genera are known to be almost cosmopolitan in their range. Of the marine genera, a very large number are cosmopolitan. About half the 70 Calcareous genera and subgenera are wanting in the Arctic seas, and none are peculiar to these or to the North Temperate area; thus the warmer regions are the most favoured. But while on the one hand many genera have an increased number of species in tropical regions, a greater number are as prolific in species in temperate as in tropical waters. 12 genera are peculiar to tropical regions. The more complicated forms, as a rule, affect the warmer regions.

Arctic Seas. Table of distribution of the species obtained on the west side of Novaya Zemlya, and on the coast of Franz-Josef Land, by the Austro-Hungarian Expedition, given by Brady, (17). These localities differ from the American side of the Arctic Ocean in having the Arenaceous forms *Rheophax difflugiiformis*, *R. scorpiurus*, and *Haplophragmium nanum*, generally distributed. *Lagena* diminishes in frequency towards the north, while most Arenaceous forms are large and abundant there.

Lamlash Bay, Isle of Arran (Scotland): list of 28 species of *Foraminifera*, by F. PEARCEY, in W. A. HERDMAN'S Invertebrate Fauna of Lamlash Bay, P. Phys. Soc. Edinb. 1880–81, p. 19.

Firth of Forth: list of 35 species of *Foraminifera*, by G. LESLIE & W. A. HERDMAN, in Invertebrate Fauna of the Firth of Forth, P. Phys. Soc. Edinb. 1880–81, p. 201.

Mediterranean (deep sea). *Foraminifera* of the 'Travailleur' Expedition of 1881, reported briefly by A. MILNE-EDWARDS, C. R. xciii. p. 881; a new genus, *Amphicoryna* (see below), discovered.

Atlantic (deep). *Tom. cit.* p. 936; a *Euglypha*, resembling *Difflugia*, and some small *Actinophrys*, from 2260 mètres depth, are the only species mentioned.

HÄCKEL, (26) finds the *Radiolaria* divisible as to distribution into 3 groups:—A. *Pelagic*, from the surface; B. *Zonar*, moving in certain bathymetric zones, down to 20,000 feet and more; C. *Profound*, living on the bottom.

See also General Subject (*suprà*).

CLASSIFICATION.

BRADY, (16) p. 40, proposes the following as the result of his study of the 'Challenger' *Foraminifera*:—

Order FORAMINIFERA.

A. Test imperforate, chitinous . . . . . *Gromidæ*.

B. Test imperforate; normally porcellanous, sometimes encrusted with sand; in starved condition becoming chitinous, or chitino-arenaceous; at abyssal depths occasionally consisting of a thin homogeneous, imperforate, silicious lamina . *Miliolidæ*. (*Dactyloporinæ* included with doubt).

C. Test invariably arenaceous . *Astrorrhizidæ* (and all recent deep-water arenaceous forms except *Textularidæ*)—*Lituolidæ*, *Parkeridæ*.

D. Tests of the larger species arenaceous, either with or without a perforate, calcareous basis; smaller forms hyaline and conspicuously perforated . . . . . *Textularidæ*.

E. Test calcareous, finely perforate . . . *Chilostomellidæ* (*Chilostomella*, *Allomorphina*, *Ellipsoidina*) and *Lagenidæ*.

F. Test calcareous, generally very coarsely perforated, no trace of canal-system . . . . . *Globigerinidæ*.

G. Test coarsely perforate, a few of the higher forms with double chamber-walls and interseptal chambers . . *Rotalidæ*. (comprises *Rotalinæ*, with *Spirillina*).

H. Test very finely tubulated. All the higher types possessing a system of interseptal canals of greater or less complexity *Nummulinidæ*.

HÄCKEL (26) classifies the *Radiolaria* as follows:—

Subclass I. MONOCYTTARIA.

Order I. *Monopylaria*. Fam. 1, *Plectida*; 2, *Cyrtida*; 3, *Botrida*; 4, *Spyrida*; 5, *Stephida*.

Order II. *Peripylaria.* Fam. 6, *Sphærida*; 7, *Discida*; 8, *Zygartida*; 9, *Pylonida*; 10, *Lithelida.*

Order III. *Acantharia* (= *Acanthometræ*, J. Müller). Fam. 11, *Acanthonida*; 12, *Diploconida*; 13, *Dorataspida*; 14, *Sphærocapsida*; 15, *Litholophida.*

Order IV. *Collodaria.* Fam. 16, *Thalassocollida*; 17, *Thalassosphærida.*

Order V. *Phæodaria.* Fam. 18, *Phæocystida*; 19, *Phæogromida*; 20, *Phæosphærida*; 21, *Phæoconchida.*

[It is to be noted that this division of the *Phæodaria* is entirely different from that first put forth by the author. See Zool. Rec. xvi.]

Subclass 2, POLYCYTTARIA.

Order VI. *Symbelaria.* Fam. 22, *Collosphærida.*

Order VII. *Syncollaria.* Fam. 23; *Sphærozoida*; 24, *Collozoida.*

GENERA, SPECIES, &c., REFERRED TO.

RADIOLARIA.

Acanthometrida. Like the axial fibres of the pseudopodia of the *Heliozoa*, the acanthin spicules characteristic of this family are found by BRANDT, (19) p. 400, to be soluble in 10 to 20 per cent. solutions of chloride of sodium; they are similarly soluble in 1 per cent. solution of carbonate of soda; thus the substance composing them is better described as albumen than acanthin. The skeletons of siliceous *Radiolaria* contain an organic substance in addition to the silica.

Sphærozoida. BRANDT'S investigations, (19) p. 391, figs., have convinced him that the nuclei of these *Radiolaria* are not always homogeneous; at the commencement of spore-formation, they separate into two distinct substances, the one consisting of granules or filaments, and in mature spores of a complete network, and capable of taking a deep stain, the other only slightly susceptible to staining. The presence of a membrane on the central capsule is by no means universal; it is wanting in young specimens of *Sphærozoum punctatum* and in all specimens of *Collozoum inerme* and *pelagicum* in which spore-formation has not commenced; the connection between the different central capsules of the colony is brought about by the gelatinous substance.

Rhaphidozoum acuferum, *Sphærozoum italicum* and *spinulosum* are united by BRANDT, (19) p. 390, under the name *Sphærozoum acuferum.*

Sphærozoum ovodimare = *S. punctatum*, (19) p. 390, figs. 4–6, 10 & 54.

Collozoum inerme, (19) p. 393, figs. 11–13.

Cricoidea, term applied by BÜTSCHLI, (21) p. 493, to a group composed of the *Acanthodesmida*, *Lygocyrtida*, and *Cyrtida*; the *Lygocyrtida* appear to connect the other two families together.

Acanthodesmida. The genera *Lithocircus* and *Stephanolithis* defined by BÜTSCHLI, (21) pp. 496 & 497, and other genera discussed.

Zygocyrtida, (21) p. 501: probably derived from species of *Stephanolithis* wanting the secondary skeletal ring. *Dictyospyris*, *Ceratospyris*, *Cladospyris*, *Petalospyris*: characters revised. The species of the group may be associated with one or other of these four types, so as to

form the *Dictyospyris* group, &c., but a sharp distinction between the types is not possible. *Spiridobotrys*, Häckel, should be included in the family.

Cyrtida, Häckel, (21) p. 512 : no true *Monocyrtida* exist, as in all species the test is divided into two by a septum. Häckel's other subdivisions are also unnatural.

Clathrocanium, *Dictyophimus*, *Lithomelissa* : characters revised (21). Lists of the species assignable to the two latter are given.

Polycyrtida, Häckel : *Lithobotrys*, *Botryocampe*, *Arachnocorys*, *Eucecryphalus*, *Pterocanium*, *Podocyrtis*, *Rhopalocanium* : characters revised and lists of species given for most genera by Bütschli, (21) pp. 519–526. Natural groups of species range themselves around the genera *Cycladophora*, *Thyrsocyrtis*, *Eucyrtidium*, *Lithostrobus*, *Lithomitra*.

Some species of *Pterocanium* are placed with other forms under the new genus, *Pterocyrtidium*. *Lithopera*, *Lithochytris*, *Anthocyrtis*, *Calocyclas*, *Pterocodon*, *Dictyocephalus*, *Carpocanium*, *Cryptoprora*, *Litharachnium*, *Cornutella* : characters revised and lists of species given by Bütschli, *l. c.*

Wagnerellida, new Family of *Heliozoa* established by C. Mereschkowsky, Ann. N. H. (5) viii. p. 290, for the organism originally described by him as a Calcareous Sponge under the name *Wagnerella borealis* ; the spicules are siliceous. The Family is characterized by the formation of a skeleton of separate spicules, and the presence of a peduncle for attachment.

Wagnerella borealis : P. Mayer, Zool. Anz. iv. p. 592, now states that he has repeatedly observed pseudopodia, their structure and activity, in this form, and recommends fluoric acid for the study of this and other forms containing silex.

Heliozoa.

The group dealt with by Bütschli, (20) p. 267, as distinct from Radiolaria. Its most constant characteristics are those of the pseudopodia ; though exceptions occur even here, in which the amœboid type of pseudopodia is represented ; it may even replace the ordinary form. It seems probable that all species possess a nucleus. This organ shows a very close resemblance to that of the *Rhizopoda*, st. str. The wide distribution, but irregular occurrence, of green chlorophyll in these *Protozoa* is commented on. Free upward movements of the animal in liquids will probably prove to be caused by the development of gas within the body. Bütschli believes in a wide-spread occurrence of a true skeleton in these forms, whether constructed of gelatinous, siliceous, or foreign material. The reproductive processes resemble very closely those of the *Rhizopoda*. They consist of fission—sometimes accompanied by formation of colonies —formation of spores, and encystation combined with conjugation and copulation (the last is not yet proved to result in actual multiplication of individuals).

The systematic account of the divisions of the *Heliozoa*, down to genera, is commenced by Bütschli, (20) p. 318. He adopts as the four main divisions, *Aphrothoraca*, *Chalarothoraca*, and *Desmothoraca*, of

Hertwig, adding *Chlamydophora*. He recognizes in the class about 24 genera and 36 species, 7 of the genera being of uncertain soundness. Various species figured by him, *l. c.* pls. xiii.–xvi.

Actinophrys sol, some phenomena in the conjugation of; J. D. Cox, Am. Micr. J. ii. p. 183, figs. [Not seen by Recorder.]

Centropyxis nebelliformis, Vejdovsky, (27) p. 138, note, spring-water, Prague.

Plagiophrys sacciformis, (23) p. 116, pl. iv. figs. 30–37. Fission commences by the formation of an equatorial furrow in the test which ends in the division of the body in this direction.

FORAMINIFERA.

Globigerina dutrerteri, var. n. *borealis*, Brady, (16) p. 69, Arctic Seas.

Orbitolites tenuissimus, Carpenter, The Microscope and its Revelations, Ed. vi. p. 556, fig. 318, showing mode of reparation of broken disk.

Nummoloculina contraria, Steinmann, is in part *Hauerina contraria*, Brady, according to the latter, (16) p. 71.

Squamulina. Systematic position discussed by Carter, Ann. N. H. (5) vii. p. 364.

Saccammina sphærica. (17) pp. 400 & 402, the most prominent Foraminifer found off Franz-Josef Land; not found off Novaya Zemlya.

Proteonina fusiformis, Williamson, (17) p. 405, = *Rheophax scorpius*.

Haplophragmium nanum, Brady, (17) p. 406, pl. xxi. fig. 1.

Hippocrepina indivisa, Parker, (17) p. 407, pl. xxi. figs. 3 & 4.

Truncatulina lobatula, (17) p. 400, in northern seas, when adherent, assumes a coat of fine sand; so also some *Nonioninæ* and *Polystomellæ*, and some adherent arenaceous forms.

Lagena tricincta, Gümbel, = *Fissurina orbigniana*, Seguenza; Brady, (17) p. 410.

Arcella, (23) p. 111. Appears to agree with *Cyphoderia* in its mode of division.

Difflugia, (23) p. 112, pl. iv. figs. 16–18. Gruber believes the sand grains to be first taken into the protoplasm of the body and then arranged so as to form the shell.

Gromia socialis, (23) p. 115, pl. iv. figs. 21–24. The early stages of fission observed; an actively amœboid protoplasmic mass is extruded from the shell of the original cell and takes the adult form.

Cyphoderia ampulla, (23) p. 108, pl. iv. figs. 4–12. The later stages of fission observed at short intervals by Gruber; the young shell is at first quite transparent, and is not entirely filled with protoplasm; of the new nuclei formed by fission of the parent nucleus, the one destined for the young cell does not reach the latter until some time after this stage; it then becomes longitudinally striated, but loses this appearance soon afterwards; the shell is made up of small polygonal plates.

Euglypha alveolata, (22) p. 431, pl. xxiii. Fission occurs by protrusion of protoplasm from mouth of test and formation of new test over it, and by elongation of nucleus and its division into two parts, one of which remains in each test; the new test is formed by shell-plates detached from the old test; before its fission, the old nucleus becomes finely granulated,

form the *Dictyospyris* group, &c., but a sharp distinction between the types is not possible. *Spiridobotrys*, Häckel, should be included in the family.

Cyrtida, Häckel, (21) p. 512 : no true *Monocyrtida* exist, as in all species the test is divided into two by a septum. Häckel's other subdivisions are also unnatural.

Clathrocanium, *Dictyophimus*, *Lithomelissa* : characters revised (21). Lists of the species assignable to the two latter are given.

Polycyrtida, Häckel : *Lithobotrys*, *Botryocampe*, *Arachnocorys*, *Eucecryphalus*, *Pterocanium*, *Podocyrtis*, *Rhopalocanium* : characters revised and lists of species given for most genera by Bütschli, (21) pp. 519–526. Natural groups of species range themselves around the genera *Cycladophora*, *Thyrsocyrtis*, *Eucyrtidium*, *Lithostrobus*, *Lithomitra*.

Some species of *Pterocanium* are placed with other forms under the new genus, *Pterocyrtidium*. *Lithopera*, *Lithochytris*, *Anthocyrtis*, *Calocyclas*, *Pterocodon*, *Dictyocephalus*, *Carpocanium*, *Cryptoprora*, *Litharachnium*, *Cornutella* : characters revised and lists of species given by Bütschli, *l. c.*

Wagnerellida, new Family of *Heliozoa* established by C. Mereschkowsky, Ann. N. H. (5) viii. p. 290, for the organism originally described by him as a Calcareous Sponge under the name *Wagnerella borealis* ; the spicules are siliceous. The Family is characterized by the formation of a skeleton of separate spicules, and the presence of a peduncle for attachment.

Wagnerella borealis : P. Mayer, Zool. Anz. iv. p. 592, now states that he has repeatedly observed pseudopodia, their structure and activity, in this form, and recommends fluoric acid for the study of this and other forms containing silex.

Heliozoa.

The group dealt with by Bütschli, (20) p. 267, as distinct from Radiolaria. Its most constant characteristics are those of the pseudopodia ; though exceptions occur even here, in which the amœboid type of pseudopodia is represented ; it may even replace the ordinary form. It seems probable that all species possess a nucleus. This organ shows a very close resemblance to that of the *Rhizopoda*, st. str. The wide distribution, but irregular occurrence, of green chlorophyll in these *Protozoa* is commented on. Free upward movements of the animal in liquids will probably prove to be caused by the development of gas within the body. Bütschli believes in a wide-spread occurrence of a true skeleton in these forms, whether constructed of gelatinous, siliceous, or foreign material. The reproductive processes resemble very closely those of the *Rhizopoda*. They consist of fission—sometimes accompanied by formation of colonies—formation of spores, and encystation combined with conjugation and copulation (the last is not yet proved to result in actual multiplication of individuals).

The systematic account of the divisions of the *Heliozoa*, down to genera, is commenced by Bütschli, (20) p. 318. He adopts as the four main divisions, *Aphrothoraca*, *Chalarothoraca*, and *Desmothoraca*, of

Hertwig, adding *Chlamydophora*. He recognizes in the class about 24 genera and 36 species, 7 of the genera being of uncertain soundness. Various species figured by him, *l. c.* pls. xiii.–xvi.

Actinophrys sol, some phenomena in the conjugation of; J. D. Cox, Am. Micr. J. ii. p. 183, figs. [Not seen by Recorder.]

Centropyxis nebelliformis, Vejdovsky, (27) p. 138, note, spring-water, Prague.

Plagiophrys sacciformis, (23) p. 116, pl. iv. figs. 30–37. Fission commences by the formation of an equatorial furrow in the test which ends in the division of the body in this direction.

FORAMINIFERA.

Globigerina dutrerteri, var. n. *borealis*, Brady, (16) p. 69, Arctic Seas.

Orbitolites tenuissimus, Carpenter, The Microscope and its Revelations, Ed. vi. p. 556, fig. 318, showing mode of reparation of broken disk.

Nummoloculina contraria, Steinmann, is in part *Hauerina contraria*, Brady, according to the latter, (16) p. 71.

Squamulina. Systematic position discussed by Carter, Ann. N. H. (5) vii. p. 364.

Saccammina sphærica. (17) pp. 400 & 402, the most prominent Foraminifer found off Franz-Josef Land; not found off Novaya Zemlya.

Proteonina fusiformis, Williamson, (17) p. 405, = *Rheophax scorpius*.

Haplophragmium nanum, Brady, (17) p. 406, pl. xxi. fig. 1.

Hippocrepina indivisa, Parker, (17) p. 407, pl. xxi. figs. 3 & 4.

Truncatulina lobatula, (17) p. 400, in northern seas, when adherent, assumes a coat of fine sand; so also some *Nonioninæ* and *Polystomellæ*, and some adherent arenaceous forms.

Lagena tricincta, Gümbel, = *Fissurina orbigniana*, Seguenza; Brady, (17) p. 410.

Arcella, (23) p. 111. Appears to agree with *Cyphoderia* in its mode of division.

Difflugia, (23) p. 112, pl. iv. figs. 16–18. Gruber believes the sand grains to be first taken into the protoplasm of the body and then arranged so as to form the shell.

Gromia socialis, (23) p. 115, pl. iv. figs. 21–24. The early stages of fission observed; an actively amœboid protoplasmic mass is extruded from the shell of the original cell and takes the adult form.

Cyphoderia ampulla, (23) p. 108, pl. iv. figs. 4–12. The later stages of fission observed at short intervals by Gruber; the young shell is at first quite transparent, and is not entirely filled with protoplasm; of the new nuclei formed by fission of the parent nucleus, the one destined for the young cell does not reach the latter until some time after this stage; it then becomes longitudinally striated, but loses this appearance soon afterwards; the shell is made up of small polygonal plates.

Euglypha alveolata, (22) p. 431, pl. xxiii. Fission occurs by protrusion of protoplasm from mouth of test and formation of new test over it, and by elongation of nucleus and its division into two parts, one of which remains in each test; the new test is formed by shell-plates detached from the old test; before its fission, the old nucleus becomes finely granulated,

then striated longitudinally ; after its fission, the striation disappears ; then, but before the two tests separate, the protoplasm of the two becomes mixed by a circulating movement; the independence of the nucleus and body during fission appears to support the theory of their diverse character.

Lieberkuehnia wageneri of Siddall, according to Carpenter, The Microscope and its Revelations, Ed. vi. p. 473, note, is probably not Claparède & Lachmann's species.

Quadrula symmetrica, (23) p. 106.

Trinema acinus, (23) p. 108, pl. iv. fig. 3. Skeleton plates sometimes found detached within the shell.

Amœba actinophora, Auerbach, (25) p. 464, pl. xxx. figs. 9–17. A thin dermal layer of sarcode commonly invests the body, but is not permanently distinct from the rest of the sarcode.

New Genera and Species.

Radiolaria.

E. Haeckel (SB. nat. Fr. 1881, p. 67) adds to what he has already stated with regard to the *Radiolaria* collected during the 'Challenger' Expedition, that the greater part of the 2000 new species belong to the *Cystoidea* and *Sphæroidea*.

The following 483 new genera are diagnosed, together with previously known forms, by Haeckel (26) dichotomously, with various minor named sub-divisions :—

Class RADIOLARIA.

Order I. *MONOPYLARIA*.

Fam. Plectida : *Triplagia*, *Plagonium* (p. 423), *Tetraplagia*, *Plagiocarpa*, *Plagonidium*, *Hexaplagia*, *Hexaplagidium*, *Enneaplagia*, *Enneplagidium*, *Triplecta*, *Plectanium*, *Plectophora*, *Tetraplecta*, *Amphiplecta*, *Periplecta* (p. 424), *Pentaplegma*, *Hexaplegma*, *Enneaplegma*, *Plegmatium* (p. 425).

Fam. Cyrtida : *Cornutissa*, *Mitrocalpis*, *Archicorys*, *Archilophus*, *Cornutanna*, *Cornutosa*, *Cornutura*, *Acrocalpis*, *Echinocalpis*, *Cladocalpis*, *Archipilium*, *Pteropilium*, *Trissopilium*, *Tripleurium* (p. 427), *Tripterocalpis*, *Tripocalpis*, *Tripodiscus*, *Tripodiscium*, *Triprionium*, *Tripilidium*, *Tripodocorys*, *Tridictyopus*, *Bathropyramis*, *Cinclopyramis*, *Acropyramis*, *Cladopyramis*, *Peripyramis*, *Archiphormis*, *Archicapsa* (p. 428), *Halicapsa*, *Echinocapsa*, *Archibursa*, *Platybursa*, *Clathrobursa*, *Archipera*, *Archiperidium*, *Pteroperidium*, *Archiscenium*, *Cladoscenium*, *Pteroscenium*, *Archiphatna*, *Cladophatna*, *Coronophatna*, *Stephanophatna*, *Tetrarhabda*, *Tetracorethra*, *Tetrapteroma* (p. 429), *Acrocorona*, *Cladocorona*, *Cryptocephalus* [?], *Platycryphalus*, *Sethocorys*, *Cornutellium*, *Conarachnium*, *Phlebarachnium*, *Cladarachnium*, *Periarachnium*, *Sethodiscus*, *Dictyoprora*, *Platysestrum* (p. 430), *Anthocyrtidium*, *Eucyrtomphalus*, *Lamprodisculus*, *Psilomelissa*, *Sethomelissa*, *Callimitra*, *Sethopilium*, *Clathrolychnus*, *Lampromitra*, *Clathrocorona* (p. 431), *Lamprotripus*, *Lychnodictyum*, *Clathromitra*, *Clathrocorys*, *Tetraphormis*, *Pentaphormis*, *Hexaphormis*, *Enneaphormis*, *Cephalopyramis*, *Plectopyramis*, *Acanthocorys*, *Sethopyramis* (p. 432),

Sethocapsa, Cryptocapsa, Dicolocapsa, Cryptopera, Lophocapsa, Peromelissa, Micromelissa, Sethopera, Sethoperidium, Tetraedrina, Sethochytris, Sethophatna, Clistophatna (p. 433), *Tricolocampe, Cecryphalium, Axocorys, Trilampterium, Lampterium, Cycladophora, Theocorys, Lophocorys, Theosyringium, Clathrocyclas, Lamprocyclas, Diplocyclas* (p. 434), *Theopilium, Pterocorys, Pteropilium, Clathropilium, Arachnopilium, Dictyocodon, Theopodium, Dictyopodium* (p. 435), *Sestropodium, Pleuropodium, Pleurocorys, Theophormis, Theocanium, Tetralacorys, Pentalacorys, Hexalacorys, Theocapsa, Tricolocapsa, Tricolopera, Lophopera, Sestrornithium, Theopera* (p. 436), *Rhopalocanium, Rhopalatractus, Dictyatractus, Lithochytris, Theophæna, Theophatna, Lithocampium, Siphocampium, Eucyrtidium, Acanthocyrtis, Eusyringium, Anthocorys, Artocorys, Triacartus, Trictenartus, Pterocorythium, Artopilium, Acotripus, Plectotripus* (p. 437), *Artophormis, Tetracapsa, Artocapsa, Tetrapera, Artopera, Artophatna, Siphocampe, Spirocampe, Eucyrtis, Stichocyrtis, Spirocyrtis, Cyrtocoris, Stichocorys* (p. 438), *Stichocampe, Stichopilium, Stichopterygium, Clathropyrgus, Podocampe, Stichopodium, Stichophormis, Stichocapsa, Cyrtocapsa, Stichopera, Cyrtopera, Stichophatna* (p. 439).

Fam. Botrida: *Acrobotrys, Botryacantha, Botryopyle, Pylobotrys, Spyridobotrys, Echinobotrys, Botryocanna, Cannobotrys, Phormobotrys* (p. 440).

Fam. Spyrida: *Tripodospyris, Acrospyris, Tholospyris, Cladospyris, Lamprospyris, Triospyris, Triceraspyris, Tristylospyris, Cephalospyris, Dipodospyris, Dorcadospyris, Dendrospyris, Gamospyris, Stephanospyris, Dyospyris, Brachiospyris* (p. 441), *Tetraspyris, Giraffospyris, Elaphospyris, Taurospyris, Therospyris, Tessarospyris, Clathrospyris, Ægospyris, Pentaspyris, Phormospyris* (p. 442), *Sepalospyris, Patagospyris, Anthocyrtis, Liriospyris, Rhodospyris, Corythospyris, Lophospyris, Polyspyris, Tiarospyris, Gorgospyris, Thamnospyris, Desmospyris, Tricolospyris* (p. 443), *Perispyris, Amphispyris, Circospyris, Nephrodictyum, Paradictyum* (p. 444).

Fam. Stephida: *Eucoronis, Acrocoronis, Lithocoronis, Plectocoronis, Tripocoronis, Dipocoronis, Tetracoronis, Podocoronis, Triostephus, Tristephaniscus* (p. 445), *Trissocyclus, Trissocircus, Trissocircus* [bis!], *Tricyclidium, Zygostephus, Zygostephaniscus, Dyostephus, Dyostephanus, Dyostephaniscus, Parastephus, Parastephanus, Prismatidium* (p. 446), *Lithocubus, Acrocubus, Microcubus, Protympanium, Tympanium, Eutympanium, Paratympanium, Lithotympanium, Dendrocircus, Clathrocircus, Sphærocircus, Monostephus* (p. 447).

Order II. *PERIPYLARIA.*

Fam. Sphærida: *Phormosphæra, Ceriosphæra* (p. 448), *Xiphosphæra Xiphostylus, Lithomespilus, Saturnalis, Saturnalium, Staurosphæra, Staurostylus, Stylostaurus, Hexastylus, Hexastylidium, Rhaphidosphæra, Elaphococcus* (p. 450), *Conosphæra, Orosphæra, Melittosphæra, Cerasosphæra, Prunosphæra, Carposphæra, Sphærostylus, Saturnulus, Staurolonche, Staurancistra, Hexalonche, Hexalonchidium, Hexancistra, Hexapitys* (p. 451), *Heliosoma, Drymosphæra, Rhodosphæra, Sethosphæra, Thecosphæra, Amphisphæra, Amphistylus, Stauracontium, Hexacontium, Hexadrymium, Hexadendrum* (p. 452), *Echinomma, Pityomma, Lychnosphæra, Cromyo-*

sphæra, Cromyosphærium, Stylocromyum, Cromyostylus, Staurocromyum, Cromyostaurus, Hexacromyum, Hexacromydium (p. 453), *Cromyechinus, Cromyodrymus, Caryosphæra, Caryoxiphus, Caryostylus, Caryodoras, Caryolonche, Caryostaurus, Staurocaryum, Hexacaryum, Arachnopegma* (p. 454), *Spongoplegma, Plegmosphæra, Styptosphæra, Spongostylus, Spongostylium, Spongolonche, Staurodoras, Hexadoras, Hexadorium, Hexadoridium* (p. 455), *Rhizoplegma, Spongopila, Spongosphærium, Spongechinus, Spongodrymus* (p. 456).

Fam DISCIDA: *Sethodiscus, Phacodiscus, Perizona, Sethostylus, Heliostylus, Phacostylus, Triactis, Sethostaurus, Heliostaurus, Phacostaurus, Astrostaurus, Heliosestrum, Heliocladus, Heliodrymus, Astrosestrum, Astrophacus* (p. 457), *Amphicyclia, Tripocyclia, Staurocyclia, Coccostaurus, Astrocyclia, Coccocyclia, Diplactura, Amphactura* (p. 458), *Trigonactura, Hymenactura, Astractura, Stauractura, Pentactura, Hexactura, Porodiscus, Perispira, Centrospira, Atactodiscus, Perispongidium* (p. 459), *Xiphodictya, Tripodictya, Staurodictya, Stylochlamydium, Stylospongidium, Amphibrachium, Amphymenium, Amphirhopalum, Amphicraspedum, Chitonastrum, Hagiastrum, Tesserastrum, Dicranastrum, Ceratastrum, Myelastrum, Tricranastrum* (p. 460), *Pentalastrum, Pentinastrum, Hexalastrum, Hexinastrum, Spongophacus, Spongolonche, Spongotripus, Spongostaurus, Spongobrachium* (p. 461).

Fam. ZYGARTIDA: *Artiscus, Artidium, Stylartus, Cannartus, Didymophormis* (p. 462), *Cyphinus, Panarium, Ommatartus, Zygartus* (p. 463).

Fam. PYLONIDA: *Pylocapsa, Amphipyle, Amphipylonium* (p. 463), *Triopyle, Tetrapylonium, Tetraspongonium, Hexapyle, Hexaspongonium, Octopyle, Pylonium* (p. 464).

Fam. LITHELIDA: *Phorticium, Spongophortis, Soreuma, Soreumidium, Spireuma, Drymospira* (p. 464).

Order III. *ACANTHARIA.*

Fam. ACANTHONIDA: *Acanthonia, Astrolonche, Phractacantha, Doratacantha, Stauracantha, Phatnacantha* (p. 465), *Stauroptera, Xiphoptera, Staurolonche, Staurobelone, Staurodoras, Staurolithium, Acantholonche, Amphilithium, Amphibelone* (p. 466).

Fam. DIPLOCONIDA: (none new).

Fam. DORATASPIDA: *Phractaspis, Pleuraspis, Stauraspis, Echinaspis* (p. 467), *Thoracaspis, Orophaspis, Acontaspis, Belonaspis, Ceriaspis, Coleapsis, Tessaraspis, Icosaspis, Phatnaspis, Stegaspis, Lychnaspis, Phractopelma, Stauropelma* (p. 468), *Dorypelma, Tessaropelma* (p. 468).

Fam. SPHÆROCAPSIDA: *Sphærocapsa* (p. 469).

Fam. LITHOLOPHIDA: *Astrolophus* (p. 469).

Order IV. *COLLODARIA.*

Fam. THALASSOCOLLIDA: *Thalassopila* (p. 469), *Thalassophysa* (p. 470).

Fam. THALASSOPHÆRIDA: *Thalassoxanthium* (p. 470).

Order V. *PHÆODARIA* [*PHÆO-*].

Fams. PHÆOCYSTIDA, PHÆOGROMIDA, PHÆOSPHÆRIDA, and PHÆOCONCHIDA. [The names of various known and presumably new genera of

this Order are given, unaccompanied by even the slightest diagnosis, and with a reference to SB. Ges. Jena, 1879, where also no diagnosis is given of the new forms. (See Zool. Rec. xvi. *Prot.* p. 8.) The new genera still remain uncharacterized, and are therefore not mentioned here.]

Order VI. *SYMBELARIA.*

Fam. Collosphærida: *Acrosphæra*, *Tribonosphæra* (p. 471), *Clathrosphæra*, *Xanthiosphæra* (p. 472).

Order VII. *SYNCOLLARIA.*

Fams. Sphærozoida and Collozoida (none new).

Aulosphæra pourtalesi, Duncan, J. R. Micr. Soc. (2) i. p. 174, pl. iii. figs. 1–3, Caribbean Sea, 280 fath., in calix of *Lophohelia*.

Calothamnus davidoffi, Bütschli, (21) p. 486, pl. xxxi. figs. 1–5, Villefranche Bay. Diameter 1½ centim.

Zygocircus, Bütschli, (21) p. 496. Name proposed for the bilaterally symmetrical species of *Lithocircus*.

Sphærozoum neapolitanum, Brandt, (19) p. 390, figs. 14–18, Gulf of Naples. The colonies exceed in size all other *Radiolaria* except *Collozoum inerme*. It is doubtful whether the constrictions exhibited by the vacuoles ever lead to fission of the colony. The individuals which produce the two kinds of spores — crystalline and non-crystalline — are simply two different stages of development of the same species; the same is the case with *Sphærozoum punctatum*, and there appears reason to believe in a similar plurality of methods of development, or alternation of generations, in all species of the *Sphærozoidæ*.

Foraminifera.

Biloculina comata, Brady, (16) p. 45.

Miliolina insignis, *cultrata*, *transverse-striata*, *separans*, *rupertiana*, *parkeri*, *incrassata*, id. (16) pp. 45 & 46.

Hauerina borealis, North Atlantic, *circinata*, id. (16) pp. 46 & 47.

Orbitolites laciniatus, id. (16) p. 47, Friendly Islands and Fiji.

Astrorrhiza crassatina, *angulosa*, id. (16) pp. 47 & 48.

Rhabdammina discreta, id. (16) p. 48.

Botellina labyrinthica, id. (16) p. 48.

Rheophax ampullacea, *bacillaris*, *rudis*, *dentaliniformis*, *guttifera*, *distans*, id. (16) pp. 49 & 50. *R. arctica*, id. (17) p. 405, pl. xxi. fig. 2, West of Novaya Zemlya.

Discorbina wrighti, id. (17) p. 413, pl. xxi. fig. 6, = *D. parisiensis*, Wright, pt., West of Novaya Zemlya, and N.E. coast of Ireland, and deeper water, N. Atlantic.

Holophragmium foliaceum, *rotulatum*, *scitulum*, *turbinatum*, *nanum*, id. (16) p. 50.

Placopsilina bulla, id. (16) p. 51.

Ammodiscus tenuis, *spectabilis*, id. *ibid.*

Hormosina carpenteri, *monile*, *normani*, id. (16) pp. 51 & 52.

Trochammina galeata, *nitida*, id. (16) p. 52.

Cyclammina orbicularis, *pusilla*, id. (16) p. 53.

Textularia siphonifera, Brady, (16) p. 53.
Bigenerina robusta, id. (16) p. 54.
Clavulina caperata, indiscreta, id. (16) pp. 54 & 55.
Tritaxia lepida, id. (16) p. 55.
Bulimina subteres, subcylindrica, williamsoniana, id. (16) pp. 55 & 56.
Bolivina porrecta, limbata, tenuis, lævigata, tortuosa, pygmæa, robusta, decussata, hantkeniana, karreriana, lobata, schwageriana, amygdala[li]formis, subangularis, id. (16) pp. 57–59.
Cassidulina parkeriana, jonesiana, subglobosa, id. (16) p. 59 & 60.
Ehrenbergina hystrix, id. (16) p. 60.
Lagena botelliformis, quinque-latera, stelligera, longispina, unguiculata, samara, tubulifera (with var. *tenuistriata*), *fimbriata, auriculata* (with vars. *typica, substriata* and *costata*), *squamosa-alata, variata, exsculpta, wrightiana, favoso-punctata, schulzeana, trigono-ornata, plumigera, quadrulata, torquata, hertwigiana*, id. (16) pp. 60–63.
Nodosaria intercellularis, abyssorum, id. (16) p. 63.
Vaginulina spinigera, id. (16) p. 63.
Cristellaria siddalliana, gemmata, id. (16) p. 64.
Polymorphina longicollis, id. (16) p. 64.
Uvigerina spinipes, id. (16) p. 64.
Sagrina volumellaris, bifrons, id. (16) p. 64.
Discorbina tabernacularis, id. (16) p. 65.
Truncatulina rostrata, robertsoniana, margaritifera, soluta, id. (16) pp. 65 & 66.
Pulvinulina procera, id. (16) p. 66.
Polystomella imperatrix, verriculata, id. (16) p. 66.
Cycloclypeus guembeliana, Fiji Islands, *carpenteri*, Borneo, *id.* (16) pp. 66 & 67 (the latter merely named incidentally).
Nonionina orbicularis, id. (17) p. 415, pl. xxi. fig. 5, West of Novaya Zemlya and North Atlantic.
Amphicoryna. Name assigned to a representative of a new genus collected by the French ship 'Travailleur,' Mediterranean, deep sea; (Schlumberger, MS.) A. Milne-Edwards, C. R. xciii. p. 881: at first it has the form of *Cristellaria*, and then assumes that of *Nodosaria*.
Psammatodendron[-drum], Norman. Mentioned by Brady, (17) p. 404, as a MS. genus; Brady gives a few details of a species assigned to it in MS. by Norman, viz., *P. arborescens*, Norway, and off Novaya Zemlya and Franz-Josef Land.
Rotalia arenacea, Carter, Ann. N. H. (5) vii. p. 363, pl. xviii. fig. 10, Gulf of Manaar and Basse Rocks, Ceylon. Possibly identical with *R. inflata*, Williamson.
Microgromia ambigua, Archer, Ann. N. H. (5) vii. p. 230, pools on moors.
Astramœba, Vejdovsky, (27) p. 138, formed to contain a species named *Amœba radiosa*? Auerb., not described.
Amœba tentaculata, Gruber, (25) p. 460, pl. xxx. figs. 1–8, sea-water. The body is invested by a thin dermal layer, which is continued over all prominences, but is ruptured for the egress of pseudopodia; the surface is beset with longitudinal folds.
Dimorpha, Gruber, (24) p. 447; based on *D. mutans*, id. *l. c.* pl. xxix.,

from stream near Lindau. Provided with two flagella, and also with radiating pseudopodia, resembling closely those of the higher *Heliozoa*; the latter may be entirely withdrawn, leaving the animal in a wholly Flagellate condition, but the flagella always remain. There is a large contractile vacuole, and in the Monad condition an aggregation of transparent sarcode at the anterior pole. The Heliozoan condition is resumed when the animal comes to rest. Food particles are taken in at any point in the periphery. The details of the reproduction are not known with certainty.

[*Dimorpha* is placed for convenience among the *Rhizopoda*, although the author considers it as intermediate between that group and the *Flagellata*.—RECORDER.]

General Anatomy and Physiology.

According to BRADY (16), of bottom mud, obtained from a depth of 1862 fath. near the Färöe Islands, about 4 per cent. was formed by surface organisms, while 50 per cent. of the washed material was *Biloculina ringens*, and 20 per cent. *Holophragmium subglobosum*. The *Biloculina* tests showed on analysis an absence of phosphates, and of all earthy carbonates except carbonate of lime. To the east of Finmark, Bear Island, and Spitzbergen, the bottom is distinguished by the occurrence of *Rhabdammina* in such abundance as to form a *Rhabdammina*-ooze.

Holophragmium subglobosum; analysis of the tests given by Brady (16) shows them to be composed of: Silica, 76.1 per cent.; peroxide of iron with alumina, 16.3 per cent.; and carbonate of lime, 7.3 per cent.

H. J. CARTER, Ann. N. H. (5) vii. p. 364, speaking of *Rotalia arenacea*, considers that every Foraminifer with a calcareous test may be represented by an arenaceous form.

E. HÄCKEL, SB. Ges. Jena, 1881, p. 35, is reported as making some remarks on the bathymetric distribution of the *Radiolaria*, and the relations of their skeleton to this distribution.

The yellow cells of the *Sphærozoidæ* are, in BRANDT'S view, (19) p. 396, morphologically and physiologically distinct from the *Radiolaria* which they inhabit. He bases this opinion on the constant characters which they exhibit in many very different *Radiolaria*, and on their absence or variation in numbers in individuals of a given species, and on their peculiar behaviour towards re-agents. Their containing-membrane consists of plant cellulose, and their granules are amyloid: further, they live after the death of their host; they also strongly resemble the Saprolegnious parasite *Pythium actinosphærii*, found in *Actinosphærium eichhorni*. They are formed into a new genus of Unicellular *Algæ*, *Zooxanthella*, by the same author (18); those of *Collozoum inerme* are named particularly *Z. nutricula*, and are probably identical with those of the other *Polycyttaria*, and of many *Monocyttaria*.

Actinosphærium eichhorni. The above-mentioned Saprolegnious parasite *Pythium*, inhabiting the lacunæ of this Rhizopod, is described and figured in sitû and in various stages by BRANDT, (19) p. 399, figs. 33–53, under the name *P. actinosphærii*.

FOSSIL RHIZOPODA.

Chief Works.

29. De la Harpe, P. Étude des Nummulites de la Suisse, et Révision des espèces Éocènes des genres *Nummulites* et *Assilina*. Abh. schw. pal. Ges. vii. No. 2, pls. i. & ii.

Gives a full account of the distribution, &c., with elaborate tables of species.

30. Römer, F. Lethæa Geognostica. Theil. i. Lethæa Palæozoica. Stuttgart: 1880, 8vo.

The *Foraminifera* of the Carboniferous and Permian rocks are discussed in the chapter, p. 259, *et seq.*, devoted to the *Protozoa*; diagnoses of the known genera and species are given.

31. Steinmann, G. Microscopische Thierreste aus dem deutschen Kohlenkalke (Foraminiferen und Spongien). Z. geol. Ges. xxxii. p. 394, pl. xix.

Hamilton, A. On the *Foraminifera* of the Tertiary Beds at Petane, near Napier. Tr. N. Z. Inst. xiii. p. 393, pl. xvi.

Describes and figures 11 known species of *Foraminifera* from G. B. Vine's examination of this New Zealand collection.

Häusler, R. Note sur une zone à Globigérines dans les terrains jurassiques de la Suisse. P.-v. Mal. Belg. x. p. ccxli.

About 12 genera of *Foraminifera* have been identified from the lower beds of the white Jura of Argovia, but *Globigerina* is remarkable amongst them for being restricted in its distribution.

De la Harpe, P. Note sur les *Nummulites Partschi* et *Oosteri*, De la H., du calcaire du Michelsberg près Stockerau et du Gurnigelsandstein de Suisse. Bull. Soc. Vaud. (2) xvii. [1880] pp. 33–40, pl. iii.; abstract in Verh. geol. Reichsanst. 1881, p. 42.

——. Note sur la distribution par couples des Nummulites Éocènes *L. c.* p. 429.

The author draws attention to the occurrence in various Tertiary formations of pairs of species of *Nummulites* and *Assilina*, and states his belief that the two forms in each of these cases are distinct species, and not merely varieties of one species. (See Munier-Chalmas, *infrà*.)

This author also gives, in Verh. schw. Ges. lxiii. p. 51, some details of the *Nummulites* of the Western Alps, and the distribution of Nummulitic rocks in Switzerland,

K. A. Zittel. Handbuch der Palæontologie. München: 1879, 8vo, Bk. i. Lief. ii. figs. Deals with Sponges at p. 129. Various species figured; systematic account, with diagnoses of groups down to genera, on the same lines as the author's previous works on Fossil Sponges, noticed in Zool. Rec. xvi., &c.

Fossil *Foraminifera* of Siena (province), note on, by D. PANTANELLI, Atti Soc. Tosc. v. p. 237.

List of chief forms of Northern Apennines by C. DE STEFANI, *tom. cit.* pp. 251 & 252.

Lists of the *Foraminifera* of the Tertiary formations of Western France given by G. VASSEUR, Ann. Sci. Géol. xiii. pp. 1–432, arranged according to strata.

GENERA, SPECIES, &c., REFERRED TO.

To the *Protozoa*, are appended by RÖMER (30), the genus *Receptaculites* and its allies, for which a distinct family, *Receptaculitidæ*, is formed, to include *Receptaculites*, *Ischadites*, *Cyclocrinus*, *Pasceolus*, *Archæocyathus*, *Tetragonis*, and a new genus. Several of the species are figured.

Dactyloporidæ excluded by BÜTSCHLI, (20) p. 227, from the Animal Kingdom.

2 species of *Nummulites* and 1 of *Orbitoides* from a Tertiary deposit in Java mentioned by R. D. M. VERBEEK, Verh. Ak. Amst. xxi. iii. p. 21.

Nummulites. Munier-Chalmas is recorded as mentioning 4 species and 2 *Assilinæ*, which he finds to be dimorphic; Bull. Soc. Geol. (3) viii. p. 30.

Endothyra. Steinmann, (31) p. 399, finds that in two species the shell-structure is not homogeneous, and pore-canals do not exist.

Three other spp. of fossil *Foraminifera* figured; *id. l. c.*

Cribrostomum, Von Müller, = *Climacammmia*, Brady; (16) p. 54.

NEW GENERA AND SPECIES.

Stephanolithis muelleri, hæckeli, Bütschli, p. 499, pl. xxxi. figs. 8 & 6, Barbados tripoli.

Dictyospyris sphæra, Bütschli, (21) p. 511, pl. xxxii. fig. 15, Barbados tripoli.

Clathrocanium ? ehrenbergi, Bütschli, (21) p. 515, pl. xxxi. fig. 18, Barbados tripoli. May possibly prove to belong to a new genus.

Pterocyrtidium, Bütschli, (21) p. 531. Based on *P. zitteli*, id. *l. c.* pl. xxxiii. fig. 28, fossil in Barbados tripoli, and on species of *Pterocanium*, Ehrenberg, &c.

Ceratocyrtis, Bütschli, (21) p. 536. Formed to contain *Cornutella mitra, cucullaris, ampliata*, and perhaps *circularis*, Ehrenberg. The head, though well developed, is, in appearance, barely distinct from the next segment.

Saccammina ? eriana, J. W. Dawson, Canad. Nat. (n.s.) x. p. 5, fig. 3, Devonian limestone, Ohio.

Cornuspira carbonaria, Trochammina rœmeri, spp. nn., Steinmann, (31) p. 396, pl. xix. figs. 1 & 2, Carboniferous limestone.

Tetragonis eifelensis, Römer, (30) p. 304, fig. 56, Devonian.

Polygonosphærites, g. n., Römer, (30) p. 296. Based on *Sphæronites tessellatus*, Phillips, and other species.

Stromatopora porchovensis, H. Trautschold, Bull. Mosc. lvi. p. 438 Devonian of River Schelonj, Russia.

Coccoliths in the fossil state in flint; H. J. CARTER, Ann. N. H. (5) vii. p. 312. In Chalk; G. C. WALLICH, *op. cit.* viii. p. 49.

FLAGELLATA, MONADS, &c.

Chief Works.

32. Bergh, R. S. Der Organismus der Cilioflagellaten. Morph. JB. vii. p. 177, pls. xii.–xvi. [A short account of this paper is given by the author under the title, "Bidrag till Cilioflagellaternes Naturhistorie," in Vid. Medd. 1881, p. 60.]

A histological and systematic study of some genera of *Cilioflagellata*; the results are summed up in a classification and some phylogenetic trees. Tables are given which show an immense range of variability in the proportions of certain species. 5 new species described from the Baltic.

33. Cunningham, J. D. On the Development of certain Microscopic Organisms occurring in the Intestinal Canal. Q. J. Micr. Sci. xxi. p. 234, pl. xviii., and 26 woodcuts.

Stated to have been first published as an appendix to the fifteenth Annual Report of the Sanitary Commission of India.

33a. Geddes, P. Sur une nouvelle sous-classe d'Infusoires. C. R. xciii. p. 1083.

34. Kunstler, J. Contribution à l'étude des Flagellates. C. R. xciii. pp. 602 & 746; reported in Ann. N. H. (5) viii. p. 390.

35. Maggi, L. Tassonomia e corologia dei Cilioflagellati. Boll. scient. ii. [1880] p. 7.

Gives a classified list of the described genera and species, recent and fossil, with references and synonyms, and with the distribution of each species.

And see Kent, W. S., suprà [*Infusoria*].

L. Maggi. Intorno ai Cilioflagellati. Nota corologica. Rend. Ist. Lomb. (2) xiii.

J. Smita. Ueber Moneren, xix. Programm d. erst. deutsch. Staats-Oberrealschule. Prag: 1880, 8vo, 1 plate. [Not seen by Recorder.]

Faunæ.

Denmark. See Bergh (32).
Italy. See General Subject.

Classification.

Bergh (32) considers the *Flagellata* as a starting-point from which have diverged in different directions the *Noctilucæ*, the *Rhizopoda*, the *Cilioflagellata*, and, by way of the latter group, the *Peritricha*, which he regards as the most ancient of the *Ciliata*. He believes the anterior,

oral pole of the *Flagellata* to represent the hinder and ab-oral pole of the *Ciliata*. At p. 273, he classifies the *Cilioflagellata* as follows :—

Fam. 1. *Adinida*. Body compressed ; both flagellum and cilia placed at the anterior pole ; neither transverse nor longitudinal furrows ; a membrane present. Genus *Prorocentrum*.

Fam. 2. *Dinifera*. A transverse, and usually also a longitudinal, furrow occurs ; flagellum more or less displaced backwards from the anterior end ; naked or provided with a membrane.

Subfam. 1. *Dinophyida*. Genera, *Dinophysis*, *Amphidinium*.

Subfam. 2. *Peridinida*. Genera, *Protoperidinium*, *Peridinium*, *Protoceratium*, *Ceratium*, *Diplopsalis*, *Glenodinium*.

Subfam. 3. *Gymnodinida*. Genera, *Gymnodinium*, *Hemidinium*, *Polykrikos* [*-cricus*].

The *Adinida* appear to connect the group with the *Flagellata*. Phylogenetic trees are given to show the mutual relations of the chief forms.

PULSATORIA, a new sub-class of *Infusoria*, formed by GEDDES, (33A), to contain *Pulsatella*, g. n. (*infrà*).

GENERA, SPECIES, &c., REFERRED TO.

Systematic descriptions, with synonyms, are given by KENT, (10) pp. 433–469, of those families, genera, and species of the Flagellate *Infusoria* which were not included in parts 1–3 of the Manual of the *Infusoria*. Many, viz., in Order *Cilioflagellata* and part of *Flagellata-Eustomata*, of the species are figured ; only the new genera and species are noticed below. The new families *Sphenomonadidæ*, *Heteromastigidæ*, *Mallomonadidæ*, *Stephanomonadidæ*, and *Trichonemidæ* are established.

The following are the chief general results of BERGH's anatomical studies of the *Cilioflagellata*, (32) p. 266. These forms are bilaterally asymmetrical (but see *Prorocentrum*, infrà) ; a cell-membrane is wanting in but two genera, and consists of cellulose or a similar carbo-hydrate. The protoplasm is probably always differentiated into an ectoplasm and an endoplasm, the former of very simple structure in the testaceous, but variously differentiated in the naked forms ; the latter contains either chlorophyll, diatomin, and starch, or an amyloid allied to the latter, or else the remains of other organisms, or none of these. Existence of contractile vacuole not proved. Nucleus usually single. The cilia are placed either directly in the anterior margin of the body, or on either one or two contractile bands which lie in the transverse furrow. Little is known with certainty as to reproduction in the group ; both fission and conjugation occur. The former takes place either in the free or encysted state, or in an intermediate state, in which the animal is entirely withdrawn within its membrane.

Peridinium tabulatum, *cinctum*, *apiculatum*, and *Ceratium furca*, synonyms and distribution ; they all occur in the Lake of Lobbio (Trent). MAGGI (2).

Ceratium characterized and species classified and characterized by BERGH, (32) pp. 195 & 216.

Ceratium furca, (32) p. 195, figs. 1–3, 13–20. Tables showing variation in proportions of different individuals; thus, in a series of 7 varieties, the distance from the end of the anterior horn to that of the left posterior one may vary from ·145 to ·3 mm., the distance between the ends of the two posterior horns from ·037 to ·079 mm., the breadth of the transverse groove from ·031 to ·057 mm. The stripes of the skeletal membrane consist of elongated thickenings of its outer wall; the fine points are pores which penetrate the skeletal membrane; the latter consists of an organic substance which shows the cellulose reaction with iodine, but is insoluble in ammoniate of copper; the posterior horns may or may not bear small hooks outside and inside; the protoplasm contains starch or some other amyloid substance, diatomin, and chlorophyll, hence is probably nourished like a plant. No contractile vacuole was observed.

Ceratium tripos, (32) p. 204, figs. 4–6, 21–27. A table shows very considerable variations in proportions to occur between different individuals, and that the stoutness of the body is inversely proportional to that of the horns. The species is connected with *C. furca* by varieties of both forms; the chemical and histological proportions of the different parts agree with those of *C. furca*.

Ceratium fusus, (32) p. 208, figs. 7, 8, 28–32. The relations to one another of the lengths of the two horns may vary from ·253 : ·110 mm. to ·088 : ·264 mm., and the small right posterior horn may be either quite rudimentary or fully developed, even though small; the protoplasm almost invariably contains a transparent vesicle filled with liquid.

Ceratium cornutum, (32) p. 211, figs. 9–11, 33–35. A table of variations in the proportions shows that the right posterior horn may entirely disappear; the skeletal membrane is divided up by a regular network of lines; no pores have been found in it as in the three preceding species; the membrane is frequently wanting over a large part of the surface.

Ceratium hirudinella, (32) p. 215, fig. 12. In the structure of the skeletal membrane, it agrees with *C. cornutum*.

Dinophysis, (32) p. 217 & 226, characterized. *D. acuta*, p. 218, figs. 49–52. Variation in proportions not great; the chemical composition and the microscopic structure of the different parts agree in general with those of *Ceratium* (see above).

Dinophysis michaelis ?, (32) p. 224, figs. 53 & 54. *D. lævis*, p. 224, fig. 55; variation very slight.

Peridinium, (32) pp. 234 & 241, characterized. *P. divergens*, p. 234, figs. 39–45, includes *depressum*, Bailey. In structure and chemical properties, the skeletal membrane closely resembles that of *Protoperidinium pellucidum*, sp. n. (vide *infrà*). The protoplasm contains numerous red fat-globules, and usually a transparent vesicle. The proportions show great variations in the different varieties.

Peridinium tabulatum, (32) p. 239, figs. 37 & 38. The skeleton agrees essentially with that of *P. divergens*, but the protoplasm contains diatomin, chlorophyll, and starch, and few or no fat-globules.

Peridinium arcticum, Ehrb., *P. longipes*, *depressum*, *carolinianum*, Bailey, referred by MAGGI (35) to *Ceratium*.

Glenodinium, (32) pp. 246 & 251, characterized. *G. cinctum*, l. c.

figs. 65–67. Variations in proportions very slight. Skeletal membrane quite structureless ; the protoplasm contains diatomin, chlorophyll, and starch, and sometimes a few red oil-globules. Fission takes place within globular cysts, which contain naked individuals ; probably they have become encysted after throwing off the skeletal membrane.

Glenodinium tabulatum, *apiculatum*, Ehrb., *roscolum*, *inæquale*, Schm., referred to *Peridinium* by MAGGI, (35).

Gymnodinium, (32) pp. 251 & 255, characterized. *G. gracile*, p. 251, figs. 68 & 69. Protoplasm distinctly divided into ectoplasm and endoplasm ; the former is truly albuminoid, the latter contains no diatomin, chlorophyll, or starch, but very frequently remains of other organisms.

Polykrikos[*cricus*], l. c. pp. 255 & 259, characterized. It is to be considered as equivalent to a colony of *Gymnodinium*.

Prorocentrum, (32) pp. 259 & 265, characterized. *P. micans*, p. 260, figs. 56 & 59, is exceptional in its group in being strictly bilaterally symmetrical. The skeletal membrane consists of two valves, perforated with pores, and is composed of cellulose. The protoplasm contains diatomin, chlorophyll, and starch, and has two vacuoles, which are probably contractile.

Transverse striation of flagella in various *Flagellata*, recorded by KUNSTLER, (34) p. 603.

Rhipidodendrum splendidum, Stein, (6) p. 242, from New Jersey.

Hexamita (probably) described from intestine of patient affected with enterocolitis, in Italy ; Gazz. Med. Ital. Lomb. xxxix. p. 286.

Phacus pleuronectes, Dujardin. KUNSTLER, (34) p. 605, is able to develope a large and brilliant eyespot in this species by exposure to a strong light. The spot consists of irregularly pyriform red granules, with a turned-up end ; it is their exterior alone which is coloured ; they enclose a transparent, refractive lenticular body. The ocular function of the organ appears thus established.

Vampyrella and *Nuclearia* characterized by BÜTSCHLI, (20) p. 320.

Nuclearia delicatula, Cienkowsky, (20) p. 296, note. Includes *Heterophrys varians*, F. E. Schulze, and *Heliophrys variabilis*, Greef.

Chlamydomonas pulvisculus has four striated flagella—W. KUNSTLER, (34)—placed round the margins of an opening. The body-walls consist of four layers, the deepest of which contains polygonal grains of starch, which are almost in contact. The interior of these grains is apparently absolutely liquid ; the outer three body-walls layers are finely vacuolated, the vacuoles being filled with a watery protoplasm. There is a stomach, but no œsophageal tube. The contractile vacuole communicates with the exterior by a pore which opens into the digestive vestibule. The nucleus is vacuolated, and contains nucleoli; each surrounded by protoplasm ; the masses thus formed within the nucleus divide, become detached from it, and fall into a tube which leads from the bottom of the vestibule into an incubating chamber near the nucleus. A mass of finely vacuolar protoplasm containing nucleoloid bodies, above the stomach, appears to be a male organ. The incubating chamber contains germs in various stages of development ; the simplest is a mere nucleolus surrounded by a layer of protoplasm ; the next an elongated body, in one

end of which an axial cord of protoplasm forms the commencement of the digestive tube; this cord becomes vacuolated by fission of a few large vacuoles. The body-cavity is formed by two cavities appearing on each side of the digestive tube, enlarging and uniting. The layers of the body-wall appear after birth; part of the chlorophyll is produced from two distinct green bodies within the protoplasm, part independently at other points.

Cryptomonas ovata, Ehrb. KUNSTLER (34) finds that the flagella are inserted in a tube which projects within a cavity on the antero-lateral aspect of the body. They are finely striated transversly. A series of flagella lines the margins of the body cleft.

Chilomonas paramæcium, Ehrb., (34) agrees with *Cryptomonas* in its main points of structure, as above described.

Trachelomonas hispida. KUNSTLER (34) finds two short flagella at the base of the chief one.

NEW GENERA AND SPECIES.

Kuenckelia, Kunstler, (34) p. 747. Based on *K. gyrans*, sp. n., *id. l c.*, fresh-water. Generally globular, may be elongated and perform creeping movements. An immense mobile locomotor tentacle. Two subcuticular muscular layers; mouth at base of tentacle; a needle in a sheath in inferior part of body, connected with glandular-looking bodies, and moved by muscles. Nucleus central; its refractive corpuscules invested by radiating hyaline filaments. No phosphorescence observed. Allied to *Noctiluca*.

Protoceratium, Bergh, (32) pp. 242 & 243. Between *Peridinium* and *Ceratium*. Body roundish. Transverse furrow approximately median. Skeletal membrane not composed of plates, but covering the longitudinal furrow, with the exception of the aperture for the flagellum. *P. aceros*[*us*], id. *l. c.* fig. 36. Sea off Strib, Little Belt, Denmark. The protoplasm is opaque, and contains chlorophyll, diatomin, and probably starch.

Diplopsalis, Bergh, (32) pp. 244 & 246. Lenticular; roundish in transverse section. Skeletal membrane composed of plates. Apparatus surrounding longitudinal furrow consisting only of two weakly refracting bands. *D. lenticula*, id. *l. c.* figs. 60-62. Marine, Strib, Little Belt, Denmark. Skeletal membrane of cellulose; no chlorophyll, diatomin, starch, or oil in the protoplasm; a transparent vesicle occurs.

Glenodinium warmingi, Bergh, (32) p. 249, figs. 63 & 64. Surface of sea, Strib, Little Belt, Denmark. Variations of form slight. Central part of protoplasm coloured brown by diatomin and a little chlorophyll; the outer part is mostly colourless, and contains the nucleus.

Gymnodinium spirale, Bergh, (32) p. 253, figs. 70 & 71. Marine, Strib, Little Belt, Denmark. The exoplasm has a layer which appears to represent the "myophan-layer" of Ciliate Infusoria. No diatomin, chlorophyll, or starch in the endoplasm, but remains of other organisms.

Protoperidinium, Bergh, (32) pp. 227 & 234. Based on *Peridinium michaelis*, Ehrenberg, and *P. pellucidum*, sp. n. Body roundish in transverse section, and pointed in front. Transverse furrow approximately

median. Membrane composed of plates. Longitudinal furrow accompanied by the same lines and teeth as those of the "handle" of *Dinophysis*. *P. pellucidum*, id. *l. c.* figs. 46–48. Sea off Strib, Small Belt, Denmark. The structures surrounding the longitudinal furrow are homologous with the "handle" of *Dinophysis*. Variation not great. Plates composing the skeletal membrane separated by narrow tracts, and their number constant; they consist of cellulose. No diatomin or chlorophyll, and apparently no starch, in the protoplasm. Between the edges of the transverse furrow there is a cleft for the egress of the contractile band. *P. michaelis* agrees essentially with *P. pellucidum* in the structure of its skeletal membrane.

Polykrikos [*-cricus*] *auricularia*, Bergh, (32) p. 256, figs. 72 & 73. Strib, Little Belt, Denmark. Protoplasm differentiated into ecto- and endoplasm. Thread cells. No chorophyll, diatomin, starch, or fatty matter could be detected, but remains of other organisms. Transverse fission takes place.

Nuclearia. L. Maggi. Una nuova *Nuclearia*. Descrizione e considerazioni intorno al suo posto nella Sistematica, ed alla sua importanza nell' Ontologia Animale. Rend. Ist. Lomb. (2) xiii. [Not seen by Recorder.]

The following *Flagellata* are described as new by Kent, (10) pp. 433–469, pls. xxiv. & xxv. :—

Diplomastix affinis.
Anisonema ludibundum, intermedium.
Gymnodinium marinum, lachmanni.
Peridinium æqualis [*-le*].
Dinophysis caudata.
Mallomonas freseni, sp. n., or var. of *M. plosslii*, Perty.

Astasia costata, Kunstler, (34) p. 747.

Anisonema quadricostatum, Mereschkowsky, (13) p. 218, pl. xii. fig. 12, Sorrento, Bay of Naples.

Trachelomonas acanthophora, Archer, (Rep. Dubl. Micr. Club) Ann. N. H. (5) vii. p. 342.

Monas electrica, F. Krasan, Verh.-z.-b. Wien, xxx. p. 289. Produced in emulsion of nut-kernels and water.

Limnophysalis hyalina, reported, Gazz. Med. Ital.-Lomb. xl. p. 208, to have been described as a new parasite from the blood of malaria patients, by Eklund.

Pulsatella, Geddes, *l. c.* p. 1086. Based on *P. convoluta*, id. *ibid.* Parasitic in mesoderm of the Planarian Worm *Convoluta schulzi*. Free-moving, pyriform, containing a large central contractile vacuole; the wall near one end provided with parallel contractile fibril; nest of cell granular. If placed in sea-water, the cell contracts rhythmically 100 to 180 times per minute, becoming somewhat bent up. When quiescent, its nucleus oscillates from one side of the cell to the other.

Protomyxomyces, Cunningham. This writer, (33) p. 235, is inclined to believe the monad forms hitherto observed in choleraic and other

excreta of the human subject to be referable to a single species, which assumes at different times the characters of *Trichomonas*, *Cercomonas*, and *Amœba*. The monadic forms, viz., those connecting it with *Amœba*, are indistinguishable from swarm spores of *Myxomycetes*. It is figured, pl. xviii. figs., and its form, size, and behaviour towards chemical reagents described; the flagella vary from one to four in number, and may be seen to be formed and retracted; the point opposite to them is that at which nutriment is taken in. Their presence is not peculiar to cholera; they are absent in some pathological conditions of the intestine, especially in acid conditions of the alvine fluids associated with development of *Oidium*, and disappear from solutions in which this occurs. The *Amœba*-stage may occur encysted, and may be either with or without nuclei; these may occur as large bodies, and contain sporoid germs. The zoospores of the same form are found also in fresh cow-dung in India; they pass through *Amœba*-stages, and the *Amœbæ* may unite to form large compound masses, the sporangia, which may contain a network representing a capillitium, and develop an investing membrane, and then break up into spores. Under the form of a large *Amœba*, containing fusiform spores, it appears to be very nearly allied to, if not identical with, *Diplophrys stercorea*, Cienkowski. Cunningham refers the form to the *Protista* provisionally, regarding it as a rudimentary Myxomycete organism, and assigns to it the name of *Protomyxomyces coprinarius*, which = *Amœba coli*, *Cercomonas intestinalis* ?, and *Trichomonas* spp., Zunker.

GREGARINIDA.

Chief Works.

36. Bütschli, O. Kleine Beiträge zur Kenntniss der Gregarinen. Z. wiss. Zool. xxxv. p. 384, pls. xx. & xxi.

37. ——. Beiträge zur Kenntniss der Fisch-psorospermien. *Tom. cit.* p. 629, pl. xxxi.

38. Gabriel, B. Zur Classification der Gregarinen. Zool. Anz. iii. [1880] p. 569. Abstract in J. R. Micr. Soc. (2) i. p. 67.

39. Grassi, B. Intorno a speciali corpuscoli (Psorospermici) del' Uomo. Rend. Ist. Lomb. (2) xii. p. 632, figs. 1–11.

Oviform psorospermiæ described and figured from the fæces of a male child of three months. In the earliest stages the limiting membrane has only a single contour; in some of the cells several nuclei occur, in some they are replaced by fine linear bodies.

40. Schneider, A. Sur les Psorospermies oviformes ou Coccidies, espèces nouvelles ou peu connues. Arch. Z. expér. ix. p. 387, pl. xxii.

Classification.

Gabriel (38) finds the septum of compound forms not to be accompanied by any other remarkable peculiarities of organization. The dis-

tinction between the *Didymophyidæ* and *Gregarinidæ*, s. str., is of subordinate importance. He has found a form which unites *Monocystidæ* and *Gregarinidæ*, being monocystid when young, and having several segments later. His classification is as follows :—

I. *Gregarinida Isoplasta* (*Cystoplasta*, Gabriel, pt.).
Gregarine-germs and Myxomycete-forms originate simultaneously from the body mass.

II. *Gregarinida Proteroplasta* (*Acystoplasta*, Gabriel).
The sexually-mature individual is differentiated into a Myxomycete-plasmodium, from which the Gregarine-germs arise.

III. *Gregarinida Hysteroplasta* (*Cystoplasta*, Gabriel, pt.).
The Gregarine-germs appear first, and the Myxomycete-forms develop from them.

Schneider, (40) p. 388, arranges the *Coccidia* (including the new forms described below), for convenience as follows, but does not intend the arrangement to represent a formal classification :—

Tribe 1. *Monosporeæ*. The whole contents of the cyst are converted into a single spore.
(*a*) *Oligozoic* forms ; a definite number of corpuscules in the spore. Gen. *Orthospora*.
(*b*) *Polyzoic* forms : an indefinite number of corpuscules in the spores. Gen. *Eimeria*.

Tribe 2. *Oligosporeæ*. Contents of cyst converted into a number of spores, which is constant.
(*a*) *Disporeæ*. Only two spores. Gen. *Cyclospora*, *Isospora*.
(*b*) *Tetrasporeæ*. Four spores. Gen. *Coccidium*.

Tribe 3. *Polysporeæ*. Contents of cyst converted into large number of spores. Gen. *Klossia*, *Benedenia*.

Genera, Species, &c., Referred to.

Gregarina paradoxa, Gabriel, (38) p. 571, forms spores without passing through a preliminary spherical resting-stage.

Gregarina blattarum, Von Siebold, (36) p. 385, pls. xx. & xxi. figs. 10–13. The conjugating individuals really become encysted together, the process constituting a true copulation ; it commences with the abbreviation of the two individuals ; the conjoined pair tend to move round in a circle. The pseudo-navicellæ are formed by a process of budding taking place over the whole surface of the joint encysted mass ; when the individuals are completely fused, the pseudo-navicellæ disappear from the surface of the cyst. Nuclei are to be detected in young pseudo-navicellæ, but they differ widely from those of the un-encysted animals in their smaller size and in the absence of nucleoli ; they appear to be developed from a zone of free nuclei, found in the peripheral protoplasm of the cyst. The sporoducts are developed from a clear patch of protoplasm which appears in the outer part of the contents of the cyst Each really consists of direct prolongation inwards of the innermost envelope of the cyst ; it becomes surrounded with a finely granular and

reticulate plasma-network. On entering the alimentary canal of the *Blatta*, the pseudo-navicellæ emit young *Gregarinæ*, which partially embed themselves in the protoplasm of the inner ends of the intestinal epithelium-cells; they consist of cells, each slightly larger than a pseudo-navicella, and pear-shaped; the projecting portion is ultimately separated from the embedded part by a septum, and constitutes an abdominal segment, containing the nucleus.

Gregarina polymorpha, (36) p. 386, copulates in same way as *G. blattarum*.

Monocystis magna, (36) p. 402, pl. xxi. figs. 14–18, becomes embedded in epithelial cells, like the *Polycystidea*, drawing from the cells a continual supply of nutriment. Schneider's observations on the history of the pseudo-navicellæ are confirmed.

Klossia should include the genus *Benedenia* according to SCHNEIDER, (40) p. 398.

Coccidium. A species has been observed by BÜTSCHLI in the intestine of *Lithobius*, the first recorded case of the occurrence of the genus in an Arthropod, (36) p. 405, pl. xxi. figs. 19–24; it resembles that described by Eimer from the intestine of the Mouse.

The so-called *Psorospermiæ* of Fish are constituted by BÜTSCHLI (37) a distinct group, under the name *Myxosporidia*. This writer regards them as distinct both from *Gregarinida* and *Myxomycetes*, but as finding a place by the side of the former organisms. They show some interesting points of resemblance to *Pelomyxa*. Those found in the gills were investigated chiefly from Cyprinoid Fishes: they develop in the connective tissue surrounding the cartilages of the gill-plates, and, by expansion during growth, burst the capillaries of the latter, causing extravasation; they have a distinct plasmatic envelope containing nuclei and apparently produced by the Myxosporidium itself. The protoplasm of the body is filled with very small nuclei containing nucleoli; the spores have a thick two-valved coat; the polar corpuscules diminish in size when the two fibres issue from the spores, hence the capsules appear to bear the same relation to the fibres as the thread capsules of *Cœlenterata*, &c., to the threads which they contain; the spores are nucleated.

The Myxosporidium of the Pike's bladder is found in abundance on the inner surface of the latter during the winter. Structure described: the lobose and filiform processes of the body are comparable to pseudopodia, for they manifest slow movements; the ectoplasm is distinctly marked off from the endoplasm, and shows lamination-contours within its own substance; the crystals of the endoplasm are enclosed in fatty globules, and probably consist of hæmatoidin. Formation of spores described: their test appears to consist of a single piece; they are developed from globules which occur within the parent Myxospiridium; of these globules, each contains several nuclei, viz., up to six, and sometimes more; the spores arise from them by the division into two of one such mass; the six nuclei, in the case where there are six, thus become equally distributed between the two products, and of the three in each such new spore two disappear and the other persists; the polar corpuscules originate close to the point of disappearance of the two nuclei, not from these nuclei.

The development of the *Myxosporidia* found in the gills is similar in its main features to that just detailed.

New Genera and Species.

Gregarina termitis, Leidy, J. Ac. Philad. viii. p. 441, pl. lii. fig. 27, in *Termes flavipes*, New Jersey.

Orthospora, Schneider, (40) p. 389. Differs from *Eimeria* in having a definite number (four) of falciform corpuscules in its spores.

Orthospora propria, id. *l. c.* pl. xxii. figs. 1–18. Digestive canal of newts, from near Poitiers.

Cyclospora, id. *l. c.* p. 391. Cyst containing only two spores, each containing usually only two corpuscules. *C. glomericola*, id. *l. c.* p. 302, pl. xxii. figs. 19–43. Digestive canal of *Glomeris*. It contains a nucleus; in encystation a septum forms across each end of the cyst.

Eimeria nova, id. *l. c.* p. 397, pl. xxii. figs. 44–56. Malphighian vessels of *Glomeris*.

Klossia soror, id. *l. c.* p. 399, pl. xxii. figs. 58–64. Renal organ of *Neritina fluviatilis*, Poitiers.

Isospora, id. *l. c.* p. 401. Differs from *Cyclospora* in having an indefinite number of corpuscules in the spore. *I. rara*, id. *l. c.* pl. xxii. figs. 65–72, from *Limax*, Department of Aisne, France.

INDEX TO

GENERA AND SUBGENERA RECORDED AS NEW IN THIS VOLUME.

INCLUDING NEW NAMES FOR GENERA BEFORE CHARACTERIZED.*

[The symbol ‖ indicates that the name to which it is affixed has been used before in Zoology.]

Abaratha, *Moore*, Ins. 168
Abatrisops, *Reitter*, Ins. 39
Acallestes, *Pascoe*, Ins. 81
Acanthephyra, *A. Milne Edwards*, Crust. 24
Acanthocorys, *Hæckel*, Prot. 18
Acanthocyrtis „ „ 19
Acanthodon ‖, *Weise*, Ins. 103 [*Meyer*, Mamm. 1844; *Guérin*, Arachn. 1838]
Acantholonche, *Hæckel*, Prot. 20
Acanthonia „ „ 20
Acanthoniscus ‖, *Sars*, Crust. 30 [*White*, Crust. 1859]
Acanthopsyche, *Heylaerts*, Ins. 182
Acontaspis, *Hæckel*, Prot. 20
Acotripus „ „ 19
Acraspis, *Mayr*, Ins. 132
Acrobotrys, *Hæckel*, Prot. 19
Acrocalpis „ „ 18
Acrocercops, *Wallengren*, Ins. 229
Acroceuthes, *Meyrick*, Ins. 223
Acrocorona, *Hæckel*, Prot. 18
Acrocoronis „ „ 19
Acrocubus „ „ 19
Acropolitis, *Meyrick*, Ins. 223
Acropyramis, *Hæckel*, Prot. 18
Acrosphæra, *Hæckel*, Prot. 20
Acrospyris „ „ 19
Acrotoma, *Böttger*, Moll. 76
Actinotaxia, *Hamm*, Moll. 107
Adelophis, *Cope*, Rept. 10
Adenophlebia, *Eaton*, Ins. 264
Adisura, *Moore*, Ins. 198
Adoxophyes, *Meyrick*, Ins. 223
Adrastia, *Broun*, Ins. 40
Adris, *Moore*, Ins. 199
Adromisus, *Des Gozis*, Ins. 90
Ægа ‖, *Hartman*, Moll. 74. [*Leach*, Crust. 1815; *Agassiz*, 1848, amending *Laporte*, Coleopt. 1834]
Ægospyris, *Hæckel*, Prot. 19
Agastya, *Moore*, Ins. 214
Aglaophenopsis [-phan-, vel -pheniopsis], *Fewkes*, Cœl. 8
Ahasverus, *Des Gozis*, Ins. 45
Alampyris, *H. W. Bates*, Ins. 95
Alaopone, *Emery*, Ins. 119
Albuna, *Edwards*, Ins. 172 [-nea *Fabricius*, Crust. 1798; - nia *Lioy*, Dipt. 1864]
Alemo, *Wright*, Spong. 10
Alexandria, *Pfeffer*, Ech. 6
Allodon, *Marsh*, Mamm. 31

---

* The number of new genera and subgenera contained in the present volume is 1438, as against 1008 of vol. xvii. These are divided as follows:—*Mammalia*, 35; *Aves*, 26; *Reptilia* and *Batrachia*, 8; *Pisces*, 31; *Mollusca*, 76; *Molluscoida*, 20; *Crustacea*, 49; *Arachnida*, 52; *Myriopoda*, 5; *Insecta*, 543; *Vermes*, 21; *Echinodermata*, 17; *Cœlenterata*, 24; *Spongiida*, 14; and *Protozoa*, 517. As in the last Record, the expediency of publishing the volume before the end of the year, has necessitated a very superficial examination of this large number of new names, as regards prior occupation. 88 at least of them apparently require renaming.—E. C. R.

Allœocranum, *Reuter*, Ins. 292
Alloposus, *Verrill*, Moll. 34
Alonips, *Signoret*, Ins. 282
Alphinellus, *H. W. Bates*, Ins. 94
Amauronyx, *Reitter*, Ins. 38
Amicta [, *Heylaerts*, Ins. 183 [-tus, *Weidemann*, Dipt. 1817]
Amitra [, *Goode*, Pisc. 12 [-trus, *Schönherr*, Coleopt. 1840]
Amphactura, *Hæckel*, Prot. 20
Amphibelone „ „ 20
Amphibrachium „ „ 20 [*Schulze*, Cœl. 1880]
Amphicoryna, *Milne Edwards*, Prot. 22
Amphicraspedum, *Hæckel*, Prot. 20
Amphicyclia „ „ 20
Amphicynodon, *Filhol*, Mamm. 17
Amp[hi]hymenium, *Hæckel*, Prot. 20
Amphilithium, *Hæckel*, Prot. 20
Amphiplecta „ „ 18
Amphipyle „ „ 20
Amphipylonium „ „ 20
Amphi[r]rhopalum „ „ 20
Amphisphæra „ „ 19
Amphispyris „ „ 19
Amphistylus „ „ 19
Ampittia, *Moore*, Ins. 168
Anacodon, *Cope*, Mamm. 23
Anaucomœa, *Karsch*, Ins. 75
Ananus, *Sluiter*, Ech. 8
Anatropia, *Meyrick*, Ins. 223
Anchognatha, *Thorell*, Arachn. 10
Ancistrosyrinx, *Dall*, Moll. 44
Angæus, *Thorell*, Arachn. 16
Anisogona, *Meyrick*, Ins. 223
Anisonchus, *Cope*, Mamm. 23
Anomobrenthus, *Fairmaire*, Ins. 89
Anomo[r]rhynchus, *Miers*, Arachn. 27
Anthenoides, *Perrier*, Ech. 7
Anthocorys, *Hæckel*, Prot. 19
Anthocyrtidium „ „ 18
Anthospyris „ „ 19
Anthracopupa, *Whitfield*, Moll. 77
Antineura, *Osten-Sacken*, Ins. 251
Apagomera, *H. W. Bates*, Ins. 95
Apechtia, *Reuter*, Ins. 292
Apeosina, *Broun*, Ins. 73
Apharia, *Reitter*, Ins. 46
Aphelonyx, *Mayr*, Ins. 132
Aphilanthops, *Patton*, Ins. 115
Aphilesthes, *H. W. Bates*, Ins. 95
Aphyllocerus, *Fairmaire*, Ins. 71
Apirocalus, *Pascoe*, Ins. 78
Apithesis, *C. O. Waterhouse*, Ins. 71
Apochinomma, *Pavesi*, Arachn. 9
Appana, *Moore*, Ins. 198
Apterodon, *Fischer*, Mamm. 18
Arachnidium [, *Kent*, Prot. 8 [*Hincks*, 1877, amending Arachnidia, *Hincks*, Moll. 1862]
Arachnocoris, *Scott*, Ins. 292
Arachnopegma, *Hæckel*, Prot. 20
Arachnopilium „ „ 19
Araeolepia, *Walsingham*, Ins. 228
Araeosternus, *De Man*, Crust. 20
Archæodrilus, *Czerniavsky*, Verm. 12
Archæoptilus, *Scudder*, Ins. 256
Archæoryctes, *Czerniavsky*, Verm. 12
Archibursa, *Hæckel*, Prot. 18
Archicapsa „ „ 18
Archicorys „ „ 18
Archilophus „ „ 18
Archipera „ „ 18
Archiperidium „ „ 18
Archiphatna „ „ 18
Archiphormis „ „ 18
Archipilium „ „ 18
Archiscenium „ „ 18
Argadesa, *Moore*, Ins. 199
Ariphron [, *Broun*, Ins. 79 [*Erichson*, Hymenopt. 1842]
Aristocosma, *Meyrick*, Ins. 223
Ariunculus, *Lessona*, Moll. 67
Arniticus, *Pascoe*, Ins. 81
Arotrophora, *Meyrick*, Ins. 223
Arotropus, *Provancher*, Ins. 124
Artachæa, *Bergh*, Moll. 59
Artiazontes, *Distant*, Ins. 282
Artidium, *Hæckel*, Prot. 20
Artiscus „ „ 20
Artocapsa „ „ 19
Artocorys „ „ 19
Artopera „ „ 19
Artophatna „ „ 19
Artophormis „ „ 19
Artopilium „ „ 19
Asaphia, *Broun*, Ins. 80 [-phes, *Kirby*, Col. 1837, &c.]
Ascelichthys, *Jordan*, Pisc. 12
Ascopera, *Herdman*, Moll. 99
Asemolea, *H. W. Bates*, Ins. 95
Asicya, *Arribálzaga*, Ins. 243
Asotana, *Schiödte*, Crust. 32
Aspidostoma [, *Hincks*, Moll. 106 [-mus, *Agassiz*, 1848, amending *Schönherr*, Col. 1833]
Asthenoptycha, *Meyrick*, Ins. 223
Astractura, *Hæckel*, Prot. 20
Astræa [, *Hartman*, Moll. 74 [*Gmelin*, 1789, *Lamouroux*, 1801, Cœl.]
Astramœba, *Vejdovsky*, Prot. 22
Astroconia, *Sollas*, Spong. 14

Astrocyclia, *Hæckel*, Prot. 20
Astrolonche „ „ 20
Astrolophus „ „ 20
Astrophacus „ „ 20
Astrosestrum „ „ 20
Astrostaurus „ „ 20
Asyntona, *Osten-Sacken*, Ins. 251
Atactodiscus, *Hæckel*, Prot. 20
Atalophlebia, *Eaton*, Ins. 264
Atelecrinus, *Carpenter*, Ech. 8
Atelodora, *Meyrick*, Ins. 223
Atheresthes, *Jordan*, Pisc. 19
Atopognathus, *Bigot*, Ins. 252
Atopopus, *Eaton*, Ins. 264
Aulacophora ‖, *Jeffreys*, Moll. 85 [*Chevrolat*, Coleopt. 1834; -rus, *Gould*, Moll. 1851]
Auranius, *Jacoby*, Ins. 100
Aurivilliana, *Distant*, Ins. 285
Ausserería, *Holmberg*, Arachn. 8
Austrofusus, *Kobelt*, Moll. 40
Axocorys, *Hæckel*, Prot. 19
Azanus, *Moore*, Ins. 164

Bactrius, *Pascoe*, Ins. 81
Badamia, *Moore*, Ins. 167
Ballautiophora, *Butler*, Ins. 208
Baoris, *Moore*, Ins. 167
Baracus „ „ 167
Barisses, *Pascoe*, Ins. 85
Bathelia [Bathyhe-], *Moseley*, Cœl. 12
Bathropyramis, *Hæckel*, Prot. 18
Bathrotoma, *Meyrick*, Ins. 224
Bathyactis, *Moseley*, Cœl. 13
Bathymophila, *Dall*, Moll. 55
Bathyopsis, *Cope*, Mamm. 25
Bathysmataspis, *Reuter*, Ins. 292
Batraxis, *Reitter*, Ins. 39
Belenocnema, *Mayr*, Ins. 131
Belonaspis, *Hæckel*, Prot.
Beltia, *Jacoby*, Ins. 100
Benedenia ‖, *Fœttinger*, Prot. 10 [*Diesing*, Verm. 1858]
Benthesicymus, *Bate*, Crust. 24
Bergenstammia, *Mik*, Ins. 245
Bergia, *Scott*, Ins. 296
Bessula, *Grote*, Ins. 199
Bibasis, *Moore*, Ins. 167
Bibloplectus, *Reitter*, Ins. 39
Biomonaste, *Hesse*, Crust. 35
Blakiaster, *Perrier*, Ech. 7
Blasturus, *Eaton*, Ins. 264
Blechroma, *Möschler*, Ins. 208
Bopyrina, *Kossmann*, Crust. 32
Bornazon, *Des Gozis*, Ins. 77
Borolia, *Moore*, Ins. 198
Bothrioplana, *Braun*, Verm. 5
Bothrio[r]rhinus, *Fairmaire*, Ins. 89
Botryacantha, *Hæckel*, Prot. 19
Botryocanna „ „ 19
Botryopyle „ „ 19
Brachiospyris „ „ 19
Brachioteuthis, *Verrill*, Moll. 35
Brachynopus, *Broun*, Ins. 42
Brachynotocoris, *Reuter*, Ins. 289
Brachysiderus, *C. O. Waterhouse*, Ins. 53
Braga, *Schiödte*, Crust. 31
Breitensteinia, *Steindachner*, Pisc. 20
Brodia, *Scudder*, Ins. 258
Bucranium, *Cambridge*, Arachn. 17
Byzes, *Pascoe*, Ins. 81

Calcaria, *Gruber*, Prot. 9
Calleros, *Gorham*, Ins. 61
Calliarcys, *Eaton*, Ins. 264
Callibætis „ „ 264
Callicarpa, *Fewkes*, Cœl. 8
Callimitra, *Hæckel*, Prot. 18
Cal[l]istocoris, *Reuter*, Ins. 292
Callogaza [Calli-], *Dall*, Moll. 56
Callophasis [Calli-], *Hume*, Aves, 48
Calodadon, *Gorham*, Ins. 61
Calolycus „ „ 61
Calyptura ‖, *Haswell*, Crust. 33 [*Swainson*, Aves, 1837]
Camarocyphus, *Reuter*, Ins. 289
Camptodrilus, *Eisen*, Verm. 11
Cannartus, *Hæckel*, Prot. 20
Cannobotrys „ „ 19
Capnodes ‖, *Broun*, Ins. 66 [*Guérin*, Lepidoptera, 1852; -dis, *Eschscholtz*, Coleoptera, 1829]
Carditella, *E. A. Smith*, Moll. 90
Carditopsis „ „ 90
Carmenta, *Edwards*, Ins. 172
Carphontes, *H. W. Bates*, Ins. 94
Carposphæra, *Hæckel*, Prot. 19
Carterella ‖, *Potts*, Spong. 10 [*Zittel*, Spong. 1878]
Caryodoras, *Hæckel*, Prot. 20
Caryolonche „ „ 20
Caryosphæra „ „ 20
Caryostaurus „ „ 20
Caryostylus „ „ 20
Caryoxiphus „ „ 20
Casas, *Wallengren*, Ins. 229
Casigneta „ „ 229 [*Brunner*, Orthopt. 1878; -tus, *Macleay*, Coleopt. 1819]
Catachlæna, *Blanford*, Rept. 10
Cataprosopus, *Butler*, Ins. 217
Catathlæus, *Cope*, Mamm. 23
Catharesthes, *H. W. Bates*, Ins. 94

Cecryphalium, *Hæckel*, Prot. 19
Cenophengus, *Leconte*, Ins. 63
Centrospira, *Hæckel*, Prot. 20
Cephalodina, *H. W. Bates*, Ins. 95
Cephalopyramis, *Hæckel*, Prot. 18
Cephalospyris „ „ 19
Cephosoma, *Gradl*, Ins. 134
Cerais, *Van der Wulp*, Ins. 253
Cerasosphæra, *Hæckel*, Prot. 19
Ceratastrum „ „ 20
Ceratocyrtis, *Bütschli*, Prot. 25
Ceriaspis, *Hæckel*, Prot. 20
Ceriosphæra „ „ 19
Cethegus, *Thorell*, Arachn. 8
Chærius, *Pascoe*, Ins. 81
Chalcoplia, *J. Thomson*, Ins. 57
Chamædipsia, *Mik*, Ins. 245
Chapra, *Moore*, Ins. 167
Charus „ „ 150
Chatamla „ „ 174
Cheloteuthis, *Verrill*, Moll. 35
Cheritra, *Moore*, Ins. 165
Chilades „ „ 164
Chilasa „ „ 150
Chilaspis, *Mayr*, Ins. 132
Chiloides, *Butler*, Ins. 224
Chionomera „ „ 180
Chirotonetes, *Eaton*, Ins. 264
Chitonastrum, *Hæckel*, Prot. 20
Chitonotus, *Lockington*, Pisc. 12
Chlorocichla, *Sharpe*, Aves, 36
Choaspes, *Moore*, Ins. 167
Chondrorrhina, *Kraatz*, Ins. 55
Choroterpes, *Eaton*, Ins. 264
Chrestotes, *Butler*, Ins. 227 [*Scudder*, Neuropt. 1868]
Chrysopogon, *Röder*, Ins. 243
Chrysaperda, *H. W. Bates*, Ins. 95
Churia, *Moore*, Ins. 198
Cimberis, *Des Gozis*, Ins. 83
Cinclopyramis, *Hæckel*, Prot. 18
Cinogon, *Butler*, Ins. 171
Circospyris, *Hæckel*, Prot. 19
Cittotænia, *Riehm*, Verm. 5
Cladarachnium, *Hæckel*, Prot. 18
Cladocalpis „ „ 18
Cladocorona „ „ 18
Cladophatna „ „ 18
Cladopyramis „ „ 18
Cladoscenium „ „ 18
Cladospyris „ „ 19
Clathrobursa „ „ 18
Clathrocircus „ „ 19
Clathrocorona „ „ 18
Clathrocorys „ „ 18
Clathrocyclas „ „ 19
Clathrolychnus „ „ 18
Clathromitra „ „ 18
Clathropilium, *Hæckel*, Prot. 19
Clathropyrgus „ „ 19
Clathrosphæra „ „ 21
Clathospyris „ „ 19
Claudius, *Des Gozis*, Ins. 66
Claviceps, *Canestrini*, Arachn. 32
Clistophatna, *Hæckel*, Prot. 19
Clytia, *Hartman*, Moll. 74 [*Lamouroux*, Cœl. 1812; *Hübner*, 1816, *Swainson*, 1833, Lepidopt.; *Desvoidy*, Dipt. 1830; *Agassiz*, 1848, amending *Meyer*, 1840, *Reeve*, 1841, *Brown*, 1844, Crust.]
Cnemidolophus, *Walsingham*, Ins. 229
Coccocyclia, *Hæckel*, Prot. 20
Coccorchestes, *Thorell*, Arachn. 20
Coccostaurus, *Hæckel*, Prot. 20
Codonophilus, *Haswell*, Crust. 33
Cœnopus, *Cope*, Mamm. 21
Coladenia, *Moore*, Ins. 168
Coleaspis, *Hæckel*, Prot. 20
Coleotechnites, *Chambers*, Ins. 228
Colpochilocoris, *Reuter*, Ins. 291
Columbarium, *Martens*, Moll. 44
Compsoneuria, *Eaton*, Ins. 265
Conarachnium, *Hæckel*, Prot. 18
Coniocylis, *Fol*, Prot. 9
Conopistha, *Karsch*, Arachn. 11
Conoryctes, *Cope*, Mamm. 19
Conosphæra, *Hæckel*, Prot. 19
Copelus, *Provancher*, Ins. 124
Coptomerus, *Chevrolat*, Ins. 85
Coranideus, *Reuter*, Ins. 291
Corma, *Moore*, Ins. 185
Cornutanna, *Hæckel*, Prot. 18
Cornutellium „ „ 18 [-tella, *Ehrenberg*, Prot. 1838]
Cornutissa, *Hæckel*, Prot. 18
Cornutosa „ „ 18
Cornutura „ „ 18
Coronophatna „ „ 18
Corythospyris „ „ 19
Coscinoptycha, *Meyrick*, Ins. 224
Costæa, *Tiberi*, Moll. 61
Cotanda, *Moore*, Ins. 198
Craneophora, *Christoph*, Ins. 214
Crassatina, *Weinkauff*, Moll. 90
Cratonotus, *Bolivar*, Ins. 273 [*Distant*, Hemipt. 1879]
Cremnorrhinus, *Reuter*, Ins. 289
Crenitis, *Bedel*, Ins. 36
Cromyechinus, *Hæckel*, Prot. 20
Cromyodrymus „ „ 20
Cromyosphæra „ „ 19
Cromyosphærium „ „ 20 [too near Cromyosphæra]
Cromyostaurus, *Hæckel*, Prot. 20

Cromyostylus, *Hæckel*, Prot. 20
Crossata, *Jousseaume*, Moll. 47
Cryptocapsa, *Hæckel*, Prot. 19
Cryptocephalus‖ „ „ 18 [*Geoffroy*, Coleopt. 1764]
Cryptopera, *Hæckel*, Prot. 19
Cryptophila, *Meyrick*, Ins. 223
Ctenaster‖, *Perrier*, Ech. 7 [*Agassiz*, Ech. 1834]
Culasta, *Moore*, Ins. 199
Culeolus, *Herdman*, Moll. 99
Curubasa, *Moore*, Ins. 198
Cyathoceras, *Moseley*, Cœl. 12
Cycethra, *Bell*, Ech. 6
Cycladophora, *Hæckel*, Prot. 19
Cyclomorpha‖, *Broun*, Ins. 43 [-phus, *Hope*, Coleopt. 1841]
Cyclopterichthys, *Steindachner*, Pisc. 13
Cyclospora, *Schneider*, Prot. 35
Cyclosuras, *Morelet*, Moll. 83
Cydnopeltus, *Signoret*, Ins. 282
Cylicomera, *Arribálzaga*, Ins. 243
Cymbiodyta, *Bedel*, Ins. 36
Cynodontomys, *Cope*, Mamm. 12
Cyphinus, *Hæckel*, Prot. 20
Cyrtocapsa‖ „ „ 19 [-sus, *Reuter*, Hemipt. 1876]
Cyrtoclytus, *Ganglbauer*, Ins. 92
Cyrtocoris, *Hæckel*, Prot. 19
Cyrtopera „ „ 19
Cyttarocylis, *Fol*, Prot. 9

Dacerla, *Signoret*, Ins. 288
Dacnirus, *Pascoe*, Ins. 79
Dadica, *Moore*, Ins. 198
Daerlac, *Signoret*, Ins. 288
Daiphron, *Gorham*, Ins. 63
Dalchina, *Moore*, Ins. 150
Dapanoptera, *Westwood*, Ins. 240
Decipula, *Jeffreys*, Moll. 89
Delauneya, *Lethierry*, Ins. 297
Delocephalus, *Distant*, Ins. 282
Deltatherium, *Cope*, Mamm. 18
Demonax‖, *Thorell*, Arachn. 16 [*J. Thomson*, Coleopt. ? 1864]
Dendrocircus, *Hæckel*, Prot. 19
Dendrospyris „ „ 19
Dendrotrupes [-trypes: = Trypodendron], *Broun*, Ins. 89
Densipora, *MacGillivray*, Moll. 107
Derosphærius, *Westwood*, Ins. 71
Desimia, *Reitter*, Ins. 38
Desmospyris, *Hæckel*, Prot. 19
Diastoma, *Möschler*, Ins. 229
Diazoma, *Wallengren*, Ins. 239
Dicksonia, *Holmgren*, Ins. 123
Dicolocapsa, *Hæckel*, Prot. 19
Dicranastrum, *Hæckel*, Prot. 20
Dicrotrypana, *Bigot*, Ins. 244
Dictyatractus, *Hæckel*, Prot. 19
Dictyocodon „ „ 19
Dictyodoris, *Bergh*, Moll. 59
Dictyopodium, *Hæckel*, Prot. 19
Dictyoprora „ „ 18
Didymophormis „ „ 20
Dieneces, *Butler*, Ins. 171
Diethicus, *Pascoe*, Ins. 78
Dimorpha‖, *Gruber*, Prot. 22 [*Jurine*, Hymenopt. 1807; *Gray*, Moll. 1840; *Hodgson*, Aves, 1841; -phus, *Grassi*, Prot. 1880]
Dinematella, *Fewkes*, Cœl. 7
Dioxypterus, *Fairmaire*, Ins. 59
Dipaltosternus, *Fairmaire*, Ins. 85
Diphryx, *Grote*, Ins. 217
Diplactura, *Hæckel*, Prot. 20
Diplochorda, *Osten-Sacken*, Ins. 251
Diplocyclas, *Hæckel*, Prot. 19
Diplopora‖, *MacGillivray*, Moll. 104 [*Young*, Polyz. 1876; -rus, *Troschel*, Ech. 1866]
Diplopsalis, *Bergh*, Prot. 30
Diplotrypa, *Nicholson*, Cœl. 11
Dipocoronis, *Hæckel*, Prot. 19
Dipodillus, *Lataste*, Mamm. 27
Dipodospyris, *Hæckel*, Prot. 19
Dipterina, *Meyrick*, Ins. 223
Dirrhopalum, *Ridley*, Spong. 9
Discoarachne, *Hoek*, Arachn. 26
Discocnemius, *Thorell*, Arachn. 19
Discodon, *Gorham*, Ins. 63
Dissacus, *Cope*, Mamm. 19
Distaplia, *Della Valle*, Moll. 99
Ditypophis, *Günther*, Rept. 11
Docodon, *Marsh*, Mamm. 31
Doidyxodon, *Thominot*, Pisc. 9
Dolichoprosopus, *Ritsema*, Ins. 94
Doratacantha, *Hæckel*, Prot. 20
Dorcadospyris „ „ 19
Dorika, *Moore*, Ins. 198
Dorypelma, *Hæckel*, Prot. 20
Drilolampadius, *Gorham*, Ins. 62
Druryia, *Aurivillius*, Ins. 150
Drymosphæra, *Hæckel*, Prot. 19
Drymospira „ „ 20
Dyospyris „ „ 19
Dyostephaniscus „ „ 19
Dyostephanus „ „ 19
Dyostephus „ „ 19
Dyscolesthes, *Westwood*, Ins. 116
Dyseritina „ „ 17
Dyspilophora, *Kraatz*, Ins. 55

Echinaspis, *Hæckel*, Prot. 20
Echinobotrys „ „ 19

Echinocalpis, *Hæckel*, Prot. 18
Echinocapsa „ „ 18
Echinodictyum, *Ridley*, Spong. 9
Echinomma, *Hæckel*, Prot. 19
Echinonema, *Carter*, Spong. 9
Echinosoma, *Girschner*, Ins. 248 [*Serville*, Orthopt. 1838]
Echo, *Hartman*, Moll. 74
Ectacodon, *Cope*, Mamm. 22
Ectopsis, *Brown*, Ins. 86
Edesius, *Pascoe*, Ins. 85
Elaphococcus, *Hæckel*, Prot. 19
Elaphospyris „ „ 19
Elassoneuria, *Eaton*, Ins. 264
Elcysma, *Butler*, Ins. 174
Eleothinus, *H. W. Bates*, Ins. 94
Emmeria, *Pascoe*, Ins. 77
Enchleochrous, *Fairmaire*, Ins. 63
Enneacoides „ „ 68
Enneaphormis, *Hæckel*, Prot. 18
Enneaplagia „ „ 18
Enne[a]plagidium „ „ 18
Enneaplegma „ „ 18
Entione, *Kossmann*, Crust. 33
Epalxiphora, *Meyrick*, Ins. 223
Epeorus, *Eaton*, Ins. 265
Ephippus, *Thorell*, Arachn. 19 [*Cuvier*, Pisc. 1829]
Epicaulidium, *Hincks*, Moll. 103
Epipedosoma, *Chevrolat*, Ins. 78
Epitymbia, *Meyrick*, Ins. 223
Ergane, *L. Koch*, Arachn. 20 [-na, *Chapuis*, Col. 1880]
Eriauchenus, *Cambridge*, Arachn. 11
Eschatocerus, *Mayr*, Ins. 131
Eucalanus, *Claus*, Crust. 34
Eucelidia, *Mik*, Ins. 245
Euceratia, *Walsingham*, Ins. 229
Euchroura, *Reichenow*, Aves, 44
Eucinetus „ „ 44
Eucleodora, *Walsingham*, Ins. 229
Eucnemidophorus, *Wallengren*, Ins. 232
Eucoronis, *Hæckel*, Prot. 19
Eucratodes, *Miers*, Crust. 15
Eucta, *Simon*, Arachn. 13
Eucyrtidium, *Hæckel*, Prot. 19
Eucyrtis „ „ 19 [-tus, *Dejean*, Coleopt. 1833]
Eucyrtomphalus, *Hæckel*, Prot. 18
Eudesis, *Reitter*, Ins. 40 [-sia, *King*, Moll. 1850]
Euhagena, *Edwards*, Ins. 172
Eumilax, *Böttger*, Moll. 63
Eumimela, *Kraatz*, Ins. 55
Eumimimetica „ „ 55
Euperissus, *Butler*, Ins. 229
Euphranor, *Oberthür*, Ins. 188
Euphrytus, *Jacoby*, Ins. 100
Eu[r]chynchiocoris, *Reuter*, Ins. 282
Euros, *Edwards*, Ins. 199
Euryattus, *Thorell*, Arachn. 20
Eurycephala, *Röder*, Ins. 251 [*Laporte*, Hemipt. 1833; -lus, *Gray*, 1832, & *Dejean*, 1833, Coleopt., *Smith*, Aves, 1836]
Eurymachus, *Keyserling*, Arachn. 15
Euryopa, *Gorham*, Ins. 63 [-po, *Dalman*, Coleopt. 1824; -pis, *Menge*, Arachn. 1867]
Eurypanopeus, *A. Milne Edwards*, Crust. 14
Eurytemora, *Giesbrecht*, Crust. 35
Eustemmus, *Reitter*, Ins. 40 [-ma, *Diesing*, Verm. 1850]
Eusyntelia, *C. O. Waterhouse*, Ins. 67
Eusyringium, *Hæckel*, Prot. 19
Euthecа, *Grote*, Ins. 183 [*Baly*, Coleopt. 1878]
Euthiconus, *Reitter*, Ins. 40
Eutympanium, *Hæckel*, Prot. 19
Evadne, *Hartman*, Moll. 74 [*Lowen*, Crust. 1835]
Exallophthalmus, *Fairmaire*, Ins. 66
Exorides, *Pascoe*, Ins. 78
Exoteleia, *Wallengren*, Ins. 228

Fentonia, *Butler*, Ins. 184
Fernaldia, *Grote*, Ins. 229
Fluxina, *Dall*, Moll. 54
Forelia, *Haller*, Arachn. 29 [-ellia, *Desvoidy*, Dipt. 1830]
Foudrasia, *Des Gozis*, Ins. 103

Gamasomorpha, *Karsch*, Arachn. 9
Gamospyris, *Hæckel*, Prot. 19
Gampsotes, *Signoret*, Ins. 282
Gangara, *Moore*, Ins. 167
Garrodia, *W. A. Forbes*, Aves, 51
Gennadas, *Bate*, Crust. 24
Gigantopora, *Ridley*, Moll. 104
Giraffospyris, *Hæckel*, Prot. 19
Glyphocrangon, *A. Milne Edwards*, Crust. 21
Gnathonarium, *Karsch*, Arachn. 12
Gnorimimelus, *Kraatz*, Ins. 54
Goliathopsis, *O. E. Janson*, Ins. 55
Gonatonotus, *A. Milne Edwards*, Crust. 23
Goniopecten, *Perrier*, Ech. 7
Goodsiria, *Cunningham* [1871], Moll. 100
Gorgospyris, *Hæckel*, Prot. 19
Gunda, *Lang*, Verm. 3
Gyras, *Edwards*, Ins. 203

Habrophlebia, *Eaton*, Ins. 264
Hadrotarsus, *Thorell*, Arachn. 10
Hæmatonotus, *Kraatz*, Ins. 54
Hagenmulleria, *Bourguignat*, Moll. 83
Hagiastrum, *Hæckel*, Prot. 20
Halcobius, *Sharp*, Ins. 66
Halicapsa, *Hæckel*, Prot. 18
Haliophasma, *Haswell*, Crust. 33
Haliporus, *Bate*, Crust. 23
Halitemora, *Giesbrecht*, Crust. 35
Halopsyche, *Verrill*, Moll. 38
Halycidocrius, *Berg*, Ins. 90
Hannonia, *Hock*, Arachn. 25
Hantana, *Moore*, Ins. 168
Hapaloptila, *Sclater*, Aves, 43
Haploporella, *Hincks*, Moll. 104
Harimala, *Moore*, Ins. 150
Harmonia ‖, *Hartman*, Moll. 74 [*Mulsant*, Coleopt. 1846]
Hasora, *Moore*, Ins. 167
Hecista, *Wallengren*, Ins. 229
Heegeria, *Reuter*, Ins. 285
Hegemus, *J. Thomson*, Ins. 54
Helena, *Hartman*, Moll. 74
Helictophanes, *Meyrick*, Ins. 223
Heliocladus, *Hæckel*, Prot. 20
Heliocosma, *Meyrick*, Ins. 224
Heliodrymus, *Hæckel*, Prot. 20
Heliosestrum „ „ 20
Heliosoma „ „ 19
Heliostaurus „ „ 20
Heliostylus „ „ 20
Hemicerocoris, *Lethierry*, Ins. 289
Hemipagurus, *S. I. Smith*, Crust. 19
Hemipenæus, *Bate*, Crust. 23
Hemitubifex, *Eisen*, Verm. 11
Hendecasticha, *Meyrick*, Ins. 224
Hepomadus, *Bate*, Crust. 24
Heteroborus, *Cope*, Mamm. 17
Heterocarpus, *A. Milne Edwards*, Crust. 22
Heteromeyenia, *Potts*, Spong. 10
Heteromolius, *Fairmaire*, Ins. 85
Heterotrypa ‖, *Nicholson*, Cœl. 11 [-pus, *Saussure*, Orthopt. 1878]
Hexacaryum, *Hæckel*, Prot. 20
Hexacontium „ „ 19
Hexacromydium „ „ 20
Hexacromyum „ „ 20
Hexactura „ „ 20
Hexadendrum „ „ 19
Hexadoras „ „ 20
Hexadoridium „ „ 20
Hexadorium „ „ 20
Hexadrymium „ „ 19
Hexagona, *H. W. Bates*, Ins. 94 [-nia, *Kirby*, Coleopt. 1825]
Hexalacorys, *Hæckel*, Prot. 19
Hexalastrum „ „ 20
Hexaloncha „ „ 19
Hexaloncha chidium „ „ 19
Hexamerocerus, *Reuter*, Ins. 291
Hexancistra, *Hæckel*, Prot. 19
Hexaphormis „ „ 18
Hexapitys „ „ 19
Hexaplagia „ „ 18
Hexaplagidium „ „ 18
Hexaplegma „ „ 18
Hexapyle „ „ 20
Hexaspongonium „ „ 20
Hexastylidium „ „ 19
Hexastylus „ „ 19
Hexinastrum „ „ 20
Hirtia, *Thorell*, Arachn. 9 [-tea, *Scopoli*, 1763, Meigen, 180?, Dipt.]
Holcaspis ‖, *Mayr*, Ins. 132 [*Chaudoir*, Coleopt. 18—]
Holocola, *Meyrick*, Ins. 224
Homarus ‖, *Broun*, Ins. 89 [*Milne-Edwards*, Crust., 1837]
Homodus, *Broun*, Ins. 80
Homoiodoris[Homœo-], *Bergh*, Moll. 58
Homœoneuria, *Eaton*, Ins. 264
Hoplodoris, *Bergh*, Moll. 59
Horaga, *Moore*, Ins. 164
Horrimantus, *Des Gozis*, Ins. 44
Horwathia, *Reuter*, Ins. 289
Huphina, *Moore*, Ins. 153
Hyaloscotes, *Butler*, Ins. 179
Hyarotis, *Moore*, Ins. 168
Hygrochus, *Broun*, Ins. 80
Hymenactura, *Hæckel*, Prot. 20
Hyodectes, *Cope*, Mamm. 17
Hyphalonedrus, *Goode*, Pisc. 23
Hypnideus, *Pascoe*, Ins. 81 [Hypnoidus, *Stephens*, Coleopt. 1830]
Hypositta, *Newton*, Aves, 33
Hyposmochoma, *Butler*, Ins. 229
Hypsicometes, *Goode*, Pisc. 17

Ianthe, *Boraltius*, Crust. 30
Iberina, *Simon*, Arachn. 11
Icichthys, *Jordan*, Pisc. 14
Icosaspis, *Hæckel*, Prot. 20
Icosteus, *Lockington*, Pisc. 14
Icteropsis, *Von Pelzeln*, Aves, 38
Idaliella, *Bergh*, Moll. 60
Idastes, *Pascoe*, Ins. 86
Idephrynus, *H. W. Bates*, Ins. 94
Idioglossa, *Walsingham*, Ins. 229
Idiosepius, *Steenstrup*, Moll. 37
Idister, *Marseul*, Ins. 43
Ilia ‖, *Hartman*, Moll. 74 [*Leach*, Crust. 1817]

Ilyodrilus, *Eisen*, Verm. 11
Inioteuthis, *Verrill*, Moll. 37
Iraota, *Moore*, Ins. 164
Irenarchus, *Pascoe*, Ins. 81
Ischnopsis, *Walsingham*, Ins. 228
Ischnoscelis ‖, *Reuter*, Ins. 289 [*Burmeister*, Coleopt. 1842]
Isochorista, *Meyrick*, Ins. 223
Isodontia, *Patton*, Ins. 114
Isospora, *Schneider*, Prot. 35
Isseliella, *Weinkauff*, Moll. 46
Ithomisa, *Oberthür*, Ins. 187

Janulus, *Thorell*, Arachn. 11
Jimenezia, *Bolivar*, Ins. 273
Jolia, *Eaton*, Ins. 264
Joppeicus, *Puton*, Ins. 288
Jotus, *L. Koch*, Arachn. 20

Kerala, *Moore*, Ins. 191
Khadira, „ „ 199
Kowarzia, *Mik*, Ins. 245
Kueneckelia, *Kunstler*, Prot. 30

Lampasopsis [Lampad-], *Jousseaume*, Moll. 47
Lamprocyclas, *Hæckel*, Prot. 19
Lamprodisculus „ „ 18
Lampromitra „ „ 18
Lamprospyris „ „ 19
Lamprotripus „ „ 18
Lampterium „ „ 19
Lansdownia, *Heylaerts*, Ins. 182
Laopteryx, *Marsh*, Aves, 52
Larunda ‖, *Edwards*. Ins. 172 [*Leach*, Crust. 1815; *Hübner*, Lepidopt. 1816]
Laseola, *Simon*, Arachn. 12
Latervis, *Signoret*, Ins. 281
Lathosea, *Grote*, Ins. 199
Lathræna, *Schiödte*, Crust. 31
Latia ‖, *Hartman*, Moll. 74 [*Gray*, Moll. 1849]
Leiponyx [Lip-], *Jentink*, Mamm. 13
Lenospa, *Signoret*, Ins. 281
Lepetella, *Verrill*, Moll. 46
Leptocometes, *H. W. Bates*, Ins. 94
Leptoharpacticus, *Arribálzaga*, Ins. 243
Leptojana, *Butler*, Ins. 189
Leptopenus, *Moseley*, Cœl. 13
Leptostegna, *Christoph*, Ins. 209
Leuresthes, *Jordan*, Pisc. 14
Leurynnis, *Lockington*, Pisc. 17
Libera ‖, *Garrett*, Moll. 67 [*Haan*, Moll. 1825]
Ligonia, *Möschler*, Ins. 208
Linosta „ „ 214
Liocalandra, *Chevrolat*, Ins. 87
Liopasia, *Möschler*, Ins. 214
Lipodectes, *Cope*, Mamm. 18
Liriospyris, *Hæckel*, Prot. 19
Lissoblemmus, *Bolivar*, Ins. 273
Lithocampium, *Hæckel*, Prot. 19 [too near Lithocampe, *Ehr.*]
Lithochytris, *Hæckel*, Prot. 19
Lithocoronis „ „ 19
Lithocubus „ „ 19
Lithognatha ‖, *Stewart*, Verm. 12 [-thus, *Swainson*, Pisc. 1839]
Lithomespilus, *Hæckel*, Prot. 19
Lithosialis, *Scudder*, Ins. 256
Lithotympanium, *Hæckel*, Prot. 19
Lobaspis, *Chevrolat*, Ins. 84
Logæus, *C. O. Waterhouse*, Ins. 90
Lopheros, *Leconte*, Ins. 60
Lophocapsa, *Hæckel*, Prot. 19
Lophocorys „ „ 19
Lophopera „ „ 19
Lophopilumnus, *Miers*, Crust. 15
Lophospyris, *Hæckel*, Prot. 19
Loriolia, *Neumayr*, Ech. 6
Loxaulus, *Mayr*, Ins. 132
Loxochila, *Butler*, Ins. 208
Lucullus, *Giesbrecht*, Crust. 34
Lychnaspis, *Hæckel*, Prot. 20
Lychnodictyum „ „ 18
Lychnosphæra „ „ 19

Mabella, *Fewkes*, Cœl. 7
Macracanthopsis, *Reuter*, Ins. 291
Macrochthonia, *Butler*, Ins. 209
Macr[o]hymenus, *Signoret*, Ins. 281
Macroscytalus, *Broun*, Ins. 88
Malacotheria, *Fairmaire*, Ins. 104
Malakosaria [Malaco-], *Goldstein*, Moll. 103
Maltzania, *Böttger*, Rept. 12
Manteodon, *Cope*, Mamm. 22
Marginaster, *Perrier*, Ech. 7
Maronius, *Gorham*, Ins. 63
Martinezia, *Bolivar*, Ins. 273
Masalia, *Moore*, Ins. 198
Mastacocerus, *Reuter*, Ins. 292
Mastigoteuthis, *Verrill*, Moll. 36
Matapa, *Moore*, Ins. 167
Matuta ‖, *Hartman*, Moll. 74 [*Fabricius*, Crust. 1798]
Mecopisthopus, *Karsch*, Ins. 69
Megabris, *Des Gozis*, Ins. 74
Megacormus, *Karsch*, Arachn. 21
Megadyptes, *A. Milne Edwards*, Aves, 51
Megalomys, *Trouessart*, Mamm. 28
Megalophanes, *Heylaerts*, Ins. 183
Megisba, *Moore*, Ins. 164

Melanochlamys, *Cheeseman*, Moll. 58
Melan[o]hyphus, *Fairmaire*, Ins. 53
Melanostigma, *Günther*, Pisc. 17
Melanus, *Broun*, Ins. 58
Meliarchus, *Salvadori*, Aves, 37
Melinesthes, *Kraatz*, Ins. 55
Melittosphæra, *Hæckel*, Prot. 19
Meniscostomum, *Kent*, Prot. 10
Metabraxas, *Butler*, Ins. 209
Methille, *Butler*, Ins. 297
Methorasa, *Moore*, Ins. 198
Metrioidea, *Fairmaire*, Ins. 104
Meyenia, *Carter*, Spong. 10
Mezentia, *Thorell*, Arachn. 10
Microbothrus, *Fairmaire*, Ins. 85 [-bothrium, *Olsson*, Verm. 1869]
Microcubus, *Hæckel*, Prot. 19
Microdactyla ‖, *Sluiter*, Ech. 8 [-lus, *Geoffroy*, Aves, 1809; *Fitzinger*, Rept. 1843]
Microdyptes, *A. Milne Edwards*, Aves, 51
Microgaza, *Dall*, Moll. 56
Micromonacha, *Sclater*, Aves, 43
Micromelissa, *Hæckel*, Prot. 19
Micropontica, *Böttger*, Moll. 76
Micro[r]rhinus, *Chevrolat*, Ins. 87
Mictoneura, *Meyrick*, Ins. 222
Milneria, *Dall*, Moll. 90
Mimerastria, *Butler*, Ins. 185
Mimica, *Oberthür*, Ins. 175
Miuizza, *Simon*, Arachn. 22
Mioclænus, *Cope*, Mamm. 23
Mirosternus, *Sharp*, Ins. 66
Mitrocalpis, *Hæckel*, Prot. 18
Mixotermes, *Sterzel*, Ins. 261
Modeeria ‖, *Fewkes*, Cœl. 7 [*Forbes*, Cœl. 1848]
Moduza, *Moore*, Ins. 158
Moiropsis, *Agassiz*, Ech. 5
Mongoma, *Westwood*, Ins. 240
Monolene, *Goode*, Pisc. 19
Monosira, *Poey*, Pisc. 11
Monostephus, *Hæckel*, Prot. 19
Monotrypa, *Nicholson*, Cœl. 11
Myelastrum, *Hæckel*, Prot. 20
Myiophanes, *Reuter*, Ins. 292
Myriolepis, *Lockington*, Pisc. 13
Myrmicomimus [Myrmeco-], *Reuter*, Ins. 289

Nacaduba, *Moore*, Ins. 164
Nancredis, *Des Gozis*, Ins. 103
Naranga, *Moore*, Ins. 198
Nasiterna ‖, *Wallengren*, Ins. 239 [*Wagler*, Aves, 1830]
Naupoda, *Osten-Sacken*, Ins. 251
Neilonella, *Dall*, Moll. 93
Nematocarcinus, *A. Milne Edwards*, Crust. 22
Nematoneura, *André*, Ins. 134
Nemertoscolex, *Greef*, Verm. 5
Nenia ‖, *Hartman*, Moll. 74 [*Adams*, Moll. 1858]
Neocharis, *Jacoby*, Ins. 104
Neoglypsus, *Distant*, Ins. 281
Neohela, *S. I. Smith*, Crust. 27
Neohelia, *Moseley*, Cœl. 12
Neomixis, *Sharpe*, Aves, 32
Neopanope, *A. Milne Edwards*, Crust. 14
Neophrida, *Möschler*, Ins. 214
Neophya, *Selys-Longchamps*, Ins. 267
Nephrodictyum, *Hæckel*, Prot. 19
Nestima, *Osten-Sacken*, Ins. 251
Nicoletia ‖, *Canestrini*, Arachn. 30 [*Gervais*, Thysanura, 1840]
Nilasera, *Moore*, Ins. 165
Ninguis, *Wallengren*, Ins. 240
Norraca, *Moore*, Ins. 198
Notostomum, *Levinsen*, Verm. 11
Notostomus, *A. Milne Edwards*, Crust. 23
Nurscia, *Simon*, Arachn. 10
Nycterophæta, *J. B. Smith*, Ins. 199

Ochetina, *Pascoe*, Ins. 82
Ochromima, *H. W. Bates*, Ins. 95
Octatomus, *Tischbein*, Ins. 121
Octopyle, *Hæckel*, Prot. 20
Odontocaulis, *Lapworth*, Cœl. 9
Odontocyathus, *Moseley*, Cœl. 12
Œdignatha, *Thorell*, Arachn. 10
Œnone ‖, *Hartman*, Moll. 74 [*Agassiz*, 1848, amending Ænone, *Savigny*, Verm. 1817, and *Haliday*, Ins. 1838]
Oiketicoides [Œcet-] *Heylaerts*, Ins. 183
Oistophora, *Meyrick*, Ins. 224
Oligobunis, *Cope*, Mamm. 16
Ommatartus, *Hæckel*, Prot. 20
Omœdus, *Thorell*, Arachn. 20
Onalips, *Signoret*, Ins. 282
Oncomelania, *Gredler*, Moll. 49
Oo[r]rhynchus, *Hoek*, Arachn. 26
Opalinopsis, *Fattinger*, Prot. 10
Opsopœodus, *Hay*, Pisc. 21
Orectocera, *Van der Wulp*, Ins. 248
Oribates ‖, *Edwards*, Ins. 199 [*Latreille*, Arachn. 1804; -ta, *Oken*, Arachn. 1815]
Orophaspis, *Hæckel*, Prot. 20

Orosphæra, *Hæckel*, Prot. 19
Orthospora, *Schneider*, Prot. 35
Ortygocichla, *Sclater*, Aves, 32
Oscaria, *Vosmaer*, Spong. 8
Oudablis, *Signoret*, Ins. 302
Oxycercus ‖, *Bolivar*, Ins. 271 [-ca, *Gray*, Aves, 1842]
Oxylasma, *Broun*, Ins. 59
Oxynambra, *Karsch*, Arachn. 28
Oxyopomyrmex, *André*, Ins. 119

Pachycalamus, *Günther*, Rept. 9
Pachycephala ‖, *Broun*, Ins. 48 [*Swainson*, Aves, 1827; - lus, *Wiedemann*, Dipt. 1830, *Agassiz*, Pisc. 1843]
Pachycephalopsis, *Salvadori*, Aves, 35
Pachydon, *Broun*, Ins. 80
Pachygrontha, *Reuter*, Ins. 282
Pachyjana, *Butler*, Ins. 189
Pachypeza ‖, *Broun*, Ins. 85 [*Serville*, Col. 1834]
Pactorrhinus, *Avrey*, Ins. 77
Padraona, *Moore*, Ins. 167
Pægniodes, *Eaton*, 265
Pæromopus, *Karsch*, Myr. 5
Palæobia, *Meyrick*, Ins. 223
Palæotoma „ „ 223
Pallenopsis, *Wilson*, Arachn. 25
Pamponerus, *Fairmaire*, Ins. 28
Panarium, *Hæckel*, Prot. 20
Pantophyrtus, *Thieme*, Ins. 27
Pantoxystus, *Pascoe*, Ins. 85
Parabaris, *Broun*, Ins. 32
Parachela, *Steindachner*, Pisc. 21
Paradictyum, *Hæckel*, Prot. 19
Parafieldingia, *Milne Edwards*, Spong. 11
Parajalysus, *Distant*, Ins. 285
Paralenæus, *Reuter*, Ins. 292
Parallelodera, *Fairmaire*, Ins. 44
Paramelania, *E. A. Smith*, Moll. 49
Paramorpha, *Meyrick*, Ins. 224
Paranais, *Czerniavsky*, Verm. 11
Para[r]rhynchoscolex, *Czerniavsky*, Verm. 5
Parastatis, *Kirby*, Ins. 134 [-ta, *Van Heyden*, Arachn. 1826]
Parastephanus, *Hæckel*, Prot. 19
Parastephus „ „ 19
Parata, *Moore*, Ins. 167
Paratrichius, *O. E. Janson*, Ins. 55
Paratympanium, *Hæckel*, Prot. 19
Parmipalpus, *Broun*, Ins. 39
Parmula ‖, *Carter*, Spong. 10 [*Heyden*, Moll. 1825.]
Parnara, *Moore*, Ins. 167
Pasiropsis, *Reuter*, Ins. 292
Pasithea ‖, *Hartman*, Moll. 74 [*Lamouroux*, Cœl. 1812; *Lea*, Moll. 1833; - thæa, *Sowerby*, Moll. 1842; Pasy-, *Dana*, Cœl. 1846.
Patagospyris, *Hæckel*, Prot. 19
Patenaria, *Hamm*, Moll. 107
Pathodermus, *Fairmaire*, Ins. 44
Pattalinus, *H. W. Bates*, Ins. 94
Paurochela, *Reuter*, Ins. 281
Pechaudia, *Bourguignat*, Moll. 80
Pectinitarsus, *Fairmaire*, Ins. 28
Pedinorrhina, *Kraatz*, Ins. 54
Peltoxys, *Signoret*, Ins. 281
Penæopsis, *Bate*, Crust. 23
Penetopteryx, *Lunel*, Pisc. 25
Pentacitrotus, *Butler*, Ins. 179
Pentactura, *Hæckel*, Prot. 20
Pentalacorys „ „ 19
Pentalastrum „ „ 20
Pentaphormis „ „ 18
Pentaplegma „ „ 18
Pentaspyris „ „ 19
Penthetria ‖, *Edwards*, Ins. 175 [*Macquart*, Dipt. 1803]
Pentinastrum, *Hæckel*, Prot. 20
Peraceras, *Cope*, Mamm. 21
Periarachnium, *Hæckel*, Prot. 18
Periplecta „ „ 18
Periptychus, *Cope*, Mamm. 23
Peripyramis, *Hæckel*, Prot. 18
Perischocidaris, *Neumayr*, Ech. 6
Perispira, *Hæckel*, Prot. 20
Perispongidium „ „ 20
Perispyris „ „ 19
Perissoblemma, *Cambridge*, Arachn. 17
Perizona, *Hæckel*, Prot. 20
Peromelissa „ „ 19
Peronopora, *Nicholson*, Cœl. 11
Petalidium, *Bate*, Crust. 24
Petalodoris, *Bergh*, Moll. 59
Petalotricha *Kent*, Prot. 8
Petascelisca, *Distant*, Ins. 285
Phacodiscus, *Hæckel*, Prot. 20
Phacostaurus „ „ 20
Phacostylus „ „ 20
Phæobalia, *Mik*, Ins. 245
Phædima, *Thorell*, Arachn. 9
Phalga, *Moore*, Ins. 199
Phanasora, *Pascoe*, Ins. 77
Phaneropis, *Fischer*, Rept. 9
Phatnacantha, *Hæckel*, Prot. 20
Phatnaspis „ „ 20
Pherocla lus, *Fairmaire*, Ins. 60
Philemonopsis, *Salvadori*, Aves, 37
Philocompus, *Osten-Sacken*, Ins. 251
Philolutra, *Mik*, Ins. 245

Phlebarachnium, *Hæckel*, Prot. 18
Phoberus ‖, *A. Milne Edwards* Crust. 21 [*MacLeay*, Col. 1819]
Phonicocleptes, *Arribálzaga*, Ins. 243
Phormobotrys, *Hæckel*, Prot. 19
Phormosphæra „ „ 19
Phormospyris „ „ 19
Phorticium „ „ 20
Phoxophrys, *Hubrecht*, Rept. 6
Phractacántha, *Hæckel*, Prot. 20
Phractaspis „ „ 20
Phractopelma „ „ 20
Phricanthes, *Meyrick*, Ins. 223
Phrissolaus, *H. W. Bates*, Ins. 95
Phryctena, *Oberthür*, Ins. 172
Phryganeopsis, *Walsingham*, Ins. 228
Phyllolais, *Hartlaub*, Aves, 32
Pilemia, *Möschler*, Ins. 214 [-ma, *Leconte*, Col. 1873; *Hæckel*, Cœl. 1880]
Pinacopora, *Nicholson*, Cœl. 14
Pinarocichla, *Sharpe*, Aves, 36
Piotypus, *Pascoe*, Ins. 78
Pityomma, *Hæckel*, Prot. 19
Plagiocarpa „ „ 18
Plagiotrochus, *Mayr*, Ins. 132
Plagonidium, *Hæckel*, Prot. 18
Plagonium „ „ 18
Platybursa „ „ 18
Platychasma, *Butler*, Ins. 184
Platycryphalus, *Hæckel*, Prot. 18
Plat[y]eumeta, *Butler*, Ins. 183
Platy[r]rhinoidis, *Jordan*, Pisc. 7
Platysestrum, *Hæckel*, Prot. 18
Plectanium, *Hæckel*, Prot. 18
Plectocoronis „ „ 19
Plectogaster, *C. O. Waterhouse*, Ins. 92
Plectophora, *Hæckel*, Prot. 18
Plectopyramis „ „ 18
Plectoteuthis, *Owen*, Moll. 36
Plectotripus, *Hæckel*, Prot. 19
Plectroctena, *Snellen*, Ins. 214
Plegmatium, *Hæckel*, Prot. 18
Plegmosphæra „ „ 20
Plethes, *Pascoe*, Ins. 81
Pleuraspis, *Hæckel*, Prot. 20
Pleurocarpa, *Fewkes*, Cœl. 8
Pleurocorys, *Hæckel*, Prot. 19
Pleurocyathus, *Moseley*, Cœl. 12
Pleuropodium, *Hæckel*, Prot. 19
Ploiariodes [Plœarioides], *F. B. White*, Ins. 292
Plonisa, *Signoret*, Ins. 282
Plotor, *Schiödte*, Crust. 31
Plutonium, *Cavanna*, Myr. 4
Podocampe, *Hæckel*, Prot. 19
Podocoronis, *Hæckel*, Prot. 19
Pododrilus, *Czerniavsky*, Verm. 12
Pœcilocaulus, *Fairmaire*, Ins. 25
Pogonitis ‖, *Christoph*, Ins. 208 [*Sodoffsky*, Pyralidæ, 1837]
Pogonodon, *Cope*, Mamm. 15
Polemistes, *Reuter*, Ins. 291
Polycerella, *Verrill*, Moll. 60
Polydamna, *Thorell*, Arachn. 16
Polygonosphærites, *Römer*, Prot. 25
Polyspyris, *Hæckel*, Prot. 19
Polytaxia, *Hamm*, Moll. 107
Porodiscus, *Hæckel*, Prot. 20
Pradatta, *Moore*, Ins. 198
Prasopora, *Nicholson*, Cœl. 11
Pratapa, *Moore*, Ins. 165
Priateles, *Broun*, Ins. 43
Prismatidium, *Hæckel*, Prot. 19
Proboscella, *Kent*, Prot. 10
Pronous, *Keyserling*, Arachn. 14
Proplesictis, *Filhol*, Mamm. 17
Proselena, *Meyrick*, Ins. 222
Proteola, *Czerniavsky*, Verm. 5
Proteopteryx, *Walsingham*, Ins. 224
Protoceratium, *Bergh*, Prot. 30
Protodrilus ‖, *Czerniavsky*, Verm. 11 [*Hatschek*, Verm. 1880]
Protogonia ‖, *Cope*, Mamm. 23 [-nius, *Hübner*, Lepidopt. 1816]
Protomyxomyces, *Cunningham*, Prot. 31
Protoperidinium, *Bergh*, Prot. 30
Protopsalis, *Cope*, Mamm. 18
Protympanium, *Hæckel*, Prot. 19
Prunosphæra „ „ 19
Psaltrites, *Cabanis*, Aves, 33
Psammatodendron[-rum], *Brady*, Prot. 22
Psecadioides, *Butler*, Ins. 229
Pselnophorus, *Wallengren*, Ins. 232
Pseudapiconoma, *Aurivillius*, Ins. 177
Pseudebulea, *Butler*, Ins. 214
Pseuderiphia, *Miers*, Crust. 15
Pseudione, *Kossmann*, Crust. 32
Pseudoleptops, *Fairmaire*, Ins. 79
Pseudomeira, *Stierlin*, Ins. 78
Pseudomilax, *Böttger*, Moll. 63
Pseudomolius, *Fairmaire*, Ins. 85
Pseudomysis, *Sars*, Crust. 24
Pseudoplectus, *Reitter*, Ins. 39
Pseudo[r]rhabditis, *Perroncito*, Verm. 7
Pseudostegania, *Butler*, Ins. 208
Psilomelissa, *Hæckel*, Prot. 18
Psittacotherium, *Cope*, Mamm. 29
Pterocorys, *Hæckel*, Prot. 19

Pterocorythium *Hæckel*, Prot. 19
Pterocyrtidium, *Bütschli*, Prot. 25
Pterograptus, *Holm*, Cœl. 9
Pteroperidium, *Hæckel*, Prot. 18
Pteropilium „ „ 18
Pteropilium ‖ „ „ 19
Pteroporus ‖, *Fairmaire*, Ins. 85 [*Schönherr*, Coleopt. 1843]
Pteroscenium, *Hæckel*, Prot. 18
Pterostylari[oi]des, *Czerniavsky*, Verm. 71
Ptilichthys, *Bean*, Pisc. 14
Ptilodus, *Cope*, Mamm. 31
Ptorthodius, *Gorham*, Ins. 63
Ptychodes ‖, *Buckton*, Ins. 301 [*Serville*, Coleopt. 1835]
Ptychoptera ‖, *Christoph*, Ins. 209 [*Meigen*, Dipt. 1833]
Pulsatella, *Geddes*, Prot. 31
Purbia, *Moore*, Ins. 199
Purlisa „ „ 165
Pycnopygius, *Salvadori*, Aves, 37
Pylobotrys, *Hæckel*, Prot. 19
Pylocapsa „ „ 20
Pylonium „ „ 20
Pyrgotis, *Meyrick*, Ins. 223 [-ta, *Wiedemann*, Dipt. 1830]
Pyrinioides, *Butler*, Ins. 199
Pyrosis, *Oberthür*, Ins. 190 [-sia, *Schiner*, Dipt. 1862]
Pyxidium ‖, *Kent*, Prot. 8 [*Leuckart*, Cœl. 1856]

Quadrina, *Grote*, Ins. 188

Radiaster, *Perrier*, Ech. 7
Radiocavaria, *Hamm*, Moll. 107
Raghuva, *Moore*, Ins. 198
Rahinda „ „ 158
Rapala „ „ 165
Rathinda „ „ 164
Retowskia, *Böttger*, Moll. 73
Revoilia, *Bourguignat*, Moll. 85
Rhabdostyla, *Kent*, Prot. 8
Rhæbobates, *Thorell*, Arachn. 16
Rhaphidosphæra, *Hæckel*, Prot. 19
Rhinocricus, *Karsch*, Myr. 5
Rhinotropis, *Fairmaire*, Ins. 89
Rhithrogena, *Eaton*, Ins. 265
Rhizoplegma, *Hæckel*, Prot. 20
Rhodosphæra „ „ 19
Rhodospyris „ „ 19
Rhoenanthus, *Eaton*, Ins. 264
Rhoophilus, *Mayr*, Ins. 132
Rhopalatractus, *Hæckel*, Prot. 19
Rhopalocanium „ „ 19
Rhyncheros, *Leconte*, Ins. 60
Rhynchostruthus, *Sclater*, Aves, 39
Rindahara, *Moore*, Ins. 165
Risoba „ „ 191
Rochebrunia, *Bourguignat*, Moll. 85
Rœderia, *Mik*, Ins. 245
Roncador, *Jordan*, Pisc. 11
Rosca, *Schiödte*, Crust. 31
Rosenbergia, *Ritsema*, Ins. 94
Runciniopsis, *Simon*, Arachn. 16

Sarandonyx, *Des Gozis*, Ins. 72
Sarangesa, *Moore*, Ins. 168
Sarcothraustes, *Cope*, Mamm. 19
Saronaga, *Moore*, Ins. 191
Sasunaga „ „ 198
Saturnalis, *Hæckel*, Prot. 19
Saturnalium „ „ 19
Saturnulus „ „ 19
Scæo[r]rhynchus, *Wilson*, Arachn. 26
Schedophilopsis, *Steindachner*, Pisc. 11
Schiodtella [Schiœdt-], *Signoret*, Ins. 282
Schistomitra, *Butler*, Ins. 174
Scolioplecta, *Meyrick*, Ins. 223
Scotomera, *Butler*, Ins. 214
Scotophilus ‖, *Hesse*, Crust. 35 [*Leach*, Mamm. 1822; *Swainson*, Aves, 1837]
Scytalina ‖, *Jordan*, Pisc. 18 [-nus, *Erichson*, Coleopt. 1840]
Scythropesthes, *Kraatz*, Ins. 55
Senex ‖, *Pfeffer*, Crust. 20 [*Gray*, Aves, 1839]
Sepalospyris, *Hæckel*, Prot. 19
Sepiadarium, *Steenstrup*, Moll. 37
Sericophara, *Christoph*, Ins. 208
Seriefascigera, *Hamm*, Moll. 107
Sestropodium, *Hæckel*, Prot. 19
Sestrornithium „ „ 19
Sethocapsa „ „ 19
Sethocorys „ „ 18
Sethochytris „ „ 19
Sethodiscus „ „ 18
Sethodiscus ‖ „ „ 20
Sethomelissa „ „ 18
Sethopera „ „ 19
Sethoperidium „ „ 19
Sethophatna „ „ 19
Sethopilium „ „ 18
Sethopyramis „ „ 18
Sethosphæra „ „ 19
Sethostaurus „ „ 20
Sethostylus „ „ 20
Sibiriakoffia, *Holmgren*, Ins. 123
Sierola, *Cameron*, Ins. 128
Siganorosis, *Wallengren*, Ins. 228
Sigmatidium, *Giesbrecht*, Crust. 34
Simaetha, *Thorell*, Arachn. 19

Singamia, *Möschler*, Ins. 214
Siphocampe, *Hæckel*, Prot. 19
Siphocampium „ „ 19
Sisyraphora, *Kraatz*, Ins. 55
Smaragdesthes „ „ 55
Sognorus, *Reitter*, Ins. 38
Solenaspis, *Osten-Sacken*, Ins. 246
Sophaga, *Moore*, Ins. 198
Soreuma, *Hæckel*, Prot. 20
Soreumidium „ „ 20
Spaniophlebia, *Eaton*, Ins. 264
Spathophora ‖, *Jeffreys*, Moll. 85 [*Amyot & Serville*, Hemipt. 1843; *Rondani*, Dipt. 1857]
Spermodenops, *Abeille*, Ins. 65
Sphærocapsa, *Hæckel*, Prot. 20
Sphærocircus „ „ 19
Sphærostylus „ „ 19
Sphærula ‖, *Fewkes*, Cœl. 8 [*Agassiz*, 1848, amending Spherula, *Soldani*, Cœl. 1780, and *Gray*, Moll. 1821; *Megerle*, 1823, and *Stephens*, 1831, Coleopt.]
Sphallonycha, *H. W. Bates*, Ins. 95
Sphinditeles, *Brown*, Ins. 66
Spireuma, *Hæckel*, Prot. 20
Spirocampe „ „ 19
Spirocyrtis „ „ 19
Spirofascigera, *Hamm*, Moll. 107
Spirosperma, *Eisen*, Verm. 11
Spongechinus, *Hæckel*, Prot. 20
Spongobrachium „ „ 20
Spongodrymus „ „ 20
Spongoloncha „ „ 20
Spongoloncha ‖ „ „ 20
Spongophacus „ „ 20
Spongophortis „ „ 20
Spongopila „ „ 20
Spongoplegma „ „ 20
Spongosphærium „ „ 20 [too near Spongosphæra]
Spongostaurus, *Hæckel*, Prot. 20
Spongostylium „ „ 20 [too near Spongostylus]
Spongostylus, *Hæckel*, Prot. 20
Spongotripus „ „ 20
Spyridibotrys „ „ 19
Stæbe[r]rhinus, *Butler*, Ins. 229
Stauracantha, *Hæckel*, Prot. 20
Stauracontium „ „ 19
Stauractura „ „ 20
Staurancistra „ „ 19
Stauraspis „ „ 20
Staurobelone „ „ 20
Staurocaryum „ „ 20
Staurocromyum „ „ 20
Staurocyclia „ „ 20
Staurodictya „ „ 20
Staurodoras, *Hæckel*, Prot. 20
Staurodoras ‖ „ „ 20
Staurolithium ‖ „ „ 20 [*Hæckel*, Prot. 1862]
Staurolonche „ „ 19
Staurolonche ‖ „ „ 20
Stauropelma „ „ 20
Staurosphæra „ „ 19
Stauroptera „ „ 20
Staurostylus „ „ 19
Stegaspis ‖, „ „ 20 [*Germar*, Hemipt. 1833]
Stenetrium, *Haswell*, Crust. 33
Stenocoris ‖, *Signoret*, Ins. 281 [*Burmeister*, 1835, *Rambur*, 1839, Hemipt.]
Stenophanes, *Heylaerts*, Ins. 183
Stenopus ‖, *Brown*, Ins 89 [*Guilding*, Moll. 1827; *Latreille*, Crust. 1829]
Stenosternus, *Karsch*, Ins. 49
Stenoterommata, *Holmberg*, Arachn. 8
Stephanodesma, *Hamm*, Moll. 107
Stephanophatna, *Hæckel*, Prot. 18
Stephanophyllia, *Moseley*, Cœl. 13
Stephanospyris, *Hæckel*, Prot. 19
Stephanotrochus, *Moseley*, Cœl. 12
Sterope, *Hartman*, Moll. 74 [-pes, *Steven*, Coleopt. 1806; *Boisduval*, Lepidopt. 1836; *Hagen*, Neuropt. 1850]
Stichocampe, *Hæckel*, Prot. 19
Stichocapsa „ „ 19
Stichocorys „ „ 19
Stichocyrtis „ „ 19
Stichopera „ „ 19
Stichophatna „ „ 19
Stichophormis „ „ 19
Stichopilium „ „ 19
Stichopodium „ „ 19
Stichopterygium „ „ 19
Stigmatophora, *Staudinger*, Ins. 179
Stigmatopora, *Hamm*, Moll. 107
Stizopygora, *Kraatz*, Ins. 55
Stoloteuthis, *Verrill*, Moll. 37
Stoma[ta]phis, *Buckton*, Ins. 301
Storthocnemis, *Karsch*, Ins. 69
Strepsiceros ‖, *Meyrick*, Ins. 224 [*H. Smith*, Mamm. 1827]
Stromatopelma, *Karsch*, Arachn. 8
Strombidinopsis[-diops-], *Kent*, Prot. 9
Stumpffia, *Böttger*, Rept. 14
Stylartus, *Hæckel*, Prot. 20
Stylochlamydium, *Hæckel*, Prot. 20
Stylochona, *Kent*, Prot. 8
Stylocromyum, *Hæckel*, Prot. 20

Stylodactylus, *A. Milne Edwards*, Crust. 22
Stylolæmus, *Karsch*, Myr. 4
Stylospongidium, *Hæckel*, Prot. 20
Stylostaurus „ „ 19
Stypodon, *Garman*, Pisc. 22
Styptosphæra, *Hæckel*, Prot. 20
Suastus, *Moore*, Ins. 167
Sympagus, *H. W. Bates*, Ins. 94
Symphocrinus, *Trautschold*, Ech. 9
Sympleurotis, *H. W. Bates*, Ins. 95
Synaxes, *Bate*, Crust. 20
Syneunetis, *Wallengren*, Ins. 228
Synhaga, *Czerniavsky*, Verm. 5
Syphorbus, *Pascoe*, Ins. 81
Systemodon, *Cope*, Mamm. 21

Tachyphyle, *Butler*, Ins. 208
Tæniesthes, *Kraatz*, Ins. 55
Tajuria, *Moore*, Ins. 165
Talicada „ „ 164
Tanganyicia, *Crosse*, Moll. 50
Tansima, *Moore*, Ins. 161
Tanyodes, *Möschler*, Ins. 185
Tapena, *Moore*, Ins. 168
Taracticus, *Bergh*, Ins. 296
Tartarisus, *Pascoe*, Ins. 82
Tarucus, *Moore*, Ins. 164
Taurospyris, *Hæckel*, Prot. 19
Telicota, *Moore*, Ins. 167
Telmatodrilus, *Eisen*, Verm. 11
Telotrochidium, *Kent*, Prot. 8
Temorella, *Claus*, Crust. 35
Tenaspis, *Leconte*, Ins. 62
Teratopsis, *Walsingham*, Ins. 228
Terato[r]rhombus, *Macleay*, Pisc. 18
Tessaraspis, *Hæckel*, Prot. 20
Tessaropelma „ „ 20
Tessarospyris „ „ 19
Tesserastrum [Tessara-] 20
Tetanola, *H. W. Bates*, Ins. 95
Tetracapsa, *Hæckel*, Prot. 19
Tetracorethra „ „ 18
Tetracoronis „ „ 19
Tetracyphus, *Chevrolat*, Ins. 85
Tetra[h]edrina, *Hæckel*, Prot. 19
Tetralacorys „ „ 19
Tetrapera „ „ 19
Tetraphormis „ „ 18
Tetraplagia „ „ 18
Tetraplecta „ „ 18
Tetrapteroma „ „ 18
Tetrapylonium „ „ 20
Tetra[r]rhabda „ „ 18
Tetraspongonium „ „ 20
Tetraspyris „ „ 19
Thalassophysa „ „ 20
Thalassopila „ „ 20
Thalassoxanthium, *Hæckel*, Prot. 20
Thalerosphyrus, *Eaton*, Ins. 265
Thamnospyris, *Hæckel*, Prot. 19
Thaumastoplax, *Miers*, Crust. 16
Thecosphæra, *Hæckel*, Prot. 19
Thelecorus, *Karsch*, Arachn. 8
Theocanium, *Hæckel*, Prot. 19
Theocapsa „ „ 19
Theocorys „ „ 19
Theonoe, *Simon*, Arachn. 12 [-noa, *Lamouroux*, Cœl. 1821]
Theopera, *Hæckel*, Prot. 19
Theophæna „ „ 19
Theophatna „ „ 19
Theophormis „ „ 19
Theopilium „ „ 19
Theopodium „ „ 19
Theosyringium „ „ 19
Therospyris „ „ 19
Thinalmus, *Gorham*, Ins. 63
Tholospyris, *Hæckel*, Prot. 19
Thoracaspis „ „ 20
Thrasyderes, *Bolivar*, Ins. 275
Thraulius, *Eaton*, Ins. 264
Thrincophora, *Meyrick*, Ins. 223
Thuricola, *Kent*, Prot. 9
Thwaitesia, *Cambridge*, Arachn. 11
Thylacosternus, *Fairmaire*, Ins. 85
Thyris , *Goode*, Pisc. 19 [*Ochsenheimer*, Lepidopt. 1808]
Tiarechinus, *Neumayr*, Ech. 6
Tiarina, *Bergh*, Prot. 10
Tiarospyris, *Hæckel*, Prot. 19
Tilodon, *Thominot*, Pisc. 9
Timaspis, *Mayr*, Ins. 131
Tintinnidium, *Kent*, Prot. 9
Tiracola, *Moore*, Ins. 198
Tolmerolestes, *Arribalzága*, Ins. 243
Tomocera, *Howard*, Ins. 127
Trachydetania, *Ridley*, Spong. 10
Triacartus, *Hæckel*, Prot. 19
Triactis „ „ 20
Tribonosphæra „ „ 21
Triceraspyris „ „ 19
Trichalphus, *H. W. Bates*, Ins. 94
Trichapus, *Friedenreich*, Ins. 67
Trichesia, *Provancher*, Ins. 124
Trichosomus , *Chevrolat*, Ins. 85 [*Swainson*, Pisc. 1839; - ma, *Rudolphi*, Vermes, 1819, *Rambur*, Lepidoptera, 1834]
Tricolocampe, *Hæckel*, Prot. 19
Tricolocapsa „ „ 19
Tricolopera „ „ 19
Tricolospyris „ „ 19
Tricranastrum „ „ 20
Trictenartus „ „ 19

Tricyclidium, *Hæckel*, Prot. 19
Tridictyopus ‖ „ „ 18 [*Hertwig*, Denk. Ges. Jena, ii. (1879) p. 203]
Trigonactura, *Hæckel*, Prot. 20
Trigonochlamys, *Böttger*, Moll. 63
Triisodon, *Cope*, Mamm. 18
Trilampterium, *Hæckel*, Prot. 19
Triocnemis, *Grote*, Ins. 199
Triopyle, *Hæckel*, Prot. 20
Triospyris „ „ 19
Triostephus „ „ 19
Tripilidium „ „ 18
Triplagia „ „ 18
Triplecta „ „ 18
Tripleurium „ „ 18
Triplopus, *Cope*, Mamm. 20
Tripocalpis, *Hæckel*, Prot. 18
Tripocoronis „ „ 19
Tripocyclia „ „ 20
Tripodictya „ „ 20
Tripodiscium „ „ 18
Tripodiscus ‖ „ „ 18 [*Ehrenberg*, Prot. 1840]
Tripodocorys, *Hæckel*, Prot. 18
Tripodospyris „ „ 19
Triprionium „ „ 18
Tripterocalpis „ „ 18
Trissocircus „ „ 19
Trissocircus ‖ „ „ 19
Trissocyclus „ „ 19
Trissopilium „ „ 18
Tristephaniscus „ „ 19
Tristylospyris „ „ 19
Trisuloides, *Butler*, Ins. 181
Tritaxeopus, *Owen*, Moll. 34
Trochovitrina, *Böttger*, Moll. 64
Tropidophora ‖, *Jeffreys*, Moll. 85 [*J. Thomson*, Col., 1858; -rus, *Duméril*, Rept. 1839]
Trypheromera, *Butler*, Ins. 180
Tubella, *Carter*, Spong. 10
Tubulodigitus, *Carter*, Spong. 9
Tuerckheimia, *Dewitz*, Ins. 209
Turcicula, *Dall*, Moll. 55
Tutufa, *Jousseaume*, Moll. 47
Tylaster, *Danielssen*, Ech. 7
Tyloptera ‖, *Christoph*, Ins. 209 [-rus, *Leconte*, Col. 1876]
Tympanium ‖, *Hæckel*, Prot. 19 [*Ranzani*, Pisc. 1839]
Tyranneutes, *Sclater*, Aves, 41

Udaspes, *Moore*, Ins. 168
Urceolopora, *MacGillivray*, Moll. 102
Urocharis, *Salvadori*, Aves, 37
Urocichla, *Sharpe*, Aves, 33
Urodynamis, *Salvadori*, Aves, 43
Uruguaya, *Carter*, Spong. 10
Utopnia, *Reuter*, Ins. 289
Uvea, *Fauvel*, Ins. 28
Uzagaria, *Ancey*, Ins. 70

Vandana, *Moore*, Ins. 199
Vata, *Fauvel*, Ins. 25
Venassa, *Martens*, Moll. 41
Veruina, *Wallengren*, Ins. 240
Virachola, *Moore*, Ins. 164
Vitibia, *Fairmaire*, Ins. 100

Xanthiosphæra, *Hæckel*, Prot. 21
Xanthochroina, *Ganglbauer*, Ins. 76
Xeloma, *Kraatz*, Ins. 55
Xenaspis, *Osten-Sacken*, Ins. 251
Xenocera ‖, *Broun*, Ins. 66 [-rus, *Germar*, Coleopt. 1833]
Xiphodictya, *Hæckel*, Prot. 20
Xiphoptera ‖ „ „ 20 [-rus, *Agassiz*, Pisc. 1843]
Xiphosphæra, *Hæckel*, Prot. 19
Xiphostylus „ „ 19
Xiphoteuthis, *Owen*, Moll. 35
Xyletobius, *Sharp*, Ins. 66
Xystreurys, *Jordan*, Pisc. 18

Zapteryx, *Jordan*, Pisc. 7
Zarhipis, *Leconte*, Ins. 63
Zeatyrus, *Sharp*, Ins. 38
Zizera, *Moore*, Ins. 164
Zonabris, *Harold*, Ins. 74 [omitted from Index, Zool. Rec. xvi.]
Zonitides, *Abeille*, Ins. 75
Zonosoma ‖, *Butler*, Ins. 180 [*Lederer*, Geometridæ, 1850; *Loew*, Dipt. 1862]
Zophophilus, *Fairmaire*, Ins. 71
Zygartus, *Hæckel*, Prot. 20
Zygocircus, *Bütschli*, Prot. 21
Zygonopus, *Ryder*, Myr. 5
Zygostephaniscus, *Hæckel*, Prot. 19
Zygostephus „ „ 19

END OF THE EIGHTEENTH VOLUME.

London: Printed by Simmons & Botten, Shoe Lane, Fleet Street.