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

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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.).

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PREFACE.

I HAVE the pleasure of acknowledging the following grants in aid of this undertaking:—£100 from the British Association for the Advancement of Science; £100 from the Government Grant Fund of the Royal Society (the sixth contribution); and £50 (the seventh contribution) from the Council of the Zoological Society of London.

In thanking such of the Recorders as continue their assistance in this arduous work, I have to notice with regret the loss of three of my former fellow-labourers, two of whom have very suddenly been taken from us.

The late Mr. Alston's engagements prevented him from writing the Record of *Mammalia*, which he had for six years so ably undertaken; he had, however, before his lamented death, supplied a most efficient substitute in Mr. W. A. Forbes, Prosector to the Zoological Society.

The late Mr. O'Shaughnessy, another valued contributor of equal long standing, did not intend to undertake the *Reptilia* and *Pisces* in future, but had provided a successor, Mr. G. A. Boulenger, whose work at the British Museum is sufficient guarantee of his capability.

Finally, Dr. Lütken has found that he can no longer devote sufficient time to the Record of *Cœlenterata*, and has therefore reluctantly given up that work. It may appear invidious to Mr. A. G. Bourne, of the Zoological Laboratory, University of London, and Mr. S. J. Hickson, of Downing College, Cambridge, who have at a short notice most efficiently undertaken that difficult group between them; but it is nevertheless impossible to avoid the expression of sincere regret at the loss of so distinguished a writer.

The *Arachnida* omitted from last volume are supplied in this one; and Mr. Cambridge, with the assistance of Mr. F. M. Campbell, continues to record that group, the *Myriopoda* being taken by Mr. W. F. Kirby.

The present volume is some thirty pages longer than the last; it contains, however, twenty-five pages of *Arachnida* properly belonging to 1878, and is consequently only a few pages in excess.

It is confidently expected that the Record of 1880 (already in hand) will be published in the course of the present year.

EDWARD CALDWELL RYE.

ROYAL GEOGRAPHICAL SOCIETY,
1, Savile Row, Burlington Gardens, London,
April, 1881.

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

QUOTED IN THIS VOLUME.

Abh. Ak. Berl.—Abhandlungen der k. Akademie der Wissenschaften zu Berlin.

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

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

Abh. Ges. Halle—Abhandlungen der naturforschenden Gesellschaft, Halle.

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. Ac. B. Aires—Actas de la Academia Nacional de Ciencias, Buenos Aires.

Act. Lund.—Acta Universitatis Lundensis (Lund).

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

Altpreuss. Monatsschr.—Altpreussiche Monatsschrift (Königsberg).

Am. J. Micr.—American Journal of Microscopy and Popular Science (Phin : New York).

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

Am. Nat.—American Naturalist (Boston, U.S.A.).

An. Agric. Argent.—Anales de Agricultura de le Republica Argentina (Buenos Aires).

An. Mus. Méx.—Anales del Museo Nacional de México.

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

Ann. Lyc. N. York—Annals of the Lyceum of Natural History of New York.

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. Sci. Nat. (6)—Annales des Sciences Naturelles. 6me série (Paris).
Ann. Soc. Agric. Lyon—Annales de la Société d'Agriculture, Histoire naturelle, et Arts utiles de Lyon.
Ann. Soc. Ent. Fr. (5)—Annales de la Société entomologique de France. 5me série (Paris).
Ann. Soc. L. Lyon (*n.s.*)—Annales de la Société Linnéenne de Lyon. Nouvelle série.
Ann. Soc. Mod.—Annuario della Società dei Naturalisti di Modena.
Ann. Turkist. Soc.—Annals of the Turkistan Section of the Society of the Friends of Science, Anthropology, and Ethnography.
An. Soc. Arg.—Anales cientificos Argentinos (Sociedad cientifica: Buenos Aires).
An. Soc. Esp.—Anales de la Sociedad Española de Historia Natural (Madrid).
Arb. Ges. Kazan = *Tr. Soc. Kazan.*
Arb. Inst. Würzb. (2)—Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg. Neue Folge.
Arb. Petersb. Ges.—Arbeiten der St. Petersburger Gesellschaft der Naturforscher.
Arb. z. Inst. Wien—Arbeiten des zoologischen Instituts in Wien.
Arch. Anat. Entwickel.—Archiv für Anatomie und Entwickelungsgeschichte (His & Braune: Leipzig).
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. Lyon—Archives du Muséum d'Histoire Naturelle de Lyon.
Arch. Mus. R. Jan.—Archivos do Museu Nacional do Rio de Janeiro.
Arch. prakt. Med.—Deutsches Archiv für praktische Medecin (Fränkel: Leipzig).
Arch. Ver. Mecklenb.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
Arch. Z. expér.—Archives de Zoologie expérimentale et générale (Paris).
Assoc. Fr. = *Bull. Ass. Sci. Fr.*
Atti Ac. Linc. = *Atti Ac. Rom.*
Atti Acc. Nap.—Atti dell' Accademia di Scienze fisiche e mathematiche di Napoli.
Atti Acc. Rom.—Atti della R. Accademia dei Lincei (Rome).
Atti Acc. Tor.—Atti della R. Accademia delle Scienze di Torino (Turin).
Atti Ist. Veuet.—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.

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

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

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

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

Ber. Vers. Naturf.—Amtlich Bericht über die Versammlungen deutscher Naturforscher und Aertze.

Bol. Ac. Arg. and *Bol. Ac. Cordoba*—Boletin de la Academia Nacional de Ciencias exactas existente en la Universidad de Cordoba.

Boll. scient.—Bollettino scientifico (Giovanni: Milan).

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

Bull. Ac. Belg. (2)—Bulletin de l'Académie Royale des Sciences de Belgique. 2me série (Brussels).

Bull. Ass. Sci. Fr.—Bulletin de l'Association française pour l'avancement des Sciences.

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

Bull. Ent. Ital.—Bullettino della Società Entomologica Italiana (Florence).

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

Bull. haut. études lab. histol.—Bulletin du laboratoire d'histologie du Collège de France. École pratique des hautes études (Paris).

Bull. Mal. Belg.—Bulletin de la Société Malacologique de Belgique (Brussels).

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

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

Bull. Soc. Belge microsc.—Bulletin de la Société Belge de Microscopie (Bruxelles).

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

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Bull. Soc. Nimes—Bulletin de la Société d'études des Sciences Naturelles de Nimes.
Bull. Soc. Phil. Bord.—Bulletin de la Société Philomathique de Bordeaux.
Bull. Soc. Philom.—Bulletin de la Société Philomathique de Paris.
Bull. Soc. Rouen—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. Zool. and *Bull. Soc. Z. Fr.*—Bulletin de la Société Zoologique de France (Paris).
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 (New York).

Canad. Ent.—Canadian Entomologist (Bethune : Montreal).
CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch mineralogischen Vereins in Regensburg (Ratisbon).
C. H.—Coleopterologische Hefte (Von Harold : Munich).
Chesap. Zool. Lab.—Publications of the Chesapeake Zoological Laboratory.
Cist. Ent.—Cistula Entomologica (Janson : London).
Congr. Sc.—Congrès Scientifique de France.
Contr. Sm. Inst.—Contributions to Knowledge by the Smithsonian Institution (Washington).
C. R.—Comptes rendus des séances hebdomadaires de l'Académie des Sciences (Paris).
CR. Congrès Int.—Comptes rendus des séances du Congrès Internationale.
CR. Ent. Belg.—Comptes rendus des séances de la Société entomologique de Belgiques (Brussels).
CR. Soc. Biol.—Comptes rendus des séances et Mémoires de la Société de Biologie (Paris).

Dan. Selsk. Skr.—K. Danske-Videnskabernes Selskabs Skrifter (Copenhagen).
Denk. Ak. Wien—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna).
Denk. Ges. Jena—Denkschriften der medicinisch-naturwissenschaftlichen Gesellschaft, Jena.
Denk. neuruss. nat. Ges. = *Mém. Soc. Nouv. Russ.*—Mémoires de la Société des Naturalistes de la Nouvelle Russie (Odessa).
Deutsche E. Z.—Deutsche entomologische Zeitschrift (Berlin).

Ent.—The Entomologist (London).

Ent. M. M.—Entomologist's Monthly Magazine (Douglas, McLachlan, Rye, & Stainton: London).
Ent. Nachr.—Entomologische Nachrichten (Katter: Putbus).

Feuill. Nat.—Feuilles des jeunes Naturalistes (Mülhausen).
Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Geol. Mag.—Geological Magazine (Woodward: London).
Giorn. Sc. Palerm.—Giornale di scienze naturali ed economiche (Reale Istituto tecnico, Palermo).
Guide Nat.—Guide du Naturaliste. Revue Bibliographique des Sciences Naturelles (Bouvier: Paris).

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ (St. Petersburg).

Ibis—The Ibis (Salvin: London).
Isis—Isis; Maandschrift voor Natuurwetenschap (Hinzinga: Haarlem).

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. f. Mineral.—Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie (Leonhard & Geinitz: Stuttgart).
JB. schles. Ges.—Jahresberichte der schlesischen Gesellschaft für vaterländische Cultur (Breslau).
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JB. Ver. Zwickau—Jahresbericht des Vereins für Naturkunde zu Zwickau.
JB. wetter. Ges.—Jahresbericht der wetterauischen Gesellschaft für die gesammte Naturkunde (Hanau).
JB. zool. Sect. westf. Ver.—Jahresbericht der zoologischen Section für das Etatjahr 1878–79 des westfälischen provinzial-Vereins für Wissenschaft und Kunst (Münster).
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 Medecin und Naturwissenschaft (Leipzig).
J. f. O.—Journal für Ornithologie (Cabanis: Leipzig).
J. G. Soc.—Quarterly Journal of the Geological Society (London).
JH. Ver. f. vaterl. Naturk. = *JH. Ver. Württ.*—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg.
J. L. S.—Journal of the Linnean Society, Zoology (London).
J. L. Soc. N. S. W.—See *P. Linn. Soc. N. S. W.*
J. Mus. Godeffr.—Journal des Museum Godeffroy; geographische, ethnographische und naturwissenschaftliche Mittheilungen (Hamburg).

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. Götting.—Nachrichten von der k. Gesellschaft der Wissenschaften zu Göttingen.

Nachr. Ges. Mosc. (= *Bull. Sci. Nat. Mosc.*)—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde, &c., Moscow.

Nachr. mal. Ges.—Nachrichtsblatt der deutschen malakozoologischen Gesellschaft (Frankfort-o.-M.).

N. Am. Ent.—North American Entomologist (Grote: Buffalo).

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: Montreal).

Nat. Mex.—La Naturaleza (Mexico).

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

Naturalist—The Naturalist; Journal of the West Riding Consolidated Naturalists' Society (York).

Nature—Nature (London).

Naturf.—Naturforscher (Sklarek: Berlin).

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

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

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).

Nunq. Ot.—Nunquam Otiosus (Schaufuss: Dresden).

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

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

Orn. Centralbl.—Ornithologisches Centralblatt (Berlin).

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

P. Am. Ac. (2).—Proceedings of the American Academy of Arts and Sciences. 2nd series (Boston).

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

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

P. Antiq. Scot.—Proceedings of the Society of Antiquaries of Scotland.

J. of Conch.—Journal [formerly Quarterly ditto] of Conchology (London).
J. Quek. Club.—Journal of the Quekett Microscopical Club (London).
J. R. Dubl. Soc.—Journal of the Royal Dublin Society.
J. R. Micr. Soc.—Journal of the Royal Microscopical Society (London).
J. Sc. Lisb.—Jornal de Sciencias da Academia de Lisboa (Lisbon).
J. Soc. Arts—Journal of the Society of Arts (London).
J. Zool.—Journal de Zoologie (Gervais: Paris).

Kosmos—Kosmos; Zeitschrift für angewandte Naturwissenschaften (Leipzig).

L'Ab.—L'Abeille (De Marsuel: Paris).
Le Nat.—Le Naturaliste (Paris).
Leop.—Leopoldina (Dresden).

Mal. Bl.—Malakozoologische Blätter (Cassel).
MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.
Mél. biol.—Mélanges biologiques tirés du Bulletin de la Classe physico-mathématique de l'Académie impériale des sciences de St. Pétersbourg.
Mem. Ac. Bologn.—Memoire dell' Accademia di Scienze dell' Istituto di Bologna.
Mém. Ac. Toulouse (7)—Mémoires de l'Académie Nationale des Sciences, Inscriptions et Belles-lettres de Toulouse. 7me série.
Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.
Mém. cour. Ac. Belg.—Mémoires couronnés publiés par l'Académie Royale des Sciences de Belgique (Brussels).
Mém. Pétersb. (7)—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg. 7me série.
Mém. Soc. Aube—Mémoires de la Société Académique du département de l'Aube (Troyes).
Mém. Soc. Phys. Genèv.—Mémoires de la Société de Physique et d'Histoire naturelle de Genève.
Mém. Soc. Sâone-et-Loire—Mémoires de la Société des Sciences naturelles de Sâone-et-Loire (Chalon-sur-Sâone).
Morph. JB.—Morphologisches Jahrbuch: eine Zeitschrift für Anatomie und Entwickelungsgeschichte (Gegenbauer: Leipzig).
MT. aarg. Ges.—Mittheilungen der aargauischen naturforschenden Gesellschaft (Aarau).
MT. african. Ges.—Mittheilungen der africanischen Gesellschaft in Deutschland (Berlin).
MT. embryol. Inst.—Mittheilungen des embryologisches Institut der k.-k. Universität, Wien.
MT. Ges. Bern—Mittheilungen der naturforschenden Gesellschaft in Bern.
MT. Münch. ent. Ver.—Mittheilungen des Münchener entomologischen Vereins (Munich).
MT. Mus. Dresd.—Mittheilungen aus dem k. zoologischen Museum zu Dresden.

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. Götting.—Nachrichten von der k. Gesellschaft der Wissenschaften zu Göttingen.
Nachr. Ges. Mosc. (= *Bull. Sci. Nat. Mosc.*)—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde, &c., Moscow.
Nachr. mal. Ges.—Nachrichtsblatt der deutschen malakozoologischen Gesellschaft (Frankfort-o.-M.).
N. Am. Ent.—North American Entomologist (Grote: Buffalo).
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: Montreal).
Nat. Mex.—La Naturaleza (Mexico).
Nat. Tids.—Naturhistorisk Tidsskrift (Schiödte: Copenhagen).
Naturalist—The Naturalist; Journal of the West Riding Consolidated Naturalists' Society (York).
Nature—Nature (London).
Naturf.—Naturforscher (Sklarek: Berlin).
Niederl. Arch. Zool.—Niederländisches Archiv für Zoologie (Hoffmann: Haarlem).
N. Mag. Naturv.—Nyt Magazin for Naturvidenskaberne (Sars & Kjerulf: Christiania).
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).
Nunq. Ot.—Nunquam Otiosus (Schaufuss: Dresden).

Œfv. Ak. Förh.—Œfversigt af k. Vetenskaps Akademiens Förhandlingar (Stockholm).
Öfv. Fin. Soc.—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar (Helsingfors).
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P. A. S. B.—Proceedings of the Asiatic Society of Bengal (Calcutta).
P. Bost. Soc.—Proceedings of the Boston Society of Natural History.
P. Cal. Ac.—Proceedings of the California Academy of Sciences (San Francisco).
P. Cambr. Phil. Soc.—Proceedings of the Cambridge Philosophical Society.
P. Canad. Inst.—Proceedings of the Canadian Institute (Toronto).
P. Davenp. Ac.—Proceedings of the Davenport Academy of Natural Science (Davenport, Iowa).
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.
Pet. Nouv.—Petites Nouvelles Entomologiques (Deyrolle : Paris).
Phil. Tr.—Philosophical Transactions of the Royal Society (London).
P. Linn. Soc. N. S. W.—Proceedings of the Linnean Society of New South Wales (Sydney).
P. Liverp. Soc.—Proceedings of the Literary and Philosophical Society and Natural History Society of Liverpool.
Pop. Sci. Rev.—Popular Science Review (Dallas : London).
P. R. Dubl. Soc.—Proceedings of the Royal Dublin Society.
P. R. Inst.— Proceedings of the Royal Institution (London).
Prodr. Zool. Vict.—Prodromus of the Zoology of Victoria (McCoy : Victoria).
P. R. Soc.—Proceedings of the Royal Society (London).
P. R. Soc. Edinb.—Proceedings of the Royal Society of Edinburgh.
P. R. Soc. Tasm.—Monthly Notices and Proceedings of the Royal Society of Tasmania (Hobarton).
P. Sc. Ass. Trinid.—Proceedings of the Scientific Association of Trinidad (Port of Spain).
Psyche.—Psyche : Organ of the Cambridge [U.S.A.] Entomological Club.
P. U. S. Nat. Mus.—Proceedings of the United States National Museum (New York).
P. Z. S.—Proceedings of the Zoological Society (London).

Q. J. Conch.—Quarterly Journal of Conchology (London).
Q. J. Meteorol. Soc.—Quarterly Journal of Meteorological and Physical Science (London).
Q. J. Micr. Sci.—Quarterly Journal of Microscopical Science (London).
Q. J. Micr. Soc. Vict.—Quarterly Journal of the Microscopical Society of Victoria.

Rec. Geol. Surv. 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. Ent. Dep. Agric.—Report of the Entomologist in Annual Report of the Department of Agriculture (Washington).

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

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

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

Rev. Anthrop. (2).—Revue d Anthropologie. 2me série (Broca: Paris).

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

Rev. Sci.—Revue Scientifique (Paris).

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

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

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

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

SB. Ges. Halle—Bericht über die Sitzungen der naturforschenden Gesellschaft in Halle.

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

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

SB. Jen. Ges.—Sitzungsberichte der medicinisch-naturwissenschaftlichen Gesellschaft, Jena.

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

SB. Soc. Erlang. — Sitzungsberichte der physicalisch-medicinischen Societät (Erlangen).

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

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

Schr. Ver. Schlesw. Holst.—Schriften des naturwissenschaftlichen Vereins für Schleswig-Holstein (Kiel).

Sci. for All—Science for All (Brown: London).

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

Sci. News—Science News (Cassino: Salem, Mass.).

Scot. Nat.—The Scottish Naturalist (White: Perth).

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

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

Sprawozd. Kom. fizyogr.—Sprawozdanie Komisyi fizyograficznéj (Cracow).

Str. Feath.—Stray Feathers (Calcutta).

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

TB. Vers. Naturf.—Tagblatt der Versammlung der deutschen Naturforscher und Aertze.

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

Term. közl.—Természettudományi Közlemének (Pesth).

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

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

Tr. Albany Inst.—Transactions of the Albany Institute (U.S.A.).

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

Tr. Conn. Ac.—Transactions of the Connecticut Academy of Sciences (New Haven, U.S.A.).

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

Tr. E. Soc.—Transactions of the Entomological Society of London.

Tr. Inst. Z. Lille—Travaux de l'Institut Zoologique de Lille.

Tr. Kansas Ac.—Transactions of the Kansas Academy of Science (Topeka).

Tr. L. S. (2)—Transactions of the Linnean Society: Zoology. 2nd series. (London).

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. Phil. Soc. Adelaide—Transactions of the Adelaide Philosophical Society.

Tr. R. Soc. Edinb.—Transactions of the Royal Society of Edinburgh.

Tr. R. Soc. Vict.—Transactions of the Royal Society of Victoria (Melbourne).

Tr. Soc. Kazan—[Transactions of the Society of Naturalists at the Imp. Kazan University].

Tr. Soc. Kharkow and *Troudy Ges. Charkow*—Travaux de la Société des Naturalistes à l'Université Impériale de Kharkow.

Tr. Watford Soc.—Transactions of the Watford Natural History Society and Hertfordshire Field Club (Watford and Hertford).

Tr. Yorksh. Nat. Union—Transactions of the Yorkshire Naturalists' Union (Leeds).

Tr. Z. S.—Transactions of the Zoological Society (London).

Untersuch. Inst. Heidelb.—Untersuchungen des physiologischen Instituts in Heidelberg.

Vall. Nat.—The Valley Naturalist (St. Louis).
Verh. Ak. Amst.—Verhandelingen der koninklijke Akademie van Wetenschappen (Amsterdam).
Verh. L.-C. Ak.—Verhandlungen der königl. Leopoldinisch-Carolinisch deutschen Akademie der Naturforscher (Dresden).
Verh. schw. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft.
Verh. Ver. Brünn—Verhandlungen des naturforschenden Vereins in Brünn.
Verh. Ver. Hamb.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
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).
Veter.—The Veterinarian (London).
Veter. Journ.—The Veterinary Journal (London).
Vid. Medd.—Videnskabelige Meddelelser fra den naturhistoriske Forening (Copenhagen).
Viert. Ges. Zürich—Vierteljahrsschrift der naturforschenden Gesellschaft, Zürich.

Z. E. Ver. schles. (and *Z. f. Ent.*)—Zeitschrift für Entomologie des Vereins für schlesische Insektenkunde (Breslau).
Z. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft (Berlin).
Z. Ges. Erdk.—Zeitschrift der Gesellschaft für Erdkunde (Koner: Berlin).
Z. ges. Naturw. (2)—Zeitschrift für die gesammten Naturwissenschaften. Neue 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: Frankfort-o.-M.).
Zool. JB. Neap.—Zoologischer Jahresbericht. Herausgegeben von der zoologischen Station zu Neapel (Carus: Leipzig).
Zool. Rec.—Zoological Record (Rye: London).
Z. orn. Ver. Stett.—Zeitschrift des ornithologischen Vereins zu Stettin.
Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie (Siebold & Kölliker: Leipzig).

ERRATA.

MAMMALIA.

P. 26, before BRADYPODIDÆ, insert EDENTATA.

AVES.

P. 15, line 1, for "China," read "Burma."
P. 21, line 28, for "Willoughby," read "Willughby."
P. 33, line 31, add "*Artamia annæ*, sp. n. [*Artamidæ*]."
P. 40, line 11, transfer *Falculia* from UPUPIDÆ to STURNIDÆ.
P. 50, line 20, for "pt. 3," read "pt. i. p. 3."
P. 54, line 9, for "*melodes*," read "*meloda*."
P. 60, line 19, for "Belgium," read "Belgaum."

MOLLUSCA.

P. 63, line 9, after *Marionia*, for "g. n." read "Vayss. [Zool. Rec. xiv. *Moll.* p. 53]."
P. 83, line 42, after *Reinhardtia*, for "subg. n.," read "Böttger [Zool. Rec. xv. *Moll.* p. 73]."

CRUSTACEA.

P. 13, before OXYRRHYNCHA, insert *BRACHYURA*.
P. 15, line 36, after "*Apocremnus*, g.n.," insert "[Zool. Rec. xv. *Crust.* p. 16]."
P. 18, Cyclometopa should be same type as Oxyrrhyncha.
P. 20, Catometopa " " "
P. 21, Oxystoma " " "
(With corresponding emendation of headlines to p. 26, inclusive.)

ARACHNIDA.

P. 44, lines 29 & 32, after *Nebo* and *Teuthraustes*, for "g. n.," read "[*anteà*, p. 20]."
P. 49, line 40, after *Dasylobus*, for "g. n.," read "[*anteà*, p. 21]."
P. 51, line 12, after *Tanystylum*, for "g. n.," read "[*anteà*, p. 22]."

INSECTA.

P. 44, line 5, after *Callistroma*, for "g. n.," read "[Zool. Rec. xiv. *Ins.* p. 48]".
P. 51, lines 29 & 33, after *Zantheros* and *Melaneros*, insert "[Zool. Rec. xiv. *Ins.* p. 52]."
P. 53, line 9, after *Selenurus*, for "g. n.," read "[Zool. Rec. xiv. *Ins.* p. 52]."
P. 88, line 30, after *Triaplatyps*, insert "[sic: *Triaplatys*, Zool. Rec. xiv. *Ins.* p. 92]," and line 36, after *Botanoctona*, insert "[Zool. Rec. xiv. *Ins.* p. 92]."
P. 144, line 3, after *Surendra*, insert "[Zool. Rec. xv. *Ins.* p. 185]."
P. 195, line 29, for "*Negritomyia*," read "*Nigritomyia* [Zool. Rec. xiv. *Ins.* p. 191]."

ECHINODERMATA.

P. 9, lines 21 & 22, after *Trochostoma* and *Irpa*, insert "[Zool. Rec. xiv. *Ech.* p. 4]."

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ZOOLOGICAL RECORD

FOR 1879.

MAMMALIA.

BY

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

During the year 1879, the progress in our knowledge of the *Mammalia* has been satisfactory, although no very startling discoveries or novelties may have come to light. The most important memoirs published during the year are perhaps contained in Anderson's (p. 2) and Blanford's (*ibid.*) accounts of the expeditions to Western Yunnan and Yarkand. The commencement of Godman & Salvin's (p. 5) magnificent work on the Natural History of Central America must also be noticed here; and Trouessart (p. 8) has continued his General Catalogue of Mammals. The anatomy of the *Mammalia* has been studied by numerous observers, amongst whom may be particularly noted Anderson (p. 2), Alix (pp. 9, 11, & 26), Garrod (pp. 10, 13, & 15), Turner (p. 8), and Watson (*ibid.*). Many new forms of extinct life have continued to be revealed by the palæontological researches of Cope (p. 3), Marsh (p. 6), and Osborn, Scott, and Speir (p. 7), in the New World; the discovery of numerous *Mammalia* of Jurassic age in that hemisphere being particularly interesting. With these may be ranked in interest the new form of anthropoid Ape discovered by Lydekker in the Siwalik Hills (p. 6). The observations of Fries (p. 4), Eimer (p. 4), and Beneke (p. 2), as well as those of Milne-Edwards (p. 6), though not absolutely new, are also well worthy of notice.

THE GENERAL SUBJECT.

Adams, A. Leith. On Remains of *Mastodon* and other Vertebrata of the Miocene Beds of the Maltese Islands. J. G. Soc. xxxv. pp. 517–530, pl. xxv.

Remains of *Phoca*, *Delphinus*, *Squalodon*, and *Halitherium* are also noticed.

Albrecht, P. Die Epiphysen und die Amphiomphalie der Säugethierwirbelkörper. Zool. Anz. ii. pp. 12–15, 161–166, 419–425, & 443–447.

Alston, E. R. Exhibition of some Mammals from Afghanistan and Burmah. P. Z. S. 1879, pp. 665 & 666.

The species noticed are *Pteromys fimbriatus*, *Herpestes auro-punctatus*, and *Paradoxurus musanga*, Raffl.

——. On Female Deer with Antlers. P. Z. S. 1879, pp. 296–299.

See *Cervidæ*.

——. [See Godman, F. D.]

Anderson, J. Anatomical and Zoological Researches; comprising an Account of the Zoological Results of the Two Expeditions to Western Yunnan in 1868 and 1875, and a Monograph of the two Cetacean genera *Platanista* and *Orcella*. Vol. I., text, pp. 984; Vol. II., plates. London: 1878.

Although dated 1878, this work was not circulated till 1879. The part devoted to Mammals contains 564 pp., of which the accounts of *Platanista* and *Orcella* occupy nearly 200. Some general remarks on the characters of the Mammalian fauna of Western Yunnan will be found in the introduction, pp. xviii.–xxii. Remarks on the Asiatic species of many of the larger genera found in the Indian region are given, and the anatomy of several described, including that of *Orcella* and *Platanista*, the more important of these articles being mentioned below. Several new species are also described, and many figured. [See *Simiidæ*, *Cercopithecidæ*, *Hylomyidæ*, *Tupaiidæ*, *Soricidæ*, *Viverridæ*, *Mustelidæ*, *Sciuridæ*, *Muridæ*, *Spalacidæ*, *Hystricidæ*, *Manididæ*, *Platanistidæ*, *Delphinidæ*, *Balænidæ*.]

Bartlett, E. Second List of Mammals and Birds collected by Mr. Thomas Waters in Madagascar. P. Z. S. 1879, pp. 767–773.

Twenty-two species of Mammals are included, one being new (*Muridæ*).

Beneke, R. Ueber Reifung und Befruchtung des Eies bei den Fledermäusen. Zool. Anz. ii. pp. 304 & 305. [*Cf.* Fries and Eimer, *infrà*, p. 4].

Bischoff, J. L. W. Vergleichende anatomische Untersuchungen über die äusseren weiblichen Geschlechts- und Begattungs-organe des Menschen und der Affens, insbesondere der Anthropoiden. Abh. bayer. Ak. xiii. Abth. ii. pp. 207–271, pls. i.–vi.

Blanford, W. T. Scientific Results of the Second Yarkand Mission, based upon the collections and notes of the late Ferdinand Stoliczka,

Ph.D. *Mammalia* by W. T. Blanford, F.R.S. (*Chiroptera* by G. E. Dobson, M.A., M.B.) Calcutta: 1879, pp. 94, pls. xvi.

Contains an account of the *Mammalia* inhabiting Eastern Turkestan and the adjacent territories traversed by the late Dr. Stoliczka during the mission sent to Kashgar in 1873–4, in large part based on specimens then collected, with some subsequent additions from other sources. Fifty-nine species of *Mammalia* in all are treated of, of which some are left undetermined, whilst 2 are described as new. Many of the less known or more interesting species are figured. [*Soricidæ*, *Erinaceidæ*, *Felidæ*, *Mustelidæ*, *Canidæ*, *Leporidæ*, *Muridæ*, *Sciuridæ*, *Bovidæ*.]

[Blanford, W. T.] A Second Note, on *Mammalia* collected by Major Biddulph, in Gilgit. J. A. S. B. xlviii. pt. 2, pp. 95–98.

——. [See Medlicott, H. B.]

Bolau, H. Die Lebensdauer der Thiere in zoologischer Garten zu Hamburg. Zool. Gart. xx. pp. 65–71, 106–112.

These two parts contain the *Mammalia*.

Bouvier, T. B. M. H. Contribution à l'étude de l'ostéologie comparée du Chimpanzé. Paris: 1879, 4to, pp. 27.

Not seen by the Recorder. *Cf.* Zool. Anz. ii. p. 610.

Brandt, J. F. [See *Rhinocerotidæ*.]

Broca, P. Nomenclature Cérébrale. Dénomination des divisions et subdivisions des hémisphères et des anfractuosités de leur surface. Rev. Anthrop. (2) i. pp. 193–236 [1878].

——. Anatomie comparée des circonvolutions cérébrales. Le grand lobe limbique et la scissure limbique dans la série des Mammifères. *Tom. cit.* pp. 385–498 [1878].

Two important papers on the nomenclature of the cerebral hemispheres in *Mammalia*, founded on their comparative anatomy, and endeavouring to introduce a uniform nomenclature in this intricate and important subject. [See also *Simiidæ*.]

Burmeister, H. [See *Glyptodontidæ*.]

Champan, H. C. [See *Simiidæ*.]

Chantre, E., & Lortet, —. Recherches sur les Mastodontes et les faunes qui les accompagnent. Arch. Mus. Lyon, ii. pp. 285–313, pls. i.–xvii.

On the 4 species of *Mastodon*, and the animals accompanying them, in the Rhone basin. [*Elephantidæ*, *Rhinocerotidæ*, *Tapiridæ*, *Cervidæ*, *Bovidæ*, *Castoridæ*.]

Cope, E. D. The Origin of the Specialized Teeth of the *Carnivora*. Am. Nat. xiii. pp. 171–173; Ann. N. H. (5) iii. pp. 392 & 393.

——. Observations on the Faunæ of the Miocene Tertiaries of Oregon, Bull. U. S. Geol. Surv. v. pp. 55–69.

——. On some of the Characters of the Miocene Fauna of Oregon. P. Am. Phil. Soc. xviii. pp. 63–78.

Describes numerous new genera and species of *Mammalia* [*Castoridæ*,

Geomyidæ, *Sciuridæ*, *Canidæ*, *Felidæ*, *Equidæ*, *Chalicotheriidæ*, *Anthracotheriidæ*]. Cf. also Am. Nat. xiii. p. 131.

Creighton, C. Further Observations on the Formation of the Placenta in the Guinea-Pig. J. Anat. Phys. pp. 173–182, pl. xvi.

Dawkins, W. B. On the Range of the Mammoth in Space and Time. J. G. Soc. xxxv. pp. 138–147.

—— & Mello, J. M. Further Discoveries in the Cresswell Caves, with Notes on the *Mammalia* by the former. *Tom. cit.* pp. 724–735.

Eimer, —. Über die Fortpflanzung der Fledermäuse. Zool. Anz. ii. pp. 425–426. [*Cf.* Fries, *infrà*, and Beneke, *suprà*, p. 2.]

Elliot, D. G. A Monograph of the *Felidæ*.

During the year 1879, parts iv. & v. of this magnificent work have been issued. [*Felidæ*.]

Finsch, O. Reise nach West-Sibirien im Jahre 1876. Berlin: 1879, 8vo, pp. xxiii. & 663.

Many allusions to the *Mammalia* met with will be found in the text of this work, an account of the German expedition to Siberia in 1876. Figures of the Argali, *Equus hemionus*, &c., are given.

——. Reise nach West-Sibirien im Jahre 1876. Wissenschaftliche Ergebnisse. Wirbelthiere. 1. Säugethiere. Verh. z.-b. Wien, xxix. pp. 115–128 (also separately, Wien: 1879, 8vo).

Fifty-four species of *Mammalia* are here recorded as met with, and short notes on the localities, &c., of each species, as determined by Dr. Peters, are given. [*Cf.* Zool. Rec. xiv. *Mamm.* p. 6.]

Flower, W. H. On the Seals and Cetaceans of Kerguelen's Land. Phil. Trans. clxviii. pp. 95–100; *cf.* Ann. Sci. Nat. (6) viii. art. 14, pp. 4–7.

The species noticed are *Ogmorrhinus leptonyx*, *Macrorrhinus leoninus*, *Otaria gazella*, *Balæna australis*, and *Globicephalus melas*.

Forbes, W. A. [See *Elephantidæ*.]

Fries, S. Ueber die Fortpflanzung der einheimischen Cheiropteren. Nachr. Ges. Gött. 1879, pp. 295–298; Zool. Anz. ii. pp. 355–357.

Although copulation takes place in the autumn, the ova do not become fertilized till after hybernation, the semen remaining, as it were, dormant during the winter, as already noticed by Van Beneden & Eimer. [*Cf.* also Beneke and Eimer, *suprà*].

Giebel, C. G. Dr. H. G. Bronn's Klassen und Ordnungen des Thierreichs. VI. Abth. v., *Mammalia*, Nos. 21–25. Leipzig & Heidelberg: 1879, pp. 417–544, pls. lxii.–lxxvii.

Continues the description of the skeleton. [*Cf.* Zool. Rec. xv. *Mamm.* p. 5.]

——. Die geographische Verbreitung der vorweltlichen Säugethiere im Allgemeinen und der Pferde im Besondern. Z. ges. Naturw. (3) iv. pp. 488–494.

GIGLIOLI, H. H. Beiträge zur Kenntniss der Wirbelthiere Italiens. Arch. f. Nat. xlv. pp. 93–99.

Enumerates, amongst others, 23 species of *Mammalia* as either rare or new to the Italian fauna. [*Cf.* also C. J. Forsyth Major, Zool. Anz. ii. p. 140, and reply, *l. c.* p. 259.]

GIRTANNER, A. Der Alpensteinbok (*Capra ibex*, L.) mit besonderer Berücksichtigung der letzen Steinwildcolonie in den grauen Alpen. Trier : 1879.

Not seen by the Recorder ; *cf.* Zool. Anz. ii. p. 77.

GODMAN, F. D., & SALVIN, O. Biologia Centrali-Americana ; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. Zoology. Parts 1 & 2. London : 1879.

In this important work on the natural history of Central America, the part devoted to the *Mammalia* is undertaken by Mr. E. R. Alston. In the two parts now noticed, the *Primates* and *Chiroptera* are discussed, and the *Insectivora* commenced, the species inhabiting the Central American area being briefly discriminated, and their synonymy and range given. Several species are excellently figured [*Cebidæ*, *Vespertilionidæ*, *Emballonuridæ*, *Phyllostomatidæ*].

GÜNTHER, A. List of the Mammals, Reptiles, and Batrachians sent by Mr. Everett from the Philippine Islands. P. Z. S. 1879, pp. 74–79.

Eleven species of *Mammalia*, one of which is new (*Muridæ*). [See also *Galeopithecidæ*.]

——. Notice of a Collection of Mammals and Reptiles from Cyprus P. Z. S. 1879, p. 741.

The 3 Mammals noticed are *Cynonycteris collaris*?, *Vesperugo kuhli*, and *Mus alexandrinus*.

——. On Mammals and Reptiles from Johanna, Comoro Islands. Ann. N. H. (5) iii. pp. 215–219.

The four species mentioned are *Lemur anjuanensis*, *Pteropus edwardsi*, *Centetes ecaudatus*, and *Mus musculus*. [See also *Lemuridæ*.]

HENSEL, R. Ueber Homologien und Varianten in der Zahnformeln einiger Saügethiere. Morph. JB. v. pp. 529–561.

An elaborate article on the homologies and variations of the teeth of Mammals.

HUXLEY, T. H. On the Characters of the Pelvis in the *Mammalia*, and the conclusions respecting the origin of Mammals which may be based on them. P. R. Soc. xxviii. pp. 395–405, pl. viii.

KLUNZINGER, C. B. Zur Wirbelthiere im und an Rothen-Meer. Z. Ges. Erdk. xiii. [1878], pp. 61–96.

Nineteen species of Mammals, the most interesting being *Halicore dugong*, are noticed as having occurred during the author's residence at Koseir on the Red Sea (25° lat.).

KRUEG, JULIUS. Ueber die Furchung der Grosshirnrinde der Ungulaten.

Z. wiss. Zool. xxxi. [1878] pp. 297–345, pls. xx.–xxiii. A correction added, *op. cit.* xxxii. p. 318.

An important paper on the convolutions of the cerebrum of the *Ungulata*.

Leche, W. Ueber die Entwickelung des Unterarms und Unterschenkels bei *Chiroptera*. Sv. Ak. Handl. Bihang v. No. 15.

Not seen by the Recorder; *cf.* Zool. Anz. ii. p. 414.

——. Zur Kenntniss des Milch-gebisses und der Zahnhomologien bei Chiroptern. II. Thiel. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 10.] Act. Lund. xiv. pp. 37, 2 pls.

Not seen by the Recorder; *cf.* Zool. Anz. iii. p. 77.

Lemoine, V. Recherches sur les ossements fossiles des terrains tertiaires inférieures des environs de Reims. Ann. Sci. Nat. (6) viii. art. 1, pp. 1–56, pls. i.–iv.

Contains remarks on the species and structure of *Arctocyon* (vide *infrà*, p. 14).

Lortet, —. [See Chantre, E.]

Lydekker, R. Further Notices of Siwalik *Mammalia*. Rec. Geol. Surv. Ind. xii. pp. 33–52, with plate.

Remarks on further specimens of *Dinotherium*, *Mastodon*, and *Acerotherium*, with descriptions of new species in other groups, and table of distribution of the genera of Siwalik *Mammalia*. [See also *Simiidæ*, *Cercopithecidæ*, and *Spalacidæ*.]

Major, H. C. Observations on the Structure of the Brain of the White Whale (*Delphinapterus leucas*). J. Anat. Phys. xiii. pp. 127–138, pls. x.–xii.

Marsh, O. C. Polydactyle Horses, Recent and Extinct. Am. J. Sci. (3) xvii. pp. 499–505.

On horses with supernumerary digits, and on "The Pedigree of the Horse."

Medlicott, H. B., & Blanford, W. T. A Manual of the Geology of India. Calcutta: 1879, 2 vols., pp. 817, pls. i.–xxi.

An important work on the geology and palæontology of India. The geological age of the Siwalik fauna, and its relation to other faunas, living and extinct, are discussed in chap. xxiv. pp. 572–589 (see also introduction, pp. liv.–lxx). A certain number of Siwalik *Mammalia* (all described forms), with others from the Nerbudda beds, are figured (pls. xvii.–xx.).

Mello, J. M. [See Dawkins, W. B.]

Milne-Edwards, A. Recherches sur les enveloppes fœtales du Tatou à neuf bandes. Ann. Sci. Nat. (6) viii. art. 10, pp. 1–6, pls. xxii.–xxiv.

The fœtuses, four in number, are all lodged in a common chorion. [See also *Dasypodidæ*.]

Mohnike, O. Uber das vermögen verschiedener Säugethiere sich mittels der atmosphärischen Druckes an glatten, mehr oder weniger senk-

rechten Flächen festhalten und aufwärts bewegen zu können. Z. wiss. Zool. xxxii. pp. 388–406. [*Cf.* Zool. Rec. xiii. *Mamm.* p. 4.]

Mortillet, G. De. The Origin of the Domestic Animals. Am. Nat. xiii. pp. 747–753. (Translated from "Matériaux pour l'Histoire Primitive et Naturelle de l'Homme," 1879, Livr. 4 & 5.)

Osborn, H. F., Scott, W. B., & Speir, F., Jun. Palæontological Report of the Princeton Scientific Expedition of 1877 (No. 1 of "Contributions from the Museum of Geology and Archæology of Princeton College"). Sept. 1, 1878, pp. 146, pls. x.

An account of the fossil Vertebrates, chiefly Mammals, collected by the Princeton College Scientific Expedition of 1877 from the Tertiaries of Wyoming round Fort Bridger. Several new species are described and figured. Appended is a useful list (compiled from all sources) of the Eocene Vetebrates of Wyoming. [*Carnivora*, *Tapiridæ*, *Equidæ*, *Camelidæ*, *Sciuridæ*, *Uintatheriidæ*.]

Ottley, W. On the Attachment of the Eye-muscles in Mammals. 1. *Quadrumana*. P. Z. S. 1879, pp. 121–128, with cuts.

In the *Cebidæ* and *Hapalides*, as in the *Simiidæ*, there is no choanoid muscle.

Owen, R. On the Natural Term of Life and of its Chief Periods in the Hippopotamus (*H. amphibius*). Ann. N. H. (5) iii. p. 188. [*Hippopotamidæ*.]

Owsjannikow, P. Ueber die Rinde des Grosshirns beim Delphin und einigen anderen Wirbelthieren. Mem. Pétersb. xxvi. No. 11 (92 pp. 1 pl.).

Pansch, A. Beiträge zur Morphologie des Grosshirns der Säugethiere. Morph. JB. v. pp. 193–239, pls. xiv. & xv.

This first part treats of the *Carnivora*.

Peters, W. Über die von Hrn. Dr. G. A. Fischer auf einer im J. 1878 in Ostafrika, von Mombas bis in das Pokômo-Land und das südliche Galla-Land, Reise eingesammelten Säugethiere. MB. Ak. Berl. 1879, pp. 829–832.

Enumerates 16 species, 2 being new. [*Cercopithecidæ*, *Bovidæ*.]

Piana, G. P. Osservazioni intorno all' esistenza di rudimenti di denti canini e di incisivi superiori negli embrioni del Bue et del Montone. Rend. Acc. Bologn. 1877–78, pp. 86–88.

Pomel, A. Ossements d'Éléphants et d'Hippopotames découverts dans une station préhistorique de la plaine d'Eghis. Bull. Soc. Géol. (3) vii. pp. 44–51. [*Elephantidæ*.]

Pouchet, G. Mémoires sur le grand Fourmilier. Paris: 1878.

The completion of this celebrated work. [Not seen by the Recorder; *cf.* Zool. Anz. ii. p. 78.]

Ramsay, E. P. Contributions to the Zoology of New Guinea. Pts. i. & ii. P. Linn. Soc. N. S. W. iii. pp. 241–305. *Mammalia*, pp. 241–245.

Notes on 14 species of *Mammalia* collected by Mr. Goldie in S. E. New Guinea. [*Tachyglossidæ*.]

[Ramsay, E. P.] Contributions to the Zoology of N. Guinea. Pts. iv. & v. P. Linn. Soc. N. S. W. iii. pp. 85–102.

In part iv., dealing with the Mammals, 5 species are mentioned.

Roger, O. Liste der bis jetzt bekannten Saügethiere. CB. Ver. Regensb. i. pp. 43–46.

[Not seen by the Recorder; *cf.* Zool. Anz. ii. p. 414.]

Ryder, J. O. Further Notes on the Mechanical Genesis of Tooth-forms. P. Ac. Philad. 1879, pp. 47–51.

In continuation of his former paper on this subject. [Zool. Rec. xv. *Mamm.* p. 7.]

Salvin, O. [See Godman, F. D.]

Scott, W. B. [See Osborn, H. F.]

Seeley, H. G. Note on a Femur and a Humerus of a small Mammal from the Stonesfield Slate. J. G. Soc. xxxv. pp. 456–463.

Two woodcuts illustrate the bones described. They are supposed to have monotreme affinities.

Speir, Jun., F. [See Osborn, H. F.]

Storer, J. The Wild White Cattle of Great Britain. London: 1879, 8vo, pp. 1–384.

"An account of their origin, history, and present state."

Thomas, O. On Robert Kerr's Translation of the "Systema Naturæ" of Linnæus. Ann. N. H. (5) iii. pp. 396 & 397.

The changes of name rendered necessary by the "resurrection" of this work are noticed below. [*Sciuridæ*, *Caviidæ*, *Phalangistidæ*.] *Cf.* also E. Coues, Am. Nat. xiii. p. 784.

Trouessart, E. L. Catalogue des Mammifères vivants et fossiles. (*Cf.* Zool. Rec. xv. *Mamm.* p. 8.) R. Z. (3) vi. pp. 201–254.

This part contains the *Chiroptera*.

Turner, W. On the Cotyledonary and Diffused Placenta of the Mexican Deer (*Cervus mexicanus*). J. Anat. Phys. xiii. pp. 195–200.

In this deer, there are "numbers of small cotyledons and patches of diffused villi" in addition to the few large cotyledons characteristic of the *Cervidæ*. This fact thus strengthens the arguments already employed against the importance in classification of the structure of the placenta.

Watson, M. The Homology of the (Mammalian) Sexual Organs illustrated by comparative anatomy and pathology. J. Anat. Phys. xiv. pp. 50–80, pls. iii. & iv.

—— & Young, A. H. [*Hyænidæ*.] [*Delphinidæ*.]

Wrzésniowski, A. [*Bovidæ*.]

Young, A. H. [See Watson, M.]

Zigno, A. De. [*Sirenia*.]

O. Fisher has notes on a mammaliferous (post-tertiary) deposit at Barrington, near Cambridge. P. Cambr. Phil. Soc. iii. pp. 271–274; see also J. G. Soc. xxxv. pp. 670–677.

E. Friedel has some notes on the *Mammalia* of Iceland. Zool. Gart. xx. p. 144, &c.

W. N. Lockington has notes on Pacific Coast Mammals. Am. Nat. xiii. p. 708.

C. G. Giebel has remarks on the occurrence of a *patella brachialis* in *Mammalia*; Z. ges. Naturw. 1879, pp. 451 & 452. Also on remains of *Felis spelæa* from Magdeburg, and of a Fox from Quedlinburg; *l. c.* pp. 495 & 496.

H. Bolau has notes on an orang (*Simia satyrus*) with a rudimentary sixth finger on each hand. Verh. Ver. Hamb. iii. pp. 119–121.

Max Schmidt has notes on the habits of *Simia satyrus*. Zool. Gart. xx. p. 17, &c.

A. E. Brown has notes on "Grief in the Chimpanzee." Am. Nat. xiii. pp. 173–177.

E. Heckel notes a case of trichinosis in a hippopotamus. C. R. lxxxviii. p. 1139, and Ann. N. H. (5) iii. p. 99.

W. H. Greene & A. J. Parker have notes on the properties and composition of Hyraceum, the "inspissated urine" of *Hyrax capensis*. P. Ac. Philad. 1879, pp. 12 & 13.

FAUNÆ.

Afghanistan. [See E. R. Alston.]
Africa, E. [See W. Peters.]
America, Central. [See F. D. Godman & O. Salvin.]
Asia, S.E. [See J. Anderson.]
Comoro Islands. [See A. Günther.]
Cyprus. [See A. Günther.]
Gilgit. [See W. T. Blanford.]
Italy. [See H. H. Giglioli.]
Kerguelen's Land. [See W. H. Flower.]
Madagascar. [See E. Bartlett.]
New Guinea. [See E. P. Ramsay.]
Philippine Islands. [See A. Günther.]
Red Sea. [See C. B. Klunzinger.]
Turkistan, E. [See W. T. Blanford.]

PRIMATES.

On the depressor nerve in Monkeys; E. Alix, Bull. Soc. Philom. (7) ii. p. 146.

On the Gibbons and *Semnopitheci* of British Burma and Malacca; E. L. Trouessart, *op. cit.* iii. pp. 122–128.

On fossil Italian Monkeys (*Macacus florentinus* and *Oreopithecus bambolii*); C. J. Forsyth Major, Atti Soc. Tosc. (Proc. Verb.) ii. p. lxxii.

Simiidæ.

Gorilla savagii: on its brain; P. Broca, Rev. Anthrop. (2) i. [1878] pp. 1–45, pls. i.–iii. On its anatomy (muscles and viscera); T. L. W. Bischoff, Abh. bayer. Ak. (2) xiii. [not seen by the Recorder; *cf.* Zool. Anz. ii. p. 610]. On its brain and other points; A. Pansch, Schr. Ver. Schlesw. Holst. iii. pp. 127–130 [*cf.* Zool. Rec. xv. *Mamm.* p. 9] [not seen by the Recorder; *cf.* Zool. Anz. ii. p. 78].

Notes on the anatomy of *Anthropopithecus niger*; H. C. Chapman, P. Ac. Philad. 1879, pp. 52–63, pls. xi. & xii. In this example, the cerebellum was uncovered by the cerebrum! [See also Bouvier, *suprà*, p. 3].

Palæopithecus sivalensis, g. & sp. nn. (foss.); R. Lydekker, Rec. Geol. Surv. Ind. xii. p. 33, figs. 1 & 5, Siwaliks of Punjab. Founded on a fragmentary palate, which is figured. Most closely allied to *Anthropopithecus*, though in some points approaching *Homo*.

Hylobates. Remarks on the species; J. Anderson, Anat., &c., Res. W. Yunnan, pp. 1–11.

Cercopithecidæ.

Semnopithecus. Remarks on the species; Anderson, *l. c.* pp. 12–44.

Semnopithecus chrysogaster, Licht., figured; W. Peters, MB. Ak. Berl. 1879, pl. iv.*b*.

Colobus rufo-mitratus, sp. n., *id. l. c.* p. 829, pls. i. *a* & ii., Muniuni, E. Africa.

Colobus palliatus figured; *id. l. c.* pl. iv. *a* [= *C. angolensis*, Scl.; *vide* P. Z. S. 1880, p. 68].

Cercocebus galeritus, sp. n., Peters, *l. c.* p. 830, pls. i. *b* & iii., Mitola, E. Africa.

Gelada rueppelli. Its anatomy described and brain figured; A. H. Garrod, P. Z. S. 1879, pp. 451–457. It is not allied to *Cynocephalus* or *Macacus*, but to *Cercopithecus*.

Macacus. Remarks on the species; Anderson, *l. c.* pp. 45–94.

Macacus arctoides figured; *id. l. c.* pls. i. & ii. *M. rhesus*, var. figured; *id. l. c.* pl. iii. *M. cynomolgus*: notes on its placentation; H. C. Chapman, P. Ac. Philad. 1879, pp. 146 & 147. *M. sivalensis* figured; R. Lydekker, Rec. Geol. Surv. Ind. xii. p. 41, figs. 2 & 4.

Cebidæ.

C. G. Giebel has remarks on the cranial and dental characters of various species of *Ateles*; Z. ges. Naturw. (3) iv. pp. 892–897, pls. xiii.–xv.

Mycetes villosus figured; E. R. Alston, Biol. Centr. Am. pl. i.

Chrysothrix œrstedi figured; *id. l. c.* pl. ii.

LEMURES.

Lemuridæ.

Shaw, George A. A few notes upon four species of Lemurs, specimens of which were brought alive to England in 1878. P. Z. S. 1879, pp. 132–136.

The species mentioned are *Lemur catta*, *Hapalemur simus*, *Chirogaleus milii*, and *Microcebus smithi*. *Chirogaleus milii* is figured from life (*l. c.* pl. ix.).

Lemur anjuanensis. Remarks on this species: A. Günther, Ann. N. H. (5) iii. p. 215.

Hapalemur simus. Note on this species; H. Schlegel, Notes Leyd. Mus. ii. note viii. pp. 45–50.

Chiromyidæ.

Chiromys madagascariensis. On its anatomy; E. Alix, Bull. Soc. Philom. (7) ii. pp. 252–254, and (myology) iii. p. 30.

CHIROPTERA.

G. E. Dobson treats of the geographical distribution of this Order; Rep. Brit. Ass. 1878, pp. 158–167. The species are as much restricted in range as the non-volant *Mammalia*.

E. L. Trouessart writes on the same subject, basing his conclusions on Dobson's Catalogue [Zool. Rec. xv. *Mamm.* p. 10]; Ann. Sci. Nat. (6) viii. art. 12, pp. 1–24.

Z. Gerbe has remarks on the determination by Trouessart of the Bats described as new by Crespon; "Le Naturaliste," 1879 [not seen by the Recorder; *cf.* Zool. Anz. ii. p. 609].

On the *Chiroptera* (13) of the Netherlands; F. A. Jentink, Tijdschr. Nederl. Dierk. Ver. iv. pp. 58–91 [not seen by the Recorder; *cf.* Zool. Anz. ii. p. 414.]

On some points in the anatomy of Italian *Chiroptera*; E. Regalia, Atti Soc. Tosc. (Proc. Verb.) ii. pp. xcii.–xciv. (on the formation of the præmaxillæ and the number of phalanges in the digits of the manus).

See also Lèche, *suprà*, p. 6.

Pteropodidæ.

Epomophorus minor, sp. n., G. E. Dobson, P. Z. S. 1879, p. 715, Zanzibar.

Pteropus rodericensis [Zool. Rec. xv. *Mamm.* p. 10]. Note on; G. E. Dobson, Phil. Tr. clxviii. p. 457.

Pteropus seychellensis, sp. n., A. Milne-Edwards, Bull. Soc. Philom. (7) ii. p. 222, Seychelles.

Rhinolophidæ.

Rhinolophus pearsoni figured ; J. Anderson, Anat. &c., Res. W. Yunnan, pl. iv. fig. 1.

Nycterididæ.

Megaderma. Note on a Bat from Queensland, probably belonging to this genus, which is new to Australia ; G. Krefft, P. Z. S. 1879, p. 38⅁.

Vespertilionidæ.

Vesperugo andersoni figured ; J. Anderson, *tom. cit.* pl. iv. figs. 2–6. *V. affinis* figured ; *l. c.* pl. iv. figs. 7 & 8. *V. albigularis* : head figured ; E. R. Alston, Biol. Centr. Am. pl. iii. fig. 1. *V. parvulus* : head figured ; *id. l. c.* pl. iii. fig. 2. *V. savii*, note on ; E. Regalia, Rend. Ist. Lomb. (2) xi. pp. 326–331.

Vesperugo vagans, sp. n., G. E. Dobson, Ann. N. H. (5) iii. p. 135, Bermuda.

Vespertilio bechsteini : on its habits ; E. Regalia, Atti Soc. Tosc. 1879, pp. cxxv.–cxxvii. *V. akakomuli* (Temm.) [lege *akakomori*] = *V. abramus* (id.), and *V. erythrodactylus* (Temm.) = *V georgianus* (F. Cuv.) ; F. A. Jentink, Notes Leyd. Mus. ii. Note vi. pp. 37–40. *V. murinus* : on its habits ; G. B. Ercolani, Rend. Acc. Bologn. 1878–79, pp. 16–21 [not seen by the Recorder ; *cf.* Zool. Anz. ii. p. 79].

Emballonuridæ.

Saccopteryx plicata. Wing figured ; E. R. Alston, Biol. Centr. Am. pl. iii. fig. 4.

Taphozous dobsoni, sp. n., F. A. Jentink, Notes Leyd. Mus. i. Note 32, p. 121, Madagascar.

Nyctinomus vemmeleni, sp. n., *id. l. c.* note 33, p. 125, Liberia.

Phyllostomatidæ.

Ischnoglossa nivalis, *Glossonycteris lasiopyga*, *Vampyrops vittatus*, *Centurio macmurtrii*, and *Diphylla ecaudata* : heads figured ; E. R. Alston, Biol. Centr. Am. pl. iii.

Chiroderma salvini figured ; *id. l. c.* pl. iv.

Genus incertæ sedis.

Boneia bidens, g. & sp. nn., F. A. Jentink, Notes Leyd. Mus. i. note 31, p. 117, Celebes.

INSECTIVORA.

Galeopithecidæ.

Galeopithecus philippinensis. Remarks on specimens from Surigao and Dinagat Island ; A. Günther, P. Z. S. 1879, p. 74.

Tupaiidæ.

Tupaia: remarks on the genus; Anderson, Anat. &c., Res. W. Yunnan, pp. 111–137. Figures of the skulls of different species; *l. c.* pl. vii.

Tupaia chinensis, sp. n., *id. l. c.* p. 129, W. Yunnan; *T. malaccana*, sp. n., *id. l. c.* p. 134, Malacca.

Tupaia belangeri: notes on its anatomy; A. H. Garrod, P. Z. S. 1879, pp. 301–305. The brain is figured; like *T. splendidula*, this species has a cœcum, which is wanting in *T. tana*.

Dendrogale. The skulls of *D. frenata* and *D. murina* figured; Anderson, *l. c.* pl. vii. figs. 18–21.

Hylomyidæ.

Hylomys peguensis. Its osteology figured; Anderson, *l. c.* pl. vi. The genus should form a distinct family; *id. l. c.* p. 138.

Soricidæ.

Sorex alpinus. Note on its occurrence in the Riesengebirge; H. Nitsche, Zool. Anz. ii. p. 571.

Sorex myoides figured; W. T. Blanford, Yark. Miss. pl. i. fig. 1; skull, *l. c.* pl. 1 *a*.

Anurosorex. Remarks on the genus; Anderson, *l. c.* pp. 150–159. *A. assamensis*: its osteology figured; *id. l. c.* pl. v. figs. 1–16.

Chimarrogale, Anderson [Zool. Rec. xiv. *Mamm.* p. 11], characterized; *id. l. c.* p. 139. Type, *Crossopus himalayicus*, Gray. Its osteology and anatomy described, *l. c.* pp. 141–149, and figured, pl. v. figs. xvii.–xxx.

Erinaceidæ.

Erinaceus. On the Indian species of this genus; J. Anderson, J. A. S. B. xlvii. pt. 2, pp. 195–211, pls. iii–v.*a*, 5 species are recognized. *E. blanfordi*, p. 208, Sind, and *E. jerdoni*, p. 209, Sind, &c., spp. nn. *E. albulus*, figured; W. T. Blanford, Yark. Miss. pl. i. fig. 2, skull, *l. c.* pl. i.*a*.

Centetidæ.

On the Madagascar species, F. A. Jentink, Notes Leyd. Mus. i. note 36, pp. 137–151.

Talpidæ.

Scalops breweri should stand as *Scapanus americanus*, Harlan; E. Coues, Am. Nat. xiii. p. 189.

CARNIVORA.

On the genera of *Felidæ* and *Canidæ*. E. D. Cope, P. Ac. Philad. 1879, pp 168–194. Both fossil and living species are included in this paper:

of *Felidæ*, 14 genera are recognized; of *Canidæ*, the same number. *Uncia* of Gray is extended to include *Felis leo*, *F. tigris*, &c. Several new genera and species are described.

Genus incertæ sedis.

Arctocyon. The structure of this genus described and figured; V. Lemoine, Ann. Sci. Nat. (6) viii. art. 1, pp. 7–56, pls. i.–iv. *A. gervaisi*, p. 14, pls. i. & ii., *A. ducili*, p. 26, pl. ii. spp. nn. (foss.), Eocene of France.

Felidæ.

Bourguignat, T. R. Histoire des *Felidæ* fossiles constatés en France dans les dépôts de la période quarternaire. Paris: 1879, 4to (pp. 54, pl. i.).

[Not seen by the Recorder. *Cf.* Zool. Anz. ii. p. 416.]

D. G. Elliot, in parts iv. & v. of his "Monograph of the *Felidæ*" (cf. *suprà*, p. 4), describes and figures *Felis tigris*, *F. serval*, *F. tristis*, *F. rubiginosa*, *F. chaus*, *F. cuptilura*, *F. caracal*, and *F. planiceps*.

Felis shawiana figured, W. T. Blanford, Yark. Miss. pls. 1*b* & 1*c*. On the difference between the wild and domestic cat; W. Blasius, "Aus Wald und Haide," i. pp. 8–13. [Not seen by the Recorder. *Cf.* Zool. Anz. ii. p. 78.]

Dinictis cyclops, sp. n. (foss.), E. D. Cope, P. Ac. Philad. 1879, p. 176, "Truckee beds, Oregon."

Machærodus strigidens, p. 71, *brachyops*, p. 72, spp. nn. (foss.), *id.* P. Am. Phil. Soc. xviii. [1878], Miocene of Oregon (the latter referred to *Hoplophoneus*; id. Am. Nat. xiii. p. 197).

Smilodon. On the dentition of the genus; P. Gervais, C. R lxxxvii. p. 582, Ann. N. H. (5) iii. pp. 96 & 97.

Hyænidæ.

Hyæna crocuta. Its anatomy described and various organs figured; M. Watson & A. H. Young, P. Z. S. 1879, pp. 79–107, pls. v. & vi. The plates illustrate its myology.

Viverridæ.

Galidia. On the species of this genus; F. A. Jentink, Notes Leyd. Mus. i. note 35. pp. 131–136, 3 species are recognized, *G. elegans*, *G. concolor*, and *G. olivacea*.

Herpestes. Remarks on the Asiatic species; J. Anderson, Anat. &c. Res. W. Yunnan, pp. 168–182. Their skulls figured; *l. c.* pls. viii. & ix.

Paradoxurus fasciatus, Gray, = *P. musanga*, Raffl.; E. R. Alston, P. Z. S. 1879, p. 666. *P. musschenbraki*, sp. n., H. Schlegel, Notes Leyd. Mus. i. note 14, p. 43, N. Celebes.

Canidæ.

"Über Caniden aus dem Diluvium;" J. Woldrich, Denk. Ak. Wien, xxxix. Abh. ii. pp. 97–148, pls. i.–vi (*Canis lupus* and its allied forms).

Canis (*Vulpes*) *montanus* and *C. flavescens* figured; W. T. Blanford, Yark. Miss. pl. ii. *C. rudis*, sp. n., A. Günther, Ann. N. H. (5) iii. p. 316, Demerara. (The specific name is omitted in the original description, but this oversight is corrected, *l. c.* p. 400). *C. jubatus*: note on its (straight) cœcum; W. H. Flower, P. Z. S. 1879, pp. 766 & 777. *C. cuspigerus*, E. D. Cope, P. Am. Phil. Soc. xviii. p. 70, and *C. geismarianus*, l. c. p. 71, spp. nn. (foss.), Miocene of Oregon.

Synagodus mansuetus, g. & sp. nn., E. D. Cope, P. Ac. Philad. 1879, p. 186, and *Dysodus pravus*, g. & sp. nn., *id. l. c.* pp. 188 & 189 [founded on skulls of domestic lap-dogs!] Additional note on the latter; *id.* Am. Nat. xiii. p. 655.

Icticyon venaticus alive in London; P. L. Sclater, P. Z. S. 1879, p. 664. *I. crassivultus*, sp. n. (foss.), E. D. Cope, P. Ac. Philad. 1879, p. 190, Oregon.

Enhydrocyon stenocephalus and *basilatus*, g. & sp. nn. (foss.), Cope, Bull. U. S. Geol. Surv. v. pp. 56 & 57. Dentition of *Canidæ*, skull of *Putorius* and *Lutra*. Oregon White River Beds.

Temnocyon altigenis, g. & sp. n. (foss.), *id.* P. Am. Phil. Soc. xviii. [1878] p. 68, Miocene of Oregon. *T. coryphæus*, sp. n., *id.* P. Ac. Philad. 1879, p. 180, Truckee beds, Oregon.

Procyonidæ.

Bassaris. On the species of this genus, J. A. Allen, Bull. U. S. Geol. Surv. v. pp. 331–340; two species are recognized, *B. astuta* and *B. sumichrasti*.

Procyon hernandezi = *P. lotor*; C. G. Giebel, Z. ges. Naturw. (3) iv. p. 113.

Nasua. On the 2 species (*N. narica* and *N. rufa*) of this genus; J. A. Allen, Bull. U. S. Surv. v. pp. 153–174.

Mustelidæ.

Martes sylvatica is the only British species of Marten; E. R. Alston, P. Z. S. 1879, pp. 468–474.

Martes leucolachnæa, ? sp. n., W. T. Blanford, Yark. Miss. Mamm, p. 26, Yarkand.

Mustela stoliczkana figured; *id. l. c.* pl. ii. *b*; skull, pl. 1 *a*.

Fœtorius lutreola should stand as *Lutreola europæa*; E. F. von Homeyer, Zool. Gart. xx. p. 184.

Mydaus meliceps. Note on its extinction in Java; H. O. Forbes, P. Z. S. 1879, p. 664.

Helictis subaurantiaca. Notes on its anatomy, A. H. Garrod, P. Z. S. 1879, pp. 305–309, pl. xxix.; the species is figured from life, two woodcuts illustrate the structure of the brain, in which the hippocampal gyrus appears on the superior aspect, as in no other carnivorous animal.

Lutra. Remarks on the Asiatic species; J. Anderson, Anat. &c. Res. W. Yunnan, pp. 200–215. *L. sumatrana* and skulls of various species figured; *l. c.* pls. x.–xii.

Ursidæ.

Ursus arctos. Notice of a skull found in moss in Dumfriesshire, with remarks on the former presence of this bear in Scotland; J. A. Smith, P. Antiq. Soc. Scot. xiii. pp. 360–376. *U. gedrosianus* [cf. Zool. Rec. xiv. *Mamm.* p. 13]: note on; W. T. Blanford, P. A. S. B. 1879, p. 4. *U. priscus*: on a skull from the cavern of Lherm, Ariège; H. Filhol, Bull. Soc. Philom. (7) ii. p. 19.

Arctotherium simum, sp. n. (foss.), E. D. Cope, Am. Nat. xiii. p. 791, Caves of California.

Otariidæ.

Otaria gillespii: a skull of a female lately living in the Southport Aquarium exhibited; W. H. Flower, P. Z. S. 1879, p. 551. (*Cf.* also C. L. Jackson, P. Z. S. 1879, p. 460, where the species is erroneously called *O. stelleri*.)

Phocidæ.

Phoca rugosidens (Owen), sp. n. (foss.), A. Leith Adams, J. G. Soc. xxxv. p. 524, pl. xxv. figs. 1 & 2, Miocene of Malta.

Genus incertæ sedis.

Megencephalon primævus, g. & sp. nn. (foss.), H. F. Osborn, W. B. Scott, & F. Speir, Rep. Princet. Exp. p. 20. Founded on an intra-cranial cast from the Eocene of Wyoming: its true nature is uncertain, but it was probably an "aquatic carnivore."

CETACEA.

Delphinidæ.

Van Beneden, P. J. Sur la Distribution Géographique de quelques Cétodontes. Bull. Ac. Belg. (2) xlv. pp. 401–409. [Omitted from Zool. Rec. xv.]

J. S. Schneider has notes on *Delphinus albirostris* and other *Cetacea* occurring on the Norwegian coast; Tromsö Mus. Aarsheft. i. pp. 54–65.

Delphinus delphis. Remarks on the species; W. H. Flower, P. Z. S. 1879, pp. 382–384.

Delphinus tursio. A drawing of a specimen caught at Holyhead exhibited; *id. l. c.* p. 386.

Lagenorrhynchus albirostris?. A drawing of a specimen caught near Ramsgate exhibited; J. W. Clark, P. Z. S. 1879, p. 311. A specimen caught at Yarmouth; F. Southwell, Zool. iii. p. 421.

Delphinapterus leucas. On its anatomy; M. Watson & A. H. Young, Tr. R. Soc. Edinb. xxix. pp. 393–434, pls. vii. & viii. Remarks on the

capture of a specimen in Scotland, with description of its skull (the altar having been dislocated and subsequently anchylosed to the skull); W. H. Flower, P. Z. S. 1879, pp. 667–669.

Orcella fluminalis and *O. brevirostris* described, and the anatomy of the genus, including the structure of the pregnant uterus and fœtal membranes, described and figured; J. Anderson, Anat. &c. Res. W. Yunnan, pp. 358–416, pls. xxvii.–xliii. *O. brevirostris* figured, *l. c.* pl. xxv. figs. 4 & 5. *O. fluminalis* figured, pl. xxv. *a*. [See also *infrà*.]

Platanista gangetica. Its structure and anatomy, including that of the pregnant uterus and fœtal membranes, described and figured; *id. l. c.* pp. 417–550, pls. xxvi.–xliii. A map illustrating its distribution and that of *Orcella fluminalis*; l. c. p. 359. The species figured; *l. c.* pl. xxv. figs. 1–3.

Physeteridæ.

Mesoplodon. The structure of the teeth in *M. layardi* and *M. sowerbii* described; W. Turner, J. Anat. Phys. xiii. pp. 465–480, and P. R. Soc. Edinb. x. pp. 250–252.

Balænidæ.

On the geographical distribution of *Balænoptera*; P. J. Van Beneden, Bull. Ac. Belg. (2) xiv. pp. 167–178. [Omitted from Zool. Rec. xv.]

Balænoptera. On Indian species; Anderson, *l. c.* pp. 551–564. *B. edeni* and *blythi* are indicated as new species. The skull and cervical vertebræ of the former figured; *l. c.* pl. xliv.

Rachianectes. Additional note on this genus; E. D. Cope, Am. Nat. xiii. p. 655.

Balæna biscayensis. On the specimen captured in 1854 at San Sebastian; F. Gasco, Ann. Mus. Genov. xiv. pp. 573–608.

Balænus macleayius (= *B. australis*). Observations on; *id. l. c.* pp. 509–551.

Notes on the Tarento *Balæna*, and the specimen in Paris of *B. macleayius*; S. Capellini, Rend. Acc. Bologn. 1877–78, pp. 17–20, also F. Gasco, Atti Acc. Nap. [Not seen by the Recorder; *cf.* Zool. Anz. ii. p. 609.]

Balænoptera. Note on the occurrence of a specimen of this genus at Soulac; Act. Soc. L. Bord. (4) iii. p. xlix.

Balænoptera rostrata. Remarks on this species; G. O. Sars, Forh. Selsk. Chr. 1878, No. 15 (4 plates). [Not seen by the Recorder; *cf.* Zool. Anz. ii. p. 415.]

HYRACES.

Hyracidæ.

Hyrax nigricans, sp. n., W. Peters, SB. Nat. Fr. 1879, p. 10, Chinchoxo.

Res.

UNGULATA PERISSODACTYLA.

Tapiridæ.

Tapirus dowi. Remarks on its specific characters and habitat; E. R. Alston, P. Z. S. 1879, p. 666. *T. vialetti*: its jaw figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. xvi. fig. 2.

Rhinocerontidæ.

Brandt, J. F. Tentamen Synopseos Rhinocerotidum viventium et fossilium. Mém. Pétersb. xxvi. No. 5, pp. 66, pl.

The author proposes the following arrangement:—Legio i. (n.), *Kynodontes* [*Cy-*], for 3 new subfamilies, *Sphaleroceratinæ* (= *Dinocerata*, Marsh), *Brontotheri*[*i*]*næ* (= *Brontotheridæ*, Marsh), and *Palæotheriodontinæ* (*Hyracodon*, Leidy); Legio ii. (n.), *Akynodontes* [*Acy-*], for subfamilies *Rhinocerotinæ* and *Hippodontinæ* (or *Elasmotheri*[*i*]*næ*). The *Rhinocerotinæ* are divided into *Holotemnodontes* and *Colobotemnodontes*, of which the former are subdivided as *Ecornes*, *Unicornes*, and *Bicornes*. Of the *Ecornes*, *Aphelops*, Cope, is queried as a subgenus or section; a similar group, *Subhyracodon*, is proposed (p. 30) for various species of *Aceratherium*. In the *Bicornes*, *Dihoplus*, g. n., p. 48, is characterized for *Rhinoceros schleiermacheri*, Kaup, and *R. sansaniensis*, Lartet. In the *Colobotemnodontes*, the following new subgenera of *Atelodus*, Pomel, are proposed:—*Colobognathus*, p. 51 (with sections nn. *Dactylochilus* and *Cylochilus*), and *Meso*[*r*]*rhinoceros*.

Cope, E. D. On the Extinct Species of *Rhinoceridæ* [sic] of N. America and their Allies. Bull. U. S. Geol. Surv. v. pp. 227–237.

Seven genera and 27 species, of which only 6 are living, of *Rhinocerontidæ* are enumerated, *Hyracodon* being referred to a separate family, *Hyracodontidæ*. No extinct species of true *Rhinoceros* has yet been found in N. America or Europe, and all American species are without a dermal horn. [Cf. also *id.*, Am. Nat. xiii. pp. 771 *a*–771 *j*.]

Zalabis, g. n. (foss.), proposed for *R. sivalensis*. C. & F., from the Siwaliks; E. D. Cope, Bull. U. S. Geol. Surv. v. p. 229.

Elasmotherium. The characters and affinities of this genus discussed, and its osteology figured; J. F. Brandt, Mém. Pétersb. xxvi. No. 6, (37 pp. & 6 pls.). It constitutes a subfamily of the *Rhinocerontidæ*, which may be called *Elasmotheri*[*i*]*næ* or *Hippodontinæ*. Mandible of *E. fischeri* figured; *id. l. c.* No. 5.

Rhinoceros antiquitatis: on a specimen found frozen in E. Siberia; W. Dybowski, Zool. Anz. ii. pp. 375–379. *R. leptorrhinus*: molar figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. viii. fig. 6. *E. megarrhinus*: its skull and dentition figured; *ibid.* pl. xvii.

Hyrachyus imperialis, p. 50, *H. intermedius*, p. 51, *H. crassidens*, p. 52,

spp. nn. (foss.), H. F. Osborn, W. B. Scott, & F. Speir, Rep. Princet. Exp., Eocene of Wyoming.

Palæosyops paludosus: remains figured: *iid. l. c.* pl. iii. *P. major*: the innominate bone figured; *l. c.* pl. v.

Leurocephalus cultridens, g. & sp. nn. (foss.), *iid. l. c.* p. 42, pl. iv., Eocene of Wyoming. Allied to *Palæosyops*.

Helaletes latidens, sp. n. (foss.), *iid. l. c.* p. 54.

Anchirodon, g. n. (foss.) [type, *Hyracodon quadriplicatus*, Cope], E. D. Cope, Am. Nat. xiii. p. 270; also Bull. U. S. Geol. Surv. v. pp. 233. Its affinities are uncertain, being in some respects allied to *Rhinoceros*, in others to *Lophiodon*, *Hyrachyus*, &c. *A. tubifer*, sp. n. (foss.), *id. l. c.* p. 271, Oregon.

Hyracodontidæ.

Hyracodon: further observations on its structure; E. D. Cope, Bull. U. S. Geol. Surv. v. p. 234. It should form a separate family, as above; p. 228.

Equidæ.

Equus. Notes on hybrids in this genus, and description of one between *E. hemionus* and *E. burchelli*, which is figured; Huet, N. Arch. Mus. (2) ii. pp. 46–52, pl. iv.

Hipparion. On the occurrence of a species of this genus in Algeria; A. Pomel, Bull. Soc. Géol. (3) vi. pp. 213–216.

Anchitherium præstans, E. D. Cope, Am. Nat. xiii. p. 462, Oregon; *A. equiceps*, p. 73, *A. brachylophum*, p. 74, *A. longicristis*, p. 75, spp. nn., (foss.), *id.* P. Am. Phil. Soc. xviii., Miocene of Oregon.

Orohippus major. Remains figured, Osborn, Scott, & Speir, Rep. Princet. Exp. pl. ix.

Stylonus seversus, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xviii. p. 76, Pliocene of Oregon. Allied to *Anchippus* and *Hippotherium*.

UNGULATA ARTIODACTYLA.

Hippopotamidæ.

Hippopotamus amphibius. On its natural term of life, &c.; R. Owen, Ann. N. H. (5) iii. pp. 188. On some minor points in its anatomy; E. Alix, Bull. Soc. Philom. (7) iii. pp. 146, 167, & 168. *H. hipponensis*: note on the precise horizon of this species; Passer, Bull. Soc. Géol. (3) vi. pp. 389–391.

Anthracotheriidæ.

Cœnotherium. On a jaw discovered at Aix (Bouches du Rhône); F. Cairol, C. R. lxxxviii. p. 987.

Hyopotamus guyotianus, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc.

xviii. p 77. This is the type of a new genus, *Merycopater*; id. Am. Nat. xiii. p. 197.

Anthracotherium. On 3 species of this genus; E. Renevier, Bull. Soc. Vaud. (2) xvi. pp. 140–148, pls. iv.–viii. One is new, *A. laharpii*, l. c. p. 146, Rochette. *A. hippoideum*: on remains of this species at Armessan; J. B. Noulet, Mem. Soc. Toulouse (7) x. pp. 52–58, pl.

Chalicotheriidæ.

Daodon shoshonensis, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xviii. p. 77, Miocene of Oregon. Allied to *Menodus* and *Symborodon*.

Camelidæ.

On the "descent of the *Camelidæ*" [cf. Zool. Rec. xii. p. 19, & xv. *Mamm.* p. 20]; Osborn, Scott, & Speir, Rep. Princet. Exp pp. 58 & 59, pl. x.

Camelus bactrianus. On its vertebral nerve; E. Alix, Bull. Soc. Philom. (7) ii. p. 147.

Genus incertæ sedis.

Ithygrammodon cameloides, g. & sp. nn. (foss.), Osborn, Scott, & Speir, *l. c.* p. 56, pl. x. figs. 1–4, Eocene of Wyoming. Of uncertain position, Artiodactyle, and perhaps allied to the *Tylopoda*.

Camelopardalidæ.

Camelopardalis giraffa. Further researches on its myology; Lavocat, Mém. Ac. Toulouse (7) x. pp. 99–116.

Bovidæ.

Gazella subgutturosa: the form inhabiting Eastern Turkistan is described and figured as var. *yarkandensis*; W. T. Blanford, Yark. Miss. Mamm. p. 88, pl. xv. *G. granti*: its skull and horns figured; W. Peters, MB. Ak. Berl. 1879, pl. v.

Pantholops hodgsoni figured; Blanford, *l. c.* pl. xvi.

Capricornus crispus alive in London; P. L. Sclater, P. Z. S. 1879, p. 384. *C. sumatrensis*: notes on its habits; C. Bock, P. Z. S. 1879, p 308.

Rupicapra tragus: note on and figure of a four-horned specimen; E. R. Alston, P. Z. S. 1879, pp. 802 & 803. On its occurrence in the Gran Sasso; C. Forsyth Major, Atti Soc. Tosc. 1879, p. lxxi.

Ovis nahura figured; W. T. Blanford, Yark. Miss. pl. xiv. *O. poli*: note on; T. Biddulph, P. A. S. B. 1879, p. 280.

Capra ibex: on the cranial and dental characters of the living and fossil species allied to this; C. J. Forsyth Major, Atti Soc. Tosc. (Proc. Verb.) iii. pls. i.–vii. *C. ibex*, *C. caucasica*, and *C. sinaitica*: on the cranial characters of these species; C. G. Giebel, Z. ges. Naturw. (3) iv. pp. 122–128, pl. i. figs. 1–9 [see also Girtanner, *suprà*, p. 5].

Bos. On the horns of cattle found in the bogs of Roxburghshire and Aberdeenshire; T. A. Smith, P. Ant. Soc. Scot. xiii. pp. 492–497.

On the wild white cattle of Great Britain; J. Storer (*suprà*, p. 8).

Bos primigenius. On its history; A. Wrzésniowski, Z. wiss. Zool. xxx. Suppl. B, 1878, pp. 493–555.

On the specific determination of certain fossil or extinct species of *Bos* and its allies; Sanson, C. R. lxxxvii. pp. 756–759.

Ovibos moschatus. On remains of this species at Crayford, Kent; W. Davies, Geol. Mag. 1879, pp. 246–248.

Orygotherium escheri. Molar figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. viii. fig. 8.

Cervidæ.

L. J. Fitzinger continues his review of the species of this family; SB. Ak. Wien, xxxviii. pp. 301–376.

On the Pliocene *Cervidæ* (6 in number) of the Val d'Arno; C. J. Forsyth Major, Atti Soc. Tosc. (Proc. Verb.) ii. pp. c.–cii.

On the *Cervidæ* of Brazil; R. Hensel, Zool. Gart. xx. pp. 3–10.

On female Deer with antlers; E. R. Alston, P. Z. S. 1879, p. 296. Figures a female *Capreolus capræa* with antlers, and mentions other cases in this and other species of *Cervidæ*. He suggests that the primeval deer possessed antlers in both sexes.

Panolia eldi. Note on its placenta; R. Boulart, Bull. Soc. Philom. (7) iii. p. 144.

Cervus alfredi: evidence as to its being found in the islands of Samao and Leyte, Philippines; A. B. Meyer, P. Z. S. 1879, p. 666. *C. dama*: notice of an abnormal head of this species; W. B. Tegetmeier, P. Z. S. 1879, p. 713. *C. sika*: notes on its introduction into Ireland; P. L. Sclater, P. Z. S. 1879, p. 294. *C. pardinensis*: its teeth, and portions of the skull and horns, figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. xvi. figs. 3–6.

Capreolus capræa: the name *europæus* cannot be used; E. R. Alston, P. Z. S. 1879, p. 296, note. *C. pygargus* alive in London; P. L. Sclater, P. Z. S. 1879, p. 384.

Rangifer tarandus. On fossil remains of this species from Iowa; J. Leidy, P. Ac. Philad. 1879, p. 32.

Dicrocerus sp. Molar figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. viii. figs. 9 & 9 *a*.

Cervus (*Cariacus*) *acapulcensis*, sp. n., J. D. Caton, Ant. and Deer of America [1877], p. 113, Mexico.

Cervus (*Cariacus*) *yucatanensis*, sp. n., W. J. Hays, Ann. Lyc. N. York, x. p. 218, pl. x., Yucatan and Mexico [omitted from Zool. Rec. xi.].

GLIRES.

Anomaluridæ.

Anomalurus erythronotus, sp. n., A. Milne-Edwards, C. R. lxxxix. p. 771 Gaboon.

Sciuridæ.

Pteromys: remarks on the species; J. Anderson, Anat. &c., Res. W. Yunnan, pp. 278–303. *P. pearsoni* figured; *l. c.* pl. xxiii.

Pteromys yunnanensis, sp. n., *id. l. c.* p. 282, pl. xxii., W. Yunnan.

Meniscomys hippodus, g. & sp. nn. (foss.), E. D. Cope, P. Am. Phil. Soc. xvii. p. 67, also *M. multiplicatus*, sp. n., p. 68, Miocene of Oregon. Allied to *Pteromys*.

Sciuropterus volucella. On its osteology; G. H. Perkins, P. Am. Ass. 1878, pp. 289–296.

Sciurus: remarks on the S.E. Asiatic species; Anderson, *l. c.* pp. 214–277. *S. blanfordi*, *gordoni*, and *sladeni* figured; *l. c.* pls. xviii.–xx. *S. alstoni*, sp. n., *id. l. c.* p. 252, pl. xxi., ? Borneo; *S. caniceps* (Temm., *nec* Gray) renamed *S. temmincki*; id. *l. c.* p. 229. *S. ferrugineus*: notes on; A. Milne-Edwards, Bull. Soc. Philom. (7) i. p. 16. *S. rosenbergi*, p. 37, Sanghi Islands, *S. diardi*, p. 37, Nusakambangan Island, Java, and *S. microtis*, p. 41, Saleyer Island, spp. nn., F. A. Jentink, Notes Leyd. Mus. i., note 13.

Xerus namaquensis, Licht., = *capensis*, Kerr; O. Thomas, Ann. N. H. (5) iii. p. 397.

Arctomys: on fossil remains of Marmots in Germany; A. Nehring, Z. ges. Naturw. (3) iv. pp. 117 & 118. From Como; G. Mercalli, Atti Soc. Ital. xxi. p. 103. *A. bobac*: its skull described and figured; R. Hensel, Arch. f. Nat. xlv. pp. 198–210, pl. xiii. *A. aureus* figured, with skull, pls. xi. & xi. *a*, *A. himalayanus*, pls. xii. & xii. *a*, *A. caudatus*, pls. xiii. & xiii. *a*; W. T. Blanford, Yark. Miss. Mamm. *A. hemachalanus* (Hodgson) renamed *hodgsoni*; id. *l. c.* p. 35 (note).

Spermophilus richardsoni. Notes on its habits; S. M. Swigert, Am. Nat. xiii. p. 709; also S. W. Williston, Tr. Kansas Ac. vi. pp. 39 & 40 [not seen by the Recorder; *cf.* Zool. Anz. ii. p. 417].

Paramys superbus, sp. n. (foss.), H. F. Osborn, W. B. Scott, & F. Speir, Rep. Princet. Exp. p. 84, Eocene of Wyoming.

Castoridæ.

Castor sp. A portion of a lower jaw figured; E. Chantre & — Lortet, Arch. Mus. Lyon, ii. pl. viii. figs. 11 & 11 *a*.

Chalicomys jageri. Portion of jaw figured: *iid. l. c.* pl. viii. fig. 10.

Steneofiber gradatus, sp. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xviii. p. 63, Miocene of Oregon.

Myoxidæ.

Myoxus glis. On its dentition and that of its allies (*Muscardinus* and *Eliomys*); A. Nehring, Z. ges. Naturw. (3) iv. pp. 736–740.

Muridæ.

Gerbillus (*indicus* ?). Note on its ravages in the Deccan; S. B. Fairbank, P. A. S. B. 1879, p. 202. *G. cryptorrhinus* figured; W. T. Blanford, Yark. Miss. pl. x., and skull, *l. c.* pl. x. *b*.

Cricetus fulvus figured, Blanford, *l. c.* pl. ix. fig. 1, and skull, *l. c.* pl. x. *b*.

Mus rattus. Its occurrence in Westphalia; H. Bolsmann, Zool. Gart. xx. pp. 161–171. *M. rattus*, *M. alexandrinus*, and *M. decumanus*: C. G. Giebel has notes on the osteological and dental characters of these species; Z. ges. Naturw. (3) iv. pp. 619–622, pl. ix. *M. rattus*: note on specimen from New Zealand; T. White, Tr. N. Z. Inst. xi. pp. 343 & 344. *M. maorium*, sp. n., F. W. Hutton, Tr. N. Z. Inst. xi. p. 344, New Zealand, On species of *Mus* collected in Celebes, F. A. Jentink, Notes Leyd. Mus. i. note 11, pp. 7–13; *M. musschenbræki*, p. 10, *M. hellwaldi*, p. 11, *M. callitrichus* and *M. meyeri*, p. 12, *id. l. c.* spp. nn. *M. everetti*, sp. n., A. Günther, P. Z. S. 1879, p. 75, Philippines. *M. diardi*, W. Java, p. 15, *M. neglectus*, Borneo and Batchian, p. 14, *M. ephippium*, Sumatra, and *M. jessook*, Tama, New Hebrides, p. 15, *M. mulleri*, Sumatra, p. 16, *M. lepturus*, Java, p. 17, and *M. ruber*, Dorey, p. 18, spp. nn.; F. A. Jentink, Notes Leyd. Mus. ii. note iv. *M. leucopus*: note on; *id. l. c.* i. note 2, p. 8. *Acanthomys leucopus*, Gray, is a true *Mus*, which must stand as *M. terræ-reginæ*; Alston, P. Z. S. 1879, p. 646. *M. leucopus* (Jentink, Notes Leyd. Mus. i. p. 8), *nec* Desmarest, is renamed *beccarii*, Jentink, *op. cit.* ii. note iii. p. 11 (*vide suprà*). *M. bowersi*, p. 304, pl. xvii. Yunnan, *M. sladeni*, p. 305, Burma, &c., *M. rubricosa*, p. 306, W. Yunnan, *M. yunnanensis*, p. 307, *M. kaphyenensis*, p. 307, *M. virculorum*, p. 308, Yunnan, J. Anderson, Anat. &c. Res., spp. nn. *M. pachycercus* figured, W. T. Blanford, Yark. Miss. pl. ix. fig. 2, and skull, *l. c.* pl. x. *b*. *M. sublimis*, sp. n., *id. l. c.* Mamm. p. 51, Ladák.

Nesokia. Notes on the species of this genus; J. Anderson, J. A. S. B. xlvii. pt. 2, pp. 214–234, pls. xiii. & xiv., *N. blythcana*, p. 227, *barclayana*, p. 229, *elliotana*, p. 229, *id. l. c.*, spp. nn., India. *N. barclayana* (*indica* on plate, *errore*), the skull figured; W. T. Blanford, Yark. Miss. pl. x. *a*. *N. scullii* figured; *id. l. c.* pl. viii. *a*, and skull, *l. c.* pl. x. *a*.

Nesomys betsileoensis, sp. n., E. Bartlett, P. Z. S. 1879, p. 770, S. E. Betsileo, Madagascar.

Hallomys audeberti, g. & sp. nn., F. A. Jentink, Notes Leyd. Mus. i. note 27, p. 107, N. E. Madagascar.

Arvicola. On the species that inhabit Piedmont; M. Lessona, Atti Ac. Tor. xiv. pp. 721–729. *A. indica*, Gray: notes on; J. Anderson, J. A. S. B. xlvii. pt. 2, pp. 214, &c. *A. nivalis*: on its occurrence in the Gran Sasso; C. J. Forsyth Major, Atti Soc. Tosc. (Proc. Verb.) ii. p. lxxi. *A. stoliczkanus* and *A. blythi* figured; W. T. Blanford, Yark. Miss. pl. viii., skulls, *l. c.* pl. x. *b*.

Myodes torquatus. On fossil remains of this species in Germany; A. Nehring, Z. ges. Naturw. (3) iv. pp. 142, 143, & 633–635.

Geomyidæ.

Entoptychus, g. n. (foss.), E. D. Cope, P. Am. Phil. Soc. xviii. p. 64. Probably one of the *Saccomyidæ*. *E. cavifrons*, p. 64, *planifrons*, and *crassiramis*, p. 65, *id. l. c.* spp. nn., Miocene of Oregon.

Pleurolicus sulcifrons, g. & sp. nn. (foss.), Cope *l. c.* p. 66, Miocene of Oregon.

Spalacidæ.

Rhizomys. Remarks on the anatomy, &c., of the genus; J. Anderson, Anat. &c., Res. pp. 314–322. *R. pruinosus*, *badius*, *minor*, and other skulls figured, *l. c.* pls. xiii.–xvi. *R. erythrogenys* figured, *l. c.* pl. xiii. *a*. *R. sivalensis* figured, R. Lydekker, Rec. Geol. Surv. Ind. xii. p. 41, fig. 3.

Dipodidæ.

Alactaga jaculus. Notes on fossil remains of this species in Germany; A. Nehring, Z. ges. Naturw. (3) iv. pp. 115 & 116.

Octodontidæ.

Echinomys macrourus [*macru-*], sp. n., F. A. Jentink, Notes Leyd. Mus. i. note 23, p. 97, Surinam.

Thrinacodus albicauda, g. & sp. nn., A. Günther, P. Z. S. 1879, p. 144, pl. x. Medellin.

Hystricidæ.

Hystrix mulleri, sp. n., F. A. Jentink, Notes Leyd. Mus. i. note 21, p. 89, Sumatra. *H. pumila*, sp. n., A. Günther, Ann. N. H. (5) iii. p. 106, Paraqua, Philippine Islands. *H. yunnanensis*, sp. n., J. Anderson, Anat. &c., Res. p. 332, Yunnan.

Hystrix (*Sphingurus*) *brandti*, sp. n., Jentink, *l. c.* note 22, p, 96, S. America.

Erethizon dorsatus. Note on its occurrence in W. Virginia; S. B. Goode, Pr. U. S. Nat. Mus. 1878, pp. 264 & 265.

Caviidæ.

Dolichotis patachonica (Shaw) = *magellanica* (Kerr); O. Thomas, Ann. N. H. (5) iii. p. 397.

Lagomyidæ.

Lagomys ladacensis, *L. auritus*, and *L. griseus*, figured; W. T. Blanford, Yark. Miss. pls. vi. & vii. *a*.

Leporidæ.

"Zur Leporidenfrage"; H. von Nathusius, Zool. Gart. xx. pp. 119–135.

Lepus hypsibius, *L. pallipes* var., *L. yarkandensis*, *L. tibetanus*, *L. pamirensis*, and *L. stoliczkanus*, figured; W. T. Blanford, Yark. Miss. pls. 3–5 *a*.

Myolagus sardus. Note on its remains in Corsica; C. J. Forsyth Major, Atti Soc. Tosc. (Proc. Verb.) ii. pp. lxxii. & lxxxix.

PROBOSCIDEA.

Elephantidæ.

Elephas africanus. Its anatomy described, and several of the organs figured, and compared with those of *E. indicus*; W. A. Forbes, P. Z. S. 1879, pp. 420–435. It is closely related to *E. indicus.* Portions of its anatomy (pharynx, pancreas, male organs, &c.) described; A. von Mojsisovics, Arch. f. Nat. xlv. pp. 56–92, pls. v.–vii. *E. indicus*: record of the size and weight of specimens in the Zoological Gardens; P. L. Sclater, P. Z. S. 1879, p. 385. *E. atlanticus*, sp. n. (foss.), A. Pomel, Bull. Soc. Géol. (3) vii. p. 51, Quaternaries of Eghis, Oran. *E. antiquus*: note on a tooth from the Silurian of Rixdorf: W. Dames, SB. nat. Fr. 1879, pp. 27 & 28. *E. primigenius*: on its range in space and time; W. B. Dawkins, J. G. Soc. xxxv. pp. 138–147. On its occurrence in Siberia; H. H. Howorth, Rep. Brit. Ass. 1878, pp. 571 & 572, also Ann. N. H. (5) iii. pp. 91 & 92. On the teeth of an elephant (probably this species) from Liguria; A. Issel, Ann. Mus. Genov. xiv. pp. 153–168.

Mastodon. A large number of bones of various species of this group, as well as some of *Dinotherium* and *Elephas*, are figured and described by E. Chantre & Lortet, Arch. Mus. Lyon, ii. pp. 285–311, pls. i.–xvii.

Mastodon angustidens. On remains from Malta; A. Leith Adams, J. G. Soc. xxxv. p. 523, pl. xxv. figs. 5 & 5 *a*.

AMBLYPODA.

DINOCERATA.

Uintatheriidæ.

Uintatherium leidianum, p. 63, *U. princeps*, p. 81, spp. nn. (foss.), H. F. Osborn, W. B. Scott, & F. Speir, Rep. Princet. Exp. p. 63, pls. A, vi.–viii., Eocene of Wyoming.

Loxolophodon cornutus. Its mandible described; H. F. Osborn & F. Speir, Am. J. Sci. (3) xvii. pp. 304–309, pl. i.; *cf.* E. D. Cope, Am. Nat. xiii. p. 334.

SIRENIA.

On the fossil *Sirenia* of Italy; A. de Zigno, Bull. Soc. Géol. (3) vi. pp. 66–69.

Halicoridæ.

Halicore dugong. On its occurrence in the Red Sea, *vide* Klunzinger *suprà*, p. 5.

Halitheriidæ.

Halitherium. On remains from Malta; A. Leith Adams, J. G. Soc. xxxv. pp. 525–527, pl. xxv. fig. 4.

Felsinotherium gastaldi [cf. Zool. Rec. xv. *Mamm.* p. 15]. Further remarks on; A. de Zigno, Atti Acc. Rom., Mem. Sci. Fis. (3) ii. pp. 939–949, pls. i.–vi.

Manatidæ.

Manatus coulombi, sp. n. (foss.), H. Filhol, Bull. Soc. Philom. (7) ii. p. 124, "Carrières de Mokattam, Cairo."

Bradypodidæ.

C. G. Giebel has notes on the varying number of phalanges in this family; Z. ges. Naturw. (3) iv. pp. 319–321.

Bradypus tridactylus. Note on Joly's paper on the placentation [*cf.* Zool. Rec. xv. *Mamm.* p. 23]; J. Anat. Phys. xiv. pp. 147 & 148.

Grypotherium darwini, g. n. (foss.), J. Reinhardt, Dan. Selsk. Skr. (5) xii., No. 4, pp. 353–380, pls. i. & ii., for *Mylodon darwini*, Owen, Plistocene of the Argentine Republic. [*Cf.* also J. A. Ryder, Am. Nat. xiii. pp. 590–592.]

Manididæ.

Manis. Remarks on the Asiatic species; J. Anderson, Anat. &c. Res. pp. 341–353. The skull figured; *l. c.* pl. xxiv. On the stomach; *l. c.* p. 347. On the fœtal membranes and placentation, pp. 347–351.

Dasypodidæ.

Dasypus novem-cinctus. On the fœtal structures; A. Milne-Edwards, Ann. Sci. Nat. (6) viii. art. 10, pp. 1–6, pls. xxii.–xxiv. Four fœtuses are contained in a common chorion! The placenta common is zonary-formed, owing to the fusion of the four (primitively separate?) discoidal placentas of the embryos, the allantois small, and a decidua probably present.

Dædycurus giganteus. Its osteology described and figured; H. Burmeister, Abh. Ak. Berl. 1879, pp. 1–23, pls. i. & ii.

Orycteropodidæ.

Orycteropus. Note on its sternum; E. Alix, Bull. Soc. Philom. (7) iii. p. 30.

Myrmecophagidæ.

See Pouchet, *suprà*, p. 7.

MARSUPIALIA.

Didelphyidæ.

On the female generative organs of the Marsupials; E. Alix, Bull. Soc. Philom. (7) iii. pp. 147 & 148.

Didelphys turneri, sp. n., A. Günther, Ann. N. H. (5) iii. p. 108, Demerara. *D. cancrivora* : on its nervous system ; Alix, *op. cit.* ii. pp. 148 & 149.

Dryole[i]stes vorax [*cf.* Zool. Rec. xv. *Mamm.* p. 23], p. 215, Jurassic of Rocky Mountains, *arcuatus*, p. 397, Upper Jurassic of Rocky Mountains, O. C. Marsh, Am. J. Sci. (3) xviii., spp. nn. (foss.).

Dasyuridæ.

Dasyurus albo-punctatus, sp. n., H. Schlegel, Notes Leyd. Mus. ii. note ix. p. 51, Arfak Mountains, New Guinea.

Stylodontidæ (n.).

Stylacodon gracilis, g. & sp. nn. (foss.), allied to the English Jurassic *Stylodon*, with which it forms a family, *Stylodontidæ*; O. C. Marsh, Am. J. Sci. (3) xviii. p. 61, Ann. N. H. (5) iii. pp. 167 & 168, "Atlantosaurus beds," Rocky Mountains.

Tinodontidæ (n.).

Tinodon bellus, g. & sp. nn. (foss.). Allied in some respects to the English Jurassic *Triconodon*, but forming the type of a family, *Tinodontidæ*. Its marsupial nature is doubtful. O. C. Marsh, Am. J. Sci. (3) xviii. p. 216, Jurassic of Rocky Mountains. *T. robustus*, p. 396, and *T. lepidus*, sp. n., *l. c.* p. 397, Upper Jurassic of Wyoming.

Phalangistidæ.

Phalangista vulpina (Shaw) = *vulpecula* (Kerr); O. Thomas, Ann. N. H. (5) iii. p. 397.

Petaurus taguanoides, Desm., = *volans* (Kerr); *id. ibid.*

Phascolarctus cinereus. The male generative organs described; A. H. Young, J. Anat. Phys. xiii. pp. 305–317, pl. xviii.

Plagiaulacidæ (n.).

Ctenacodon serratus, g. & sp. n. (foss.). Allied to *Plagiaulax*, with which it forms a family, *Plagiaulacidæ*. O. C. Marsh, Am. J. Sci. (3) xviii. p. 397, "Atlantosaurus beds" of Wyoming.

Peramelidæ.

Perameles broadbenti, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii.

p. 402, pl. xxvii., Port Moresby. [In the title, this new Marsupial is said to be "allied to the genus *Perameles*" !]

Macropodidæ.

Hypsiprymnodon moschatus (Ramsay) [Zool. Rec. xv. *Mamm.* p. 24], described and figured, with osteological details; R. Owen, Tr. L. S. (2) i. pp. 573-582, pls. lxxi. & lxxii. It is the type of a distinct family "*Pleopodidæ*" (Owen).

Hypsiprymnus penicillatus. Note on a specimen with irregular dentition; G. Leslie, J. Anat. Phys. xiii. pp. 546-548.

ORNITHODELPHIA.

Tachyglossidæ.

On the salivary glands of the two known genera; H. Viallanes, C. R. lxxxix. pp. 910-912,

Tachyglossus lawesi [cf. Zool. Rec. xiv. *Mamm.* p. 24]: further notes on; E. P. Ramsay, P. Linn. Soc. N. S. W. iii. pp. 244 & 245.

AVES.

BY

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

THE year 1879 has produced some very important publications, amongst which the following may here be cited as bearing upon special geographical divisions. In the Palæarctic region, the distinguishing feature is the amount of literature relating to the Russian possessions: see Bogdanow, Boultycheff, and Goebel, Finsch, and Seebohm (Siberia); whilst Dresser's "Birds of Europe" approaches conclusion. For the Ethiopian region, see Du Bocage (West Africa), Fischer and Reichenow (East Africa), Milne-Edwards and Grandidier (Madagascar), Günther and Newton (Rodriguez). There is a slight falling-off in the number of papers relating to the Indian region, owing to the lamented death of the Marquis of Tweeddale; but important contributions have been made by Hume, Scully, Anderson (Yunnan), and Legge (Ceylon). For Sumatra, Celebes, Borneo, the Moluccas, and Papuasia, reference may be made to Salvadori, D'Albertis, Meyer, Ramsay, Sclater, and Sharpe; whilst for New Caledonia and the New Hebrides, see Layard and Tristram; and for the Sandwich Islands, see Dole and Sclater. Passing to the Neotropical region, the commencement of the important "Biologia Centrali-Americana" by Salvin & Godman should be noticed, and in addition to other work by one or both of the above, Sclater, Taczanowski (Peru), and Lawrence (West Indies) have supplied valuable material. In the Nearctic region, see Belding, McChesney, Sennett, and Kumlien (Arctic). For Oceanic explorations, see Sharpe (Transit of Venus Expedition) and Moseley (Voyage of the 'Challenger'). For Anatomy and Embryology, see Balfour, Dareste, Forbes, Gadow, and Garrod. Shelley has concluded his Monograph of the *Nectariniidæ*, and Sharpe has produced a fourth volume of his Catalogue of Birds, treating of the *Campophagidæ* and *Muscicapidæ*.

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

ADAMSON, C. M. Natural History Scraps: more especially about Birds. Newcastle-on-Tyne: 1879, 8vo.
Collected reprints of various articles.

ALLEN, GRANT. The Colour Sense: its Origin and Development. An Essay in Comparative Psychology. London: 1879.

This essay contains numerous remarks and speculations on the above sense in relation to Birds. For criticism and reply, see "Nature," xix. pp. 501 & 580.

ALLEN, J. A. Notes on the Sea-Birds of the Grand Banks. Bull. Nutt. Orn. Club, iv. p. 127. [Observations in September, 1878, on *Laridæ*, *Procellariidæ*, &c.]

——. See also *Dendræca cærulea* [*Mniotiltidæ*].

ANDERSON, JOHN. Anatomical and Zoological Researches: comprising an account of the zoological results of the two expeditions to Western Yunnan in 1868 and 1875. London: 1878, 2 vols., 4to. [The preface being dated Calcutta, 21st Dec., 1878, this work could not be, and as a fact was not, published until 1879.] *Aves*, i. pp. 565–702, ii. pls. xlv.–liv.

The author states in the Introduction that "the identifications of the birds (233 species) were verified by Mr. R. Bowdler Sharpe, who has carefully worked out the literature." One new species, *Arachnethra edeni* [*Nectariniidæ*], is described and figured; for other species figured, see under *Falconidæ*, *Nectariniidæ*, *Muscicapidæ*, *Timeliidæ*, *Pycnonotidæ*, *Sylviidæ*, *Phasianidæ*, *Perdicidæ*.

ANDERSON, JOSEPH. See LOW, GEORGE.

AYRES, THOMAS. Additional Notes on the Ornithology of the Transvaal. Communicated by J. H. GURNEY. Ibis, 1879, pp. 285–300, 389–405.

The species collected now amount to 335 [*cf.* Zool. Rec. xiii. *Aves*, p. 2, xiv. *Aves*, p. 1, xv. *Aves*, p. 2]. In the present list it is, presumably, T. AYRES who describes one species, *Pycnonotus layardi* [*Pycnonotidæ*], as new; whilst in the same paper (p. 403) H. SEEBOHM describes another novelty, *Eremomela hemixantha* [*Sylviidæ*].

BALFOUR, F. M., & SEDGWICK, A. On the Existence of a Head-Kidney in the Embryo Chick, and on certain points in the Development of the Mullerian Duct. Q. J. Micr. Sci. 1879, pp. 1–20, pls. i. & ii. [*Cf.* Zool. Rec. xv. *Aves*, p. 3.]

BALL, V. Jungle Life in India; or, the Journeys and Journals of an Indian Geologist. London: 1880, large 8vo, pp. 713 [published Dec., 1879].

Numerous remarks on birds are scattered through the pages of this interesting volume, but all, or nearly all, have already occurred in papers in "Stray Feathers," &c. [*Cf.* Zool. Rec. vii. p. 29, viii. p. 38, ix. p. 28, x. p. 30, xi. p. 27, xii. p. 26, xiii. *Aves*, p. 2, xiv. *Aves*, p. 1, xv. *Aves*, p. 3].

BALLON, H. H. Natural History of the Islands of Lake Erie. "Field and Forest," iii. p. 135. [See Bull. Nutt. Orn. Club, v. p. 112.]

BARTLETT, A. D. See *Spheniscus humboldti* [*Spheniscidæ*].

BARTLETT, EDWARD. Second List of Mammals and Birds collected by Mr. Thomas Waters in Madagascar. P. Z. S. 1879, pp. 767–773, pl. lxi. [*Cf.* Zool. Rec. xii. p. 26.]

Twenty-three species of birds are enumerated, amongst which *Cypselus balstoni* [*Cypselidæ*] and *Zapornia watersi* [*Rallidæ*] are described as new.

BEERBOHM, J. See *Rhea darwini* [*Struthionidæ*].

BELDING, L. A Partial List of the Birds of Central California. Edited by R. RIDGWAY. P. U. S. Nat. Mus. i. [March 21, April 22, 1879], pp. 388–449.

This excellent paper, based upon observations during twenty, and collections made during the last two, years, treats of 220 species, determined where necessary by R. Ridgway, who has also undertaken their nomenclature.

BEMMELEN, A. A. VAN. Mededelingen over nederlandsche Vögels. Tijdschr. Nederl. Dierk. Ver. iv. pp. 69–104.

BÉRENGIER, THÉOPHILE. La Nouvelle-Nursie. Paris: 1879.

In this description of a Benedictine colony on the Moore River, near Perth, West Australia, there is (pp. 285–308) a kind of list, with descriptions of a somewhat popular nature, of the birds observed.

BERLEPSCH, H. v. Eine neue Gattung und neue Arten aus Südamerika. Orn. Centralbl. 1879, p. 63; also (at greater length) J. f. O. 1879, pp. 206–210.

See *Callithraupis*, g. n. [*Tanagridæ*]; *Basileuterus* [*Mniotiltidæ*], *Pachyrrhamphus* [*Cotingidæ*], *Panychlora* [*Trochilidæ*], spp. nn.

BESSELS, EMIL. Die Amerikanische Nordpol-Expeditionen. Leipzig: 1879, 8vo, pp. 647.

This work contains several notices of Arctic birds, especially on pp. 465–468, where the identity of a species of the *Hirundinidæ* is discussed.

BIANCONI, G. G. Di alcuni giganteschi avanzi di Uccelli referibile probabilmente all' *Aepyornis* o Ruck. Rend. Acc. Bologn. 1877–78, pp. 167 & 168.

Remarks on a gigantic fossil foot found under the Sainte Chapelle, Paris, and on a somewhat mythical foot said to have been presented to Charlemagne.

BINGHAM, C. T. Notes on some Tenasserim Birds. Str. Feath. viii. pp. 190–197.

BISHOP, N. H. Four Months in a Sneak-Box. A boat voyage of 2600 miles down the Ohio and Mississippi rivers and along the Gulf of Mexico. Boston, U.S.A.: 1879. Edinburgh: 1880, 8vo, pp. 322.

Amongst other remarks, there is a graphic account (pp. 108–112) of the real and supposed manners of nesting of Whooping and Sandhill Cranes, and (pp. 124–129) of *Conurus carolinensis*, a parrakeet now almost, if not quite, banished from South Carolina.

Blanford, W. T. Notes on the [A. O. Hume's, *infrà*] List of the Birds of India. Str. Feath. viii. pp. 176–184.

——. [In President's Address, P. A. S. B. 1879, pp. 50–53, are some remarks on the progress of Ornithology in India during 1878.]

Bocage, J. V. Barboza du. Subsidios para a Fauna das possessões portuguesas d'Africa occidental. J. Sc. Lisb. vii. [*Aves*] pp. 86 & 87, 92–95.

From the Island of S. Thomé 8 species are recorded, and from the Sertão de Angola 27 species, one of the latter, *Fiscus capelli* [*Laniidæ*], being described as new, whilst attention is drawn to the rediscovery of that rare species, *Francolinus schlegeli* [*Perdicidæ*].

——. Aves das possessões portuguesas d'Africa occidental. xviii. lista. *Tom. cit.* pp. 100–102.

On a collection of 17 species made by Senhor Anchieta at Novo Redondo.

Böckmann, F. Ornithologische Beiträge zur Fauna der Niederelbe. Verh. Ver. Hamb. iii. pp. 252–270. Nachtrag; *op. cit.* iv. p. 249.

A list of the birds observed on the Lower Elbe.

Bogdanow, Modest. Trudui obshchestva estestvoispuitatelei pri Imperatorskom kazanskom Universitetye. Tom. viii. Vuip. 4, Ptitsai Kavkaza-Kazan : 1879.

The above is the rendering into Roman characters of a Russian title, signifying, "Transactions of the Natural History Society in connection with the Imperial Kazan University. The Birds of the Caucasus." The species noticed are 323, amongst which are 6 new species and subspecies [*Falconidæ*, *Paridæ* (3), *Fringillidæ*, *Picidæ*], and 3 new genera are erected [*Fringillidæ* (2), *Alaudidæ*].

Böhm, R. Ornithologische Skizzen aus Mecklenburg und Nord-Friesland. Orn. Centralbl. 1879, pp. 1–4, 25–29, 58–60, 73–76, 81–84.

Boucard, A. See *Chiromacharis coronata*, sp. n. [*Pipridæ*], *Lampornis violicauda*, var. ? [*Trochilidæ*], *Myrmotherula nigro-rufa*, sp. n. [*Formicariidæ*].

Boulard, Raoul. Sur les sacs aériens du Marabout. Bull. Soc. Philom. (7) iii. pp. 129 & 130.

Boultycheff, N. P. [A paper on the Fauna and Flora of the Irbit District in Bulletin de la Société Ouralienne, Ekaterinburg, iv.]

[Not seen by Recorder; see Nature, xx. p. 484.]

Brehm, A. E. Thierleben, II. Abth. Vögel. i.–iii. Leipzig : 1879.

A popular illustrated work.

——. [Sketch of the Visit of the Crown Prince of Austria to Spain and Portugal, with Notices of some of the more interesting Birds observed.] J. f. O. 1879, pp. 441–443.

——. [See also Oesterreich, Rudolph von.]

BREWER, T. M. [Letter, maintaining that *Podiceps cristatus* has not been proved to occur in North America.] Ibis, 1879, p. 112.

—— Some additional Notes upon Birds observed in New England, with the names of Five Species not included in his previous List of New England Birds. Am. Nat. xx. pp. 263–277.

——. Catalogue of the Humming-Birds (*Trochilidæ*) in the Museum of the Boston Society of Natural History. *Tom. cit.* p. 335.

The latest work of the author, who did not live to revise it. He died in January, 1880.

——. See also *Tringa sub-arquata* [*Scolopacidæ*], *Bucephala islandica* [*Anatidæ*], *Empidonax* [*Tyrannidæ*], *Rhynchops* [*Laridæ*].

BREWSTER, WILLIAM. The Terns of the New England Coast. Bull. Nutt. Orn. Club, iv. pp. 13–22.

A graphic account of the *Sterninæ* visiting New England, 4 species being breeders on that coast. [*Laridæ*.]

——. Descriptions of the First Plumage in various species of North American Birds. V. *Tom. cit.* pp. 39–46.

A continuation [*cf.* Zool. Rec. xv. *Aves*, p. 5] of the author's important contributions on this subject.

——. On the Habits and Nesting of certain Rare Birds in Texas. *Tom. cit.* pp. 75–80.

Remarks upon a collection of birds and eggs obtained by W. H. Werner in Comal Co., Texas. The novelties appear to be eggs of *Lophophanes atricristatus* [*Paridæ*], *Dendræca chrysoparia* [*Mniotiltidæ*], *Ceryle americana* var. *cabanisi* [*Alcedinidæ*], *Buteo zonocercus* [*Falconidæ*].

——. See also *Peucæa* [*Fringillidæ*], *Vireo* [*Vireonidæ*], *Certhia* [*Certhiidæ*].

BROOKS, W. E. See *Milvus* [*Falconidæ*], *Reguloides*, *Phylloscopus*, *Horornis* [*Sylviidæ*].

BROWN, J. A. HARVIE. The Capercaillie in Scotland. Edinburgh: 1879, 8vo, pp. 155.

An excellent monograph of *Tetrao urogallus* since its re-introduction in 1837, with a map showing the extension of its range, and other illustrations. [*Tetraonidæ*.]

BROWN, N. C. A List of Birds observed at Coosada, Central Alabama. Bull. Nutt. Orn. Club, iv. pp. 7–13. [Conclusion : *cf.* Zool. Rec. xv. *Aves*, p. 5.]

The species observed make a total of 119.

——. Notes on a few Birds occurring in the vicinity of Portland, Me. [Maine]. *Tom. cit.* pp. 106–108.

BULLER, W. L. Remarks on a Species of *Lestris* [*Stercorarius*] inhabiting our Seas. Tr. N. Z. Inst. xi. pp. 355–359. [*Laridæ*].

——. Note on Mr. Howard Saunders's Review of the *Larinæ*, or Gulls. *Tom. cit.* pp. 359 & 360.

Buller, W. L.] Additions to List of Species, and Notices of Rare Occurrences since the publication of "The Birds of New Zealand." *Tom. cit.* pp. 361–366.

——. Further Contributions to the Ornithology of New Zealand. *Tom. cit.* pp. 366–376.

——. See also *Prion banksi* [*Procellariidæ*], *Eudynamis taitensis* [*Cuculidæ*], *Hylochelidon nigricans* [*Hirundinidæ*].

Bureau, Louis. Recherches sur le Mue du Bec des Oiseaux de la Famille des Mormonidés. Bull. Soc. Z. Fr. iv. pp. 1–68, pls. i.–vi.

An important continuation [*cf.* Zool. Rec. xiv. *Aves*, p. 5] of the author's researches on the shedding of portions of the beak in the *Mormonidæ* [*Alcidæ*]. The author's separate copies are illustrated by a map and 16 plates, but none of these have appeared in the Bulletin up to May, 1880, about a year after date!

Butler, E. A. A Catalogue of the Birds of Sind, Cutch, Ka'thia'wa'r, North Gujara't, and Mount Aboo. Bombay Gazeteer, 1879 [separate copy, pp. 83].

An excellent hand-list of the birds of the above district.

——. Further Additions to the Sind Avifauna. Str. Feath. viii. pp. 386–389.

——. See also Nidification of *Dromas ardeola* [*Charadriidæ*].

Cabanis, J. See *Aulanax* [*Tyrannidæ*], *Tmetothylacus*, g. n. [*Motacillidæ*], *Corythaix schuetti*, sp. n. [*Musophagidæ*].

Ciaccio, G. V. Nota preventiva sulla interna struttura della lengua de' papagalli. Rend. Acc. Bologn. 1877–78, pp. 157–162.

Clarke, W. E. The Birds of Yorkshire. Tr. Yorksh. Nat. Union, i. series B, pp. 16.

The present sheets comprise the majority of the *Falconidæ* found in the county, the most interesting feature being the reasserted occurrence of *Tinnunculus cenchris*, in Nov., 1876.

Clifton, Lord. Letters [on some Races of Birds observed near Brighton, and on the Species noticed during a visit to Iceland]. Ibis, 1879, pp. 368–374.

Cooper, W. A. See *Glaucidium* [*Strigidæ*].

Cordeaux, J. Some recent Notes on the Avifauna of Lincolnshire Tr. Norw. Soc. ii. pp. 555–562.

——. On the Autumn Migration of Birds in 1878. Zool. 1879, pp. 41–49. Further Notes on Migration; *tom. cit.* p. 126. Ornithological Notes from North Lincolnshire; *tom. cit.* pp. 371–375.

—— in Preston's Report on the Phenological Observations for 1878. Q. J. Meteorol. Soc. 1879—Ornithological—pp. 59–62, with map of stations.

These ornithological notes extend over nine months, from 1st January to 30th September, 1878, and are based on reports from 21 stations.

COUES, ELLIOT. On the Present Status of *Passer domesticus* in America, with special reference to the Western States and Territories. Bull. U. S. Geol. Surv. v. pp. 175–193.

The introduction of this species by ignorant sentimentalists is shown to have been productive of serious and still continuing mischief. An elaborate list of the controversial literature respecting this bird is appended. [*Fringillidæ*.]

——. Second Instalment of American Ornithological Bibliography. *Tom. cit.* pp. 239–330.

The first instalment of this important contribution was published with the author's "Birds of Colorado." [*Cf.* Zool. Rec. xv. *Aves*, p. 7.]

——. See also SENNETT, G. B.; and *Vireo atricapillus* [*Vireonidæ*], *Alle nigricans* [*Alcidæ*].

COUES, GEORGE HUGHES. List of Birds observed in the Naval Hospital Grounds, in Brooklyn City. Bull. Nutt. Orn. Club, iv. pp. 31–33.

No less than 60 species are recorded from this suburb of New York City.

COX, H. L. The Birds of Dublin and Wicklow. Zool. 1879, pp. 449–454, 477–487.

D'ALBERTIS, L. M., & SALVADORI, T. Catalogo degli uccelli raccolti da L. M. D'Albertis durante la 2ª e 3ª esplorazione del Fiume Fly negli anni 1876 e 1877. Ann. Mus. Genov. xiv. pp. 21–147.

For reference to the notice of the second journey up the Fly River, in New Guinea, see Zool. Rec. xiv. *Aves*, pp. 6 & 21. On the third expedition, 800 birds, belonging to 173 species, were collected, and the following genera and species are now described as new. *Aprosmictus callopterus*, *Trichoglossus cæruleiceps* [*Psittacidæ*], *Chætura novæ-guineæ* [*Cypselidæ*], *Campochæra* (g.n.) [*Campophagidæ*], *Rectes brunneiceps* [*Laniidæ*], *Dicæum rubrigulare* and *D. albo-punctatum* [*Dicæidæ*], *Poodytes albo-limbatus* [*Sylviidæ*], *Munia leucosticta* [*Ploceidæ*], *Megacrex* (g. n.) *inepta* [*Rallidæ*]. The last-named species is incapable of flight, and is probably destined to speedy extinction. There are also some important remarks upon geographical distribution, and on the *Paradiseidæ*; *P. novæ-guineæ* being at the end of the article, separated from *P. apoda*, and raised to specific rank. *Casuarius beccarii* is also fully described, with illustrative woodcuts [*Casuariidæ*].

DARTT, MARY. [See RIDGWAY, R.]

DARESTE, C. Nouvelles recherches sur la suspension des phénomènes de la vie dans l'embryon de la poule. C. R. lxxxvii. pp. 1045–1047. [*Cf.* Zool. Rec. xv. *Aves*, p. 8.]

——. Note sur les granules amyloïdes du jaune de l'œuf. *Op. cit.* lxxviii. pp. 551–553. [*Cf.* Zool. Rec. *l. c.*]

——. Sur l'évolution de l'embryon dans les œufs mis en incubation dans l'eau chaude. *Tom. cit.* p. 1138.

[Dareste, C.] Sur l'absence totale de l'amnios dans l'embryon poule. *Tom. cit.* pp. 1329–1332.

Darwin, Charles. Fertility of Hybrids from the Common and Chinese Goose. Nature, xxi. p. 207 [see also p. 303].

Dastre, —. Sur les granules amylacés et amyloïdes de l'œuf. C. R. lxxxviii. p. 752.

Deane, Ruthven. Additional Cases of Albinism and Melanism in North American Birds. Bull. Nutt. Orn. Club, iv. pp. 27–30. [*Cf.* Zool. Rec. xiii. *Aves*, p. 7.]

——. See also *Scops flammeola* [*Strigidæ*], *Rhynchops nigra* [*Laridæ*].

Des Murs, O. La verité sur le Coucou. Histoire naturelle de la famille des Coucous. Paris: 1879, 8vo, pp. 295.

A monograph, in popular style, of the *Cuculidæ*.

Doig, S. Some Notes on Sindh Birds. Str. Feath. vii. pt. 6 [March, 1879], pp. 502–506.

Several species new to the district are added to the list. [*Cf.* Zool. Rec. xvi. *Aves*, p. 6, E. A. Butler.]

——. Bird's-nesting on the "Eastern Narra" [Sind]. *Op. cit.* viii. pp. 369–379.

Dole, Sanford B. List of Birds of the Hawaiian Islands. 'Hawaiian Annual,' 1879, pp. 41–58.

[Only a separate copy seen by the Recorder.] Fifty-three species are noticed from the Sandwich Isles, four of which are described as new: see *Accipiter* [*Falconidæ*], *Drepanis* (2) [*Dicæidæ*], *Fringilla* [*Fringillidæ*], *Pennula*, g. & sp. nn. [*Rallidæ*].

Dresser, H. E. A History of the Birds of Europe, including all the Species inhabiting the Western Palæarctic Region. Parts lxxiii.–lxxvi.

Only four parts were issued under date of 1879, and another double or treble part will conclude the work. For species figured, see *Rallidæ*, *Falconidæ*, *Pelecanidæ*, *Podicipidæ*, *Strigidæ*, *Vulturidæ*, *Gruidæ*, *Ardeidæ*, *Laridæ*, *Scolopacidæ*, *Sylviidæ*, *Phasianidæ*, *Phœnicopteridæ*, *Anatidæ*, *Turdidæ*.]

——. Translation from the Swedish of W. Meves; Œfv. Ak. Förh. 1854, No. 8. "On the Change of Colour in Birds, through and irrespective of Moulting;" Zool. 1879, pp. 81–89, pls. i. & ii.

Drummond-Hay, H. M. Notes on the Birds of the Basin of the Tay and its Tributaries. Scot. Nat. 1879, pp. 56–62, 105–115.

Dubois, A. Faune illustrée des vertébrés de la Belgique. Serie II, Oiseaux.

[Not seen by the Recorder.]

——. Remarques sur la Faune de Belgique. Bull. Ac. Belg. xlvii. p. 827.

On the occurrence in Belgium of *Turdus sibiricus*, *Petrocincla cyanea*, and *Emberiza pusilla*.

[Dubois, A.] See also *Hypoxanthus* [*Picidæ*], *Euplocamus* [*Phasianidæ*], spp. nn.

Duval, Mathias. Études sur la ligne primitive de l'Embryon du Poulet. Ann. Sci. Nat. (6), Zool. vii. art. 17, pls. 13–18 (pp. 48).

Dybowsky, W. See *Tetrao medius* [*Tetraonidæ*].

Elliot, D. G. A Monograph of the *Bucerotidæ*, or Family of the Hornbills. Pt. vi. [*Cf.* Zool. Rec. xv. *Aves*, p. 9.] [*Bucerotidæ*.]

——. A Classification and Synopsis of the *Trochilidæ*. Contr. Sm. Inst. 317, pp. 277.

The 426 species acknowledged by the author are distributed amongst 120 genera, the characters of which are illustrated by woodcuts. *Floricola* is a new genus, comprising 4 species hitherto placed under *Heliomaster*; *Iache* is substituted for *Circe*, which is preoccupied, and *Callipharus* similarly replaces *Clotho*. In species, *Petasophora rubrigularis* is proposed for a bird differing somewhat from *P. corruscans*. [*Trochilidæ*.]

——. List of Described Species of Humming Birds. Sm. Misc. Coll. 334. Washington: 1879, 8vo, pp. 17.

Reprinted, with some alterations, from the above Synopsis.

Feilden, H. W. The Natural History of Prince Albert Land. Zool. 1879, [*Aves*] pp. 4–9.

This notice, derived from the medical return of the late Surgeon Robert Anderson, of H.M.S. 'Enterprise,' between the years 1851–52, possesses unusual interest from the position of Prince Albert Land, which connects with the Parry Archipelago and other districts whose fauna was already known.

——. Notes from an Arctic Journal. *Tom. cit.* pp. 16–24, 50–58, 89–108, 162–170, 200–202.

The above conclude the author's interesting details of the last Polar Expedition. [*Cf.* Zool. Rec. xv. *Aves*, p. 10.]

——. See also *Procellaria glacialis* [*Procellariidæ*].

Finsch, O. Reise nach West-Sibirien im Jahre 1876. Berlin: 1879, roy. 8vo, pp. 663.

This narrative of a journey to Western Siberia contains numerous allusions to the birds observed. [For O. Finsch's letters on the subject in English, see Zool. Rec. xiv. *Aves*, p. 8.]

——. Reise nach West-Sibirien im Jahre 1876. Wirbelthiere. ii. Vögel. Verh. z.-b. Wien, xxix. pp. 128–280.

In this description of the scientific results of the above journey, 283 species of birds are noticed. On collating p. 437 in the former work, and p. 251 in the latter, with O. Finsch's letter in Ibis, 1877, p. 60, in which he then stated that *Tringa sub-arquata* was found with its young, it now appears that for this species *T. alpina* should be read: consequently the young of *T. sub-arquata* are still unknown. [*Scolopacidæ*.]

[Finsch, O.] On a Collection of Birds made by Mr. Hübner on Duke-of-York Island and New Britain. P. Z. S. 1879, pp. 9–17.

On 52 species from the former (14 being hitherto unrecorded from it), and 7 from the latter.

——. See also *Domicella kuhli* [*Psittacidæ*], *Larus affinis* [*Laridæ*], *Petræca kleinschmidti* [*Muscicapidæ*], *Ptilotis xanthophrys* [*Meliphagidæ*].

Fischer, G. A. Briefliche Reiseberichte aus Ost-Afrika. iv. J. f. O. 1879, pp. 275–304.

Another of the author's valuable communications from Zanzibar. [*Cf.* Zool. Rec. xv. *Aves*, p. 10, and see also Reichenow, A.]

—— & Reichenow, A. Uebersicht der von G. A. Fischer auf einer zweiten Reise durch das ostafrikanischen Küstenland von Mombassa bis Wito und am Tana-Fluss gesammelten Vögel. J. f. O. 1879, pp. 338–356. [*Cf.* Zool. Rec. xv. *Aves*, p. 10.]

Notes on 141 species obtained by Dr. Fischer; the novelties have already been described in Orn. Centralbl. by A. Reichenow.

Forbes, W. A. On the Systematic Position of the Genus *Lathamus* of Lesson. P. Z. S. 1879, pp. 166–174, pl. xvi.

The study of the pterylosis, osteology, and other points in external and internal structure of this genus tend to show that its affinities are with the *Platycercidæ*. [*Psittacidæ*.]

——. A Synopsis of the Meliphagine Genus *Myzomela*, with Descriptions of Two New Species. *Tom. cit.* pp. 256–278, pls. xxiv. & xxv.

The two new species are named *Myzomela caledonica* and *M. sclateri*, a total number of 26 species being enumerated, with remarks on their geographical distribution. [*Meliphagidæ*.]

——. On the Systematic Position and Scientific Name of "Le Perroquet mascarin" of Brisson. Ibis, 1879, pp. 303–307.

An examination of the Paris specimen, one of the two extant, leads the author to remove it from the genus *Coracopsis*, and to accept for it Lesson's genus *Mascarinus*; the specific name of *madagascarensis* given by the latter must be discarded as misleading, and the author proposes to substitute for it that of *duboisi*. Cuts of head and feet of this parrot are given. [*Psittacidæ*.]

Fraas, O. Brüteplätze von Wasservögeln der jüngsten Tertiärzeit. JB. f. Mineral. 1879, p. 555.

Freke, P. E. A Comparative Catalogue of Birds found in Europe and North America. P. R. Dubl. Soc. Art. li. Dec. 1879 [separate copy], pp. 44.

A very useful addition to previous compilations on geographical distribution.

Frommann, C. Ueber die Structur der Dotterhaut des Hühnereies. Jen. Z. Nat. xii. suppl. pp. 86–90.

On the outer lining-membrane of the yelk of the hen's egg.

GADOW, HANS. Versuch einer vergleichenden Anatomie des Verdauungs-systemes der Vögel. Jen. Z. Nat. xiii. pp. 92–171, 339–403, pls. iv.–xiii. & xvi.

An elaborate article on the digestive organs of birds; the result arrived at being the formation of some highly artificial groups. [For details, see a criticism by W. A. Forbes, Ibis, 1880, p. 234.]

GÄTKE, H. The Migration of Birds; Nature, xx. pp. 97–99. [See WEISSMANN, A.]

——. [Records of Recent Stragglers to Heligoland.] Ibis, 1879, pp. 102–104, 220, 378–380, & 388.

The rarities are *Phylloscopus viridanus* [*Sylviidæ*], *Emberiza pyrrhuloides* and *E. melanocephala* [*Emberizidæ*], *Alauda pispoletta* [*Alaudidæ*].

GARROD, A. H. Notes on Points in the Anatomy of the Hoatzin (*Opisthocomus cristatus*). P. Z. S. 1879, pp. 109–114.

Remarks on, with woodcuts of, the trachea are followed by investigations of the myology of this species, the deduction being that *Opisthocomus* must either be classed with the Gallinaceous Birds, or form a group by itself. A diagram is given to show these and other affinities. [*Opisthocomidæ*.]

——. On the Conformation of the Thoracic Extremity of the Trachea in the Class *Aves*. Part i. The *Gallinæ*. Tom. cit. pp. 354–380.

Numerous woodcuts illustrate the text, and the result of examination points to two divisions of this family, the Coturnicine and the Phasianine.

GATCOMBE, J. Ornithological Notes from Devon and Cornwall. Zool. 1879, pp. 112–116, 205–208, 418–420.

GIBBS, MORRIS. Annotated List of the Birds of Michigan. Bull. U. S. Geol. Surv. v. pp. 481–497.

GIBSON, ERNEST. Ornithological Notes from the Neighbourhood of Cape San Antonio, Buenos Ayres. Ibis, 1879, pp. 405–424.

In this first instalment of a series of papers the habits of the *Accipitres* and *Striges* are graphically described.

GIGLIOLI, E. H., & MAZELLA, A. Iconografia dell' Avifauna Italica ovvero Tavole illustrante le specie di Uccelli che trovansi in Italia. Prato (Toscana): 1879, fo. Fascicoli i. & ii.

The commencement of a work in which it is proposed to describe and illustrate the 418 species which Giglioli includes in the Italian avifauna. The species described (and figured by Mazella) are, Pt. i., *Falco communis*, *Lanius excubitor*, *Lagopus mutus*, *Bucephala clangula*, *Sternula minuta*; (Pt. ii.) *Cerchneis tinnuncula* [sic], *Caprimulgus ægyptius*, *Houbara macqueeni*, *Hydrornia* [*Porphyrio*] *alleni*, *Tadorna cornuta*.

GILL (MRS.). [In "Six Months in Ascension," London, 1879, an interesting account is given (pp. 260–265) of Mr. Gill's visit to Boatswainbird Island; pp. 206–211 treat of the well-known breeding-

place of *Sterna fuliginosa*, called "Wide-awake Fair," and there are several allusions to other birds, but for the more scientific, if less graphic, description of the birds obtained, see PENROSE, F. G., *infrà*, p. 23.]

GODMAN, F. D. See SALVIN, O.

GODWIN-AUSTEN, H. H. See *Ceriornis blythi*, *Lophophorus sclateri* [*Phasianidæ*].

GOEBEL, H. Ueber Vögel des Uman'schen Kreises. J. f. O. 1879, pp. 266–275.

Supplementary notes on the birds of Uman [*cf.* Zool. Rec. x. p. 26]. [Remarks on the above, by E. F. v. HOMEYER, *tom. cit.* pp. 417–420.]

——. Die Vögel des Kreises Uman, Gouvernment Kiew, mit besonderer Rücksicht auf ihre Zugverhältnisse und ihr Brutgeschäft. St. Petersburg: 1879, 8vo, pp. 238.

A tolerably full account of the 231 species found either on passage or breeding in the Government of Kiew, South Russia.

——. Die Vögel in ihrer Beziehung zur Land- und Forstwissenschaft. Z. orn. Ver. Stettin, iii. pp. 5–8, 19–27. From the extra sheet of the "St. Petersburg Sunday Herald."

On rapacious birds and their influence, from the point of view of a land-manager and forester.

——. See also *Cuculus canorus* [*Cuculidæ*].

GOELDLIN, E. A. Verzeichniss der im Kanton Schaffhausen vorkommenden Vögel. J. f. O. 1879, pp. 357–384.

A useful catalogue, comprising 196 species, with full notes on localities where they are found.

GOODACRE, F. B. On the Question of the Identity of Species of the Common Domestic and the Chinese Goose. P. Z. S. 1879, pp. 710–712.

GOULD, J. The Birds of New Guinea and the adjacent Papuan Islands, including any new species that may be discovered in Australia. Parts ix. & x. March and September, 1879. [*Cf.* Zool. Rec. xv. *Aves*, p. 12.] For species figured, see *Paradiseidæ*, *Psittacidæ*, *Pittidæ*, *Columbidæ*, *Muscicapidæ*, *Laniidæ*, *Dicæidæ*, *Meliphagidæ*.

——. The Birds of Asia. Part xxxi. July 1st, 1879. [*Cf.* Zool. Rec. xiv. *Aves*, p. 11.] For species figured, see *Oriolidæ*, *Pittidæ*, *Tetraonidæ*, *Sylviidæ*, *Fringillidæ*, *Dicæidæ*.

——. See also *Chlamydodera orientalis*, sp. n. [*Paradiseidæ*].

GRUNACK, A. Bornholm's Vögelweldt. Orn. Centralbl. 1879, pp. 149–152, 157–159.

Ninety-four species of birds are recorded from the island of Bornholm.

GÜNTHER, A. See *Rallus gularis*, var. *aldabrana* [*Rallidæ*].

GÜNTHER, A, & NEWTON, E. [Transit of Venus Expedition.] The Extinct Birds of Rodriguez. Phil. Tr. clxviii. pp. 423–437, pls. xli.–xliii.

The principal species noticed, with plates of their bones, are *Carine murivora* [*Strigidæ*], *Necropsar rodericanus* [*Sturnidæ*], allied to *Fregilupus* of Réunion, *Necropsittacus rodericanus* [*Psittacidæ*], *Aphanapteryx* and *Erythromachus* [*Rallidæ*], *Nycticorax megacephalus* [*Ardeidæ*].

GURNEY, J. H. Notes on a Catalogue of the *Accipitres* in the British Museum, by R. Bowdler Sharpe (1874). Ibis, 1879, pp. 71–84, 330–341, 464–470. [*Cf.* Zool. Rec. xii. p. 34, xiii. *Aves*, p. 13, xiv. *Aves*, p. 11, xv. *Aves*, p. 13.]

The discussion of the group *Milvinæ* and the genera of Milvine affinities is continued. For the more important, see *Rostrhamus*, *Machær*[*or*]*hamphus*, *Henicopernis* [*Falconidæ*].

——. See also *Micrastur*, *Morphnus*, *Buteo* (spp. nn.), *Archibuteo*, *Urubitinga* [*Falconidæ*]; and AYRES, T.

——, JUN. The Gannet City. Tr. Norw. Soc. ii. pp. 528–538.

An account of a visit to the colony of *Sula bassana* on the Bass Rock.

HAGELBERG, W. Zoologischer Hand-Atlas. B. Vögel. Berlin: 1879, 24 pls., Nos. 21–44.

A popular coloured picture-book, only noticed to prevent readers from being misled by its title.

HAMILTON, A. The District of Okarito, Westland. Tr. N. Z. Inst. xi. pp. 386–391.

An interesting notice of this district of the South Island, New Zealand, with a list of the birds found there.

HAMILTON, EDWARD. The Birds of London: Past and Present, Resident and Casual. Zool. 1879, pp. 273–291.

HARTING, J. E. See *Turdus torquatus* [*Turdidæ*], *Scolopax rusticula* [*Scolopacidæ*], *Upupa epops* [*Upupidæ*].

HARTLAUB, G. Ueber einige seltene Vögel der Bremener Sammlung. J. f. O. 1879, pp. 187–194.

Some rare birds in the Bremen Collection. *Coccycolius iris*, *Loxioides balleui*, and *Strix oustaleti* are described at length.

——. See also *Strix oustaleti*, sp. n. [*Strigidæ*], *Agapornis* [*Psittacidæ*], *Excalfatoria lepida*, sp. n. [*Perdicidæ*].

HASWELL, W. A. Notes on the Anatomy of Birds. I. The Brachial Plexus of Birds. P. Linn. Soc. N.S.W. iii. pp. 409–413. II. The Lumbar and Sacral Plexuses of Nerves. *Op. cit.* iv. pp. 303–306. III. The Myological Characters of the *Columbidæ*. Tom. cit. pp. 306–310.

HENSHAW H. W. See *Turdus pallasi* [*Turdidæ*], *Melospiza melodes* [*Fringillidæ*], *Sterna caspia* [*Laridæ*].

HESSE, F. Ueber die Tastkugeln des Entenschnabels. Arch. Anat. Entwickel. 1878, pp. 288–318, pl. i.

HODEK, E. See *Gypaetus* [*Falconidæ*].

HOMEYER, E. F. VON. Meine ornithologische Sammlung. J. f. O. 1879, pp. 171–187.

A review of the *Fringillidæ* in the author's collection. *Loxia atrata*, *Linaria brunnescens*, and *Linaria sibirica* are described as new; the last takes a MS. name of Severzow.

——. [See GOEBEL, H., and PALMEN, J. A.]

HUME, A. O. Gleanings from the Calcutta Market. Str. Feath. vii. [pt. 6, March, 1879], pp. 479–498.

Notes on the birds found there, the most interesting for geographical distribution being *Querquedula angustirostris* and *Q. falcata* [*Anatidæ*].

——. Influence of Rainfall on Distribution of Species. *Tom. cit.* p. 501, with Map from the Meteorological Department.

——. Remarks on Pennant's Indian Zoology. *Tom. cit.* p. 506. [*Cf.* letter from A. NEWTON, *op. cit.* viii. p. 414.]

——. Birds occurring in India, not described in "Jerdon" or hitherto in "Stray Feathers." *Tom. cit.* pp. 511–516. [*Cf.* Zool. Rec. xv. *Aves*, p. 14.]

——. Notes. *Tom. cit.* pp. 516–523. [Principally on vexed questions in nomenclature.]

——. A First Tentative List of the Birds of the Western half of the Malay Peninsula. *Op. cit.* viii. pp. 37–72. Second Notice, pp. 151–163.

In this valuable compendium the discovery of *Geocichla avensis* (Gray) [*Turdidæ*] in the Malay Peninsula is noticed, and *Ixidia webberi* [*Pycnonotidæ*] is described as new. The total number of species enumerated is 455.

——. Remarks on recently-described Species. *Tom. cit.* p. 72.

——. A Rough Tentative List of the Birds of India. *Tom. cit.* pp. 73–116; Index, pp. 117–150.

This important and laborious undertaking, containing list of authorities and an immense number of references, is corrected to 1st March, 1879.

——. Further Notes on the Birds of Tenasserim. *Tom. cit.* pp. 168–170.

——. Reply to Mr. Blanford's Criticisms [*suprà*] of the List of the Birds of India. *Tom. cit.* pp. 185–190.

——. Notes [principally on identification and specific distinctions]. *Tom. cit.* pp. 406–413.

——. See also *Anatidæ*, *Sturnus* and *Sturnia incognita*, sp. n. [*Sturnidæ*], *Bucanetes* [*Fringillidæ*], *Ægialitis* [*Charadriidæ*], *Ceriornis* [*Phasianidæ*], *Dromas ardeola* (nidification) [*Charadriidæ*], *Larus innominatus*, sp. n. [*Laridæ*].

Hume, O. A., & Marshall, C. H. T. The Game-Birds of India, China, and Ceylon. [Calcutta ? :] 1878 [the Preface being dated July, 1879] Vol. i., royal 8vo, pp. 279.

The letterpress is mainly by A. O. Hume, and describes the plumage, habits, &c., of those species of the *Otididæ*, *Pteroclidæ*, *Phasianidæ*, and *Perdicidæ*, found in the above region, 46 in number, with colour-printed illustrations of nearly all of them.

Hüsker, —. Beobachtungen über Sturmvögel und über die Ornis von Kerguelens-Land. Orn. Centralbl. 1879, pp. 160, 167, 177, & 181.

Notes on the sea-birds, observed during the voyage of the Prussian ship 'Gazelle' in 1874–76.

Hutchins, J. P. About the Birds of Central New York. Forest and Stream, xii. p. 25.

["Notes on birds observed about Oneida Lake;" see Bull. Nutt. Orn. Club, v. p. 44.]

Hutton, F. W. Notes on a Collection from the Auckland Islands and Campbell Island. Tr. N. Z. Inst. xi. (Birds) p. 338. [Only 5 species obtained.]

——. See also *Eudyptes filholi*, sp. n. [*Spheniscidæ*], *Phalacrocorax* [*Pelecanidæ*], *Rallus macquariensis*, sp. n. [*Rallidæ*], *Harpa novæzealandiæ* [*Falconidæ*].

Ingersoll, Ernest. Nests and Eggs of American Birds. Salem, Mass.: 1879, large 8vo. Pts. i., ii., iii., pp. 72, pls. i.–vi.

Commencing with the *Turdidæ*, the author gives a popular account of the nidification of these and other Passerine birds.

Irby, L. H. Notes on the Birds of the Straits of Gibraltar. Ibis, 1879, pp. 342–346.

Remarks supplementary to the author's previous contributions [*cf.* Zool. Rec. xii. p. 38], and chiefly based upon the observations of A. Stark. The principal novelties are the Asiatic Golden Plover, *Charadrius fulvus* [*Charadriidæ*], and *Anser erythropus* [*Anatidæ*].

Jones, J. Mathew. List of the Birds of Nova Scotia: Land Birds Forest and Stream, xii. pp. 65, 105, 205, & 245.

["An annotated list of 128 species;" see Bull. Nutt. Orn. Club, v. p. 44.]

Jones, G. E., & Shulze, Eliza J. Illustrations of the Nests and Eggs of the Birds of Ohio. Circleville, Ohio: 4to, pts. 1 & 2, July and October, 1879.

These instalments of a work in course of publication contain admirable coloured plates, with descriptive text, of the nests and eggs of *Icterus baltimore*, *Turdus mustelinus*, *Coccyzus erythrophthalmus*, *Cyanospiza cyanea*, *Agelæus phœniceus*, *Tyrannus carolinensis*.

Klunzinger, C. B. Zur Wirbelthierfauna im und am Rothen-Meer. Z. Ges. Erdk. xiii. [1878] ii. Vögel, pp. 75–91.

A catalogue, with remarks, of the species found on the Red Sea, principally in the neighbourhood of Koseir (about 26° N. lat.).

KOCH, R. Die Brutvögel des Münsterlandes. JB. zool. Sect. Westf. Ver. 1878–79, pp. 58–73. [Not seen by Recorder.]

KOLAZY, JOSEF. Das Wandern der Vögel. MT. orn. Ver. Wien, 1879, pp. 5–7, 13–16.

KUMLIEN, LUDWIG. Contributions to the Natural History of Arctic America, made in connection with the Howgate Polar Expedition, 1877–78. Bull. U. S. Nat. Mus., No. 15. Washington: 1879 [Birds] pp. 69–105.

The Expedition wintered in Cumberland Sound, and visited the previously-explored region about Lake Kennedy, in lat. 66° N., long. 73° W., the land or water to the W. being still unknown. Greenland, as far as Disco, was also visited, and 84 species of birds are here noticed. If correct, some of the statements are remarkable, such as that *Tringa subarquata* is not uncommon in North Greenland, eggs being procured at Christianshaab; and that *Stercorarius pomatorrhinus* nests in hundreds on inaccessible cliffs at Disco Island, and lays three eggs.

LAWRENCE, G. N. Catalogue of the Birds of Grenada, from a Collection made by Mr. Fred. A. Ober for the Smithsonian Institution, including others seen by him, but not obtained. P. U. S. Nat. Mus. i. pp. 265–278 [Feb. 13, 1879].

This collection consisted of 66 specimens belonging to 54 species, none of them undescribed.

——. Catalogue of the Birds collected in Martinique by Mr. Fred. A. Ober for the Smithsonian Institution. *Tom. cit.* pp. 349–360 [March 10, 1879].

Ninety-one specimens, belonging to 40 species, were obtained, *Myiarchus sclateri* [*Tyrannidæ*] being new.

——. Catalogue of a Collection of Birds obtained in Guadeloupe for the Smithsonian Institution by Mr. Fred. A. Ober. *Tom. cit.* pp. 449–462.

Forty-five species were collected in August and September. *Dendræca petechia*, var. *melanoptera* [*Mniotiltidæ*], is distinguished, this variety being identical with the bird found in Dominica; and *Quiscalus guadeloupensis* [*Icteridæ*] is described as new.

——. A General Catalogue of the Birds noted from the Islands of the Lesser Antilles visited by Mr. Fred. A. Ober; with a Table showing their distribution, and those found in the United States. *Tom. cit.* pp. 486–488.

LAYARD, E. L. Letters [on the *Sterninæ* (*Laridæ*) of New Caledonia, and on the habits of *Lorius chlorocercus* (*Psittacidæ*); Ibis, 1879, pp. 364–366. On D. G. Elliot's paper on the genus *Ptilopus* (*Columbidæ*); P. Z. S. 1879, p. 305].

——. See also *Pachycephala neglecta*, sp. n. [*Laniidæ*].

LAYARD, E. L., & L. C. Letters recording occurrence in New Caledonia of *Collocalia leucopygia*, *Sterna nereis*, *Falco melanogenys*, *Lamprotreron holsericea*, *Cyanorrhamphus saisseti*, and *Clytorrhynchus pachycephaloides*. Ibis, 1879, pp. 107–111.

LAYARD, E. L., & TRISTRAM, H. B. See *Turdus mareensis*, sp. n. [*Turdidæ*].

LEGGE, W. V. On two Races or Sub-species of Indian Birds inhabiting Ceylon. Ann. N. H. (5) iii. p. 168 [*Acridotheres melanosternus* (*Sturnidæ*), *Pyctorrhis nasalis* (*Timeliidæ*)], subspp. nn.

——. A History of the Birds of Ceylon. Part ii. *Passeres*, *Columbæ*. London: September, 1879, 4to.

The second instalment of this carefully executed work [*cf.* Zool. Rec. xv. *Aves*, p. 16] fully maintains the reputation of its predecessor. Four plates are given belonging to species in Part i. [*Accipitres*, *Picidæ*, *Cuculidæ*]: whilst for plates of those peculiar to Ceylon which are included in the present part, see *Corvidæ*, *Dicruridæ*, *Muscicapidæ*, *Turdidæ*, *Pycnonotidæ*, *Timeliidæ*, of which last family a new species of *Drymœca* is described.

LESLIE, A. The Arctic Voyages of Adolf Erik Nordenskiöld, 1858–1879. London: 1879, 8vo.

In this compiled abstract there are several notices of the birds observed, although nothing new is stated; and at p. 432 is a list of all the papers on ornithology relating to the above voyages.

LINDEN, E. Papageien-Kleider, nach den Leben beschrieben. Orn. Centralbl. 1879, pp. 84–86, 127–129.

Descriptions from living specimens of many species of Parrots.

LONGCHAMPS, M. E. DE SELYS. La Classification des Oiseaux depuis Linné. Bull. Ac. Belg. xlviii. pp. 729–813.

LOOMIS, LEVERETT M. A Partial List of the Birds of Chester County, South Carolina. Bull. Nutt. Orn. Club, iv. pp. 209–218.

One hundred and forty species are enumerated.

LOW, GEORGE. A Tour through the Islands of Orkney and Shetland, containing Hints relative to their Ancient, Modern, and Natural History collected in 1774. With an Introduction by JOSEPH ANDERSON. Kirkwall: 1879, 8vo, pp. 223.

The remarks on the birds are very interesting, although their essence has long since been anticipated by Pennant, and in the author's "Fauna Orcadensis."

LUBBOCK, R. Observations on the Fauna of Norfolk, and more particularly on the district of the Broads. New Edition by THOMAS SOUTHWELL. With a Memoir by HENRY STEVENSON, and Notes on Hawking in Norfolk by ALFRED NEWTON. Norwich and London: 1879, 8vo, pp. 239.

Prof. Newton's notes contain some interesting extracts from the Paston letters (1472), and from the Diary of Von Wedenheym in the reign of

James I., supplemented by an account of Hawking in Norfolk in the present century. For Birds, see pp. 18–175, where numerous foot-notes by T. Southwell show the alterations which have taken place during the last thirty years.

Lucas, Joseph. The Naturalist in Nidderdale. Zool. 1879 [Birds], pp. 403–417.

Lydekker, R. Notes on some Siwalik Birds. Rec. Geol. Surv. Ind. xii. pp. 52–57.

A preliminary notice of some fragmentary fossil bird-bones obtained by Mr. Theobald, and with reference to the bones previously collected by Dr. Falconer, upon which A. Milne-Edwards established two species. Some of these fossils are referred to a new species of *Dromæus* [*Casuariidæ*], and others to a new species of a new genus *Megaloscelornis* [*Ciconiidæ*].

——. Elementary Sketch of the Osteology of Birds, with 4 plates. Str. Feath. viii. pp. 1–36.

McChesney, C. E. Notes on the Birds of Fort Sisseton, Dakota Territory. Bull. U. S. Geol. Surv. v. pp. 71–103.

Field notes on the 155 species (the total number being 157) found on the little-known elevated plateau in Dakota known as the Coteau des Prairies.

MacLeod, Jules. Sur la Structure de la Glande de Harder du Canard domestique. Bull. Ac. Belg. xlvii. pp. 797–810, pl. i.

Marchand A. Note sur les Poussins des Oiseaux d'Europe. R. Z. (3) vi. pp. 309–312, pls. x.–xiii. [*Falconidæ, Scolopacidæ, Laridæ.*]

Marsh, O. C. The Vertebræ of Recent Birds. Am. J. Sci. (3) xvii. pp. 266–269. Abstract in Science News, i. pp. 164 & 165.

The author points out that the pre-sacral vertebræ of all existing species of birds, as well as of all those known from the Tertiary deposits, exhibit the saddle-shaped articulation of the centra, and that the origin of this formation is to be sought for in the Cretaceous birds, especially the widely divergent toothed birds *Ichthyornis* and *Hesperornis*. In the latter, a huge, wingless swimming-bird, the vertebræ correspond with the modern avian type; but in the former, a small bird capable of extended flight, the vertebræ are bi-concave, as in fishes, reptilians, and a few reptiles. In the third cervical vertebra of *Ichthyornis*, one form of vertebra is, as it were, detected in the act of modification, and the development of the modern style of ornithic vertebra from the fish-like bi-concave form is explained. Illustrating these and subsequent details by woodcuts, the author considers the classification and development of the various forms of vertebræ to be—(1) *Bi-concave vertebræ* (Fishes and Amphibians); (2) *Plane vertebræ* (Mammals); (3) *Cup-and-ball vertebræ* (Reptiles); (4) *Saddle vertebræ* (Birds), the highest type.

Marshall, G. F. L. See *Puchrasia biddulphi*, sp. n. [*Phasianidæ*].

MAYNARD, C. J. The Birds of Florida, with the Water and Game Birds of Eastern North America. [*Cf.* Zool. Rec. xv. *Aves*, p. 17.] Parts v.-viii. Newtonville, Mass. : 1879, 4to.

MEARNS, EDGAR A. Notes on some of the less hardy Winter Residents in the Hudson River Valley. Bull. Nutt. Orn. Club, iv. pp. 33–37.

——. A Partial List of the Birds of Fort Klamath, Oregon, collected by Lieut. Willis Wittich, U.S.A., with Annotations and Additions by the Collector. *Tom. cit.* pp. 161–166, 194–199.

The material for these interesting notes relating to 111 species, was furnished by Lieut. Wittich, during a residence of four years, and also by Dr. H. McElderry.

——. A List of the Birds of the Hudson Highlands [Southern New York], with annotations. Bull. Essex Inst. x. pp. 166–179, xi. pp. 43–52, 154–168.

The above three instalments, published down to October, 1879, comprise a portion of the *Passeres*.

MENSBIR, M. [Birds of the Government of Tula (232 species). Bull. Soc. Imp. Nat. Moscow, 1879, pp. 307–423. Original title in Russian.]

MENZIES, —. See *Nestor notabilis* [*Psittacidæ*].

MERRIAM, C. H. Remarks on some of the Birds of Lewis County, Northern New York. Bull. Nutt. Orn. Club, iv. pp. 1–7. [Continuation: *cf.* Zool. Rec. xv. *Aves*, p. 18.]

MEVES, W. Förteckning öfver de folgar som på den svenska expeditionen till Jenisei insamlades ellen observerades af Dr. Hjalmar Théel. Œfv. Ak. Förh. 1879, pp. 27–45.

Remarks on the 153 species recorded by Dr. Théel, as obtained or seen on the expedition to meet Nordenskjöld at the mouth of the Yenissei in 1876. Many are new to Siberia.

MEYER, A. B. Field-notes on the Birds of Celebes. Part I., *Psittaci*, *Rapaces*, and *Picariæ*. Ibis, 1879, pp. 43–70 ; Part II. pp. 125–147.

Observations on the species obtained and noticed in the author's diary during his visits to, and residence in, the Northern Peninsula, the Gulf of Tomini and Togian Islands, the Sangi Islands, and the South-West Peninsula of Celebes.

——. Index zu L. Reichenbach's ornithologischen Werken. Berlin: 1879, roy. 8vo, pp. 150. [For *Werken*, read *Abbildungen*: see author's letter, Ibis, 1880, p. 374.]

This useful volume contains—(1) an alphabetical index to the genera in the Naturl. Syst. der Vögel ; (2) a list of the species figured in the plates to the 'Handbuch der speciellen Ornithologie'; (3) a list of the species figured in the 'Neu-endeckte Taubenvögel'; (4) a list of the species figured in the 'Sing-vögel'; (5) an alphabetical index to the species in the above-named works.

——. Abbildung von Vogel-Skeleten. Dresden: 1879, 4to. Part I.

The first issue of this work contains 8 pages of letterpress and 10

plates. [*Psittacidæ*, *Bucerotidæ*, *Meropidæ*, *Paradiseidæ*, *Columbidæ*, *Gallinæ*.]

MILNE-EDWARDS, A., & GRANDIDIER, A. Histoire Physique Naturelle et Politique de Madagascar. Vol. xii. Histoire Naturelle des Oiseaux. Tom. i. Texte, 1re partie; Vol. xiv. Tom. iii. Atlas ii. 1re partie, 5e fascicule. Paris: 1879, royal 4to. [*Cf.* Zool. Rec. xv. *Aves*, p. 18, & xiii. *Aves*, p. 13.]

The first volume of text and third volume of atlas were issued in 1879. The former treats of the *Psittacidæ*, *Falconidæ*, *Strigidæ*, and *Cuculidæ*, with full synonymy, and extensive anatomical details. The remarks on the genus *Coua* [*Cuculidæ*] peculiar to Madagascar are of especial interest. For species figured in the Atlas, see *Nectariniidæ*, *Pittidæ*, *Sylviidæ*, *Dicæidæ*, *Sittidæ*, *Upupidæ*, *Sturnidæ*, *Pycnonotidæ*.

MITCHELL, F. S. Natural History Notes in Holland. Zool. 1879, pp. 9–15.

An excellent paper, describing amongst other matter, the nesting of Savi's Warbler.

MONTES DE OCA, RAFAEL. Ensayo ornitologico de la familia *Trochilidæ*, ó sea de los Colibries ó Chupamirtos de Mexico. Nat. Mex., iii. pp. 15–31, 59–66, 99–106, 159–167, 203–211, 299–304, pls. i. & iii.

Copious details respecting the 48 species of Mexican humming-birds, from the pen of the veteran ornithologist whose assistance is acknowledged by Gould in his monograph of the *Trochilidæ*, from which work the few illustrations of the present are adapted.

MOORE, JOHN. Columbarium. Reprinted from the original edition of 1735, by W. B. TEGETMEIER. London: 1879, 8vo, pp. 60.

MOORE, G. P. British Birds systematically arranged in Five Tables, showing the Comparative Distribution and Periodical Migrations, and giving an outline of the Geographical Range of 376 species. London: 1879, 4to.

MORENO, F. P. Viage á la Patagonia Austral en 1876–77. Tom. i. Buenos Aires: 1879, 4to, pp. 460.

The author's explorations extended from the Atlantic to the Cordillera. At p. 71 *et seq.* he enumerates and remarks upon the birds found in the neighbourhood of the river Chubut, and there are also numerous allusions to the species observed in the course of the journey.

MOSELEY, H. N. Notes by a Naturalist on the 'Challenger.' London: 1879, 8vo, pp. 620.

Numerous interesting remarks, and in many cases detailed observations on the habits of the birds observed, are to be found in this volume. Perhaps the most important, as relating to species of whose economy but little is known, are the notes on the *Laridæ*, *Procellariidæ*, and *Spheniscidæ*.

MÜLLER, A. Zur Ornithologie der Insel Cypern. J. f. O. 1879, pp. 385–393.

The author was collecting for W. Schlüter, of Halle, and this is a list of 117 species observed in Cyprus, with remarks on the number of eggs each clutch, &c. The most interesting remarks are those on *Corvus cornix*, *Saxicola leucomela*, and *Cuculus glandarius*, of which last 5 eggs were found in a nest of *Pica caudata*.

[Müller, A.] See also *Ixos xanthopygius* [*Pycnonotidæ*].

Mulsant, É., & Verreaux, É. Histoire Naturelle des Oiseaux-Mouches ou Colibris. [A supplement to this work on the *Trochilidæ*, concluded in 1878 (see Zool. Rec. xv. *Aves*, p. 19) is published in 1879, with 54 plates of 56 species.]

Musschenbroek, S. C. J. W. van. Aanteekening omtrent de Avifauna van Terschelling. Tijdschr. Nederl. Dierk. Ver. iv. pp. 169–173.

A list of the 53 species observed at the Zoological Station of Terschelling between August 16th–20th, 1879.

Nathusius, W. v. Betrachtungen über die Selectionstheorie vom Standpunkt der Oologie. J. f. O. 1879, pp. 225–261.

An elaborate review of, and reply to, Dr. Kutter's paper on the same subject [see Zool. Rec. xv. *Aves*, p. 15].

Nehring, A. See *Lagopus albus* [*Tetraonidæ*].

Nehrkorn, A. Mittheilungen über Nester und Eier des Museums Godeffroy zu Hamburg. J. f. O. 1879, pp. 393–410.

Descriptions and measurements of the eggs of many Polynesian and Australasian species.

——. See also *Rhynchocyclus* [*Tyrannidæ*].

Newton, A. Preface to the new Edition of Tunstall's 'Ornithologia Britannica,' 1773, a reprint, reduced in size, by photo-lithography, published by the new Willoughby Society, 1879.

——. On the Migration of Birds. Nature, xix. p. 433. See Weissmann, A.

——. On some moot Points in Ornithological Nomenclature. Ann. N. H. (5) iv. pp. 158–163.

Reply to some remarks of P. L. Sclater [*infrà*, p. 28], and H. Seebohm [*infrà*, p. 30], in "Ibis," 1879.

——. More moot Points in Ornithological Nomenclature. *Tom. cit.* pp. 419–422.

——. See also Lubbock, R.; *Alectorœnas nitidissima* [*Columbidæ*], *Sylvia nisoria* [*Sylviidæ*]; and articles 'Falcon,' 'Fieldfare,' 'Finch,' 'Flamingo,' 'Flycatcher,' 'Fowl,' 'Frigate-bird,' 'Fulmar,' 'Gadwall,' 'Gannet,' 'Garefowl,' 'Garganey,' 'Goatsucker,' 'Godwit,' 'Goldeneye,' 'Goldfinch,' 'Goose,' 'Goshawk,' in Encyclopædia Britannica, 9th ed. vols. ix. & x. 1879.

Newton, E. See Günther, A.

Newton, Edward, & Clark, J. W. [Transit of Venus Expedition. On the Osteology of the Solitaire (*Pezophaps solitaria*, Gmel.). Phil. Trans. clxviii. pp. 438–451, pls. xliv.–l.

A valuable supplement to Alfred & Edward Newton's Memoir of this species. [*Cf.* Zool. Rec. vi. p. 91.] [*Dididæ*.]

Nicholson, F. On a Collection of Birds made by the late Mr. E. C. Buxton in Western Java. Ibis, 1879, pp. 164–171.

Thirty-nine species were obtained in the coast opposite Lampong, and one is distinguished by the name of *Zosterops buxtoni*. [*Dicæidæ*.]

Oates, E. W. Notes on the Nidification of some Burmese Birds. No. iii. Str. Feath. viii. pp. 164–168. [*Cf.* Zool. Rec. xiv. *Aves*, p. 16; xv. *Aves*, p. 20.]

Oesterreich, Rudolph von, Homeyer, E. F., & Brehm, A. E. Zwölf Frühlingstage an den mittleren Donau. J. f. O. 1879, pp. 1–83.

——. Ornithologische Beobachtungen in den Auwäldern der Donau bei Wien. *Tom. cit.* pp. 97–129.

These narratives of the expeditions and researches of the Crown Prince Rudolph of Austria, communicate those scientific results which would otherwise be sealed to the public, as the Crown Prince's "Funfzehn Tage auf der Donau" was never published, but reserved for private circulation. Extracts from the latter work are also published by A. von Pelzeln.

Osborne, S. D. On the Coloration of Eggs. Bull. Nutt. Orn. Club, iv. pp. 23–25.

On experiments tending to show that in eggs selected from all the orders the variations in colour are mainly due to the thickness of the deposits of one and the same pigment, and the amount of calcareous matter overlying it.

Ottley, W. See *Bucorvus abyssinicus* [*Bucerotidæ*].

Oustalet, E. Catalogue méthodique des Oiseaux recueillis par M. Marche dans son voyage sur l'Ogôoué, avec description d'espèces nouvelles. N. Arch. Mus. (2) ii. pp. 53–148, pls. v. & vi.

The species obtained in the Gaboon by M. Marche and his companions amounted to 107, to which are added 41 species already existing in the Paris Museum, which have certainly come from that district, and 4 of which the origin is less sure; making a total of 152. Three species are described as new: *Dendropicus sharpii* [*Picidæ*], *Dicrurus sharpii* [*Dicruridæ*], *Andropadus marchii* [*Pycnonotidæ*], and 3 species [*Pycnonotidæ*, *Laniidæ*, *Anatidæ*] are figured.

——. Note sur une petite collection d'oiseaux provenant des îles Loss (Afrique occidentale). *Tom. cit.* pp. 149–156, pl. vii.

From the islands opposite Sierra Leone, 15 species are enumerated, amongst them the recently described *Coccycolius iris* [*Sturnidæ*], which is now figured.

[Oustalet, E.] Notes d'Ornithologie. Bull. Soc. Philom. (7) iii. pp. 212–220.

Remarks on some birds of the Indian, and the New Caledonian regions. See *Bubo* [*Strigidæ*], *Picus harmandi*, sp. n. [*Picidæ*].

——. See also *Eudyptula serresiana*, sp. n. [*Spheniscidæ*].

Palmén, J. A. Zur Discussion über die Zugstrassen. J. f. O. 1879, pp. 195–206.

Supplementary and revised observations relative to a previous paper on the routes followed by birds on migration, and E. v. Homeyer's review and subsequent remarks; *cf.* Palmén, Zool. Rec. xiii. *Aves*, p. 21, and Homeyer, p. 14, and xv *Aves*, p. 13.

Paolucci, L. Sulle voce degli Uccelli in ordine alla fisiologia e alla biologia. Atti Soc. Ital. xx. pp. 161–247.

Parker, W. K. On the Evolution of the *Vertebrata*. [Abstract of the Hunterian Lectures.] Nature, xx. pp. 30, 61, 81.

For remarks on Birds, see pp. 63, 81 & 82.

Pelzeln, A. von. Letter [on the recent rediscovery of *Notornis mantelli* in new Zealand, and on 2 Cassowaries (apparently *C. beccarii*) in the Menagerie of Schönbrunn]. Ibis, 1879, p. 376. [*Rallidæ*, *Casuariidæ*.]

——. "Fünfzehn Tage auf der Donau." MT. Orn. Ver. Wien, 1879, pp. 1–5, 9–13, 25–29, 40–43.

Extracts from the work printed for private circulation, on the expedition of the Crown Prince of Austria. See Oesterreich, Rudolph von.

——. See also *Morphnus* [*Falconidæ*].

Penrose, F. G. Notes on a Collection of Birds' Skins and Eggs made by Mr. D. Gill, F.R.A.S., on Ascension Island. Ibis, 1879, pp. 272–282.

The species hitherto found on this volcanic cinder-heap are 10 in number, all sea-birds, which resort there for breeding purposes, and the localities where they deposit their eggs are shown in the map which accompanies this very interesting paper.

Philippi, R. A. See *Tænioptera australis*, sp. n. [*Tyrannidæ*].

Platte, A. Aeronautische Betrachtungen. Wien: 1879.

An interesting pamphlet on the flight of Birds.

Radakoff, W. N. Ornithologische Bemerkungen über Bessarabien, Moldau, Walachei, Bulgarien, und Ost-Rumelien. Bull. Mosc. liii. pp. 150–178.

Brief notes on the 203 species of birds observed during the Russian campaign of 1876.

Ramsay, E. P. Contributions to the Zoology of New Guinea. Part. ii. *Aves*, P. Linn. Soc. N. S. W. iii. pp. 245–305. Part v. *Aves*, Remarks on recent collections made by Mr. Andrew Goldie in the south-east portion of New Guinea and the Louisiades; *op. cit.* iv. pp. 88–102.

This second expedition to the south-eastern portion of the island has

produced the 204 species enumerated, 11 of which are described as new, but the validity of several of them is challenged by T. Salvadori [*infra*, p. 26], See *Ninox* (2) [*Strigidæ*], *Aprosmictus* [*Psittacidæ*], *Tanysiptera* [*Alcedinidæ*], *Rhipidura* (2), *Eopsaltria*, *Micræca* [*Muscicapidæ*], *Eupetes* [*Eupetidæ*], *Zosterops* [*Dicæidæ*], *Parra* [*Parridæ*]. In the latter paper, the total number of species is raised to 220 and in a list showing the geographical distribution they increase to 224.

[Ramsay, E. P.] Notes on a Small Collection of Birds from the New Hebrides, with a description of a new species of *Merula*. Op. cit. iii. pp. 336–339.

Nineteen species are enumerated, *Merula albifrons* [*Turdidæ*] being described as new.

——. Notes on the Zoology of the Solomon Islands. Part i. *Aves*. Op. cit. iv. 65–84.

Three hundred and fifty specimens, ascribed to 45 species, were collected by Mr. J. Cockerell on the visit of the schooner 'Ariel' to three trading stations in the above group. The species described as new are *Graucalus pusillus* [*Campophagidæ*], *Myiagra ferro-cyanea* and *M. pallida*, *Monarcha rufo-castanea* and *M. brodiei*, *Sauloprocta cockerelli*, *Rhipidura rubro-frontata* [*Muscicapidæ*], *Cinnyris* (?) *dubia* [*Nectariniidæ*]. There is a kind of abstract of the results of this expedition, without any author's name or initials, in Nature, xx. p. 125, but there are several important discrepancies between the two accounts, in the scientific names both of new and other species.

——. Notes on some Recently Described Birds from the Solomon Islands, with Remarks on some Australian Birds mentioned in Mr. R. B. Sharpe's Cat. of Birds, vol. iv. *Tom. cit.* pp. 313–319.

Of the newly named species in the preceding paper, *Monarcha rufo-castanea* apparently = *M. castaneiventris*, Verr. ; *Grauculus pusillus* is to stand as *G. solomonensis* ; a *Macropygia* [*Columbidæ*] is described as new ; and the name of *Rhipidura sharpii* is proposed for the Tasmanian *R. saturata*, which has however already been altered by R. B. Sharpe to *R. diemenensis* [*Muscicapidæ*].

——. See also *Astur sharpii*, sp. n. [*Falconidæ*], *Rhipidura cervina*, sp. n. [*Muscicapidæ*], *Puffinus* [*Procellariidæ*].

Ramsay, R. G. Wardlaw. Ornithological Notes from Afghanistan. No. i. Ibis, 1879, pp. 444–449.

Field notes on the birds observed in April and May in the district of the Peiwar Kotal.

——. See also *Oriolus consobrinus*, sp. n. [*Oriolidæ*], *Pericrocotus flammeus* [*Campophagidæ*].

Rathbun, F. R. A Revised List of the Birds of Central New York. Auburn, N. Y.: 1879.

Two hundred and thirty-six species are enumerated.

Reichenow, A. Neue Vögel aus Ostafrika. Orn. Centralbl. 1879, pp. 107, 114, 138, 155.

From the novelties sent by Dr. Fischer from Zanzibar, two new genera and species, *Cosmopsarus*, *Speculipastor* [*Sturnidæ*] and one new species *Trochocercus* [*Muscicapidæ*] are selected for description in the first paper; 9 new species, *Thamnobia*, *Sylviella*, *Hapalus* [*Sylviidæ*], *Vidua*, *Uræginthus* [*Ploceidæ*], *Dryoscopus* [*Laniidæ*], *Cypselus* [*Cypselidæ*], *Barbatula* [*Capitonidæ*], *Colius* [*Coliidæ*] in the second; in the third, in anticipation of the J. f. O., 5 new species:—*Pitylia* [*Ploceidæ*], *Cuculus* [*Cuculidæ*], *Criniger* (2) [*Pycnonotidæ*], *Aedon* [*Sylviidæ*] are described; and in the last 1 new genus and species, *Spilocorydon* [*Alaudidæ*], and 1 new species, *Turdirostris* [*Timeliidæ*], are added.

—— & Schalow, H. Compendium der neu beschriebenen Gattungen und Arten. i. ii. J. f. O. 1879, pp. 308-329, 420-437.

The first and second instalments of a reproduction of the descriptions of recently-named genera and species.

Reinhardt, J. See *Mitua salvini*, sp. n. [*Cracidæ*], *Œdemia*, *Somateria* [*Anatidæ*].

Ridgway, R. Descriptions of several New Species and Geographical Races of Birds contained in the Collection of the United States National Museum. Pr. U. S. Nat. Mus. i. pp. 247–252 [Dec. 18th, 1878].

The forms and species named are *Rhodinocichla rosea*, β, *schistacea* [*Turdidæ*], *Embernagra rufivirgata*, β, *crassirostris*, *E.* γ, *verticalis*, *Loxigilla violacea*, β, *bahamensis* [*Fringillidæ*], *Anas aberti*, sp. n (♀, *A. wyvilliana*, Scl., being also described) [*Anatidæ*].

——. Description of Two New Species of Birds from Costa Rica, and Notes on other rare species from that country. *Tom. cit.* pp 252–255.

The new species are *Thryophilus zeledoni* [*Troglodytidæ*] and *Pseudocolaptes lawrencii* [*Dendrocolaptidæ*]; *Carpodectes nitidus* and *Junco volcani* are also noticed.

——. Descriptions of New Species and Races of American Birds, including a Synopsis of the Genus *Tyrannus*, Cuvier. *Tom. cit.* pp. 466–486 [May 22nd, 1879].

In the first portion of this paper, 13 species are enumerated and described under the genus *Tyrannus*, 1 being new; for those in the second portion, see *Tyrannidæ*, *Cœrebidæ*, *Paridæ*.

—. On the use of Trinomials in Zoological Nomenclature. Bull. Nutt. Orn. Club, iv. pp. 129–133. [A German translation has appeared in J. f. O. 1879, p. 410.]

——. In an Appendix to Mary Dartt's "On the Plains and among the Peaks; or, How Mrs. Maxwell made her Natural History Collection." Philadelphia: 1879.

The above writer enumerates 234 species and varieties obtained in Colorado, and describes a new variety of Owl, *Scops asio* var. *E. max-*

welliæ [See Bull. Nutt. Orn. Club, iv. p. 113; not seen by Recorder, who is therefore unable to give the reference for this form under *Strigidæ*].

[RIDGWAY, R.] See also *Peucæa illinoensis*, sp. n. [*Fringillidæ*].

ROBERTS, T. S. Notes on some Minnesota Birds. Bull. Nutt. Orn. Club, iv. pp. 152-155.

Remarks on 9 species and varieties, principally observed in the neighbourhood of Minneapolis.

ROHWEDER, J. Ornithologischen Notizen über Schleswig-Holstein. Schr. Ver. Schles. Holst. iii. pp. 136–141.

Notes on 10 species. [Not seen by Recorder; see Zool. Anz. 1879, p. 73.]

ROLLAND, EUGÈNE. Faune populaire de la France. Vol. II. Oiseaux. Paris: 1879, 8vo, pp. 421.

An interesting collection of provincial names, common sayings, proverbs, superstitions, &c., relating to birds.

RUSS, CARL. Die fremländischen Stubenvögel, ihre Naturgeschichte, Pflege und Zucht. Hanover: 1879, 8vo. [*Cf.* Zool. Rec. xv. *Aves*, p. 24].

Five more parts of this illustrated work on cage-birds were published in 1879.

SALVADORI, T. Letter relating to remarks on his papers by the Editors of 'Ibis' in 1878. Ibis, 1879, pp. 104–106.

——. On *Melaniparus semilarvatus*. Tom. cit. pp. 300–303, pl. ix.

A defence of the validity of this species against A. O. Hume's criticism, and a review of the genus *Melaniparus* [*Paridæ*].

——. Remarks on the Second Part of Mr. Ramsay's "Contributions to the Zoology of New Guinea." *Tom. cit.* pp. 317-327.

E. P. Ramsay's report [*suprà*, p. 26] is minutely criticized, and the validity of several of his new species is questioned, whilst on others important observations are made.

——. Letter [contradicting a statement made by the reviewer in the 'Ibis' of his paper on *Globicera*, and pointing out anew the geographical distribution of the 7 species of this section of the genus *Carpophaga* (*Columbidæ*)].

——. A Few Remarks on Mr. Elliot's Paper "On the Fruit Pigeons of the Genus *Ptilopus*." P. Z. S. 1879, pp. 61–68.

A criticism on the Moluccan and Papuan species enumerated in the above paper. [*Cf.* Zool. Rec. xv. *Aves*, p. 9.] [*Columbidæ*.]

——. Di alcune Specie del Genere *Porphyrio*, Briss. Atti Acc. Tor. xiv. pp. 1165–1170.

A review of D. G. Elliot's paper on this genus [*cf.* Zool. Rec. xv. *Aves*, p. 9], with description of *P. ellioti*, considered to be new [*Rallidæ*].

[Salvadori, T.] Ornitologia della Papuasia e delle Molucche. Prefazione. *Tom. cit.* pp. 1171–1177.

The preface and argument of the above work, which is to be published in Mem. Acc. Tor.

——. Catalogo di una collezione di uccelli fatta nella parte occidentale di Sumatra dal Prof. Odoardo Beccari. Ann. Mus. Genov. xiv. pp. 169–253.

This collection, principally from the volcanic cone of Mount Singalan, contains 506 specimens belonging to 179 species, of which the following 24 are described as new:—*Chrysophlegma mystacalis* [*Picidæ*], *Caprimulgus pulchellus* [*Caprimulgidæ*], *Niltava sumatrana*, *Stoparola rufricrissa*, *Rhipidura atrata* [*Muscicapidæ*], *Pericrocotus montanus*, *Graucalus melanocephalus* [*Campophagidæ*], *Hemipus intermedius*, *Hyloterpe brunneicauda* [*Laniidæ*], *Zosterops atricapilla* [*Dicæidæ*], *Stachyris bocagii*, *Turdinus rufipectus*, *Rimator albo-striatus*, *Brachypteryx saturata*, *B. flaviventris* [*Timeliidæ*], *My*[*i*]*ophon*[*e*]*us dicror*[*r*]*hynchus*, *Arrenga melanura*, *Cochoa beccarii* [*Turdidæ*], *Liothrix laurinæ*, *Heterophasia simillima*, *Pteruthius cameranoi* [*Paridæ*], *Prinia hypoxantha* [*Sylviidæ*], *Acomus inornatus* [*Phasianidæ*], *Peloperdix rubrirostris* [*Perdicidæ*]. Attention is called to the representatives in this series of Indo-Chinese genera, which are absent from the Lampong collection described by Lord Tweeddale [*cf.* Zool. Rec. xiv. *Aves*, p. 26].

——. Prodromus Ornithologiæ Papuasiæ et Moluccarum. VII. Passeres (*Hirundinidæ–Muscicapidæ*). Tom. cit. pp. 490–508. [*Cf.* Zool. Rec. xv. *Aves*, p. 25.]

Of the former, 3 well-known species are enumerated, and of the latter, 106 species, to which is appended a list of the 6 recently described by E. P. Ramsay [*cf. suprà*, p. 24].

——. Catalogo degli uccelli delle isole Kei. *Tom. cit.* pp. 628–670. [*Cf.* Zool. Rec. xv. *Aves*, p. 25.]

The avifauna of these islands, consisting at present of the 82 species enumerated, is analysed, and shown to be more Papuan than Moluccan.

——. See also *Acomus inornatus*, sp. n. [*Phasianidæ*], *Gallinula*, *Porzana* [*Rallidæ*], *Urospizias pallidiceps*, sp. n. [*Falconidæ*], and D'Albertis, L. M.

Salvin, Osbert. On some Birds transmitted from the Samoan Islands by the Rev. T. Powell. P. Z. S. 1879, pp. 128–131.

Of this small collection of only 5 species from Tutuila and Manoa, the two easternmost islands of the Samoan group, 2, viz., *Pinarolestes powelli* [*Laniidæ*] and *Fregatta mœstissima* [*Procellariidæ*], appear to be new.

——, & Godman, F. D. On a Collection of Birds from the Sierra Nevada of Santa Marta, Colombia. Ibis, 1879, pp. 196–206.

This first consignment from Mr. F. A. A. Simons contains about 50 species from this little-known region. The collection is largely composed of widely-ranging savana species, with a few forest and highland forms. A species of *Campylopterus* [*Trochilidæ*] is described as new.

[Salvin, Osbert, & Godman, F. D.] Biologia Centrali-Americana; or, Contributions to the Fauna and Flora of Mexico and Central America. London: 1879, 4to. Zoology, *Aves*, pt. i. pp. 1–32, pls. i.–iii.; pt. ii. pp. 33–56, pl. iv.

These instalments of this fine work, with plates by Keulemans, comprise the *Turdidæ*, *Cinclidæ*, *Sylviidæ*, and a portion of the *Paridæ*; the species figured belonging to the *Turdidæ*, one species of which, *Catharus alticola*, is described as new.

——. See also Sclater, P. L.

Saunders, Howard. [The Transit of Venus Expedition.] The Collections from Kerguelen Island. Phil. Tr. clxviii., Eggs of Birds, pp. 163–165.

The eggs of 17 species (1 *Chionis*, 1 *Anas*, 3 *Laridæ*, 8 *Procellariidæ*, 1 *Phalacrocorax*, 3 *Spheniscidæ*) are here described.

Schalow, Herman. Ueber die Fortschritte auf dem Gebiete der Ornithologie vom Jahre 1875 bis zur Gegenwart. J. f. O. 1879, pp. 131–169.

An important essay on the advance made in ornithological exploration and knowledge during the past five years, with a useful supplementary catalogue of the works and papers bearing on the subject.

Schiavuzzi, —. Elenco degli Uccelli viventi nell' Istria ed in éspecialitá nell' agro Piranese. Boll. Soc. Adr. iv. p. 53.

Schlegel, H. See *Nisus rufitorques* and *N. poliocephalus* [*Falconidæ*], *Strix inexpectata*, sp. n., and *S. tenebricosa arfaki*, subsp. n. [*Strigidæ*], *Cuculus audeberti*, sp. n. [*Cuculidæ*], *Treron teysmanni*, sp. n. [*Columbidæ*], *Artamia bernieri* [*Artamidæ*], *Ardea lansbergii*, sp. n. [*Ardeidæ*], *Hypherpes** *corallirostris* [*Sittidæ*], *Talegallus pyrrhopygius*, sp. n. [*Megapodiidæ*], *Gallinula franki*, sp. n. [*Rallidæ*].

Schmeltz, J. D. E. Ueber die Thierwelt der Neu-Hebriden. Verh. Ver. Hamb. 1877 [July 15, 1879], pp. 71–91 (*Aves*, pp. 75–81).

On the species collected by M. Eckardt, with a list of the literature relating to the above islands.

——. [Review of D. G. Elliot's paper (*cf.* Zool. Rec. xv. *Aves*, p. 54) on the genus *Ptilopus* (*Columbidæ*), with especial reference to the species in the Museum Godeffroy.] *L. c.* pp. 177–180.

Sclater, P. L. On Recent Additions to our Knowledge of the Avifauna of the Sandwich Islands. Ibis, 1879, pp. 89–92, pl. ii.

About 44 species occur in, and 23 are peculiar to, the Hawaiian group. *Loxioides bailleui* [*Fringillidæ*] is discussed and figured. [This name is sometimes mis-spelt *bailleni*, but it was conferred in honour of M. Bailleu, the sender.]

——. Remarks on the Nomenclature of the British Owls, and on the arrangement of the Order *Striges*. Ibis, 1879, pp. 346–352. [*Cf.* Newton, A., *suprà*, p. 21.]

* Newton, 1863; Chaudoir, *Insecta*, 1838.

[Sclater, P. L.] On the Breeding of the Argus Pheasant and other *Phasianidæ* in the Society's Gardens. P. Z. S. 1879, pp. 114–118, pls. vii. & viii. [*Phasianidæ*.]

——. Remarks on some Parrots living in the Society's Gardens. *Tom. cit.* pp. 299–301, pl. xxviii.

Six species are noticed, and the very rare *Caica xanthomera* is figured [*Psittacidæ*].

——. On a Fourth Collection of Birds made by the Rev. G. Brown on Duke of York Island and its vicinity. *Tom. cit.* pp. 446–451, pls. xxxvi. & xxxvii.

Twenty species are added to those previously obtained, and *Graucalus sublineatus* (fig.) [*Campophagidæ*]. *Myzomela cineracea* (fig.) [*Meliphagidæ*], *Donacicola spectabilis* (fig.), *Munia forbesi* (fig.) [*Ploceidæ*], are described as new.

——. Exhibition of and Remarks upon 9 species of Birds forwarded by Dr. A. Döring, of Cordova, Argentine States. *Tom. cit.* pp. 460 & 461.

——. [Exhibition of 14 species of Birds obtained at the Island of Montserrat, all of which have, however, been found on the neighbouring islands of Barbuda, Antigua, and Guadalupe.] *Tom. cit.* p. 764.

——. List of the Vertebrated Animals now or lately living in the Gardens of the Zoological Society of London. 7th edn. London: 1879. *Aves*, pp. 179–475.

——. A Monograph of the Jacamars and Puff-Birds, or Families *Galbulidæ* and *Bucconidæ*. Part I. London: October, 1879, 4to.

Nine species are noticed, with plates by Keulemans [*Galbulidæ*].

——. See also *Mitua* [*Cracidæ*]. *Xanthura* [*Corvidæ*], *Ciconia* [*Ciconiidæ*], *Porphyrio* [*Rallidæ*], *Phainopepla* [*Ampelidæ*], *Euchætes* [*Tanagridæ*], *Thaumasius* [*Trochilidæ*], *Carpophaga* [*Columbidæ*], *Nymphicus*, *Ara* [*Psittacidæ*].

——, & Salvin, O. On the Birds collected by the late Mr. T. K. Salmon in the State of Antioquia, United States of Colombia. P. Z. S. 1879, pp. 486–450, pls. xli.–xliii.

Details, with a map, are given of the above collector's ground, on which, in the course of more than five years, he obtained about 3,500 specimens referable to the 468 species here enumerated. *Cyphorrhinus dichrous* (fig.) [*Troglodytidæ*], *Buarremon elæoprorus* [*Tanagridæ*], *Automolus ignobilis* [*Dendrocolaptidæ*], *Grallaria rufo cinerea* [*Formicariidæ*], *Brachygalba salmoni* [*Galbulidæ*], are described as new, and two plates of eggs are given.

——. On the Birds collected in Bolivia by Mr. C. Buckley. *Tom. cit.* pp. 588–645.

A complete list of the 501 species obtained on two expeditions, and most of the novelties of which have already been noticed [*cf.* Zool. Rec.

xiii. *Aves*, p. 28], but *Synallaxis rufipennis* [*Dendrocolaptidæ*] and *Leptoptila megalura* [*Columbidæ*] are here described as new.

[Sclater, P. L., & Salvin, O.] Description of some new Tanagers of the Genus *Buarremon*. Ibis, 1879, pp. 425–427, pl. x. [*Tanagridæ*.]

Scott, W. E. D. Late Fall and Winter Notes on some Birds observed in the vicinity of Princeton, N. J., 1878–79. Bull Nutt. Orn. Club, iv. pp. 81–85.

——. Notes on Birds observed at Twin Lakes, Lake County, Colorado. *Tom. cit.* pp. 90–96.

Sixty species are enumerated from this portion of the valley of the Arkansas river.

——. Notes on Birds observed during the Spring Migration in Western Missouri. *Tom. cit.* pp. 139–147.

Between March 27th and June 15th, 1874, 148 species were noted in the neighbourhood of Warrensburg, a district in which the flora and fauna are Carolinan in their main features, although the alternations of heat and cold are somewhat severe.

——. Notes on Birds observed on Long Beach, New Jersey. *Tom. cit.* pp. 222–228.

Seventy-four species are enumerated, with remarks on the migrants and breeders.

Scully, J. A Contribution to the Ornithology of Nepal. Str. Feath. viii. pp. 204–368.

The most important communication since the time of B. Hodgson on the birds of this politically-closed country. 243 species are recorded; with valuable notes on their habits, distribution, &c.; and two species, *Picus incognitus* [*Picidæ*] and *Siphia rufigularis* [*Muscicapidæ*], are described as new.

Seebohm, H. Contributions to the Ornithology of Siberia. Ibis, 1879, pp. 1–18, 147–163.

This continuation [*cf.* Zool. Rec. xv. *Aves*, p. 28] of the author's interesting papers reaches to the end of the *Laridæ*. Amongst the most important are the remarks on the *Turdidæ*, *Sylviidæ* (including the description of the first authentic eggs of *Phylloscopus superciliosus*), *Charadrius fulvus*, and *Bernicla ruficollis*.

——. Remarks on Messrs. Blakiston & Pryer's Catalogue of the Birds of Japan. [*Cf.* Zool. Rec. xv. *Aves*, p. 3.] *Tom. cit.* pp. 18–43, pl. i.

Two collections, consisting of 38 skins from Hakodate, with 12 added from Yokohama, and 64 skins from 2000 feet up the volcanic mountain of Fusiyama, are here noticed, and some useful identifications are given, with many corrections of synonymy. *Emberiza yessoensis* and *E. passerina* are figured [*Emberizidæ*].

——. Remarks on the Genus *Sylvia*, and on the Synonymy of the Species. *Tom. cit* pp. 308–317.

The distinctive characteristics of the *Turdidæ* and the *Sylviidæ* are

pointed out, and the synonymy of the species comprised in the genus *Sylvia* is discussed, and in some cases altered [*Sylviidæ*].

[Seebohm, H.] Remarks on Certain Points in Ornithological Nomenclature. *Tom. cit.* pp. 428–437.

——. [Exhibition of 13 species of Birds obtained on the Attreck river, the frontier between Russia and Persia.] P. Z. S. 1879, p. 764.

——. See also *Turdus dissimilis* and *T. hortulorum* [*Turdidæ*], and Ayres, T.

Sennett, G. B. Further Notes on the Ornithology of the Lower Rio Grande of Texas, from Observations made during the Spring of 1878. Edited, with Annotations, by Dr. Elliott Coues. [*Cf.* Zool. Rec. xv. *Aves*, p. 29.] Bull. U. S. Geol. Surv. v. pp. 371–440.

Copious notes on 166 species, many of which show an extension of their geographical range as previously known.

——. Later Notes on Texan Birds. Science News, 1879, pp. 57, 106, 120, 132, 151.

Notes on 27 species [see Bull. Nutt. Orn. Club, v. p. 45].

Sharpe, R. B. [Transit of Venus Expedition]. The Collections from Kerguelen Island. Birds. Phil. Trans. clxviii. pp. 101–162, pls. vi.–viii.

In this paper (which has already been generally noticed in scientific periodicals, separate copies having been issued two years before actual publication) the author's descriptions and nomenclature are supplemented by the full and interesting field-notes of the naturalist, the Rev. A. E. Eaton. The species noticed belong principally to the *Anatidæ*, *Laridæ*, *Procellariidæ*, and *Spheniscidæ*. A good abstract of the results is to be found in Ann. Sc. Nat. (6) viii. art. 14, pp. 7–21 (Proc. verb.).

——. [Transit of Venus Expedition.] The Collections from Rodriguez. Birds. *Tom. cit.* pp. 459–469.

Details are given of 15 species, 8 of which are sea-birds, and amongst the latter is the rare Tern *Sterna bernsteini*. In a supplementary note the author reviews the acknowledged species of *Anous*, and adds to them 3 which he considers distinct. [*Laridæ*.]

——. Notes from the Leyden Museum, i.

See *Arses batantæ*, *A. aruensis*, *Rhipidura elegantula*, *Pœcilodryas cinerea*, spp. nn., *Muscicapa rufigula*, *Pseudogerygone rubra*, g. & sp. nn., *Clytomyias insignis*, g. & sp. nn. [*Muscicapidæ*], *Volvocivora melanura*, *Calage nychthemera* [*Campophagidæ*].

——. Contributions to the Ornithology of New Guinea. Part v. On recent Collections from the Neighbourhood of Port Moresby, S.E. New Guinea; J. L. S. xiv. pp. 626–634. Part vi. On collections made by the Rev. W. G. Lawes in S.E. New Guinea; *tom. cit.* pp. 685–688.

The first of these collections was made by Mr. K. Broadbent, and contains 29 species, two supposed novelties in which prove to have been

already described by E. P. Ramsay [*suprà*, p. 23]. The second collection consists of 53 species.

[SHARPE, R. B.] Contributions to the Ornithology of Borneo. Part iv. On the Birds of the Province of Lumbidan, N.W. Borneo. Ibis, 1873, pp 233–272, pls. vii. & viii. [*Cf.* Zool. Rec. xiii. *Aves*, p. 29; xiv. *Aves*, p. 23; xv. *Aves*, p. 29.]

A report on two very important collections made by Governor Ussher, and by W. H. Treacher, Acting Governor of Labuan, in which the exact localities for each specimen are given, and consequently the geographical distribution of the Bornean avifauna can with some certainty be mapped out. One genus (*Hematortyx*) and 5 species are described as new: [*Microhierax* (*Falconidæ*), *Dendrocitta* (*Corvidæ*), *Henicurus* (*Motacillidæ*), *Hematortyx*, *Bambusicola* (*Perdicidæ*); see also *Lobiophasis* (*Phasianidæ*)].

——. On Collections of Birds from Kina Balu Mountain, in North-western Borneo. P. Z. S. 1879, pp. 245–249, pl. xxiii.

This interesting and previously unexplored district has so far produced 17 species, of which *Chibia borneensis*, *Buchanga stigmatops* [*Dicruridæ*], *Rubigula montis*, *Criniger rufierissus* [*Pycnonotidæ*], *Ianthocincla treacheri* (pl.xxiii.) [*Timeliidæ*], are described as new.

——. A Contribution to the Avifauna of the Sooloo Islands. *Tom. cit.* pp. 311–317.

Twenty species were obtained there by F. W. Burbidge, 2 of them, *Tanygnathus burbidgii* [*Psittacidæ*] and *Gallus stramineicollis* [*Phasianidæ*] being described as new.

——. A List of the Birds of Labûan Island and its Dependencies. *Tom. cit.* pp. 317–354, pl. xxx.

The collections made by Governor Ussher, Hon. Hugh Low, and Mr. Treacher contain the 137 species now enumerated, with many field-notes. One species, *Cypselus lowi* [*Cypselidæ*], appears to be new, and 2 *Prionochili* [*Dicæidæ*] are figured.

——. Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum. *Cichlomorphæ*. Part I., containing the families *Campophagidæ* and *Muscicapidæ*. [Vol. iv. of series; *cf.* Zool. Rec xiv. *Aves*, p. 23.]

In this volume, the *Prionopidæ* are concluded by the addition of the genera *Cochoa* and *Phæornis*, whilst the *Campophagidæ* and *Muscicapidæ* are exhaustively treated. In the *Campophagidæ* (10 genera, 108 species), 4 new species and subspecies are described [*Edoliisoma*, rectius *Hedoliosoma*, (2), *Campophaga*, *Lalage*]. In *Muscicapidæ* (69 genera, 391 species), 7 new genera are erected [*Erythromyias*, *Poliomyias*, *Heteromyias*, *Æthomyias*, *Cyanomyias*, *Neomyias*, *Rhinomyias*], and 17 new species and subspecies are described. [See under *Alseonax*, *Muscicapa*, *Petræca* (2), *Pseudogerygone*, *Hypothemis*, *Malurus*, *Rhipidura* (5), *Terpsiphone*, *Myiagra*, *Piezorrhynchus*, *Siphia*, *Digenea*.] It will be observed that *Gerygone*, *Pratincola*, and *Malurus* are placed in this family. The work is illustrated with 14 plates by Keulemans.

SHARPE, R. B.] "Aves," in Cassell's Natural History, illustrated. London: 1879, 4to, i. pp. 235–380, ii. pts. 37–39, pp. 1–100.

The above parts of this excellent popular work in course of publication comprise the *Accipitres*, *Picariæ*, and a portion of the *Passeriformes*.

——. See also *Heliodilus soumagnii* [*Strigidæ*], *Dromæocercus seebohmi*, sp. n. [*Sylviidæ*].

SHELLEY, G. E. A Monograph of the *Cinnyridæ*, or Family of Sun-Birds. Pts. ix. & x. London: 1879, 4to. [*Cf.* Zool. Rec. xv. *Aves*, p. 30.]

For species figured in these parts [see *Nectariniidæ*]. The work will be concluded in 1880.

——. On a Collection of Birds from the Comoro Islands. P. Z. S. 1879, pp. 673–679.

The number of species obtained on the islands of Grand Comoro and Anjuan amount to 36, one of which, *Zosterops kirki* [*Diceidæ*], is described as new.

——. See also *Chrysococcyx flavigularis* [*Cuculidæ*], *Pogonorrhynchus affinis* [*Capitonidæ*], spp. nn.

SMITH, CECIL. The Birds of Guernsey and the neighbouring Islands. London: 1879, pp. 223, 8vo.

In this carefully compiled list, 176 species are proved to have occurred, and graphic accounts are given of the habits and nidification of many of them.

——, J. A. See *Alca impennis* [*Alcidæ*].

SNOW, FRANK H. Additions to the Catalogue of Kansas Birds. Tr. Kansas Ac. iv. p. 38.

SOUTHWELL, T. Norfolk Decoys. Tr. Norw. Soc. ii. pp. 538–555.

——. See also LUBBOCK, R.

STEJNEGER, LEONARD. See *Tylas strophiatus*, sp. n. [*Pycnonotidæ*], *Lanius bairdi*, sp. n. [*Laniidæ*].

STERLAND, W. J., & WHITTAKER, J. Descriptive List of the Birds of Nottinghamshire. Mansfield: 1879, 8vo, pp. 71.

A total of 238 species.

STEVENSON, H. Ornithological Notes [from Norfolk] for 1878. Tr. Norw. Soc. ii. pp. 594–601; Zool. 1879, pp. 153–162.

——. See also LUBBOCK, R.

STRASSER, HANS. Zur Mechanik des Flugs. Arch. f. Nat. xliv. i. [1878], pp. 319–350.

STRECKER, C. W. Die im Obereichsfelde und bei Mühlhausen, besonders aber bei Dingelstädt und Heiligenstädt von mir beobachteten Vögel. Orn. Centralbl. 1879, pp. 5 & 6, 9 & 10, 51–53.

Sundman, G. Finska Fogelägg. Suomen lintuin munia. Helsingfors: 1879, fol., 2 pts., text and pls.

The commencement of an illustrated work on Finland eggs.

Taczanowski, L. Liste des Oiseaux recueillis au Nord du Pérou par MM Stolzmann et Jelski en 1878. P. Z. S. 1879, pp. 220–245, pls. xxi. & xxii.

The 56 species in the above have been collected at Pacasmayo, on the coast, and in localities of various elevations in the department of Cajamarca, with direction towards the valley of the Marañon. *Thryothorus sclateri* [*Troglodytidæ*], *Cyclorrhis contrerasi* (pl. xxi.) [*Vireonidæ*], *Nemosia inornata* [*Tanagridæ*], *Synallaxis maranonica* [*Dendrocolaptidæ*], *Leptopogon minor* [*Tyrannidæ*], *Pipreola lubomirskii* (pl. xxii.) [*Cotingidæ*], *Leucolia pelzelni* [*Trochilidæ*], spp. nn., are described.

——. Notice sur quelques Oiseaux du Turkestan. *Tom. cit.* p. 672.

Amongst other species noticed, a large form of *Carduelis elegans* is designated *C. major* [*Fringillidæ*].

——. See also *Synallaxis fruticicola*, sp. n. [*Dendrocolaptidæ*], *Myiarchus cephalotes*, sp. n. [*Tyrannidæ*].

Talsky, Josef. Beitrag zur Ornithologie Mährens. MT. orn. Ver. Wien, 1879, pp. 64–66, 75–78, 89–91, 101–103, 120–122.

On the Birds of Moravia, especially of the district round Olmütz.

Tegetmeier, W. B. See Moore, J.

Toeppen, H., in "Die Doppel Insel Nowaja Semlja" (Leipzig: 1879, 8vo), gives, at pp. 110 & 111, a short notice of the species of Birds observed by various travellers.

Tristram, H. B. Notes on Collections of Birds sent from New Caledonia, from Lifu (one of the Loyalty Islands), and from the New Hebrides, by E. L. Layard, C.M.G. &c. Ibis, 1879, pp. 180–195, pls. iv.–vi

The New Caledonian collection contains 37 species, and that from Lifu 18 species, of which 5 are described as new, others being figured. In a lengthy foot-note a synopsis is given of the Thrushes of the Pacific Islands, and a *Turdus* from Samoa is parenthetically described, whilst from the New Hebrides 18 species are recorded, 4 of which were previously undescribed. [*Glycyphila*, *Myzomela* (*Meliphagidæ*), *Myiagra* (*Muscicapidæ*), *Graucalus* (*Campophagidæ*), *Zosterops* (*Dicæidæ*), *Turdus* (*Turdidæ*), *Pachycephala* (*Laniidæ*), *Ianthœnas* (*Columbidæ*), *Megapodius* (*Megapodiidæ*)].

——. On a Collection of Birds from the Solomon Islands and New Hebrides. *Tom. cit.* pp. 437–444, pls. xi. & xii.

This collection made by Lieut. Richards, R.N., in the Solomon Islands, consists of 33 species, 12 of which are described as new: *Ceyx* [*Alcedinidæ*], *Piezorrhynchus*, *Myiagra*, *Rhipidura* [*Muscicapidæ*], *Symmorphus*, *Edoliisoma* (*Hedoliosoma*), *Graucalus* [*Campophagidæ*], *Pachycephalus* [*Laniidæ*], *Charmosyna* [*Psittacidæ*], *Carpophaga*, *Macropygia*, *Ptilopus*

[*Columbidæ*]. There is also a new species of *Zosterops* [*Dicæidæ*] from Vate, New Hebrides.

[TRISTRAM, H. B.] See also *Dryocopus richardsi*, sp. n. [*Picidæ*], and LAYARD, E. L.

TSCHUSI ZU SCHMIDTHOFFEN, V. VON. Ornithologische Mittheilungen aus Oesterreich und Ungarn. J. f. O. 1879, pp. 129–131.

TWEEDDALE, (LATE) MARQUIS OF. Contributions to the Ornithology of the Philippines. No. xii. On the Collection made by Mr. A. H. Everett in the Island of Basilan. P. Z. S. 1879, pp. 68–73.

Fifty-six species are enumerated, 48 of which are additions to the avifauna of Basilan.

VIALLANE, H. Note sur le Tube Digestif du *Carpophaga goliath*. Ann. Sc. Nat. (6) Zool. vii. Art. 12, pl. ix. [*Columbidæ*.]

——. Note sur les muscles peauciers du *Lophorina superba*. Tom. cit. Art. 12, pls. x. & xi. [*Paradiseidæ*.]

VIDAL, G. The Influence of Rainfall on the Distribution of Migratory Waders and Water Birds. Str. Feath. viii. pp. 170–174.

Referring to A. O. Hume's "Birds of a Drought" [*cf.* Zool. Rec. xv. *Aves*, p. 14], where absence of rain is shown to have caused a scarcity of species, the present writer shows that in the district of South Konkan, a similar absence, extending even to Waders and Waterfowl, resulted from an exceptionally heavy rainfall.

VILLADA, M. M. Aves de las regiones del circulo ártico en las Lagunas del Valle de Mexico. Ann. Mus. Mex. i. pp. 279–282.

The visitants to the Valley of Mexico are named as *Stercorarius parasiticus* [description shows that it is *S. pomatorrhinus*], *Colymbus glacialis*, and *Squatarola helvetica*.

VOGT, C. L'Archæopteryx macroura—Un intermediare entre les oiseaux et les reptiles. Rev. Sci. (2) 9e Ann. Mo. 11, pp. 241–248.

An elaborate description of remains of the above extinct species recently obtained by M. Haeberlein at Solenhofen, Bavaria; the author's deductions being illustrated by woodcuts in the text. The complete specimen shows that this link between reptiles and birds possessed a toothed bill, armed wings, bird-like claws, and a tail of twenty vertebræ.

VOSMAER, G. C. J. Strickland's Regels voor de zoölogische Nomenclatuur. Tijdschr, Nederl. Dierk. Ver. iv. pp. 33–50.

Remarks on and translation of the 1878 edition of Strickland's Rules [*cf.* Zool. Rec. xiv. *Aves*, p. 28, SCLATER].

VOUGA, A. [On 10 species obtained in Switzerland since the time of Schinz, 1837.] Bull. Soc. Neuch. xi. pp. 274 & 275.

WEISSMANN, A. Ueber das Wandern der Vögel. Ber. Vers. Naturf. xiii. p. 291.

A translation, or adaptation, of the above, entitled "On the Migration of Birds," appeared in Contemp. Rev. 1879, pp. 531–552, and was criti-

cised by A. Newton, 'Nature,' xix. p. 433. For further controversy, see *tom. cit.* p. 579, and *op. cit.* xx. p. 97 (Gätke).

WEYENBERGH, D. H. Informe sobre una excursion zoologica á Santa Fé, practicada en 1876. Period. Zool. Argent. iii. pp. 39–64; also Bol. Ac. Cordoba, ii. pp. 217–243, 273–289.

Remarks on the birds observed.

WHARTON, HENRY T. On the Orthography of some Birds' Names. Ibis, 1879, pp. 449–454. [See *Cracidæ*, *Hirundinidæ*, *Trochilidæ*, *Anatidæ*, *Picidæ*, *Scolopacidæ*.]

WOLF, THEODOR. Ein Besuch der Galápagos-Inseln. Heidelberg: 1879, 8vo, pp. 41.

WOOD, J. G., in a new edition (London: 1879) of "Wanderings in South America" by Charles Waterton, gives an Appendix with supposed identifications of the Birds mentioned by their local names in the original work.

WOOD, WILLIAM. The [Rapacious] Birds of Connecticut. [See Bull. Nutt. Orn. Club, v. p. 113.]

WRIGHT, E. P. Animal Life; with illustrations. London: 1879, roy. 8vo, *Aves*, pp. 223–347.

A compilation abounding with errors, as regards the Birds.

ACCIPITRES.

VULTURIDÆ.

Neophron percnopterus figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

FALCONIDÆ.

Accipiter hawaii, sp. n., S. B. Dole, Hawaiian Annual, 1879, p. 43, Hawaii.

Archibuteo hemiptilopus, Blyth: on an unusually rufescent example; J. H. Gurney, Ibis, 1879, pp. 178–180, Thibet.

Astur sharpii, sp. n., E. Oustalet, Bull. Soc. Philom. (6) ii. p. 25, Marianne Islands. [Omitted from Zool. Rec. xii.]

Astur sharpii, sp. n. [*nec* Oust.], distinguished from *A. cruentus* Gould; E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 173, Port Moresby. T. Salvadori, Ibis, 1879, p. 319, doubts its validity.

Buteo pœcilochrous, sp. n., J. H. Gurney, Ibis, 1879, p. 176, Yaua-[? Yana]-yacu, Ecuador. *B. menetriesi*, sp. n., M. Bogdanow, "Tr. Soc. Kazan," viii. 4, p. 45, Caucasus. *B. zonocercus*: first authentic eggs obtained, in Texas; W. Brewster, Bull. Nutt. Orn. Club, iv. p. 80.

Circus melanoleucus figured; J. Anderson, Yunnan Exp. ii. pls. xlv.–xlvi. *C. cyaneus* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Elanus cæruleus : notes on its breeding in Shalapur district ; J. Davidson (p. 415) and Poona, J. H. Yule (p. 416), Str. Feath. viii.

Falco sacer figured ; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv. : young in down described and figured ; A. Marchand, R. Z. (3) vi. p. 309, pl. xi.

Gypaetus barbatus in Austrian Hungary ; E. Hodek, MT. Orn. Ver. Wien, 1879, pp. 16–19 & 30.

Haliaetus albicilla ; an albino offspring of light-coloured parents, bred near Loch Rannoch ; J. M. Drummond-Hay, Scot. Nat. 1879, p. 57.

Harpa novæ-zealandiæ : remarks on this species ; F. W. Hutton, Ibis, 1879, p. 456.

Henicopernis : remarks on genus, and on its geographical distribution ; J. H. Gurney, Ibis, 1879, p. 469.

Machær[or]hamphus : remarks on the genus and some hitherto unnoticed peculiarities ; *id. tom. cit.* pp. 464–469. *M. anderssoni* : description and anatomy ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. i. pp. 77–83.

Micrastur amaurus, sp. n., J. H. Gurney, Ibis, 1879, pp. 171–173, Panama.

Microhierax latifrons, sp. n., R. B. Sharpe, *tom. cit.* p. 237, figured, pl. vii., North-western Borneo.

Milvus govinda, Sykes : W. E. Brookes, *tom. cit.* pp. 282–284, discusses the identification of this species, disagreeing with Gurney, Hume, and Sharpe.

Morphnus tæniatus, sp. n., J. H. Gurney, *tom. cit.* pp. 173–176, figured pl. iii., Sarayacu, Ecuador. Remarks on this species, and on *M. guianensis*, Daud. ; A. von Pelzeln, J. f. O. 1879, pp. 261–266.

Nisus rufitorques and *N. poliocephalus* : remarks on ; H. Schlegel, Notes Leyden Mus. i. pp. 1–6.

Rostrhamus : the species constituting this genus and their synonymy fully discussed ; J. H. Gurney, Ibis, 1879, pp. 336–341.

Spizaetus ceylonensis figured ; W. V. Legge, B. Ceylon (with) pt. ii.

Urospizias pallidiceps, sp. n., T. Salvadori, Ibis, 1879, pp. 473 & 474, Bouru.

Urubitinga anthracina : on the dimensions of this species ; J. H. Gurney, Ibis, 1879, p. 221.

Strigidæ.

Asio butleri : an owl obtained at Mt. Sinai identified with this species : H. B. Tristram, Str. Feath. viii. p. 416.

Bubo sinensis, Heude, = *B. coromandus* ; E. Oustalet, Bull. Soc. Philom. (7) iii. pp. 213 & 214.

Carine murivora ; remains described and figured ; A. Günther & E. Newton, Phil. Tr. clxviii. p. 424, pl. xli.

Glaucidium californicum : on its breeding-habits and eggs ; W. A. Cooper, Bull. Nutt. Orn. Club, iv. p. 86.

Heliodilus soumagnii : description and anatomy ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. i. pp. 113–118. Note on ; R. B. Sharpe, P. Z. S. 1879, p. 175.

Ninox albo-maculata and *N. undulata*, spp. nn., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 249, South-eastern New Guinea. *N. borneensis* occurs in Java ; J. H. Gurney, Ibis, 1879, p. 470.

Syrnium uralense, *S. aluco*, and *S. lapponicum* figured ; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv. *S. aluco* : its breeding in a rabbit-burrow ; J. W. P. Orde, Ibis, 1879, p. 378.

Strix oustaleti, sp. n., G. Hartlaub, P. Z. S. 1879, p. 295, Island of Viti-Levu. *S. inexspectata* [sic], sp. n., differentiated from *S. rosenbergi* ; H. Schlegel, Notes Leyden Mus. i. p. 50, Minahassa, Celebes. *S tenebricosa arfaki*, subsp. n., *id. tom. cit.* p. 101, Arfak, New Guinea.

Scops flammeola : a third specimen, and first authentic eggs obtained, in Fremont Co., Colorado ; R. Deane, Bull. Nutt. Orn. Club, iv. p. 188. *S. lempiji* : a large form occurs in Sumatra ; J. H. Gurney, Ibis, 1879, p. 471. *S. asio* var. *E. maxwellia*, see Ridgway, *suprà*, p. 25.

PSITTACI.

Agaporuis swinderniana : remarks upon synonymy ; G. Hartlaub, Ibis 1879, pp. 84–86.

Aprosmictus broadbenti, sp. n., R. B. Sharpe, Ann. N. H. (5) iii. p. 313, South-eastern New Guinea ; = *A. chloropterus*, Ramsay (*infrà*) and cancelled ; *id.* J. L. S. xiv. p. 628. *A. chloropterus*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 251, Goldie River, S. E. New Guinea ; = *A. broadbenti*, Sharpe [*suprà*], T. Salvadori. Ibis, 1879, p. 320. *A. callopterus*, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 29, Fly River, New Guinea ; figured, J. Gould, B. New Guinea, pl. x.

Ara glauca : remarks on this, and other blue members of the genus ; P. L. Sclater, P. Z. S. 1879, p. 551.

Brotogerys tirica, skeleton figured ; A. B. Meyer, Abb. v. Vögelskel. pl. iii.

Caica xanthomera figured ; P. L. Sclater, P. Z. S. 1879, p. 301, pl. xxviii.

Charmosyna margarethæ, sp. n., H. B. Tristram, Ibis, 1879, p. 442, figured, pl. xii., Solomon Islands. *C. josefinæ* : skeleton figured ; A. B. Meyer, Abb. v. Vögelskel. pl. ii.

Coracopsis nigra ; description and anatomical details ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. i. pp. 6–17.

Cyclopsitta diophthalma, *C. aruensis* (pt. ix.), *C. cervicalis* (pt. x.), figured ; J. Gould, B. New Guinea.

Dasyptilus pecqueti : skeleton figured ; A. B. Meyer, Abb. v. Vögelskel. pl. i.

Domicella kuhli : remarks on ; O. Finsch, J. f. O. 1879, p. 330.

Euphema petrophila bred in Europe, and the young plumage described ; Carl Russ, Gefied. Welt, 1879, No. 44, p. 463.

Lathamus : on its systematic position ; W. A. Forbes, P. Z. S. 1879, pp. 166–174, pl. xvi. [anatomical].

Loriculus culacissi : skeleton figured ; A. B. Meyer, Abb. v. Vögelskel. pl. ii.

Lorius chlorocercus : remarks on its habits in confinement; E. L. Layard, Ibis, 1879, p. 346.

Mascarinus duboisi, new name proposed for *Coracopsis mascarina*, auctt.; W. A. Forbes, Ibis, 1879, pp. 303–307.

Necropsittacus rodericanus: remains described and figured: A. Günther & E. Newton, Phil. Tr. clxviii. p. 429, pl. xlii.

Nestor notabilis: on its carnivorous habits; Menzies, Tr. N. Z. Inst. xi. p. 376.

Nymphicus cornutus figured; P. L. Sclater, P. Z. S. 1879, p. 550, pl. xliv.

Palæornis indo-burmanicus, new name for the forms of the Indo-Burmese region, differing from *P. nipalensis*; A. O. Hume, Str. Feath. vii. p. 459.

Psittacula madagascariensis: description and anatomy; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. i. pp. 17–24.

Tanygnathus burbidgii, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 313, Sooloo Islands.

Trichoglossus cæruleiceps, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 41, Kataw river, New Guinea.

PICARIÆ.

Picidæ.

Brachypternus ceylonus and *B. puncticollis* figured; W. V. Legge, B. Ceylon, (with) pt. ii.

Chrysophlegma mystacalis [*-le*], sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 182, Mount Singalan, Sumatra.

Dendropicus sharpii, sp. n., E. Oustalet, N. Arch. Mus. (2) ii. p. 62, Doumé, Gaboon.

Dryocopus richardsi, sp. n., H. B. Tristram, P. Z. S. 1879, p. 386 figured pl. xxxi., Island of Tzus Sima, between Japan and the Corea.

Hypoxanthus æquatorialis, sp. n. (distinguished from *H. rivolii*), A. Dubois, Bull. Ac. Belg. (2) xlvii. p. 823, Ecuador.

Picus incognitus, J. Scully, Str. Feath. viii. p. 246, Valley of Nepal; *P. poelzami*, M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 121, Caucasus; *P. harmandi*, E. Oustalet, Bull. Soc. Philom. (7) iii. p. 215, Laos: spp. nn.

Iynx is the correct orthography of the generic name commonly written *Yunx*; H. T. Wharton, Ibis, 1879, p. 453 [so in Liddell and Scott, also practically in Agassiz.—Ed.].

Galbulidæ.

See Sclater, P. L.

Brachygalba salmoni, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 535, Neche, Antioquia.

Galbula viridis, *G. rufo-viridis*, *G. ruficauda*, *G. melanogenia*, *G. tombacea*, *G. albirostris*, *G. cyaneicollis* figured; P. L. Sclater, Mon. Galbulidæ, pt. i. pls. ii.–viii.

Urogalba paradisea and *U. amazonum* figured; *id. tom. cit.* pl. i. figs. 1 & 2.

Meropidæ.

Meropogon forsteni: skeleton figured; A. B. Meyer, Abb. v. Vögel-skel. pl. v.

Alcedinidæ.

Ceryle americana, var. *cabanisi*: first authentic eggs obtained; W. Brewster, Bull. Nutt. Orn. Club, iv. p. 79, Texas.

Ceyx gentiana, sp. n., H. B. Tristram, Ibis, 1879, p. 438, figured pl. xi., San Cristoval, Solomon Islands.

Tanysiptera salvadoriana, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 259, inland from Port Moresby, New Guinea.

Upupidæ.

Falculia palliata figured (pl. cxvii.), skeleton (pl. cxviii.), osteology (pls. cxix. & cxx.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Upupa epops: early mention of it as a British bird; J. E. Harting, Zool. 1879, p. 379.

Capitonidæ.

Barbatula affinis, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, & J. f. O. 1879, p. 342, Kipini, East Africa.

Pogonorrhynchus affinis, sp. n., G. E. Shelley, P. Z. S. 1879, p. 680, Natal.

Musophagidæ.

Corythaix schuetti, sp. n., J. Cabanis, J. f. O. 1879, p. 445, interior of S. W. Africa.

Coliidæ.

Colius leucocephalus, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, & J. f. O. 1879, p. 341, Kinakomba, East Africa.

Cuculidæ.

Centropus chlororrhynchus figured; W. V. Legge, B. Ceylon, (with) pt. ii.

Coua: remarks, anatomical details, &c., on this Madagascar genus; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. i. pp. 138–175.

Cuculus validus, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 139, & J. f. O. 1879, p. 341, Muniuni, E. Africa. *C. audeberti*, sp. n., allied to *C. sparveroides*; H. Schlegel, Notes Leyden Mus. i. p. 99, N. E. Madagascar. *C. canorus*: concluding remarks on; Von Pralle, Orn. Centralbl. 1879, pp. 17–21 [*cf.* Zool. Rec. xv. *Aves*, p. 37]. Notes on, with reference to its eggs and selection; H. Goebel, J. f. O. 1879, pp. 169–171.

Chrysococcyx flavigularis, sp. n., G. E. Shelley, P. Z. S. 1879, p. 679, Elmina, Fantee.

Eudynamis taitensis: remarks on; W. L. Buller, Tr. N. Z. Inst. xi. p. 353.

Bucerotidæ.

Anthracocerus fraterculus figured; D. G. Elliot, Mon. Bucerot. pt. vi.

Bucorvus abyssinicus: on the vessels in its head and neck; W. Ottley, P. Z. S. 1879, pp. 461–467, with woodcuts in text. *B. pyrrhops* figured; D. G. Elliot, Mon. Bucerot. pt. vi.

Ceratogymna elata figured; *id. tom. cit.*

Hydrocissa exarata figured; *id. tom. cit.*

Ocyceros (*Anorrhinus*) *tickelli* and *A. austeni*: remarks on; A. O. Hume, Str. Feath. vii. pt. 6 [March, 1879], p. 499.

Penelopides manilæ: skeleton figured; A. B. Meyer, Abb. v. Vögelskel. pl. iv.

Rhytidocerus subruficollis figured; D. G. Elliot, Mon. Bucerot. pt. vi.

Tockus erythrorrhynchus figured; *id. tom. cit.*

Caprimulgidæ.

Caprimulgus pulchellus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 195, Mount Singalan, Sumatra.

Cypselidæ.

Chætura novæ-guineæ, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 55, Fly River, New Guinea.

Cypselus balstoni, sp. n., E. Bartlett, P. Z. S. 1879, p. 770, S.W. interior Betsileo country, Madagascar. *C. lowi*, sp. n., distinguished from *C. infumatus* (tails figured); R. B. Sharpe, *tom. cit.* p. 333, Labuan, Borneo. *C. stictilæmus*, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, and J. f. O. 1879, p. 344, Ualimi, East Africa.

Trochilidæ.

See Elliot, D. G., & Mulsant.

Agyrtria: see *Thaumatias*, infrà.

Bourcieria assimilis, sp. n., D. G. Elliot, Cl. & Syn. Troch. p. 78, Ecuador ?.

Callipharus, new generic name replacing *Clotho*, Muls., which is preoccupied; *id. op. cit.* p. 211.

Campyloplerus phainopeplus, sp. n., O. Salvin & F. D. J. Godman, Ibis, 1879, p. 202, Sierra Nevada de Santa Marta.

Eugenes viridiceps, sp. n., A. Boucard, Ann. Soc. L. Lyon, xxv. p. 55, Guatemala.

Floricola, g. n., type, *Trochilus longirostris*, Vieill.; D. G. Elliot, Cl. & Syn. Troch. p. 82.

Gouldia (Bp., 1850) was preoccupied for a genus of Shells by C. B. Adams in 1847; W. H. Dall, P. Z. S. 1879, p. 131.

Iache: new generic name replacing *Circe*; D. G. Elliot, Cl. & Syn. Troch. p. 234.

Lampornis violicauda, var. ?; A. Boucard, P. Z. S. 1879, p. 178, Brazil, may be a melanism.

Leucolia pelzelni, sp. n., L. Taczanowski, P. Z. S. 1879, p. 239, Guajango, Northern Peru.

Panychlora (*Chlorostilbon*) *inexpectata*, sp. n., H. v. Berlepsch, Orn. Centralbl. 1879, p. 63, and J. f. O. 1879, p. 209, Bogota.

Petasophora rubrigularis, sp. n., apparently distinct from *P. corruscans*; D. G. Elliot, Cl. & Syn. Troch. p. 51, note, Colombia ?.

Thaumatias nigricauda, sp. n., D. G. Elliot, Ibis, 1878, p. 47, Trinidad, British Guiana, Cayenne, Bahia. *T. nitidicauda*, sp. n. ?, name proposed for a Cayenne bird; *id. l. c.* [omitted from Zool. Rec. xv.]. *Thaumasius taczanowskii*, sp. n., P. L. Sclater, P. Z. S. 1879, p. 146, Guajango, prov. Cajamarca, Peru. *Thaumasius* is a preferable orthography to *Thaumatias*; id. l. c. *Thaumantias* is the correct orthography, and not *Thaumatias*; H. T. Wharton, Ibis, 1879, p. 452. *Agyrtria*, Reich., is adopted as a preferable generic name; D. G. Elliot, Cl. & Syn. Troch. p. 200.

PASSERES.

Pittidæ.

Philepitta castanea (pl. cix., osteology, pl. cxii.), *P. schlegeli* (pls. cix. & cxi.), *P. castanea* (pl. cx.), figured; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Pitta ellioti, *P. granatina*, *P. coccinea*, figured; J. Gould, B. Asia, pt. xxxi. *P. concinna* (pl. ix.), *P. forsteni* (pl. x.), figured; *id.* B. New Guinea.

Dendrocolaptidæ.

Automolus ignobilis, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 522, Antioquia.

Pseudocolaptes lawrencii, sp. n. (Costa Rica), distinguished from *P. boissonneauti*; R. Ridgway, P. U. S. Nat. Mus. i. p. 253.

Synallaxis maranonica, sp. n., L. Taczanowski, P. Z. S. 1879, p. 230, Guajango, Northern Peru. *S. fruticicola*, sp. n., *id. tom. cit.* p. 670, Tambillo, Peru. *S. rufipennis*, sp. n., P. L. Sclater & O. Salvin, *tom. cit.* p. 620, Tilotilo, Yungas, Bolivia.

Meliphagidæ.

Glycyphila satelles, sp. n., H. B. Tristram, Ibis, 1879, p. 185, Lifu, Loyalty Islands.

Myzomela: synopsis of this genus; W. A. Forbes, P. Z. S. 1879,

pp. 256–278. *M. caledonica* (p. 260, New Caledonia), *M. sclateri* (p. 265, figured, pl. xxv. fig. 2), New Britain, spp. nn.; *id.* tom. cit. *M. chloroptera*, *M. rubro-brunnea*, *M. adolphinæ* (pl. xxiv.), *M. chermesina* (pl. xxv.), figured, *id.* l. c. *M. cineracea*, sp. n., P. L. Sclater, *tom. cit.* p. 448, figured, pl. xxxvii., New Britain. *M. sclateri*, ♀ described, *id.* l. c. *M. lifuensis*, sp. n., H. B. Tristram, Ibis, 1879, p. 186, Lifu, Loyalty Islands. *M. splendida*, sp. n., *id. tom. cit.* p. 191, Tanna, New Hebrides. *M. rosenbergi* figured, J. Gould, B. New Guinea, pt. x.

Ptilotis xanthophrys, Finsch [*cf.* Zool. Rec. xiii. *Aves*, p. 41], = *P. provocator*, Lay.; O. Finsch, Verh. Ver. Hamb. iv. p. 176.

Dicæidæ.

Dicæum rubrigulare (p. 74, Fly River), and *D. albo-punctatum* (p. 75, Katan River); L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv., New Guinea. *D. geelvinkianum*, figured; J. Gould, B. New Guinea, pt. ix.

Drepanis rosea (p. 44) and *D. aurea* (p. 45), spp. nn.; S. B. Dole, Hawaiian Annual, 1879, Sandwich Islands.

Prionochilus everetti and *P. obsoletus*, figured; R. B. Sharpe, P. Z. S. 1879, pl. xxx. *P. vincens* figured; J. Gould, B. Asia, pt. xxxi.

Zosterops atricapilla, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 215, Mount Singalan, Sumatra. *Z. longirostris*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 288, Heath Island, New Guinea. *Z. kirki*, sp. n., G. E. Shelley, P. Z. S. 1879, p. 676, Grand Comoro Islands. *Z. buxtoni*, sp. n., F. Nicholson, Ibis, 1879, p. 167, Western Java. *Z. vatensis*, sp. n., H. B. Tristram, *tom. cit.* p. 444, Vate, New Hebrides. *Z. minuta* and *Z. inornata* figured; *id. tom. cit.* pl. iv. *Z. madagascarensis* figured (pl. cxiii.), osteology (pl. cxiv.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Nectariniidæ.

Æthopyga siparaja, *Æ. bella*, *Æ. ignicauda*, *Æ. vigorsi* figured; G. E. Shelley, Mon. Cinnyr. pts. ix. & x.

Anthreptes griseigularis, *A. fraseri*, *A. aurantia*, *A. longuemarii* figured; *id. op. cit.* pts. ix. & x.

Arachnethra edeni, sp. n., J. Anderson, Yunnan Exp. i. p. 661, Bhamo, figured ii. pl. xlix.

Arachnorrhaphis flavigastra figured; G. E. Shelley, Mon. Cinnyr. pts. ix. & x.

Arachnothera chrysogenys and *A. flammifera* figured; *id. op. cit.* pts. ix. & x.

Cinnyris (?) *dubia*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iv. p. 83, Savo, Solomon Islands. This species may prove to belong to the *Meliphagidæ*.

Cinnyris kirki, *C. osea*, *C. comorensis*, *C. solaris*, *C. verticalis*, *C. cupreus*, *C. angolensis*, *C. obscurus*, *C. souimanga*, figured; G. E. Shelley, Mon. Cinnyr. pts. ix. & x.

Nectarinia souimanga (pl. cv., osteology, pl. cvii. & cvii. *a*), *N. notata*

(pl. cvi., osteology, pls. cvii. & cvii. *a*) figured; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Neodrepanis coruscans figured (pl. cviii.), osteology (pl. cviii. *a*); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Ampelidæ.

Phainopepla: on the orthography of this generic name; P. L. Sclater, Ibis, 1879, p. 222.

Timeliidæ.

Alcippe phayrii figured; J. Anderson, Yunnan Exp. ii. pl. xlviii.

Brachypteryx saturata and *B. flaviventris*, spp. nn., T. Salvadori, Ann. Mus. Genov. xiv. pp. 225 & 226, Mount Singalan, Sumatra.

Chatarrhæa gularis figured; J. Anderson, Yunnan Exp. ii. pl. xlviii.

Chleuasicus ruficeps, figured; *id. op. cit.* ii. pl. xlvii.

Drymœca insularis, sp. n., W. V. Legge, B. Ceylon, pt. ii. p. 528, Ceylon.

Drymocataphus cinereiceps, sp. n., Marquis of Tweeddale, P. Z. S. 1878, p. 617, Palawan, Philippines [omitted from Zool. Rec. xv.].

Garrulax cinereifrons figured; W. V. Legge, B. Ceylon, pt. ii.

Ianthocincla berthemii, sp. n., E. Oustalet, Bull. Soc. Philom. (6) xii. p. 91, Fokien [omitted from Zool. Rec. xiii.].

Ianthocincla treacheri, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 248, pl. xxiii. North-west Borneo.

Malacocercus rufescens figured; W. V. Legge, B. Ceylon, pt. ii.

Pomatorrhinus melanurus figured; *id. tom. cit.*

Pterorhinus æralatus figured; J. Anderson, Yunnan Exp. ii. pl. xlvii.

Pyctorrhis nasalis, subsp. n., W. V. Legge, Ann. N. H. (5) iii. p. 169, Ceylon.

Rimator albo-striatus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 224, Mount Singalan, Sumatra.

Stachyris bocagii, sp. n., *id. tom. cit.* p. 223, Mount Singalan, Sumatra.

Suthora brunnea figured; J. Anderson, Yunnan Exp. ii. pl. xlix.

Turdinus rufipectus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 224, Mount Singalan, Sumatra.

Turdirostris leptor[*r*]*hyncha*, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 155, and J. f. O. 1879, p. 347, Tschara, East Africa.

Hirundinidæ.

Cotile is the correct orthography, and its derivation discussed; H. T. Wharton, Ibis, 1879, p. 451.

Hylochelidon nigricans: on a further occurrence of this Australian species in New Zealand: Tr. N. Z. Inst. xi. p. 360.

Tyrannidæ.

Aulanax: on the species comprised in this genus; J. Cabanis, J. f. O. 1879, p. 335.

Empidonax: notes on the nests and eggs of the 8 North American species of this genus; T. M. Brewer, P. U. S. Nat. Mus. ii. pp. 1–10.

Leptopogon minor, sp. n., L. Taczanowski, P. Z. S. 1879, p. 233, Tambillo, Northern Peru.

Lichenops perspicillatus, β *andinus*, new name for form from Western S. America; R. Ridgway, P. U. S. Nat. Mus. i. p. 483.

Myiarchus cephalotes, sp. n., L. Taczanowski, P. Z. S. 1879, p. 670, Northern Peru. *M. sclateri*, sp. n., G. N. Lawrence, P. U. S. Nat. Mus. i. p. 357, Martinique.

Rhynchocyclus cinereiceps: description of nest and eggs from Chiriqui, Central America; A. Nehrkorn, J. f. O. 1879, p. 356.

Tænioptera australis, sp. n., R. A. Philippi, Arch. f. Nat. xlv. 1, p. 158, Chili.

Tyrannus, Cuvier: synopsis of the genus; R. Ridgway, P. U. S. Nat. Mus. i. p. 466. *T. luggeri*, sp. n., *id. tom. cit.* p. 481, Guiana.

Pipridæ.

Chiromachæris coronata, sp. n., A. Boucard, P. Z. S. 1879, p. 178, figured, pl. xvii., Colombia.

Cotingidæ.

Pachyrrhamphus intermedius, sp. n., H. v. Berlepsch, Orn. Centralbl. 1879, p. 63, Puerto Cabello, Venezuela.

Pipreola lubomirskii, sp. n., L. Taczanowski, P. Z. S. 1879, p. 236, figured pl. xxii., Tambillo, Northern Peru.

Formicariidæ.

Grallaria rufo-cinerea, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 526, Sta. Elena, Antioquia.

Myrmotherula nigro-rufa, sp. n., A. Boucard, Ann. Soc. Linn. Lyon, xxv. p. 48, Guatemala. Believed to be ♂ juv. of *M. menetriesi*; P. L. Sclater & O. Salvin, editorial note, Ibis, 1879, p. 215.

Laniidæ.

Dryoscopus nigerrimus, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, and J. f. O. 1879, p. 346, Kipini, East Africa.

Fiscus capelli, sp. n., J. V. B. du Bocage, J. Sc. Lisb. vii. p. 93, Cassange, Angola.

Hemipus intermedius, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 209, Mount Singalan, Sumatra.

Hyloterpe brunneicauda, sp. n., *id. l. c.* p. 210, Ajer Mantcior, Sumatra.

Lanius bairdi, sp. n., L. Stejneger, Arch. Math. Naturvid. 1878, pp. 323–339. [Not seen by Recorder.]

Pachycephala neglecta, sp. n. (with note on *P. icteroides*, Peale); E. L.

Layard, P. Z. S. 1879, p. 147, Ovalau, Fiji. *P. christophori*, sp. n., H. B. Tristram, Ibis, 1879, p. 441, Solomon Islands. *P. littayii*, ♂ ♀ figured; *id. tom. cit.* pl. vi. *P. schlegeli* figured; J. Gould, B. New Guinea, pt. ix.

Pinarolestes powelli, sp. n., O. Salvin, P. Z. S. 1879, p. 128, Tutuila, Samoan Islands.

Rectes brunneiceps, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 70, Fly River, New Guinea.

Sigmodus rufiventris figured; E. Oustalet, N. Arch. Mus. (2) pl. v. fig. 1.

Artamidæ.

Artamia bernieri: on a series; H. Schlegel, Notes Leyden Mus. i. p. 111. *A. annæ*, sp. n., L. Stejneger, N. Mag. Naturvid. 1879, pt. 4, Madagascar. [Not seen by Recorder; *cf.* J. f. O. 1880, p. 98.]

Campophagidæ.

Campochæra, g. n., allied to *Lalage*, type *Campophaga sloeti*, Schl.; L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 67.

Campophaga polioptera, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 69, figured pl. ii., Cochin China.

Edoliisoma [*Hedolios-*] *salomonis*, sp. n., H. B. Tristram, Ibis, 1879, p. 440, Solomon Islands. *E. timorensis* (altered to *E. timoriense*), sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. pp. 49 & 470, figured pl. i. fig. 1, Timor. *E. marginatum* figured; *id. op. cit.* pl. i. fig. 1. *E. grayi* (Salv. MS.), sp. n., *id. tom. cit.* p. 57, Halmahera or Gilolo, Batchian, Ternate, Morty Island.

Graucalus melanocephalus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 206, Mount Singalan, Sumatra. *G. sublineatus*, sp. n., P. L. Sclater, P. Z. S. 1879, p. 448, figured pl. xxxvi., New Ireland. *G. lifuensis*, sp. n., H. B. Tristram, Ibis, 1879, p. 190, Lifu, Loyalty Islands. *G. monotonus*, sp. n., *id. tom. cit.* p. 441, Solomon Islands. *G. pusillus*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iv. p. 71, Guadalcanar, Solomon Islands; name changed to *G. solomonensis*, id. *tom. cit.* p. 314.

Lalage melanothorax, subsp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 91, Madras; head figured, *l. c.* with that of *L. sykesi*, p. 90, to show extent of black throat. *L. nychthemera*, Bp., = *Oreicola melanoleuca*, Vieill.; *id.* Notes Leyden Mus. i. p. 34.

Pericrocotus montanus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 205, Mount Singalan. *P. flammeus*: exhibition of a specimen in abnormal plumage; R. G. W. Ramsay, P. Z. S. 1879, p. 765.

Symmorphus (*Lalage*) *affinis*, sp. n., H. B. Tristram, Ibis, 1879, p. 440, Solomon Islands.

Volvocivora melanura, Hartl., = a defective specimen of *V. lugubris*, Sund.; R. B. Sharpe, Notes Leyden Mus. i. p. 34.

Dicruridæ.

Buchanga stigmatops, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 247, North-

western Borneo. *B. leucopygialis* figured; W. V. Legge, B. Ceylon, pt. ii.

Chibia borneensis, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 246, North-western Borneo.

Dicrurus sharpii, sp. n., E. Oustalet, N. Arch. Mus. (2) ii. p. 97, Doumé, Gaboon.

Dissemurus paradiseus and *D. lophorrhinus* figured; W. V. Legge, B. Ceylon, pt. ii.

Muscicapidæ.

Æthomyias, g. n., confined to New Guinea; type, *Entomophila ? spilodera*, Gray; R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 271.

Alsconax fantisiensis, sp. n., *id. tom. cit.* p. 131, Western Africa, Gold Coast and Gaboon. *A. muttui* figured; W. V. Legge, B. Ceylon, pt. ii.

Arses batantæ (Batanta and Waigiou) and *A. aruensis* (Aru Islands and Southern New Guinea), spp. nn., R. B. Sharpe, Notes Leyden Mus. i. pp. 21 & 22. *A. insularis* (pt. ix.), *A. telescophthalmus*, *A. batantæ*, *A. aruensis* (pt. x.), figured; J. Gould, B. New Guinea.

'omyias fuliginosa and *A. ussheri* figured; R. B. Sharpe, Cat. B. Mus. iv. pl. iii.

omyias insignis, g. & sp. nn., *id.* Notes Leyden Mus. i. p. 31, Tjobonda, Arfak Mountains; between *Todopsis* and *Malurus*.

Culicipeta tephrocephala figured; J. Anderson, Yunnan Exp. ii. pl. l. *C. ruficapilla* and *C. umbro-virens* figured; R. B. Sharpe, Cat. B. Brit. Mus. iv. pl. xii. figs. 1 & 2.

Cyanomyias, g. n., type, *Hypothemis cœlestis*, Tweed.: *id. tom. cit.* p. 278.

Digenea cerviniventris, sp. n., *id. tom. cit.* p. 460, Munipur Hills. *D. leucomelanura* (pl. xiii.), *D. moniliger* and *D. solitaria* (pl. xiv.), figured; *id. tom. cit.*

Eopsaltria placens, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 272, Goldie river, New Guinea. Identical with *Pœcilodryas flavicincta*, which latter name is cancelled; R. B. Sharpe, J. L. S. xiv. p. 630.

Erythrocercus maccalli and *E. livingstoni* figured; *id. tom. cit.* pl. ix. figs. 1 & 2.

Erythromyias, g. n.; type, *Saxicola dumetoria*, Wall.; *id. tom. cit.* p. 199. *E. dumetoria* and *E. muelleri* figured; *id. tom. cit.* pl. iv. figs. 1 & 2.

Gerygone inornata (fig. 1) and *G. flaveola* (fig. 2) figured; *id. tom. cit.* pl. v.

Heteromyias, g. n.; type, *Pœcilodryas cinereifrons*, Ramsay: *id. tom. cit.* pp. 114 & 239. *H. cinereifrons* figured; J. Gould, B. New Guinea, pt. x.

Hypothymis ceylonensis, sp. n. (*Myiagra azurea*, Holdsw., *nec* Bodd), R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 277, Ceylon. Figured; W. V. Legge, B. Ceylon, pt. ii.

Malurus gouldi, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 287, Tasmania, S. Australia, and Victoria.

Micræca albo-frontata, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 304, Goldie river, New Guinea.

Monarcha rufo-castanea and *M. brodiei*, spp. nn., *id. op. cit.* iv. pp. 79 & 80, Guadalcanar, Solomon Islands. *M. rufo-castanea* appears to be identical with *M. castaneiventris*, Verreaux; *id. tom. cit.* p. 313 [figured as *Pomarea castaneiventris*, infrà].

Muscicapa cinerascens, subsp. n. of *M. cærulescens*, R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 155, Gold Coast. *M. rufigula* (Müll.) = ♀ *M. luteola*, Pall.; *id.* Notes Leyden Mus. i. p. 27.

Myiagra luguieri and *M. intermedia*, spp. nn., H. B. Tristram, Ibis, 1879, pp. 188 & 189, Lifu, Loyalty Islands; *M. tannaensis*, sp. n., *id. tom. cit.* p. 192, Tanna, New Hebrides; *M. cervinicauda*, sp. n., *id. tom. cit.* p. 439, Solomon Islands; *M. goramensis*, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 386, I. of Goram, Moluccas. *M. rufiventris* figured; *id. tom. cit.* pl. xi. fig. 1. *M. ferro-cyanea* and *M. pallida*, spp. nn., E. P. Ramsay, P. Linn. Soc. N. S. W. iv. pp. 78 & 79, Guadalcanar, Solomon Islands.

Neomyias, g. n.; type, *Rhipidura euryura*, S. Müll.: R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 342.

Niltava sumatrana, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 201, Mount Singalan, Sumatra.

Petræca leggii, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 165, Australia; *P. ramsayi*, sp. n., *id. tom. cit.* p. 172, Western Australia. *P. kleinschmidti*, Finsch [*cf.* Zool. Rec. xii. *Aves*, p. 76], = *P. pusilla*; O. Finsch, Verh. Ver. Hamb. iv. p. 176.

Pœcilodryas flavicincta, sp. n., R. B. Sharpe, Ann. N. H. (5) iii. p. 313, South-eastern New Guinea; = *Eopsaltria placens*, Ramsay, and cancelled, *id.* J. L. S. xiv. p. 630; figured as *P. placens*, J. Gould, B. New Guinea, pt. x. *P. cinerea*, sp. n. (with list of the species comprised in the genus), Sharpe, Notes Leyden Mus. i. p. 25, Noisaroe, Arfak Mountains. *P. albinotata* (pl. vii.), *P. papuana* and *P. leucops* (pl. viii. figs. 1 & 2) figured; *id.* Cat. B. Brit. Mus. iv.

Piezorrhynchus vidua, sp. n., H. B. Tristram, Ibis, 1879, p. 439, Solomon Islands; *P. morotensis*, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 423, Morty Island, Moluccas.

Poliomyias, g. n.; type, *Motacilla luteola*, Pall.: R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 201.

Pomarea castaneiventris figured; *id. tom. cit.* pl. xi. fig. 2.

Pseudogerygone, g. n.; type, *Gerygone personata*; *Pseudogerygone rubra*, sp. n.; *id.* Notes Leyden Mus. i. pp. 29 & 30, N.W. New Guinea. Key to the species of this genus; *id.* Cat. B. Brit. Mus. iv. p. 216. *P. brunneipectus*, sp. n., *id.* Notes Leyden Mus. i. p. 30 [*descr. nulla*]: described, Cat. B. Brit. Mus. iv. p. 221. *P. palpebrosa*: ♂ ♀ figured; *id. tom. cit.* pl. vi.

Rhipidura castaneo-thorax and *R. ambusta*, spp. nn., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 270, Goldie River, South-east New Guinea. *R. cervina*, sp. n., *id. tom. cit.* p. 340, Lord Howe's Island. *R. rubro-frontata*, sp. n., *id. op. cit.* iv. p. 82, Guadalcanar. *R. sharpii*, name proposed for *R. saturata*, Sharpe (*nec* Salvadori), who has, however, altered it to *R.*

diemenensis; id. *tom. cit.* p. 318. *R. atrata*, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 203, Mount Singalan, Sumatra. *R. elegantula*, sp. n., R. B. Sharpe, Notes Leyden Mus. i. p. 23, Island of Lettie, near Timor. *R. saturata*, sp. n., *id.* Cat. B. Brit. Mus. iv. p. 311, Tasmania: this name being preoccupied, to be changed to *R. diemenensis*; id. Ibis, 1879, p. 368. *R. brenchleyi*, sp. n., *id.* Cat. B. Brit. Mus. iv. p. 311, New Hebrides. *R. melanolæma*, sp. n., *id. tom. cit.* p. 313, I. of Vanikoro, New Hebrides. *R. erythronota* (Vanua Levu) and *R. rufilateralis* (Taviuni), spp. nn., *id. tom. cit.* p. 237, figured pl. x. figs. 1 & 2, Fiji group. *R. russata*, sp. n., H. B. Tristram, Ibis, 1879, p. 440, Solomon Islands.

Rhinomyias, g. n. (*Setaria*, pt. auctt. recent., nec Blyth); R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 367.

Sauloprocta cockerelli, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iv. p. 81, Gaudalcanar, Solomon Islands.

Siphia sumatrensis, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 451, Sumatra. *S. rufigularis*, sp. n., J. Scully, Str. Feath. viii. p. 279, Sheopuri Ridge, Nepal. *S. mandellii*, Hume, is an *Alseonax*; R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 472.

Stoparola ruficrissa, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 202, Mount Singalan, Sumatra. *S. sordida* figured; W. V. Legge, B. Ceylon, pt. ii.

Terpsiphone erythroptera, sp. n., R. B. Sharpe, Cat. B. Brit. Mus. iv. p. 357, Senegambia.

Trochocercus bivittatus, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 108, & J. f. O. 1879, p. 345, Muniuni, East Africa.

Eupetidæ.

Eupetes goldiei, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 303, inland from Port Moresby, New Guinea.

Oriolidæ.

Oriolus consobrinus, sp. n., R. G. W. Ramsay, P. Z. S. 1879, p. 709, Northern Borneo. *O. broderipi* figured; J. Gould, B. Asia, pt. xxxi.

Pycnonotidæ.

Andropadus (*Criniger*?) *marchii*, sp. n., E. Oustalet, N. Arch. Mus. (2) ii. p. 100, Gaboon.

Criniger ruficrissus, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 248, North-west Borneo. *C. fischeri* (Muniuni) and *C. strepitans* (Malindi), spp. nn., A. Reichenow, Orn. Centralbl. 1879, p. 139, and J. f. O. 1879, p. 348, East Africa.

Hypsipetes madagascariensis figured (pl. cxli.), osteology (pl. cxlii.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii. *H. yunnanensis* figured; J. Anderson, Yunnan Exp. ii. pl. l.

Ixidia webberi, sp. n., ?, A. O. Hume, Str. Feath. viii. p. 40, Tonka, Malay Peninsula.

Ixonotus guttatus figured; E. Oustalet, N. Arch. Mus. (2) ii. pl. v. fig. 2.

Ixos xanthopygius: on its history, with figures of its eggs; A. Müller, J. f. O. 1879, pp. 304–308, pl. i. figs. 4 & 5.

Kelaartia penicillata figured; W. V. Legge, B. Ceylon, pt. ii.

Pycnonotus layardi, sp. n., T. Ayres, Ibis, 1879, p. 390, Rustenburg, Transvaal. *P. xanthorrhous* figured, J. Anderson, Yunnan Exp. ii. pl. li.

Rubigula montis, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 247, North-west Borneo.

Tylas strophiatus, sp. n., L. Stejneger, Orn. Centralbl. 1879, p. 182, West Coast of Madagascar. *T. eduardi* (pl. cxli.), *T. madagascariensis* (pl. cxliii.), osteology (pl. cxliv.), figured; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Turdidæ.

Arrenga melanura, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 227, Mount Singalan, Sumatra.

Catharus alticola, sp. n., distinguished from *C. franzi*; O. Salvin & F. D. Godman, Biol. Centr. Amer. *Aves*, pt. 3, Forests of Volcan de Fuego, Guatemala. *C. gracilirostris*, *C. griseiceps* (pl. i.), *C. mexicanus*, *C. dryas* (pl. ii.), figured; *iid. tom. cit.*

Cochoa beccarii, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 228, Mount Singalan, Sumatra.

Geocichla aveusis (Gray) re-discovered in Malay Peninsula; A. O. Hume, Str. Feath. viii. p. 38.

Melanoptila glabrirostris figured; O. Salvin & F. D. Godman, Biol. Centr. Amer. *Aves*, pl. iii. fig. 2.

Merula albifrons, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 336, Island of Eromanga.

My[i]ophon[e]us dicror[r]hynchus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 227, Western Sumatra.

Oreocincla imbricata figured; W. V. Legge, B. Ceylon, pt. ii.

Petrocincla cyanea obtained in Belgium; A. Dubois, Bull. Ac. Belg. (2) xlvii. p. 827.

Rhodinocichla rosea, β. *schistacea*: new name for the form from Western Mexico; R. Ridgway, P. U. S. Nat. Mus. i. p. 247.

Turdus mareensis, sp. n., E. L. Layard & H. B. Tristram, Ibis, 1879, pp. 471–473, Maré Island, Loyalty Group. *T. samoensis*, sp. n., H. B. Tristram, Ibis, 1879, p. 188 (footnote), Samoa, and the true Pacific Thrushes reviewed. *T. pritzbueri* figured; *id. l. c.* pl. v. *T. pallasi* and its varieties; H. W. Henshaw, Bull. Nutt. Orn. Club, iv. pp. 134–139. *T. dubius* and *T. obscurus*: remarks on their nidification; H. Seebohm, Ibis, 1879, pp. 3–5. *T. dissimilis* (figured, pl. lxiv.) and *T. hortulorum* [remarks on these much confused species, with rectifications of synonymy]; H. Seebohm, P. Z. S. 1879, pp. 803–806. *T. flavirostris* (pl. iii. fig. 1), *T. nigrescens* (pl. iv.), figured; O. Salvin &

F. D. Godman, Biol. Centr. Amer. *Aves*. *T. spiloptera* figured; W. V. Legge, B. Ceylon, pt. ii. *T. varius* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.: obtained in Berwickshire; A. Brotherton, Scot. Nat. 1879, p. 78. *T. torquatus*: on its wintering in England; J. E. Harting, Zool. 1879, p. 203. *T. sibiricus* obtained in Belgium; A. Dubois, Bull. Ac. Belg. (2) xlvii. p. 827.

Sylviidæ.

Acdon psammochroa, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 139, and J. f. O. 1879, p. 355, Massa, East Africa.

Apalis [*Hapalus*] *chariessa*, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, and J. f. O. 1879, p. 354, Mitole, East Africa.

Bernieria madagascariensis figured (pl. cxxiii.), osteology (pl. cxxiv.), *B. zosterops* figured (pl. cxxv.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Calamodyta newtoni figured; *iid. tom. cit.* pl. cxxxi. fig. 2.

Calliope camtschatkensis, *C. pectoralis*, *C. tschebaiewi* figured; J. Gould, B. Asia, pt. xxxi.

Cisticola madagascariensis figured; A. Milne-Edwards & A. Grandidier, Ois. Madagas. Atlas, ii. pl. cxxx.

Copsychus albo-specularis, typicus ♂ ♀ (pl. cxxxv.), juv. (pl. cxxxvi.), var. *pica* (pl. cxxxvi.), osteology (pl. cxxxvii.), figured; *iid. tom. cit.*

Cossypha imerina (pl. cxxxviii.), osteology (pl. cxxxix.), *C. sharpii* (pl. cxl.), figured; *iid. tom. cit.*

Dromæocercus seebohmi, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 177, Antananarivo, Madagascar. *D. brunneus* figured (pl. cxxxi.), osteology (pl. cxxxii.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Drymœca gracilis figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Ellisia madagascariensis, typica (pl. cxxvii.), osteology (pl. cxxix.), *E. madagascariensis* var. *filicum* (pl. cxxvii.), var. *lanzi* (pl. cxxviii.), figured; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Eremomela hemixantha, sp. n., H. Seebohm, Ibis, 1879, p. 403, Rustenburg, Transvaal.

Eroessa tenella figured (pl. cxiii.), osteology (pl. cxiv.): A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Horornis fulviventer, Hodgson: note on; W. E. Brooks, Str. Feath. viii. p. 379.

Mystacornis crossleyi figured (pl. cxxii.), osteology (pl. cxxiv.); A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Oxylabes madagascariensis and *O. xanthophrys* figured; *iid. tom. cit.* pl. cxxvi.

Phylloscopus superciliosus: its nest and eggs obtained [for the first time] on the Yenissei; H. Seebohm, Ibis, 1879, p. 12. *P. viridanus* obtained in Heligoland; H. Gätke, Ibis, 1879, p. 102. *P. plumbeitarsus* and *P. viridanus*: notes on; W. E. Brooks, Str. Feath. vii. pp. 508–510. Nest of latter found in Cashmere; *id. l. c.* Further notes on both; *id. op. cit.* viii. p. 385.

Poodytes albo-limbatus, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 87, Fly River, New Guinea.

Pratincola torquata figured ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii. pl. cxxxii. ; skeleton, pl. cxxxiv.

Prinia hypoxantha, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 235, Sungei Bulu, Sumatra.

Reguloides superciliosus, *R. humii*, and *R. subviridis* : further observations on ; W. E. Brooks, Str. Feath. vii. [March, 1879] p. 475. *R. humii* var. ; J. Scully, *op. cit.* viii. p. 308, Nepal. *R. humii* : further observations on ; W. E. Brooks, *tom. cit.* p. 385. *R. mandellii*, sp. n., *id. tom. cit.* pp. 389–393, Darjeeling. Diagnostic table of the genus, *l. c.*

Suya superciliaris figured : J. Anderson, Yunnan Exp. ii. pl. li.

Sylvia : remarks on the genus ; H. Seebohm, Ibis, 1879, pp. 308–317. *S. deserticola*, Trist., and *S. melanothorax*, Trist., both appear to be valid although neglected species ; *id.* l. c. *S. nisoria* : exhibition of a specimen believed to have been killed at Cambridge about forty years ago ; A. Newton, P. Z. S. 1879, p. 219.

Sylviella leucopsis, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, Kibaradja, East Africa.

Thamnobia quadrivirgata, sp. n., *id. tom. cit.* p. 114, and J. f. O. 1879, p. 355, Kipini, East Africa.

Thamnornis chloropetoides figured ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii. pl. cxxviii. fig. 2.

Mniotiltidæ.

Basileuterus cabanisi, sp. n., H. v. Berlepsch, Orn. Centralbl. 1879, p. 63, and J. f. O. 1879, p. 207, Puerto Cabello, Venezuela.

Dendræca petechia var. *melanoptera* is the form found in Guadeloupe and also in Dominica, West India ; G. N. Lawrence, P. U. S. Nat. Mus. i. p. 453. *D. cærulea* : on its nest and eggs ; J. A. Allen, Bull. Nutt. Orn. Club, iv. p. 25. *D. chrysoparia* the fourth known specimen obtained in Texas ; H. A. Purdie, *tom. cit.* p. 60 : its nesting there and eggs described ; W. Brewster, *tom. cit.* p. 77.

Vireonidæ.

Cyclorrhis contrerasi, sp. n., L. Taczanowski, P. Z. S. 1879, p. 224, figured, pl. xxi., Tambillo, Northern Peru.

Vireo atricapillus : its distribution, habits, and nesting ; W. Brewster, Bull. Nutt. Orn. Club, iv. pp. 99–103. Note on and figure ; E. Coues, *tom. cit.* p. 193, pl. i.

Motacillidæ.

Henicurus rufidorsalis, sp. n., distinguished from *H. ruficapillus* ; R. B. Sharpe, Ibis, 1879, p. 255, Cawas River, North-western Borneo.

Motacilla flaviventris figured (pl. cxxxiii.), skeleton (pl. cxxxiv.) ; A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Tmetothylacus, g. n. : type, *Macronyx tenellus* ; J. Cabanis, J. f. O. 1879, p. 438.

Troglodytidæ.

Cyphorrhinus dichrous, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 492, figured, pl. xli., Remedios, Antioquia.

Thryophilus zeledoni, sp. n., R. Ridgway, P. U. S. Nat. Mus. i. p. 252, Costa Rica.

Thryothorus sclateri, sp. n., L. Taczanowski, P. Z. S. 1879, p. 222, Guajango, Northern Peru.

Certhiidæ.

Certhia familiaris americana: its breeding habits; W. Brewster, Bull. Nutt. Orn. Club, iv. p. 199.

Sittidæ.

Hypherpes corallirostris: on a series of both sexes; H. Schlegel, Notes Leyden Mus. i. p. 115. Figured, A. Milne-Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii. pl. cxxi.

Paridæ.

Ægithalus caspius, Pölzam [sic], sp. n., M. Bogdanow, Tr. Soc. Kazan. viii. 4, p. 91, ? Astrachan [Probably = *Æ. castaneus*, Severtz.].

Heterophasia simillima, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 232, Mount Singalan, Sumatra.

Liothrix laurinæ, sp. n., *id. tom. cit.* p. 231, Mount Singalan, Sumatra.

Lophophanes atricristatus: nesting and eggs described; W. Brewster, Bull. Nutt. Orn. Club, iv. p. 76, Texas.

Melaniparus semilarvatus discussed and figured; T. Salvadori, Ibis, 1879, pp. 300–303, pl. ix.

Parus michalowskii, sp. n., M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 87, Caucasus. *P. rufescens*, β *neglectus*: new name for form from Coast of California; R. Ridgway, P. U. S. Nat. Mus. i. p. 485.

Pœcile brandti, sp. n., M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 89, Caucasus.

Pteruthius cameranoi, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 233, Mount Singalan, Sumatra.

Fringillidæ.

Bucanetes githagineus obtained in the Gourgaon district; A. O. Hume, Str. Feath. vii. p. 454.

Carduelis major: name given to a large pale race of *C. elegans* from Turkistan; L. Taczanowski, P. Z. S. 1879, p. 672.

Carpodacus roseus figured; J. Gould, B. Asia, pt. xxxi.

Embernagra rufivirgata β *crassirostris* (Mexico), γ *verticalis* (Merida, Yucatan): new names proposed for these forms; R. Ridgway, P. U. S. Nat. Mus. i. p. 248.

Fringilla anna, sp. n., S. B. Dole, Hawaiian Annual, 1879, p. 49, Hawaii.

Linaria brunnescens, sp. n., distinguished from *L. hornemanni*; E. F. v. Homeyer, J. f. O. 1879, p. 184, Lapland. *L. sibirica*, Sevezow (in litt.) [sic], sp. n., *id. tom. cit.* p. 185, Siberia.

Loxia atrata, sp. n., E. F. v. Homeyer, *tom. cit.* p. 179, North America.

Loxigilla violacea β *bahamensis*: new name for the Bahama form; R. Ridgway, P. U. S. Nat. Mus. i. p. 250.

Loxioides bailleui discussed and figured; P. L. Sclater, Ibis, 1879, p. 90, pl. ii.

Melospiza melodes and its allies; H. W. Henshaw, Bull. Nutt. Orn. Club, iv. pp. 155–160.

Passer domesticus, subsp. n. *caucasicus*; M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 59, Caucasus. *P. domesticus*: on the evils of its introduction into America; E. Coues, Bull. U. S. Geol. Surv. v. pp. 175–193.

Passerculus princeps [on the characters distinguishing it from *P. savannæ*]; W. A. Jeffreys, Bull. Nutt. Orn. Club, iv. pp. 103–106.

Peucæa ruficeps: its habits and distribution; W. Brewster, *tom. cit.* pp. 47 & 48. *P. illinoensis*, sp. n., R. Ridgway, *tom. cit.* p. 219, Southern Illinois and Central Texas.

Plectrofringilla, g. n.: type, *Passer alpicola*, Pall.; M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 67.

Salicipasser, g. n.: type, *Passer montanus*; id. *tom. cit.* p. 60.

Urocynchramus pylzowi figured; J. Gould, B. Asia, pt. xxxi.

Cœrebidæ.

Dacnis pulcherrima β *aureinucha*: new name for the Ecuador form; R. Ridgway, P. U. S. Nat. Mus. i. p. 484.

Tanagridæ.

Buarremon elæoprorus, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 504, Medellin and Sta. Elena, Antioquia; egg figured pl. xlii. fig. 7. *B. melanolæmus*, sp. n., *iid.*, Ibis, 1879, p. 425, figured pl. x. fig. 2, Andes of Cuzco. *B. spodionotus*, sp. n., *iid. l. c.* figured pl. x. fig. 1, Ecuador. *B. comptus*, sp. n., *iid. tom. cit.* p. 426, Maraviña, Ecuador. *B. inornatus*, sp. n., *iid. tom. cit.* p. 427, Ecuador. *B. latinuchus* figured, *iid. l. c.* pl. x. fig. 1.

Callithraupis, g. n.: type, *Pyranga cyanictera*, Vieillot; H. v. Berlepsch, Orn. Centralbl. 1879, p. 63, and J. f. O. 1879, p. 206.

Euchætes. This generic name having been used in entomology, it is proposed to change it into *Calochætes**; P. L. Sclater, Ibis, 1879, p. 388.

Nemosia inornata, sp. n., L. Taczanowski, P. Z. S. 1879, p. 228, Northern Peru.

Ploceidæ.

Ægintha duhringi, sp. n., C. Russ, Gefied. Welt, 1878, pp. 299 & 311, Benguela. [Not seen by the Recorder.]

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* *Calochætis* [*Calli-*], Bigot, *Insecta*, 1877.—Ed.

Donacicola (new amended name for *Donacola*, Gould) *spectabilis*, sp. n., P. L. Sclater, P. Z. S. 1879, p. 449, figured pl. xxxvii., New Britain.

Euplectes diadematus figured; A. Reichenow, J. f. O. 1879, pl. ii. fig. 4.

Munia leucosticta, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 88, Fly River, New Guinea. *M. forbesi*, sp. n., P. L. Sclater, P. Z. S. 1879, p. 449, figured pl. xxxvii., New Ireland.

Neochmia evangelinæ, sp. n., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. p. 89, Fly River, distinguished from *N. phaeton*.

Pitylia caniceps, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 139, and J. f. O. 1879, p. 352, figured pl. ii. fig. 3, Massa, East Africa.

Nigrita lucieni, sp. n., R. B. Sharpe & A. Bouvier, Bull. Soc. Zool. Fr. iii. p. 75, Congo. [Omitted from Zool. Rec. xv.]

Spermestes haldi, sp. n., C. Russ, Gefied. Welt, No. 44, p. 466, "East Indies."

Uræginthus ianthinogaster, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 114, and J. f. O. 1879, p. 353, Massa, East Africa, figured pl. ii. figs. 1 & 2.

Vidua splendens, sp n., *id.* Orn. Centralb. 1879, p. 114, Kibaradja, East Africa.

Emberizidæ.

Emberiza yessoensis and *E. passerina* discussed and figured; H. Seebohm, Ibis, 1879, p. 39, pl. i. *E. pyrrhuloides* (p. 378), *E. melanocephala* (pp. 379 & 388) obtained at Heligoland; H. Gätke, Ibis, 1879, also the former in Orn. Centralbl. 1879, p. 86. *E. pusilla* obtained in Belgium; A. Dubois, Bull. Ac. Belg. (2) xlvii. p. 827.

Plectrophanes lapponicus obtained for the first time in S.W. France; M. Dubalen, Act. Soc. L. Bord. 1879, p. lxxx.

Lophospingus, g. n.: type, *Gubernatrix pusilla*; J. Cabanis, J. f. O. 1878, p. 195. [Omitted from Zool. Rec. xv.]

Alaudidæ.

Alauda pœcilosterna, sp. n., A. Reichenow, Orn. Centralbl. 1879, p. 155, and J. f. O. 1879, p. 353, Kibaradja, East Africa. *A. pispoletta* obtained at Heligoland; H. Gätke, Ibis, 1879, p. 379.

Nigrilauda, g. n.: type, *Alauda nigra*, Guld.; M. Bogdanow, Tr. Soc. Kazan, viii. 4, p. 76.

Spilocorydon hypermetrus, g. & sp. nn., A. Reichenow, Orn. Centralbl. 1879, p. 155, and J. f. O. 1879, p. 354, Kibaradja, East Africa; between *Mirafra* and *Melanocorypha*.

Sturnidæ.

Acridotheres melanosternus, subsp. n., W. V. Legge, Ann. N. H. (5) iii. p. 168, Ceylon.

Coccycolius iris figured; E. Oustalet, N. Arch. Mus. (2) ii. pl. vii.

Cosmopsarus regius, g. & sp. nn., A. Reichenow, Orn. Centralbl. 1879,

p. 108, Massa, East Africa; allied to *Lamprotornis*, also J. f. O. 1879, p. 349, figured pl. i. fig. 1.

Hartlaubius madagascariensis figured (pl. cxv.), osteology (pl. cxvi.); A. Milne Edwards & A. Grandidier, Ois. Madagasc. Atlas, ii.

Necropsar rodericanus: remains described and figured; A. Günther & E. Newton, Phil. Trans. clxviii. p. 427, pl. xlii.

Speculipastor bicolor, g. & sp. nn., A. Reichenow, Orn. Centralbl. 1879, p. 108, Kipini, East Africa, also J. f. O. 1879, p. 349, figured pl. i. figs. 2 & 3.

Sturnia incognita, sp. n., A. O. Hume, Str. Feath. viii. p. 396, Siam frontier.

Sturnus: a review of the Starlings of India; *id. tom. cit.* pp. 174–176.

Icteridæ.

Quiscalus guadeloupensis, sp. n., G. N. Lawrence, P. U. S. Nat Mus. i., p. 457, Island of Guadeloupe, West Indies.

Paradiseidæ.

Amblyornis inornata figured; J. Gould, B. New Guinea, pt. ix.

Cicinnurus regius: skeleton figured; A. B. Meyer, Abb. v. Vögelskel. pl. v.

Chlamydodera orientalis, sp. n., J. Gould, Ann. N. H. (5) iv. p. 73, Port Denison, Queensland. *C. occipitalis* figured; *id.* B. New Guinea, pt. x.

Craspedophora magnifica figured; *id. op. cit.* pt. ix.

Lophorrhina superba: note on its cutaneous muscles; H. Viallane, Ann. Sc. Nat. (6) Zool. vii. art. 13, pls. x. & xi.

Manucodia chalybeata: skeleton, tongue, and trachea figured; A. B. Meyer, Abb. v. Vögelskel. pls. vii. & vii. A.

Paradisea raggiana: on this species, and on hybrids between it and *P. apoda*, var. *novæ-guineæ*; L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. pp. 100–106. *P. novæ-guineæ*, sp. n., distinguished from *P. apoda*; iid. *tom. cit.* p. 147. *P. apoda* (pt. ix.), *P. papuana* (pt. x.) figured; J. Gould, B. New Guinea. *P. minor*: skeleton figured; A. B. Meyer, Abb. v. Vögelskel. pl. vi.

Scenopæus dentirostris figured; J. Gould, B. New Guinea, pt. x.

Corvidæ.

Cissa ornata figured; W. V. Legge, B. Ceylon, pt. ii.

Corvus cornix is common in winter in N.W. Punjab; A. O. Hume, Str. Feath. vii. p. 517.

Dendrocitta cinerascens, sp. n., R. B. Sharpe, Ibis, 1879, p. 250, figured pl. viii., North-western Borneo (distinguished from *D. occipitalis*).

Xanthura: remarks on the American Crows of this subgenus; P. L. Sclater, Ibis, 1879, pp. 87–89.

COLUMBÆ.

Columbidæ.

Alectorœnas nitidissima: remarks on the third known existing specimen, exhibited by Dr. Traquair; A. Newton, P. Z. S. 1879, pp. 2–4.

Carpophaga (*Globicera*) *richardsi*, sp. n., H. B. Tristram, Ibis, 1879, p. 443, Solomon Islands. *C. goliath*: on its digestive organs; H. Viallane, Ann. Sci. Nat. (6) Zool. vii. art. 12, pl. ix. *C. vanwyeki* and *C. rhodinolœma* exhibited, and distinctions pointed out; P. L. Sclater, P. Z. S. 1879, p. 218.

Columba œnas nesting near Dunkeld, the first recorded instance in Scotland; A. B. Brooke, Scot. Nat. 1879, p. 36.

Globicera: letter on its geographical distribution; T. Salvadori, Ibis, 1879, p. 334.

Ianthœnas leopoldi, sp. n., H. B. Tristram, Ibis, 1879, p. 193, Vaté Island, New Hebrides.

Leptoptila megalura, sp. n., P. L. Sclater & O. Salvin, P. Z. S. 1879, p. 640, Tilotilo, Yungas, Bolivia.

Macropygia arossi [*-ana*, vel *-ca*], sp. n., H. B. Tristram, Ibis, 1879, p. 443, Solomon Islands. *M. rufo-castanea*, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iv. p. 314, Solomon Islands.

Otidophaps nobilis: skeleton figured; A. B. Meyer, Abb. v. Vogelskel. pl. viii.

Ptilopus: on the Moluccan and Papuan species named in D. G. Elliot's paper; T. Salvadori, P. Z. S. 1879, pp. 61–68; also E. L. Layard, *tom. cit.* p. 305; also J. D. E. Schmeltz, Verh. Ver. Hamb. 1879, p. 177. *P. cerasciperctus*, sp. n., H. B. Tristram, Ibis, 1879, p. 442, Solomon Islands. *P. speciosus*, *P. bellus*, *P. rivolii*, figured; J. Gould, B. New Guinea, pt. ix.

Treron teysmanni, sp. n., H. Schlegel, Notes Leyden Mus. i. p. 103, Sumba or Sandalwood Island.

Didiæ.

Pezophaps solitaria: its osteology; E. Newton & J. W. Clark, Phil. Tr. 1879, pp. 438–451, pls. xliv.–l.

GALLINÆ.

See Garrod, A. H., for Anatomy of Trachea.

Phasianidæ.

Acomus inornatus, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 250, Mount Singalan, Sumatra: further remarks on; P. Z. S. 1879, p. 651, figured pl. xlviii.

Argus giganteus: on the breeding of this and other *Phasianidæ* in the

London Zoological Society's Gardens, with fig. ♂ *pull.* pl. vii.; P. L. Sclater, P. Z. S. 1879, pp. 114–118. Egg of above, and of *Polyplectron chinquis*, *Ceriornis temminckii*, *C. satyra*, and *Crossoptilon mantchuricum* figured; *l. c.* pl. viii.

Ceriornis temminckii obtained in the Mishmi Hills, Assam; A. O. Hume, Str. Feath. viii. p. 201. *C. blythii* ♀ described and figured; H. H. Godwin-Austen, P. Z. S. 1879, p. 457, pl. xxxix.

Euplocamus sumatranus, sp. n., A. Dubois, Bull. Ac. Belg. (2) xlvii. p. 825, Sumatra. *E. andersoni* figured; J. Anderson, Yunnan Exp. ii. pl. liii.

Gallus stramineicollis, sp. n., R. B. Sharpe, P. Z. S. 1879, p. 317, Sooloo Islands. *G. bankiva*: skeleton figured; A. B. Meyer, Abb. v. Vögelskel. pl. ix.

Lobiophasis castaneicaudatus proves to be identical with the previously-described *L. bulweri*; R. B. Sharpe, Ibis, 1879, p. 267.

Lophophorus sclateri: ♀ described from Eastern Assam; H. H. Godwin-Austen, P. Z. S. 1879, p. 681, figured, pl. li.

Phasianus sladeni: ♂ ♀ figured; J. Anderson, Yunnan Exp. ii. pl. liii. *P. colchicus* figured; H. E Dresser, B. Eur. pts. lxxv. & lxxvi.

Pucrasia biddulphi, sp. n., G. F. L. Marshall, Ibis, 1879, pp. 461–464, N.W. Himalayas.

Tetraonidæ.

Tetrao medius: on the hybrids included in this supposed species; W. Dybowski, Zool. Anz. ii. pp. 400–402. *T. mlokosiewiczi* figured, J. Gould, B. Asia, pt. xxxi. *T. urogallus* in Scotland; see Harvie-Brown, *suprà*, p 5.

Lagopus albus: fossil remains in Germany; A. Nehring, Die Natur, 1879, p. 570.

Perdicidæ.

Bambusicola hyperythra, sp. n., R. B. Sharpe, Ibis, 1879, p. 266, North-western Borneo; figured, J. Gould, B. Asia, pt. xxxi. *B. fytchii* figured; J. Anderson, Yunnan Exp. ii. pl. liv.; also in A. Fytche's "Burma," vol. ii. pl. iv.

Ecalfatoria lepida, sp. n., G. Hartlaub, SB. Ver. Hamb., Mioko, Duke of York group [only a separate copy seen by Recorder].

Francolius petiti, sp. n., J. V. B. du Bocage, J. Sc. Lisb. vii. p. 68, Landana, Loango. *F. schlegeli*, Heugl.: this rare species, hitherto supposed to be restricted to Central Africa, obtained in Angola; *id. tom. cit.* p. 94.

Hematortyx, g. n., allied to *Rollulus*; type, *H. sanguiniceps*, sp. n. R. B. Sharpe, Ibis, 1879, p. 266, Lawas river, Borneo; figured, J. Gould, B. Asia, pt. xxxi.

Peloperdix rubrirostris, sp. n., T. Salvadori, Ann. Mus. Genov. xiv. p. 251, Mount Singalan, Sumatra.

Pternistes lucani, sp. n., J. V. B. du Bocage, J. Sc. Lisb. vii. p. 68, Landana, Loango.

MEGAPODIIDÆ.

Megapodius layardi, sp. n., H. B. Tristram, Ibis, 1879, p. 194, Vaté Island, New Hebrides.

Talegallus pyrrhopygius, sp. n., H. Schlegel, Notes Leyden Mus. i. p. 159, New Guinea.

CRACIDÆ.

Mitua salvini, sp. n., J. Reinhardt, Vid. Medd. January, 1879 [sep.]; a white-bellied species, purchased at Bahia, and lately living in the Zoological Gardens at Copenhagen. Also *id.* and P. L. Sclater, in P. Z. S. 1879, p. 108.

Ortalis is the correct name for the genus hitherto known as *Ortalida*, the latter being, in fact, the accusative case of the former; H. T. Wharton, Ibis, 1879, p. 450.

OPISTHOCOMI.

OPISTHOCOMIDÆ.

Opisthocomus cristatus: on its anatomy and affinities; A. H. Garrod, P. Z. S. 1879, pp. 109–114.

GRALLÆ.

RALLIDÆ.

Aphanapteryx and *Erythromachus*: remains described and figured; A. Günther & E. Newton, Phil. Tr. clxviii. p. 431, pl. xliii.

Fuligula cristata and *F. atra* figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Gallinula franki, sp. n., H. Schlegel, Notes Leyden Mus. i. p. 163, New Guinea. *G. olivacea*, Meyen, of the Philippines is distinct from *Erythra ruficrissa*, Gould; T. Salvadori, Atti Acc. Tor. xiv. p. 943. *G. chloropus* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Megacrex inepta, g. & sp. nn., L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. pp. 129 & 130, Fly river, New Guinea.

Notornis mantelli: its rediscovery in New Zealand; A. von Pelzeln, Ibis, 1879, p. 376, & MT. orn. Ver. Wien, 1879, p. 56.

Pennula millii, g. & sp. nn., S. B. Dole, Hawaiian Annual, 1879, p. 54, Hawaii; a new genus with rudimentary wings, the native name for the bird, which is nearly extinct, being "Moho."

Porphyrio: remarks on the species composing this genus; T. Salvadori, Atti Acc. Tor. xiv. pp. 1165–1170. *P. ellioti*, sp. n., *id. tom. cit.* p. 1168, Admiralty Islands. *P. cæruleus* (Vandelli) is the proper scientific name for the Purple Water-Hen of South-western Europe; P. L. Sclater, Ibis, 1879, p. 195. *P. smaragdonotus* obtained for the third time in Norfolk; J. H. Gurney, jun., Zool. 1879, p. 458.

Porphyrula chloronotus, Blyth, = *Gallinula alleni*, Thomps., juv.; A. O. Hume, Str. Feath. vii. p. 456.

Porzana moluccana, Wall.: synonymy given, showing that *Amaurornis* is identical as a genus with, and has priority over *Erythra*; T. Salvadori, Atti Acc. Tor. xiv. p. 944.

Rallus: on a species denominated *R. gularis*, var. *aldabrana*, found in the Island of Aldabra [Comoro Islands, S.E. Africa]; A. Günther, Ann. N. H. (5) iii. pp. 164–168. *R. macquariensis*, sp. n., F. W. Hutton, Ibis, 1879, p. 454, Macquarie Island.

Zapornia watersi, sp. n., E. Bartlett, P. Z. S. 1879, p. 772, figured pl. lxi., S.E. Betsileo, Madagascar.

Parridæ.

Parra novæ-guin[e]æ, sp. n., E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 298, Port Moresby, New Guinea (distinguished from *P. gallinacea*, Temm.).

Scolopacidæ.

Machetes pugnax figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Scolopax rusticula, not *S. rusticola*, is the correct orthography; H. T. Wharton, Ibis, 1879, p. 453. *S. rusticula* in Belgium and N. Kanara, J. S. Laird (p. 470); and at Tanna, J. D. Inverarity (p. 525): Str. Feath. vii. *S. gallinula*: young in down described and figured; A. Marchand, R. Z. (3) vi. p. 310, pl. xiii.

Symphemia semipalmata: young in down described and figured; *id. tom. cit.* p. 310, pl. x.

Tringa sub-arquata. Obtained in New England; R. Deane, Bull. Nutt. Orn. Club, iv. p. 124. Supposed discovery of its eggs by L. Kumlien in North Greenland in 1878; T. M. Brewer, *tom. cit.* p. 190, & Ibis, 1879, p. 375; also L. Kumlien, Bull. U. S. Nat. Mus. No. 15, p. 87. Identification doubted, as the bird had never been found there; H. W. Feilden, Ibis, 1879, p. 486. [From O. Finsch's remarks in Reise n. W. Sibirien, p. 437, & Verh. z.-b. Wien, xxix. p. 251; it appears that his statement as to finding of the young (*cf.* Zool. Rec. xiv. *Aves*, p. 55) was an error, and the downy stage is consequently still unknown.]

Numenius borealis obtained in Aberdeenshire; G. Sim, Scot. Nat. 1879, p. 36.

Charadriidæ.

Ægialites hiaticula obtained in the Goorgaon District, India; A. O. Hume, Str. Feath. viii. pp. 197–201.

Charadrius fulvus obtained near Malaga; L. H. Irby, Ibis, 1879, p. 345.

Cursorius gallicus obtained in the Modenese; L. Picaglia, Ann. Soc. Mod. xiii. (2) p. 130.

Dromas ardeola: on its nidification; A. O. Hume, Str. Feath. viii. p. 381. [A letter here quoted from Capt. E. A. Butler shows that this species deposits its eggs in holes in the sandhills of the islands in the

Persian Gulf. The eggs (specimens of which have been sent to the Recorder) are pure white.]

Strepsilas interpres obtained for the first time in Lombardy; P. Pavesi, Rend. Ist. Lomb. (2) xii. fasc. 11–12.

Gruidæ.

Grus virgo figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Ciconiidæ.

Ciconia nigra: its breeding-places in Denmark; P. L. Sclater, Ibis, 1879, p. 118.

Megaloscelornis sivalensis, g. & sp. nn. (fossil), R. Lyddeker, Rec. Geol. Surv. Ind. xii. p. 56; allied to *Leptoptilus*, but larger.

Ardeidæ.

Ardea lansbergii, sp. n., H. Schlegel, Notes Leyden Mus. i. p. 113, Macassar, S. Celebes. *A. bubulcus* and *A. ralloides* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Botaurus lentiginosus figured; *id. op. cit.* pts. lxxiii. & lxxiv.

Nycticorax megacephalus: remains described and figured; A. Günther & E. Newton, Phil. Trans. clxviii. p. 435, pl. xli. fig. G. *N. griseus* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Phœnicopteridæ.

Phœnicopterus roseus figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

ANSERES.

Anatidæ.

Anas aberti, sp. n., R. Ridgway, P. U. S. Nat. Mus. i. p. 250, Mazatlan, Mexico. *A. wyvilliana*, Scl., female described; *id. l. c.* *A. boscas* is the correct orthography, and not *A. boschas*; H. T. Wharton, Ibis, 1879, p. 452.

Anser erythropus obtained near Seville; L. H. Irby, Ibis, 1879, p. 346. *A. segetum* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Buchephala islandica, remarks on; T. M. Brewer, Bull. Nutt. Orn. Club, iv. pp. 148–152.

Clangula glaucion, obtained in Sindh; S. Doig, Str. Feath. vii. p. 505, see also *tom. cit.* p. 464.

Mareca penelope obtained in North Carolina; De L. Berier, Bull. Nutt. Orn. Club, iv. p. 190.

Œdemia fusca obtained near Godthaab, Greenland, and now in Museum at Copenhagen; J. Reinhardt, Vid. Medd. Jan. 8th, 1879 [sep.]

Querquedula (*Pterocyanea*) *hartlaubi* figured; E. Oustalet, N. Arch.

Mus. (2) ii. pl. vi. *Q. angustirostris* (pp. 493 & 523) and *Q. falcata* (p. 494) obtained in the Calcutta Market; A. O. Hume, Str. Feath. vii. pt. 6 [March, 1879]. *Q. eatoni* figured; R. B. Sharpe, Phil. Trans. clxviii. pl. vi.

Somateria spectabilis: on the scapular feathers in this and some other species; J. Reinhardt, Vid. Medd. i. Jan. 8th, 1879 [sep.].

Laridæ.

See Moseley, H. N., for habits of those observed in 'Challenger' Expedition.

Larus affinis: on specimens from Lisbon, Leiden, Kamtchatka, and Macao; O. Finsch, Ibis, 1879, p. 111. *L. glaucescens* breeds in Cumberland Sound; L. Kumlien, Bull. U. S. Nat. Mus. No. 15, p. 98. *L. ridibundus*: on a breeding colony of about 2000, at Adelsdorf; H. Neumann, J. f. O. 1879, p. 194. *L. ridibundus* and *L. melanocephalus* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi. *L. innominatus*, sp. n., distinguished from *L. ichthyaetus*; A. O. Hume, Str. Feath. viii. p. 394, Gopalpore, Ganjam coast.

Rissa tridactyla, juv., figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Stercorarius parasiticus [? *S. crepidatus*]: W. L. Buller, Tr. N. Z. Inst. xi. pp. 355–359, remarks on a species of which four specimens have now been obtained in New Zealand. *S. antarcticus*: on its habits in confinement; *id. tom. cit.* p. 373. *S. antarcticus* and *S. catarrhactes*: heads figured; R. B. Sharpe, Phil. Trans. clxviii. pl. vii. figs. 1 & 2. *S. parasiticus* [*crepidatus*]: young in down described and figured; A. Marchand, R. Z. (3) vi. p. 311, pl. xii.

Rhynchops nigra in New England and Massachusetts; R. Deane, and also T. M. Brewer, Bull. Nutt. Orn. Club, iv. pp. 242 & 243.

Sterninæ: on the species visiting and breeding on the coast of New England; W. Brewster, Bull. Nutt. Orn. Club, iv. pp. 13–22. On the species observed in New Caledonia; E. L. Layard, Ibis, 1879, p. 364.

Sterna caspia, breeding on coast of Virginia; H. W. Henshaw, Bull. Nutt. Orn. Club, iv. p. 243. *S. media* figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Anous superciliosus (p. 463, Coast of Central America and Antilles), *A. plumbeigularis* (p. 468, Red Sea), *A. galapagensis* (p. 469, Galapagos Archipelago), spp. nn.; R. B. Sharpe, Phil. Trans. clxviii.

Procellariidæ.

See Moseley, H. N., for habits of species observed in 'Challenger' Expedition.

Fregatta mœstissima, sp. n., O. Salvin, P. Z. S. 1879, p. 130, Samoan Islands.

Prion banksi: on its specific value; W. L. Buller, Tr. N. Z. Inst. xi. p. 351.

Prion vittatus, *P. banksi*, *P. desolatus*: bills figured; R. B. Sharpe, Phil. Trans. clxviii. pl. vii.

Procellaria glacialis breeding at Foula, Shetland Islands; J. Garriock, Zool. 1879, p. 380, also H. W. Feilden, *tom. cit.* p. 422. *Fulmarus glacialis* obtained on the coast of New England; T. M. Brewer, Bull. Nutt. Orn. Club, iv. p. 64.

Puffinus carneipes: note on its breeding and eggs; E. P. Ramsay, P. Linn. Soc. N. S. W. iii. p. 406.

Pelecanidæ.

Pelecanus onocrotalus and *P. crispus* figured; H. E. Dresser, B. Eur. pts. lxxv. & lxxvi.

Phalacrocorax magellanicus obtained at Campbell Island; F. W. Hutton, Tr. N. Z. Inst. xi. p. 338. Appears to be *P. nychthemerus*, Cab.; *id.* P. Linn. Soc. N. S. W. iv. p. 356. Analysis of the subgenus *Leucocarbo*; id. ibid. *P. carunculatus*: remarks on this and allied species; *id. tom. cit.* pp. 332–337. *P. graculus* and *P. carbo* figured; H. E. Dresser, B. Eur. pts. lxxiii. & lxxiv.

Tachypetes [*Fregata*] *aquila* obtained off Halifax, Nova Scotia; R. Deane, Bull. Nutt. Orn. Club, iv. p. 64.

Podicipidæ.

Podiceps cristatus (pts. lxxiii. & lxxiv.), *P. auritus* and *P. nigricollis* (pts. lxxv. & lxxvi.) figured; H. E. Dresser, B. Eur.

ALCIDÆ.

See Bureau, L.

Alca impennis: notice of its remains in Caithness, with notes of its occurrence in Scotland, and of its early history; J. A. Smith, Pr. Soc. Antiq. Scot. xiii. pp. 76–105.

Alle nigricans: note on; E. Coues, Bull. Nutt. Orn. Club, iv. p. 244 [Link's generic name *Alle* antedates *Mergulus*, Vieillot, and *nigricans* is the tenable specific name].

Spheniscidæ.

See Moseley, H. W.

Eudyptes filholi, sp. n., F. W. Hutton, P. Linn. Soc. N. S. W. iii. p. 334, Campbell Island.

Eudyptes saltator, *E. chrysolophus*, *E. chrysocome*: heads figured; R. B. Sharpe, Phil. Trans. clxviii. pl. viii.

Eudyptula serresiana, sp. n., E. Oustalet, Ann. Sc. Nat. (6) Zool. viii. art. 4, Churraca, Tierra del Fuego.

Spheniscus humboldti: remarks on its habits and change of plumage; A. D. Bartlett, P. Z. S. 1879, pp. 6–8, with 2 woodcuts.

STRUTHIONES.

Struthionidæ.

Rhea albescens, sp. n., E. L. Arribalzaga & E. L. Holmberg, El Naturalista Argentino, i. [1878], pp, 1–4 (sep. copy), Carhué, on Buenos Aires frontier, many examples. The supposed albino var. of *R. americana*, ♂, mentioned in the "Zoology of the Beagle," iii. p. 121, note.

Rhea darwini: remarks on its nidification; J. Beerbohm, 'Wanderings in Patagonia,' pp. 50–52.

Casuariidæ.

Casuarius sclateri, sp. n., Southern New Guinea, distinguished from *C. beccarii*, Scl., Aru Islands; T. Salvadori, Ann. Mus. Genov. xii. p. 422 [omitted from Zool. Rec. xv.]. *C. beccarii* fully described with woodcuts of heads and wattles; L. M. D'Albertis & T. Salvadori, Ann. Mus. Genov. xiv. pp. 137–145. On 2 examples apparently of this species, in the Schoenbrunn Menagerie; A. von Pelzeln, Ibis, 1879, p. 377.

Dromæus sivalensis, sp. n. (fossil); R. Lydekker, Rec. Geol. Surv. Ind. xii. p. 54, Siwalik Hills, Western Punjab. [Described, and its position assigned, from 4 phalanges.]

ODONTORNITHES.

See Marsh, O. C., Owen. R., and Vogt, C.

REPTILIA.

BY

A. W. E. O'Shaughnessy.

PHYSIOLOGICAL, ANATOMICAL, AND GENERAL.

Reference must be made to the detailed reports and analyses of progressive physiological and anatomical literature published annually under the editorship of F. Hofmann & G. Schwalbe. For the literature of 1878, consult JB. Anat. Phys. xvii. Abth. i. Anatomie; Abth. ii. Entwicklungsgeschichte (mit Einschluss der Anatomie der wirbellosen Thiere).

Altmann, R. Ueber die Veränderungen der serösen Epithels am blossgelegten Frosch-mesenterium. Arch. mikr. Anat. xvi. pp. 111–116, 3 woodcuts.

Angelucci, R. Ricerche istologiche sull' epitelio retinico dei Vertebrati. Atti Acc. Linc. (3) ii. pp. 1031–1055, pls. i. & ii.

Balbiani, G. Leçons sur la Génération des Vertébrés. Recueillies par M. F. Henneguy. (Cours d'Embryologie Comparée du Collége de France, Semestre 1877–78). Paris: 1879, 8vo, 279 pp. 6 pls. 150 figs. in text.

Balfour, F. M. On the Early Development of the *Lacertilia*, together with some observations on the nature and relations of the Primitive Streak. Q. J. Micr. Sci. (n. s.) xix. pp. 421–430, pl. xix.

Blanchard, —. [See Jolyet.]

Braun, M. Bau und Entwickelung der Nebennieren bei Reptilien. Arb. Inst. Würzb. (2) v. pp. 1–30, pls. i. & ii.; also Zool. Anz. ii. pp. 238 & 239.

——. Ueber die Haftorgane an der Unterseite der Zehen bei *Anolis*. L. c. pp. 31–37, pl. iii.

Bridge, T. Pori Abdominales of Vertebrata. J. Anat. Phys. xiv. pp. 81–102.

Pori abdominales, peritoneal papillæ, and cloacal pits have not been detected in *Rana*, *Bufo*, *Triton*, *Proteus*, *Siren*, *Siredon*, or *Menobranchus*. They are described in *Chelonia* and *Crocodilia*.

Goette, A. Beiträge zur vergleichenden Morphologie des Skeletsystems der Wirbelthiere. II. Die Wirbelsäule und ihr Anhänge. Arch. mikr. Anat. xvi. pp. 117–142, pls. vii.–ix. [Continued from *op. cit.* xv. pp. 442–541, pls. xxviii.–xxxiii. See Zool. Rec. xv. *Pisces*, p. 2.]

The ribs of the *Urodela*, pp. 143–147, pl. ix.

——. Ueber Entwickelung und Regeneration des Gliedmassenskelets der Molche. Leipzig: 1879, 4to, 47 pp.

Hasse, C., & Born, G. Bemerkungen über die Morphologie der Rippen. Zool. Anz. ii. pp. 81–84.

Hoffmann, C. Beiträge zur vergleichenden Anatomie der Wirbelthiere. Niederl. Arch. Zool. v. pp. 19–114, pl. ii. figs. 1–4.

On cervical ribs in *Chelonia*; comparison of the atlas and epistropheus in *Chelonia*; comparative morphology of the shoulder-girdle and breast bone in Reptiles and other animals.

——. Over het voorkomen van Halsribben bij de Schildpadden. Versl. Ak. Amst. (2) xiv. pp. 52–78, pl.

——. Bijdrage tot de kennis der Morphologie van den Schoudergordel en het Borstbeen bij Reptilien, Vogels, Zoogdieren en den Mensch. Verh. Ak. Amst. xix. 69 pp. 7 pls.

Jolyet, F., & Blanchard, —. Sur les ligaments spéciaux de la moelle épinière des serpents. [An analysis.] J. de l'Anat. Phys. 1879, p. 528. [Soc. de Biol., Avril, 1879.]

—— & ——. Ueber das Vorkommen eigenthümlicher Bänder am Rückenmarke der Schlangen. Zool. Anz. ii. pp. 284–286.

Machate, J. Untersuchungen über den feineren Bau des Darm-canals von *Emys europæa*. Z. wiss. Zool. xxxii. pp. 443–459, pl. xxviii. figs. 1–4.

Mivart, St. G., & Clarke, R. On the Sacral Plexus and Sacral Vertebræ of Lizards and other *Vertebrata*. Tr. L. S. (2) i. pp. 513–522, pls. lxvi. & lxvii., 9 woodcuts. Abst. in J. L. S. xiii. p. 370.

Osborn, —. [See Scott.]

Parker, W. K. On the Development of the Skull and its Nerves in the Green Turtle (*Chelone midas*), with remarks on the segmentation seen in the skull of various types. Pr. R. Soc. xxviii. pp. 329–345.

Pouchet, G. Évolution et structure des noyaux des éléments du sang chez le Triton. J. de l'Anat. Phys. 1879, pp. 9–34, pl. iii. [*T. cristatus* and *alpestris*.]

LBE, G. Das Ganglion oculomotorii, ein Beitrag zur vergleichenden Anatomie der Kopfnerven. Jen. Z. Nat. xiii. pp. 173–268, pls. xii.–xiv.

The descriptive part relating to Reptiles, pp. 196–208.

Scott, W., & Osborn, H. On some points of the Early Development of the common Newt. Q. J. Micr. Sci. (n. s.) xix. pp. 449–472, pls. xx. & xxi.

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Todaro, F. Sulla struttura intima della pelle de' Rettili. Atti Acc. Linc. (3) ii. (Memorie) pp 1073–1128, 5 pls.

A. S. Packard, Jun., in his "Zoology for Students and General Readers" (New York: 1879, cr. 8vo), describes and figures the anatomy of *Rana helicina*, pp. 470–475, fig. 433; *Sceloporus undulatus*, pp. 493 & 494, fig. 440; *Eutænia sirtalis*, p. 498, fig. 441; and *Chrysemys picta*, pp. 506–509, figs. 445–447.

F. Knauer publishes remarks on the periodical sloughing of the skin in Reptiles and Batrachians, giving a table of its approximate dates and duration, as observed by himself in a number of different species during many years. Zool. Anz. ii. pp. 496–499.

The same author contributes a short paper on the colouring of Reptiles in its relation to the sexual instinct; *l. c.* pp. 253–255. Also on colour as a means of protection in European Reptiles; *l. c.* pp. 84–86.

R. Pirotte notices some cases of albinism in Reptiles; Atti Soc. Ital. xxi. pp. 448–451.

Albinism in Tadpoles; see *Batrachia*, Lataste, *infrà*, p. 15.

FAUNÆ.

Norway.

Notices of the Norwegian indigenous Reptiles; R. Collett, Vid. Selsk. Chr. (1878) 1879, No. 3, 12 pp.

Western Asia.

J. v. Bedriaga has compiled a very extensive Catalogue of the Reptilian fauna of Western Highland Asia. Bull. Mosc. liv. pt. 2, pp. 22–52.

Caucasus.

The zoological portion of Kessler's Voyage, published in Ges. Naturf. St. Petersburg, viii., is unfortunately, like the rest of the work, entirely in Russian. The *Reptilia* begin at p. 143. Among the *Lacertidæ* two species are described as new.

See also Schreiber, on *Reptilia* and *Amphibia*, in Schneider's "Naturwissenschaftliche Beiträge zur Kenntniss der Kaukasusländer" [Dresden: 1878], pp. 94–96.

Hungary.

Notices of the *Batrachia* will be found in Term. füzetek, 1878; and of the *Ophidia*, op. cit. 1879.

Cyprus.

A. Günther gives a list of Reptiles from Cyprus; P. Z. S. 1879, p. 74.

Italy.

E. de Betta has contributed some notes on the herpetology of Italy, in which eight species are treated of; Atti Ist. Venet. (5) iv. pp. 963–981. Also a supplementary series of notes; *id. op. cit.* (5) v. 41 pp.

Spain and Portugal.

E. Bosca gives an account of a herpetological excursion made in Spain, and enumerates all the Reptiles collected; An. Soc. Esp. viii. pp. 463–484.

A memoir professing to be a monograph of the *Reptilia* of Southern Portugal is published by O. Böttger, in Z. ges. Naturw. (2) iv. pp. 497–534. One new species of *Triton* is added. The number of Reptiles belonging to the fauna of Portugal, adding together those enumerated by Bosca and Böttger, is given as 39, viz., 22 *Reptilia* and 17 *Batrachia*.

Balearic Islands.

J. v. Bedriaga, pursuing his plan of devoting some time every year to studying the herpetological fauna of islands, has investigated that of the Balearic group. The results obtained, and the further considerations of the author relative to the interesting subject of the insular distribution of Lizards, are given in a very extensive memoir in Arch. f. Nat. xlv. pp. 243–339, pls. xvii. & xix. The various Lizards to which he has devoted lengthened descriptions in this paper, will be referred to below.

Madeira and Canary Islands.

In the seventh section of the paper referred to above, pp. 325–332, Bedriaga treats of the Lizard fauna of Madeira and the Canary Islands.

Western Africa.

Notes on Reptiles belonging to the Portuguese possessions in Western Africa; J. V. Barboza du Bocage, J. Sc. Lisb. 1879, pp. 85–96.

Some new Reptiles and Batrachians from Angola; *id. l. c.* pp. 97–99.

Comoro Islands.

A. Günther notices the Reptiles collected by Bewsher in Johanna, Comoro Islands. New to its fauna are: an *Eremias*, of which there is only one example, too young to be specifically determined; an undescribed Phyllodactyline Gecko, *Paroedura sancti-johannis*; *Typhlops pammeces* (Gthr.), hitherto known from Southern India only; and an undescribed Lycodont snake, *Lycodryas sancti-johannis*. Ann. N. H. (5) iii. pp. 217–219.

Madagascar.

O. Böttger has published two supplements to his monograph of the Reptiles of this country. Abh. Senck Ges. xi. [1878] pp. 269–282, pl., and *l. c.* 1879, pp. 457–497, pl. (also separately, Frankfurt: 1878, 4to, pp. 15, 1 pl., and 1879, pp. 41, 1 pl.). These two papers contain a large number of additional notices of species, and some new forms are described among the *Geckotidæ* and *Batrachia*. The total number of Madagascar Reptiles, with the exclusion of some doubtful ones, is now raised to 129.

Günther has described five new species of *Chamæleon* from Madagascar. Ann. N. H. (5) iv. p. 246, and P. Z. S. 1879, pp. 148–150.

Yunnan.

Anderson, J. Anatomical and Zoological Researches, comprising an account of the zoological results of the two expeditions to Western Yunnan in 1868 and 1875, &c. 1st. vol. text; 2nd vol. pls. London: 1878.

Reptilia: *Chelonia*, pp. 705–794; *Sauria*, pp. 795–807; *Ophidia*, pp. 808–834. *Batrachia*: pp. 837–860. *Reptilia*: pls. lv.–lxxviii.

General remarks on the characteristics of the Reptilian fauna of the district round Bhamô; Introduction, p. xxii.

The *Reptilia* obtained or observed during the two Yunnan expeditions are described in detail and figured in this large and important work.

India.

W. T. Blanford gives a list, with details and particular descriptions, of Reptiles collected by Major St. John, at Ajmere, in Rajputana. J. A. S. B. xlviii. pt. ii. pp. 119–127.

Also notes on a number of Reptiles from different parts of India, including one new Snake, *l. c.* pp. 127–132; and notes on Reptiles and Frogs from Ellore and Dumagudem, Godavari Valley, *l. c.* pp. 110–116.

New Guinea.

The *Reptilia* of New Guinea are further described by Sauvage, in Bull. Soc. Philom. (7) iii. pp. 47–61.

Günther notices a collection of Reptiles from islands in Torres Straits; Ann. N. H. (5) iii. pp. 84–87.

Philippine Islands.

Günther, in the list of Mammals, Reptiles, and Batrachians sent by Mr. Everett from the Philippine Islands, enumerates 1 Tortoise, 1 Crocodile, 20 Lizards, 18 Snakes, and 7 Frogs. Two of the Snakes are described as new. P. Z. S. 1879, pp. 74–79, pl. iv.

New Caledonia.

Sauvage has published notes on the *Geckotidæ* of New Caledonia; Bull. Soc. Philom. (7) iii. pp. 63–73.

America.

Cope, G. Eleventh Contribution to the Herpetology of Tropical America. P. Am. Phil. Soc. xviii. pp. 261–276.

Cope also contributes notices of the Reptilian fauna of Montana, describing a new *Bufo*; Am. Nat. xiii. pp. 435–439.

A. Dugès on the Crotaline Snakes of Mexico; *infrâ*, p. 13.

New *Batrachia Anura* from Central America. P. Brocchi, Bull. Soc. Philom. (7) iii. pp. 19–24.

CHELONIA.

Bronn, —. Klassen und Ordnungen des Thierreichs. Band vi. Abth. iii. pp. 1–76, pls. i.–xxiii. *Reptilia* by C. Hoffmann. *Chelonia*.

The last cervical vertebra in *Chelonia* is not opisthocœlian, and is united to the first dorsal only by a ligament, the zygapophyses forming the only solid means of articulation between these two bones; Vaillant, Bull. Soc. Philom. (7) iii. p. 239. A correction of a former conclusion; see Zool. Rec. xiv. *Rept.* p. 5.

Testudo elongata, Blyth, p. 706, *platynota*, Blyth (*T. elegans*, var., Gthr.), p. 712, described; Anderson, Yunnan, vol. i.

Geoemyda: generic characters discussed, p. 716, *G. depressa*, Anders., p. 721, pls. lv. lvi. & lxxv. *b*, figs. 1–5, described and figured; *id. op. cit.*

Emys trijuga, D. & B., var. *burmana*, described and figured; *id. l. c.* p. 723, pls. lvii. & lviii.

Batagur tricittata, D. & B., p. 730, pls. lxii. & lxiii., *duvaucellii*, D. & B., p. 739, *lineata*, Gray, p. 745, described; *B. iravadica*, sp. n., p. 705, pls. xliv. xlv. xlviii. & xlix., Irawady: *id. op. cit.*

Batagur (*Morenia*) *ocellata*, D. & B., p. 755, pls. lx. & lxi., *petersi*, Anders., p. 761, pl. lix.; *B.* (*Hardella*) *thurgi*, Gray, p. 764; *B.* (*Tetraonyx*) *baska*, Less., p. 771, pls. lxvi. & lxvii.: *id. op. cit.*

Emyda scutata, Pet., p. 779, pls. lxxiv. lxxv. & lxxv. *a*: *id. op. cit.*

Trionyx peguensis, Gray, p. 786, pls. lxx.–lxxiii., with particular remarks on the specimens of *Trionyx* collected by Theobald; *id. op. cit.*

RHYNCHOCEPHALIA.

Sphenodon punctatum. Further notes on the Tuatara Lizard; W. Buller, Tr. N. Z. Inst. xi. pp. 349–351.

SAURIA.

Amphisbænidæ.

In a paper (MB. Ak. Berl. 1879, pp. 273–277, plate) which deals with the characters and classification of the Amphisbænians, Peters describes and notices the following:—

Lepidosternon wuchereri, sp. n., p. 276, pl. fig. 1, Bahia.

Monopeltis sphenorrhynchus, sp. n. (*M. capensis*, Pet., *nec* Smith), p. 275, footnote.

Dalophis welwitschi, Gray, = *Phractogonus galeatus*, Hallow, p. 276, footnote.

Monopeltis (*Phractogonus*) *magnipartitus*, sp. n., p. 276, footnote, Gaboon.

Lepidosternon grayi, Smith, = *L. polystegum*, Dum., p. 276, footnote.

Figures of the head shields are given of *Lepidosternon octostegum*, Dum., *polystegum*, Dum., *Amphisbæna quadrifrons*, Peters, and *leucura*, D. & B.

Ophioproctus, g. n. Head oblong, muzzle rounded, rostral small, triangular, two large naso-frenals covering the muzzle as far as the eyes and descending to the end of the lip. Body slender, elongate, tail short, cylindrical, rounded at the end ; tegumentary compartments of the upper and lateral surfaces square or lengthened, those of the lower surface forming two median series much broader than long ; præ-anal plates very large, 2. Lateral grooves distinct. *O. liberiensis*, sp. n. Boulenger, Bull. Soc. Zool. iii. [1878] pp. 300–302, fig., Liberia.

Table of the genera of *Amphisbænina* ; id. *l. c.* p. 303.

Varanidæ.

Varanus lunatus. Specimens from Ajmere, in Rajputana, supposed to belong to this species, described ; the characters available for distinguishing *V. lunatus* and *V. dracæna* (*V. heraldicus*, Gray) discussed at length. Blanford, J. A. S. B. xlviii. pt. ii. pp. 120–123.

The same species also described from the Godávari valley ; *id. l. c.* p. 111.

Teiidæ.

Cnemidophorus maculatus, p. 95, pl. iv. figs. 1–6, *divisus*, p. 99, pl. v. figs. 1–6, spp. nn., Fischer, Verh. Ver. Hamb. (n. s.) iii., Colombia.

Neusticurus ecpleopus, Cope, noticed by the Recorder, Ann. N. H. (5) iv. p. 295.

Cercosauridæ.

Emphrassotis, g. n., for *E. simoterus*, sp. n. ; A. W. E. O'Shaughnessy, Ann. N. H. (5) iv. p. 296, Ecuador.

Ecpleopus (*Proctoporus*) *fraseri*, p. 296, *oculatus*, p. 297, spp. nn., *id. l. c.*, Ecuador.

Cercosaura (*Pantodactylus*) *vertebralis*, sp. n., *id. l. c.* p. 298, Ecuador.

Ecpleopus (*Oreosaurus*) *petersi*, sp. n., Böttger, JB. Offenb. Ver. xvii. & xviii. p. 9, pl. i. fig. 2, Pará.

Lacertidæ.

Lacerta. In the extensive memoir mentioned above (p. 4), J. v. Bedriaga describes at great length the following forms of this genus, giving complete details of the localities where the species and several varieties have been found, with especial reference to the subject of the distribution of Lizards in islands :—

L. muralis var. *gigliolii*, p. 247, pl. xvii. figs. 2, 4, & 5.
L. muralis var. *latastii*, p. 264.
L. muralis neapolitana, p. 274, pl. xviii. figs. 4 *a–d*.
L. muralis fusca, p. 288, pl. xvii. fig. 3, pl. xviii. figs. 8–13.
L. muralis var. *brueggemanni*, p. 304, pl. xvii. fig. 1.
Podarcis depressa, *judaica*, *Lacerta portschinskii* [infrà], *L. oxycephala*, and *Zootoca danfordi*, p. 306.
L. ocellata, Daud., p. 316, pl. xviii. figs. 1 & 7.
L. galloti, D. & B., p. 325, pl. xviii. figs. 5 *a* & *b*.
L. dugesi, M. Edw., p. 330, pl. xviii. figs. 3 *a* & *b*.

Lacerta muralis tiliguerta. De Betta remarks that the *tiliguerta* has been unanimously regarded as identical with *L. muralis*. Camerano, however, having recently reasserted its distinctness (Atti Acc. Tor. xiii.), the question is discussed in detail, and the conclusion arrived at that the *tiliguertæ* of Cetti, De Filippi, and Camerano are severally varieties only of *L. muralis*. Atti Ist. Venet. (5) iv. pp. 889–905.

Also on the varieties of *L. muralis*; id. *op. cit.* v.

Lacerta muralis. Bedriaga gives a summary of his views respecting the European varieties of this species in an article in Bull. Soc. Zool. iv. pp. 194–228. After defining the general characters which are common to all the forms, he divides the varieties or subspecies which he recognizes into four groups, and enumerates them systematically as follows, giving complete synonymy in chronological order and descriptions of each :—

Group I. Varieties: 1, *neapolitana*, Bedr. (*tiliguerta*, Cetti, De Filippi, &c.); 2, *faraglioniensis*, Bedr.; 3, *latastii*, Bedr.; 4, *filfolensis*, Bedr. (*Zootoca lilfordi*, Günth.); 5, *viridi-ocellata*, Bedr.

Group II. Varieties: 1, *fusca*, Bedr.; 2, *rasquineti*, Bedr. (*L. muralis* var. *fusca*, Bedr., Arch. f. Nat. 1879).

Group III. Variety: 1, *brueggemanni*, Bedr.

Group IV. Varieties: 1, *balearica*, Bedr. (*L. muralis* var. *fusca*, Bedr., Arch. f. Nat. 1878); 2, *gigliolii*, Bedr.; 3, *lilfordi*, Gthr.

Four additional varieties which the writer has not had the means of studying: 1, *melisellensis*, Braun; 2, *archipelagica*, Bedr. (after Erhard); 3, variety α of Erhard; 4, variety γ of Erhard.

Note on the colour variation of the Filfola lizard; Leith-Adams, Nature, xix. p. 53.

On the fact that *L. muralis* constantly presents dark varieties on islets adjoining small islands; Giglioli, *l. c.* p. 97.

Further condensed account of his researches on this subject, with list of the dark varieties at present known as inhabiting islets; Bedriaga, *l. c.* xx. p. 480.

Lacerta portschinskii, sp. n., Kessler, Transcaucasian Voyage, p. 160, pl. i.

Lacerta viridis. On spinal marrow and reproduction of tail in this species: Giuliana, Atti Acc. Linc. ii. pp. 1129–1142.

Lacerta ocellata. On tumours observed in three lizards of this species; R. Blanchard, Bull. Soc. Zool. iv. pp. 148–156, pl. viii.

Zootoca vivipara in Piedmont described; Lessona, Atti Acc. Tor. xvi. pp. 1135–1140.

Tropidosaura algira, L., described by J. v. Bedriaga, Arch. f. Nat. xlv. p. 332. Remarks by Collin de Plancy, Bull. Soc. Zool. iii. [1878] pp. 309–311.

Acanthodactylus. G. Boulenger has published a monograph on the species of this genus which inhabit the countries bordering upon the Mediterranean. He has found Schreiber's account of them in the "Erpetologia Europæa" unsatisfactory, and apparently based upon an insufficient series of examples. Having studied a very large series himself, he gives detailed and comparative descriptions, with revised synonymy of the various species under the following heads:—1, *A. boskianus*, Daud.; 2, *scutellatus*, Aud.; 3, *savignii*, D. & B., var. n. *schreiberi*, Boulenger; 4, *lineo-maculatus*, D. & B.; 5, *vulgaris*, D. & B. Bull. Soc. Zool. iii. [1878] pp. 179–197.

Acanthodactylus vulgaris, D. & B., described by J. v. Bedriaga, Arch. f. Nat. xlv. p. 335.

Eremias strauchi, sp. n., Kessler, Transcaucasian Voyage, p. 166, pl. ii.; also diagnosis given by Bedriaga, Bull. Mosc. liv. p. 32.

Podarces (*Eremias*) *intermedia*, Strauch: diagnosis given by Bedriaga, *l. c.* p. 33.

Mesalina pardalis, D. & B., *nec* Licht., = *guttulata*, Licht., according to Peters; Blanford, J. A. S. B. xlviii. pt. ii. p. 127.

Zonuridæ.

Platysaurus torquatus, sp. n., Peters, SB. nat. Fr. 1879, p. 10, Mozambique.

Gymnophthalmidæ.

Ablepharus rutilus, sp. n., Peters, SB. nat. Fr. 1879, p. 37, Pelew Islands.

Scincidæ.

Sauroscincus, g. n. Nostrils between three shields, the nasal, fronto-nasal, and first supra-labial; in other respects like *Euprepes*, with keeled dorsal scales and transparent lower eyelid. *G. braconnieri*, sp. n. Peters, SB. nat. Fr. 1879, p. 149, New Caledonia.

Eumeces punctatus. Two species are confounded in the synonymy of this lizard by Günther. *E. guentheri*, sp. n., Peters, SB. nat. Fr. 1879, p. 35.

Lygosoma (*Hinulia*) *sima* and *maindroni*, spp. nn., Sauvage, Bull. Soc. Philom. (7) iii. p. 54, New Guinea.

Elania annulata, sp. n., *id. l. c.* p. 59, New Guinea.

Lygosoma (*Mocoa*) *orichalceum*, Böttger, JB. Offenb. Ver. xvii. & xviii. p. 2, Australia.

Mocoa tetradactyla, sp. n., p. 300; *Lygosoma lacrymans*, Peters, = *M.*

mustelina, O'S., and note on *M. cuprea*, Gray, p. 301; A. W. E. O'Shaughnessy, Ann. N. H. (5) iv.

Mocoa exigua, sp. n., Anderson, Anat. &c., W. Yunnan, p. 797, Momein.

Anguis fragilis, L. Observations on the secondary sexual characters; Camerano, Atti Acc. Tor. xiv. pp. 1141–1143.

Enoplosaurus, g. n. Back with six series of strong spines, a double series of spines throughout the length of the tail; head continued immediately from body, covered above with distinct shields; in other respects like *Tribolonotus*. *E. insignis*, sp. n. Sauvage, Bull. Soc. Philom. (7) iii. p. 210, Manilla.

(*Tiliqua*) *Euprepes maculatus*. On the two well-marked varieties of this species; one characterized as var. *sub-unicolor*, and on the distinction between it and *E. carinatus*; Blanford, J. A. S. B. xlviii. pt. ii. p. 112.

Euprepes (*Tiliqua*) *guineensis*, sp. n., Peters, MB. Ak. Berl. 1879, p. 773, fig. 1, West Africa.

Euprepes notabilis, sp. n., *id.* SB. nat. Fr. 1879, p. 36, Chinchoxo.

Euprepes monticola, Gthr. The locality originally assigned to this lizard is incorrect; it really belongs to the fauna of the dry plains of Upper India, never having been found in Sikkim, and in consequence of its not being a mountain form, the name is changed to *E. guentheri*; Blanford, J. A. S. B. xlviii. pt. ii. pp. 123 & 124.

Euprepes ivensi, sp. n., Bocage, J. Sc. Lisb. 1879, p. 97, Angola.

Ophiomoridæ.

Zygnopsis [*Zygnopsis* olim] *brevipes*, Blanf. Description corrected, with further details of this rare lizard from two additional specimens. Blanford, *l. c.* p. 128.

Sepidæ.

Gongylus gastrostictus, sp. n., O'Shaughnessy, Ann. N. H. (5) iv. p. 301, Madagascar.

Acontias lineatus, sp. n., Peters, MB. Ak. Berl. 1879, p. 774, fig. 2, S. Africa.

Geckotidæ.

Parædura, g. n. Allied to *Œdura* and *Discodactylus*; differing from the former by its lepidosis, and from the latter by the scutellation of the toes. *P. sancti-johannis*, sp. n., Günther. Ann. N. H. (5) iii. p. 217, Johanna Island.

Ebenavia, g. n., for *E. inunguis*, sp. n., Böttger, Abh. Senck. Ges. xi. p. 276, pl. fig. 3 *a–g*, Nossi-Bé.

Phyllodactylus stumpfi, sp. n., Böttger, Abh. Senck. Ges. xi. p. 473, and Ber. Senck. Ges. 1878–79, p. 85, Madagascar.

Phyllodactylus doriæ, Lat., = *P. europæus*. Lataste, Bull. Soc. Zool. iv. p. 144, De Betta, Atti Ist. Venet. (5) v. [see Zool. Rec. xv. *Rept.* p. 9].

Hemidactylus tristis, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 49, New Guinea.

Hemidactylus triedrus (? *subtriedrus*), Stol. A specimen described from Ajmere; Blanford, J. A. S. B. xlviii. pt. ii. p. 124.

Hemidactylus (*Peripia*) *bavayi*, sp. n., Sauvage, *l. c.* p. 71, New Caledonia.

Uroplates ebenavi, sp. n., Böttger, Abh. Senck. Ges. xi. p. 273, pl. i. fig. 1 *a–d*, Nossi-Bé.

Platydactylus. The New Caledonian species of Bavay are noticed by Sauvage; *P.* (*Theconyx*), sp. n., indicated, p. 65; *Eurydactylus*, g. n., created for *P. vieillardi*, Bav., p. 70; Bull. Soc. Philom. (7) iii. pp. 66–71.

Chameleonurus trachycephalus, g. & sp. nn., Boulenger, Bull. Soc. Zool. iii. [1878] p. 68, pl. ii. = *Platydactylus chahoua*, Bavay, *id. op. cit.* iv. p. 140.

Gymnodactylus kotschii. De Betta thinks it probable that the *Stenodactylus guttatus* of Bibron & Bory, included by Schreiber in the synonymy of this species, is not *S. guttatus*, Cuv. He also throws great doubt on the occurrence of a second species of *Gymnodactylus* in Greece, and is still less inclined to credit its existence in Italy (Calabria) Atti Ist. Venet. (5) v.

Iguanidæ.

Anolis. On the organs for adhesion on the lower surface of the toes, see Braun, *suprà*, p. 1.

Tropidolepis intermedius, sp. n., Dugés, Nat. Mex. iv. p. 29, pl. i. figs. 21–32, Mexico.

Liocephalus (*Craniopeltis*) *variegatus*, p. 301, Cordova, *aculeatus*, p. 303, Moyobamba, spp. nn., O'Shaughnessy, Ann. N. H. (5) iv.

Agamidæ.

Draco major. A specimen described presenting differences which may be of specific value; Blanford, J. A. S. B. xlviii. pt. ii. p. 128.

Cophotis sumatrana, sp. n., Hubrecht, Notes Leyd. Mus. 1879, p. 243, note xlvi.

Oriocalotes kakhienensis, sp. n., Anderson, *l. c.* p. 806, pl. lxxvi. fig. 1, Yunnan.

Japalura yunnanensis, sp. n., *id. l. c.* p. 803, pl. lxxvi. fig. 2, Yunnan.

Agama agilis = *sanguinolenta*, Pallas, = *aralensis*, Licht. *A. agilis*, Ollivier, is a form nearly allied to *Trapelus ruderata*, according to Peters in a communication to Blanford; Blanford. *l. c.* p. 129. [This must apply to *A. agilis*, Blanf., and others, though as given it might be *A. agilis*, auct.—Rec.]

Chamæleontidæ.

Chamæleon malthe, p. 148, pl. xi., *brevicornis*, pl. xii. fig. A, *gularis*, p. 149, pl. xii. fig. B, *globifer*, pl. xiii.; Günther, P. Z. S. 1879, and *C. minor*, id. Ann. N. H. (5) iv. p. 246, pl. xiii., spp. nn., Madagascar.

OPHIDIA.

J. G. Fischer remarks upon the methods at present employed in drawing up the descriptions of Snakes, and upon the inconvenience attending the practice of including certain essential characters which are of immediate and primary importance in the determination of species in the general text of the description. He advises the adoption of a formula placed as a heading to the diagnosis, according to the plan so long in use among ichthyologists, and showing at a glance the chief numeral characters, indicated as follows :—

Sl.—Number of longitudinal rows of scales in the median line of the body.
O.—Number of ante- and post-oculars.
L.—Number of upper and lower labials (as a fraction).
T.—Number and series of temporal shields between the parietal and the labials.
V.—Number of ventral shields to anal exclusively.
A.—The single or (as a fraction) the double anal.
Sc.—Number of the single or (as a fraction) divided caudal shields.

These suggestions form the preface to a paper in which the writer has described a number of new species in conformity with the rules thus laid down. Verh. Ver. Hamb. (n. s.) iii. p. 76.

For Jolyet & Blanchard's investigations on the presence of special ligaments in the spinal marrow of Snakes (Soc. de Biol., April, 1879), see J. de l'Anat. Phys. 1879, p. 528 (analysis), and Zool. Anz. ii. 1879, pp. 284–286.

On vibrations in the tail of Snakes; C. Aldrich, Am. Nat. xiii. p. 712.

Typhlops bipartitus, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 60, New Guinea.

Typhlops ligatus, p. 775, fig. 3, and *curvirostris*, p. 776, fig. 3, Australia, *cuneirostris*, p. 775, fig. 4, Barawa, spp. nn., Peters, MB. Ak. Berl. 1879.

Eryx (*Rhoptrura*) *reinhardti*, Schleg., described and figured ; Fischer, Verh. Ver. Hamb. (n. s.) iii. p. 91, pl. iii.

Chondropython pulcher, Sauv., = *C. azureus*, Mey. ; observations on the genus, which is made to rank as a new tribe intermediate between *Boa* and *Python* : Boulenger, Bull. Soc. Zool. iv. p. 146.

Python curtus (Schleg., MS.), sp. n. (diagnosis only), Hubrecht, Notes Leyd. Mus. 1879, p. 244, note xlvi.

Python sebæ. The peritoneum accompanies and does not exceed the genital organs ; dissection of two adults. F. Lataste & R. Blanchard, Bull. Soc. Zool. iv. pp. 95–112.

Python molurus from Ajmere, Rajputana ; Blanford, J. A. S. B. xlviii. pt. ii. p. 127.

Liasis cornwallisius, p. 85, fig. 1, Cornwallis Island, Torres Straits, and *duceboracensis*, p. 86, fig. 2, Duke of York Island, Günther, Ann. N. H. (5) iii., spp. nn.

Atractocephalus, g. n. (Calamar.), for *A. raffrayi*, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 62, Ternate.

Typhlogeophis, g. n. (Calamar.), for *T. brevis*, sp. n., Günther, P. Z. S. 1879, p. 77, Philippine Islands.

Oxyorrhus, g. n., for *O. fusiformis*, sp. n., Fischer, Verh. Ver. Hamb. (n. s.) iii. p. 89, pl. ii. fig. 4, Boeroe Island.

Oligodon subgriseus? described ; Blanford, J. A. S. B. xlviii. pt. ii. p. 114.

Ablabes humberti, var. from Ellore, described ; *id. l. c.* p. 115.

Coronella bachmanni, sp. n., Weyenbergh, Period. Zool. Argent. ii. p. 193, Cordoba.

Elaphis yunnanensis, sp. n., Anderson, Yunnan, p. 813.

Cynophis helena from Ajmere; Blanford, J. A. S. B. xlviii. pt. ii. p. 125.

Zamenis diadema from Ajmere; *id. ibid.*

Zamenis fischeri, sp. n., Peters, MB. Ak. Berl. 1879, p. 777, Malindi.

Spilotes rhombifer, sp. n., *id. ibid.* New Granada.

Bellophis, g. n., (Colubr.), for *B. zonatus*, sp. n., Lockington, P. Cal. Ac. vii. p. 52, North California.

Tropidonotus quadriserialis, sp. n., Fischer, *l. c.* p. 82, pl. i. fig. 2, Mazatlan.

Calopisma septem-vittatum, sp. n., Fischer, *l. c.* p. 84, pl. i. fig. 3, Mexico.

Hypsirrhina maculata, sp. n., Blanford. *l. c.* p. 130, Pegu.

Dendrophis philippinensis, sp. n., Günther, P. Z. S. 1879, p. 78, pl. iv., Philippine Islands.

Leptognathus affinis, sp. n., Fischer, *l. c.* p. 78, pl. i. fig. 1, Colombia.

Ophites fasciatus, sp. n., Anderson, Yunnan, p. 827, pl. lxxviii., Ponsee.

Lycodryas, g. n. (Lycodont.), for *L. sancti-johannis*, sp. n., Günther, Ann. N. H. (5) iii. p. 218, Johanna Island.

Procinura, g. n., E. D. Cope, P. Am. Phil. Soc. xviii. p. 262. Dentition opisthoglyph ; form of *Elapomorphus*. Near *Scolecophis*, Cope, with caudal tubercular carination. *P. æmula*, sp. n., *id. ibid.*, Mexico.

Diemenia superciliosa, Fisch., figured and described from Victoria; death from its bite recorded: F. McCoy, Prodr. Zool. Vict. iii. pp. 11 & 12, pl. xxiii. figs. 1–1*f*. *D. microlepidota*, p. 12, pl. xxiii. figs. 2 & 3, Murray and Darling rivers, and *D. aspido*[*r*]*rhyncha*, p. 13, fig. 4, Victoria, spp. nn., *id. l. c.*

Naia anchietæ, sp. n., or ? *N. haje* var. *viridis*, Peters ; Bocage, J. Sc. Lisb. 1879, p. 98, Angola.

Pelias berus in Piedmont; Lessona, Atti Acc. Tor. xiv. p. 748.

On the Vipers of Spain, with *Vipera latastii*, sp. n. ; Bosca, An. Soc. Esp. viii. p. 67 ; Bull. Soc. Z. iii. [1878] p. 116, pl. iv.

Vipera ammodytes, Latr. On its geographical distribution in Italy ; De Betta, Atti Ist. Venet. (5) v. May, 1879 (29 pp.).

Vipera berus seoanii, subsp. n., Lataste, Bull. Soc. Zool. iv. p. 132, Spain.

Echis carinata in woods near Ellore ; Blanford, *l. c.* p. 116.

A. Dugés publishes materials for a monograph of the Crotaline snakes of Mexico in Nat. Mex. iv. pp. 1–29. He furnishes details and figures of the anatomy, and describes *Crotalus jimmezii*, sp. n., p. 23, pl. i. fig. 18.

Bothrops jararaca. Experimental observations on the poison of the Brazilian Fer-de-Lance ; Filho, Arch. Mus. R. Jan. ii. pp. 1–17. See also Couty & Lacerda, C. R. lxxxix. p. 372.

BATRACHIA.

F. Lataste, Actes Soc. L. Bord. (4) iii. p. 339, gives the following sketch of a partial classification of the *Batrachia* in a paper on *Discoglossus pictus* :—

Class: *Batrachia*.
Order: *Salientia* (vel *Ecaudata*).
Suborder 1: *Lævogyrinidæ* (vel *Procœlidæ*).
(The order in which the families *Ranidæ*, *Hylidæ*, *Bufonidæ*, *Hemisidæ*, and *Pelobatidæ* would be ranged, is indicated in a note.)
Suborder 2: *Mediogyrinidæ* (or *Opisthocalidæ*).
Tribe 1: *Opisthoglossa*.
Subtribe 1: *Ecostati*.
Family: *Asterophrydidæ*, Cope.
Subtribe 2: *Costati*.
Family 1: *Discoglossidæ* (genera, *Discoglossus*, Otth., and *Bombinator*, Merr.).
Family 2: *Alytidæ* (genera, *Alytes*, Wagl., and *Ammorycetis*, Lataste).
Tribe 2: *Aglossa*.

Knauer, F. Naturgeschichte der Lurche (Amphibiologie). Eine umfassendere Darlegung unserer Kenntnisse von dem anatomischen Bau, der Entwicklung und systematischen Eintheilung der Amphibien, sowie eine eingehende Schilderung des Lebens dieser Thiere. Wien: 1878, 8vo, 340 pp., 2 pls.

A general work on the structure, development, habits, &c., of the *Batrachia*.

Lataste, F. On attempts to produce hybridization in Batrachians, *Anura*, and *Urodela*. Bull. Soc. Zool. iii. [1878] pp. 315–328, pl. vii.

Löwe, L. Ueber eine eigenthümliche Art von Gelenknervenkörperchen beim Frosch. (Kleinere histologische Mittheilungen.) Arch. mikr. Anat. xvi. pp. 615–617, fig. 13.

Spengel, J. Ueber die Metamorphose der Amphibien. Verh. Ver. Hamb. iii. [1878] pp. 88–96.

On the action of light upon the irritability of the skin of the Frog; N. Wedensky, Bull. Petersb. xxv. p. 349; also Md. Biol. x. pp. 273 & 274.

On the effect of dry and moist heat on *Batrachia*. B. Lautenbach, Am. Nat. xiii. p. 395.

Note on the venomous character of the fluid secreted by the parotid glands of Batrachians. Sauvage, Bull. Soc. Acclim (3) vi. p. 607. See infrà, *Bufo icterieus*.

Some observations on the form of the pupil and the colour of the iris in certain *Batrachia*. Boulenger, Bull. Soc. Zool. iv. pp. 119–131.

In a paper "Division en familles naturelles des Batraciens Anoures d'Europe," F. Lataste gives a classification of the European *Anura*, followed by a list of the *Anura* and *Urodela* of France (the result of five years of research). The author then details a series of observations respecting the act of copulation in tailed Batrachians. Rev. Int. ii. [1878] pp. 488–499.

ANURA.

HÉRON-ROYER, —. Researches on the fecundity of tail-less Batrachians (*Alytes obstetricans*, *Hyla viridis*), and on the impregnation of the eggs of *Bufo vulgaris* in darkness. Bull. Soc. Zool. iii. [1878] pp. 278–285.

On the same subject, referring to *Rana temporaria*, *Bufo vulgaris*, *Pelobates fuscus*, *Pelodytes punctatus*, and *Rana oxyrrhina*; id. *l. c.* pp. 122–127.

——. On the utility of tail-less Batrachians as a means of combating the *Phylloxera*. Id. *l. c.* pp. 286–298.

KESSLER, K. Ueber einen Fall der Ueberwinterung von Kaulgnappen der *Rana esculenta*. Bull. Mosc. liv. pt. i. p. 207.

SOGOT, P. Recherches des plantes très-vénéneuses par l'essai sur les têtards des Batraciens. Paris: 1879, 8vo, 6 pp.

Héron-Royer has made experiments on the changes of colour in the tadpoles of tailless Batrachians, with a view to showing the effect produced by variations in the quality and amount of their food. Bull. Soc. Zool. iii. [1878] pp. 62–67.

On albinism in the tadpoles of tail-less Batrachians; Lataste, Bull. Soc. Zool. iii. [1878] pp. 46–52.

F. Lataste has proposed a division of the *Anura* into sub-orders, *Mediogyrinides* and *Lævogyrinides*, characterized by differences in the position of the spiraculum in the tadpole and in the form of the vertebræ in the adult. Rev. Int. ii. [1878] p. 488, and iii. p. 49; also C.R. lxxxviii. p. 984; and Actes Soc. L. Bord. (4) iii. p. 339. Vide *suprà*.

Rana temporaria. A study of the various species which have been confounded under this head, the characters given in a tabular synopsis, and 7 species fully described. *R. iberica*, p. 177, *latastii*, p. 180, *japonica* (*R. temporaria*, var. *japonica*, Gthr.), p. 190, spp. nn., Boulenger, Bull. Soc. Zool. iv. pp. 158–193.

On the tadpole of *Rana agilis*, with a note on the means of determining that of *Pelodytes punctatus*. Héron-Royer, Bull. Soc. Zool. iii. [1878] pp. 128–132, pl. iii.

Supplementary description of *Pelodytes punctatus*; id. *l. c.* p. 299. Further supplement on the egg and first embryonic period: *id. op. cit.* iv. pp. 229-239.

Rana mascareniensis, D. & B. Description of a frog from Egypt sup-

posed to be new; Lataste, Bull. Soc. Zool. iv. pp. 89–91. Determined as this species, and synonymy given; Boulenger, *l. c.* pp. 92–94.

Rana ornatissima, sp. n., Bocage, J. Sc. Lisb. 1879, p. 98, Angola.

Rana rugosa, Schleg., p. 868, *marmorata*, Hallow, p. 871, *sylvatica*, Lec., p. 876, described from specimens in the Museum of Turin; Camerano, Atti Acc. Tor. xiv.

Rana yunnanensis, sp. n., Anderson, Yunnan, p. 839, pl. lxxviii. fig. 2.

Ceratophrys cafferi, sp. n., Camerano, Atti Acc. Tor. xiv. Brazil.

Cystignathus microtis, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 265, Guanajuato.

Discoglossus. A study of this genus, describing in detail *D. pictus*, Otth., *sardus*, Tsch., and *scovazzii*, Camerano, and maintaining the distinctness of the two former species, the third being given as if for the first time [compare Zool. Rec. xv. *Rept.* p. 14], and also with a wrong reference, viz., tom. xiv. instead of xiii Camerano, Atti Acc. Tor. xiv. pp. 435–491, pl. figs. 1–8.

Discoglossus pictus, Otth. Lataste has made an exhaustive study of this species, with a view of fixing its position in the series. He analyses *D. sardus*, *pictus*, and *scovazzii* of Camerano, but does not recognize their distinctness. Actes Soc. L. Bord. (4) iii. pp. 275–341, pls. iii.–v.

Alytes cisternasii, sp. n., Bosca, An. Soc. Esp. viii. pp. 217–227, Spain. F. Lataste has further investigated this species, and created for it a new genus, *Ammorycetis*, which he compares with *Alytes*; he also characterizes the family *Alytidæ*. C. R. lxxxviii. pp. 983–985.

Alytes obstetricans boscai, subsp. n., Lataste, Rev. Int. iv. p. 543, Spain.

Scaphiopus. The species long known under the name *S. holbrooki* is the *S. solitarius*, Holbr. It would appear that another species, distinct from *S. solitarius*, has also been frequently confounded under the name of *S. holbrooki*; this is described as *S. dugesi*, sp. n. Brocchi, Bull. Soc. Philom. (7) iii. p. 23, Mexico.

Bombinator igneus. Further remarks on the so-called *B. pachypus*, Fitz.; Bedriaga, Zool. Anz. ii. pp. 664–668.

Dromoplectrus, g. n., for *Bufo anomalus*, Gthr.; Camerano, Atti Acc. Tor. xiv. p. 882.

Bufo mexicanus, sp. n., Brocchi, Bull. Soc. Philom. (7) iii. p. 23, Mexico.

Bufo japonicus, Schleg., p. 884, *intermedius*, Gthr., p. 887, *arenarum*, Hens., p. 891, described, and *occipitalis*, sp. n., p. 889, Mexico; Camerano, Atti Acc. Tor. xiv.

Remarks on the genus *Bufo*, with indication of *B. boulengeri*, sp. n.; Lataste, Rev. Int. iii. pp. 436–438.

Bufo monksiæ, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 263, Guanajuato.

Bufo dipternus, sp. n, Cope, Am. Nat. xiii. p. 437, Montana.

Bufo ictericus, Spix. Experiments on the venomous properties of the parotid humours of the Brazilian Toad. Lacerda Filho, Arch. Mus. R. Jan. iii. [1878] pp. 33–39.

Hylarana margariana, sp. n., Anderson, Yunnan, p. 846, pl. lxxviii. fig. 4.

Ixalus kakhienensis and *tuberculatus*, spp. nn., Anderson, *l. c.* p. 845, pl. lxxviii. figs. 6 & 7, Yunnan.

Polypedates dispar, sp. n., Böttger, Abh. Senck. Ges. xi. p. 488, and Ber. Senck. Ges. 1878–79, p 86, Madagascar.

Polypedates yunnanensis, sp. n., Anderson, Yunnan, p 843, pl. lxxviii. fig. 3.

Hylodes augusti (Dugés, MS.), p. 21, *lineatus*, p. 22, spp. nn., Brocchi, Bull. Soc. Philom. (7) iii., Mexico.

Note on a Frog (*Hylodes*) with eggs on its back; F. Müller, Nature, xix. p. 462.

Lithodytes latrans, sp. n., Cope, Am. Nat. xii. p. 186, South-west Texas.

Malachylodes, g. n. Like *Syrrhopus* and *Phyllobates*, but with a fronto-parietal fontanelle, as in *Liuperus*. Nasal bones wide, in contact on the middle line; no vomerine teeth; toes free, no tarsal spurs. *M. guttulatus*, sp. n., Cope, P. Am. Phil. Soc. xviii. p. 264, Guanajuato.

Hyla chinensis, Gthr., p. 894, and *japonica*, Schleg., p. 895, described; Camerano, Atti Acc. Tor. xiv.

Hyla pœnulata, sp. n., Brocchi, Bull. Soc. Philom. (7) iii. p. 21, Guatemala.

Exerodonta, g. n. Habit of *Hyla*; no vomerine teeth; sacral vertebræ with pallet-like dilatations; tympanum distinct; fingers almost free; toes webbed. *E. sumichrasti*, sp. n. Brocchi, Bull. Soc. Philom. (7) iii. p. 20, Tehuantepec.

Urodela.

Smith, W. The Tailed Amphibians, including the Cæcilians. Michigan: 1877.

A handbook or compendium.

Klein, E. Observations on the Glandular Epithelium and Division of Nuclei in the Skin of the Newt. Q. J. Micr. Sc. (n.s.) xix. pp. 404–420, pl. xviii.

Parker, W. K. On the Structure and Development of the Skull in the Urodelous Amphibia. Abstract in J. L. S. xiv. pp. 717–719. See also Stöhr, *anteà*, p. 3.

On the ribs of the *Urodela*, see Goette, *anteà*, p. 2.

Strasser, H. Zur Entwickelung der Extremitätenknorpel bei Salamandern und Tritonen. Morph. JB. v. pp. 240–315, pls. xvi.–xix.

Valaoritis, E. Ueber die Oogenesis beim Landsalamander (*S. maculata*). Zool. Anz. ii. pp. 597–599.

On copulation in the *Urodela*; Lataste, Rev. Int. ii. pp. 496–499.

Pelonectes, g. n. Like *Triton*, but without dorsal crest; cloaca of females somewhat conical, as in *Euproctis*. *P. boscai*, sp. n., Lataste, Rev. Int. iii. p. 275, and A. Tourneville, Bull. Soc. Zool. iv. pp. 69–87, pl. vii., Spain; Bosca, An. Soc. Esp. viii. pp. 87–89.

Pelonectes = *Triton palmatus*, Schm., in the opinion of both Peters and Böttger; Böttger, Z. ges. Naturw. (3) iv. pp. 516–521. In the earlier portion of the paper it is given as = *T. alpestris*. [M. Lataste has

strongly refuted this determination, but his new paper belongs to 1880.—Rec.]

Triton maltzani, sp. n., Böttger, Z. ges. Nat. (3) iv. p. 521, Portugal.

Euproctus. Description of a specimen with large parotides referred provisionally to *E. platycephalus*; general remarks on species of the genus, and adoption of the genus *Triturus*, Raf., with the following subgenera:—*Triturus*, *Euproctus*, *Pleurodeles*, *Tylotriton*. Boulenger, Bull. Soc. Zool. iii. [1878] pp. 304–308.

On *Euproctus montanus* and *rusconii* and *Molge platycephala*, Grav. [see Zool. Rec. xv. *Rept.* p. 15]: H. Giglioli, Nature, xix. p. 97; Bedriaga, Zool. Anz. ii. pp. 451–455; De Betta, Atti Ist. Venet. (5) v.

Pleurodeles waltli: J. Bedriaga, "Beiträge zur Kenntniss des Rippenmolches," Bull. Mosc. 1879, pp. 179–201 (woodcut); also *id.* Zool. Anz. ii. 1879, p. 94. On the costal spines or projections in this animal; Leydig, Arch. f. Nat. xlv. pp. 211–234, pls. xiv. & xv. On its skeleton; Wiedersheim, Zool. Anz. ii. 1879, p. 622.

Bradybates ventricosus, Fisch., = *Pleurodeles waltli*, Mich.; Lataste, Actes Soc. Linn. Bord. (4) iii. pp. 113–118, & Zool. Anz. ii. p. 307.

Pachytriton, g. n., for *Triton brevipes*, Sauvage; Boulenger, Bull. Soc. Zool. iii. [1878] p. 72.

Tylotriton verrucosus, Anders. Redescribed in detail and figured; the osteological characters are particularly dwelt upon. *Tylotriton* belongs to the Mecodont section of Strauch, but shows peculiarities which separate it from all others of that section. Anderson, Yunnan, p. 848, pl. lxxvi. fig. 6.

Salamandra atra. An account in English of Mdme. von Chauvin's experiment with respect to the development of this species [Zool. Rec. xiv. *Rept.* p. 13]; G. Bettany, Nature, xviii. p. 108.

Batrachuperus, g. n.: for *Salamandrella sinensis*, Sauvage; Boulenger, Bull. Soc. Zool. iii. [1878] p. 71.

Spelerpes (*Œdipus*) *parvipes*, from New Granada, *infuscatus*, from Hayti, spp. nn., Peters, MB. Ak. Berl. 1879, p. 778 [a writer in Am. Nat. xiv. p. 287, remarks that if the last locality be correct, it gives an entirely new distribution for the genus].

Amblystoma. On the eggs produced by *Amblystomæ* reared from Axolotls in the Muséum d'Hist. Nat.; L. Vaillant, C. R. lxxxix. pp. 108–110.

On the metamorphosis of *Siredon lichenoides*, Baird, into *Amblystoma mavortium*, Baird; H Hartmann, SB. nat. Fr. 1879, pp. 76–78.

A new species of *Siredon* is described, its anatomy and metamorphosis being treated at great length, by J. Velasco, in Nat. Mex. iv. pp. 209–233, pls. vii.–ix. See also M. Villada, *l. c.* p. 234. *S. tigrinus*, sp. n., Velasco, Mem. Soc. Mex. 1875, Mexico. Its distinctness from *Ambl. mavortium*, Bd., questioned by Cope, Am. Nat. xiii. p. 456.

R. Wiedersheim has given a detailed account of the anatomy of Axolotl before and after the metamorphosis into *Amblystoma*, which was established by the discovery of Weismann in 1875, applying to it the name of *Amblystoma weismanni*, which is characterized as a species; Z. wiss. Zool. xxxii. pp. 216–236, pls. xi. & xii.

RYDER, J. Morphological Notes on the Limbs of the *Amphiumidæ*, as indicating a possible synonymy of the supposed genera. P. Ac. Philad. 1879, pp. 14 & 15.

Amphiuma. Notes on anatomical structure by H. Chapman, P. Ac. Philad. 1879, pp. 144 & 145.

APODA.

PETERS has published (MB. Ak. Berl. 1879, pp. 924–943, pl.) the results of a study of the *Cæciliidæ*, giving a classification and synopsis, in which he recognizes ten generic divisions, seven of which are newly established. In two of these, *Gymnopis* and *Herpele*, the usual position of the orbit is covered over by the squamosal bone, the rudimental eye being thus enclosed in the fundus of the tentacular canal. He relies, amongst other characters, upon the form of the tentacle, which may be valve-shaped, globular at the extremity, or acute. He finds that the generic name *Rhinatrema* was proposed on an immature *Ichthyophis*.

Ichthyophis glutinosus, L., noticed and figured, p. 931, pl. figs. 1–3. *I. beddomii*, sp. n., p. 932, fig. 4, Nilgherries.

Gegenes, Gthr. (1875), altered to *Gegeneophis*, the former name being preoccupied in *Lepidoptera*, p. 932.

Uraeotyphlus, g. n., p. 933 : for *Cæcilia oxyura*, Dum., and *malabarica*, Bedd.

Cæcilia tentaculata, L., figured, fig. 5. *C. rostrata*, Gthr. (1859), cannot possibly belong to that species, which is known only from the Seychelles ; renamed *C. guentheri*, sp. n. The other species of *Cæcilia* noticed, pp. 934–936.

Hygeophis, g. n. : for *C. rostrata*, Cuv., and *seraphini*, Dum., p. 936.

Dermophis, g. n. : for *Siphonops mexicanus*, D. B. ; figured, fig. 6 ; *brevirostris*, Peters, *thomensis*, Bocage, *brasiliensis*, Lütk., *proximus*, Cope, and *simus*, Cope, p. 937.

Gymnopis multiplicata, Pet., figured, fig. 7.

Herpele, g. n. : for *C. squalostoma*, Stutchb., fig. 8, p. 939.

Chthonerpeton, g. n. : for *Siphonops indistinctus*, Rein. & Ltk., figs. 9 & 9 *e*, p. 940.

Siphonops annulatus, Mikan, figured, fig. 10.

Typhlonectes, g. n. : for *C. compressicauda*, D. B., fig. 11, *dorsalis*, Pet. *natans*, Fisch., and *Siphonops syntremus*, Cope, p. 940.

The figures illustrate the characters of the head and tentacle as above mentioned.

WIEDERSHEIM, R. Die Anatomie der Gymnophionen. Jena : 1879, 4to, 101 pp., 9 pls.

Remarks at considerable length on the above work have been made by Peters in SB. nat. Fr. 1879, pp. 150–159.

Wiedersheim also treats of the characters of the head in these animals, "Ueber den Kopf der Gymnophionen," Zool. Anz. ii. pp. 87–89, and supplement, *l. c.* pp. 158–160.

PISCES.

BY

A. W. E. O'Shaughnessy.

Anatomy and Physiology.

Reference must be made to the detailed reports and study of progressive anatomical and physiological literature published annually under the editorship of F. Hofmann & G. Schwalbe. For the literature of 1878, consult JB. Anat. Phys. xvii. Abth. 1, Anatomie; Abth. 2, Entwicklungsgeschichte (mit Einschluss der Anatomie der wirbellosen Thiere).

Bridge, T. Pori Abdominales of *Vertebrata*. J. Anat. Phys. xiv. pp. 81–102.

The condition of the peritoneal papillæ and cloacal pits described in the various families of the *Elasmobranchii*, in *Marsipobranchii*, *Holocephala*, *Ganoidei*, *Dipnoi*, *Teleostei* (*Salmonidæ*, *Muræniдæ*, and *Mormyridæ*).

Davidoff, M. Beiträge zur vergleichenden Anatomie der hinteren Gliedmasse der Fische. i. Morph. JB. v. pp. 450–520, pls. xxviii.–xxxi. & woodcut.

Dercum, F. The Lateral Sensory Apparatus of Fishes. P. Ac. Philad. 1879, pp. 152–154.

On the lateral line, which the writer proposes to call by the above name.

Gegenbaur, C. Zur Gliedmassenfrage. An die Untersuchungen von Davidoff's angeknüpfte Bemerkungen. Morph. JB. v. pp. 521–525.

Henneguy, F. Procédé technique pour l'étude des embryons des Poissons. Bull. Soc. Philom. (7) iii. pp. 75–77; and Ann. N. H. (5) iii. p. 240.

Hertwig, O. Ueber das Hautskelet der Fische. 2e Abth. Morph. JB. v. pp. 1–21, pls. i.–iii.

McKendrick, —. Observations of the Respiratory Movements of Fishes. (No. 1.) J. Anat. Phys. xiv. pp. 461–466, pl. xxviii.

MAREY, E. Nouvelles recherches sur les poissons électriques. (*Gymnotus* and *Torpedo*.) C. R. lxxxviii. pp. 318–321.

MARTENS, E. VON. Hermaphroditische Fische. Naturf. 1879, p. 116.
After Brock's researches. See p. 9.

RYDER, J. Note on the origin of bilateral symmetry and the numerous segments of the soft rays of Fishes. Am. Nat. xiii. pp. 41–43.

SCHWALBE, G. Das Ganglion oculomotorii, ein Beitrag zur vergleichenden Anatomie der Kopfnerven. Jen. Z. Nat. xiii. pp. 173–268, pls. xii.–xiv.
The descriptive part relating to Fishes, pp. 180–196.

SORENSEN, W. Sur l'appareil du son chez divers Poissons de l'Amérique du Sud. C. R. lxxxviii. pp. 1042 & 1043.

USSOW, M. Ueber den Bau der sogenannten augenähnlichen Flecken einiger Knockenfische. Bull. Soc. Mosc. liv. pt. 1, pp. 79–115, pls. i.–iv.
On the eyelike spots or accessory eyes possessed by a large number of Fishes, such as *Stomias*, *Chauliodus*, *Astronesthes*, *Gonostoma*, *Scopelus*, and *Maurolicus*.

Notes and observations on the warts and dermal excrescences on the head, trunk, and pectoral fins of various freshwater fishes in the spawning season—*Gobio fluviatilis*, *Chondrostoma nasus*, *Leuciscus rutilus*. B. SOLGER, "Ueber Perifische," Zool. Anz. ii. pp. 185–187, also SB. Ges. Halle, 14th Dec., 1878.

Additional observations on the fungus-disease affecting Salmon and other Fish; A. B. STIRLING, Pr. R. Soc. Edinb. 1878–1879, pp. 232–249.

Observations on Fishes in the Aquarium of the Zoological Garden at Hamburg. H. BOLAU, Verh. Ver. Hamb. (n.s.) iii. pp. 122–130. 1. On the copulation and propagation of species of the genus *Scyllium*. 2. On the eyes of Fishes observed in the dark, and on the changes which they undergo.

The habits of a number of different kinds of Fishes, Selachian and Teleostean, have been observed in the Aquaria of the station at Naples, and furnish the subject of an extensive contribution by R. SCHMIDTLEIN, MT. z. Stat. Neap. i. pp. 1–27 & 489–511.

DAY, on the Fishes of Weston-super-Mare. Remarks on the influence of temperature on the migration of Fishes. Comments on a number of Fishes enumerated, from observations in that and other localities. P. Z. S. 1879, pp. 742–766, pls. lxi. & lxii.

FAUNÆ.

MARTENS, E. VON. Die Fische der abflusslosen Centralbecken in Asien und Nord-America. Naturf. 1879, pp. 164 & 165.
Referring chiefly to Kessler's accounts of Prejewalski's expedition.

Europe.

R. Collett has published observations on deep-sea Fishes of 10 species collected in the North Sea Expeditions in 1876 and 1877, one *Lycodes* being described as new. Forh. Selsk. Chr. 1878, No. 4.

A more extensive collection was made in the southerly portions of the North Sea, visited in the summer of 1878, and is described in a Preliminary Report; *id. l. c.* No. 14, 106 pp. It yields several new species. A larger general report, written in English, will be published in the autumn of 1880, large folio, with large plates.

The same author gives farther descriptions of a large number of Norwegian Fishes, *op. cit.* 1879, No. 1, 107 pp. 1 pl. This is a first supplement to his "Norges Fiske," and contains all additional observations made between 1875 and 1878.

Houghton, W. British Freshwater Fishes. Illustrated with a coloured figure of each species, drawn from nature, by F. Lydon, and numerous engravings. London, Edinburgh, and Dublin: 2 vols. large 4to, 204 pp.

A work on the plan of Morris's British Birds, intended to supply amateur or ornamental purposes.

Fitzinger, L. Bericht über die gepflogenen Erhebungen bezüglich der in den beiden Seen Nieder-österreichs, dem Erlaph- und dem Lunzer-See vorkommenden Fischarten. SB. Ak. Wien, lxxviii. Abth. 1, pp. 596–602.

L. Häpke contributes a second paper on the Fish and Fisheries of the Wieser, giving further notices of the Fishes found in its waters. Abh. Ver Brem. vi. pp. 577–616. [See Zool. Rec. xiv. *Pisces*, p. 3.]

Materials for the Venetian fauna: A. Ninni, Atti Acc. Venet. (5) iv. pp. 1043, 1058, 1191. See infrà, *Callionymus*, *Zeus*, and *Gadus*.

Africa.

Dambeck, C. Die Verbreitung der Süss- und Brackwasser-Fische in Africa. Jen. Z. Nat. xiii. pp. 404–456.

A very elaborate memoir on the distribution of African Fishes. [See Zool. Rec. *Pisces*, p 5.]

On the ichthyology of the Ogowé; Sauvage, Bull. Soc. Philom. (7) iii. pp. 90–103.

Mauritius.

A contribution to the ichthyological fauna of Mauritius, by Bleeker, adds 14 species to that fauna, and affords some revisions, and a suppo ed new species. A complete list of Mauritian Fish is also given. Verh. Ak. Amst. xviii. 23 pp. 3 pls.

Asia.

Kessler, K. Beiträge zur Ichthyologie von Central-Asien. Bull. Pétersb. xxv. pp. 282–310, and Mél. Biol. x. pp. 233–272.

An extensive memoir in which the materials afforded by the collections

of Poljakow, Potanin, and Prejewalski are described, many new species being characterized. Poljakow's collection was made in the Balkash region, including Syssykkul and Alakul and the rivers flowing into those lakes. This collection, though rich in individual specimens, yielded few species which had not been obtained by Dr. Schrenck forty years previously in the same waters, viz., only two forms of *Phoxinus*, one of which must be regarded as a mere variety. A list of the 10 species hitherto received from Lake Balkash, Syssykkul, and Alakul is given on p. 287. Prejewalski also brought two new species of *Cobitidinæ* from the Balkash district, but the main part of the collections made during his second expedition is from Lob-Nor, the Lower Tarim and northern tributaries of the Tarim, the Greater and Lesser Juldus, and Balgantaigol rivers. They consist of 11 species, 8 true Cyprinoids and 3 *Cobitidinæ*, mostly new. This second expedition was begun in the autumn of 1876, the winter months being passed in the Lob-Nor district, and the return to Kuldja effected in the spring of 1877. The third collection, that of Potanin, was made principally in the steppe-region on the southern side of the Altai range; it comprised but few specimens, obtained under circumstances of considerable difficulty.

A short notice of fishes of the Tuapse river, Caucasus, mostly similar to those of S.E. Europe, and especially the Crimea; K. Kessler, Bull. Mosc. liv. pt. i. pp. 424–428.

Day, F. Geographical Distribution of Indian Freshwater Fishes. Pt. iii. (Conclusion). J. L. S. xiv. pp. 534–579.

Anderson, J. Zoological and Anatomical Researches in Yunnan. See *Reptilia*, p. 5.

The part devoted to Ichthyology occupies pp. 863–869.

Descriptions of new or little known Chinese Fish by Bleeker are published, bringing the ichthyological fauna of China to the number of 1030; Verh. Ak. Amst. xviii. pp. 17, 2 pls.

Bleeker has also enumerated the known Fishes of Japan (516) and added 3 supposed new ones; *l. c.* 31 pp. 3 pls.

Some contributions to the Ichthyology of Japan; Hilgendorf, SB. nat. Fr. 1879, pp. 78–81 & 105–111.

Sumatra.

D. Vinciguerra publishes his determinations of the fishes collected by O. Beccari in Sumatra in 1878, 57 specimens of 12 species, all known and with the exception of two, already recorded from Sumatra. Ann. Mus. Genov. xiv. pp. 384–397.

Australia.

On a new Ganoid Fish from Queensland; Castelnau, p. 164, pl. xix.A: On a species of *Amphisile* from the Palau Islands; W. Macleay, p. 165, pl. xix. B: On the *Plagiostomata* of the Pacific; N. de Miklucho-Maclay & W. Macleay, pp. 306–333, pls. xxii.–xxvi., Pt. i., the *Cestraciontidæ*: Essay on the Ichthyology of Port Jackson; Castelnau, pp. 347–401. P. Linn. Soc. N. S. W. iii. In the first of these papers

Castelnau founds a new genus, and probably a new family, on a specimen of Ganoid fish allied to *Atractosteus which had been eaten for breakfast by a Mr. Staiger, and all the characters of which are gathered from a drawing made after and not before the repast.* He designates it, "in the present state of our knowledge of this fish, by the mysterious historical name of *Ompax*." In the present state of our knowledge, the Recorder thinks he would be scarcely justified in admitting *Ompax spatuloides*, sp. n., into the system.

In a paper on the *Clupeidæ* of Australia, W. Macleay enumerates and notices all the species which he has been able to observe or which rest on the authority of Castelnau. He gives his views as to the identification of these species, for which the paper may be consulted, and describes one new species. P. Linn. Soc. N. S. W. iv. pp. 363–384.

Additions to the fauna of Southern Australia by STEINDACHNER, Denk. Ak. Berl. xli. Abth. i. pp. 1–15, pls. ix., New Zealand.

New Zealand.

THOMSON, P. Concluding notes on the Dunedin Fish supply. Tr. N. Z. Inst. xi. pp. 380–386.

Polynesia.

On the Polynesian *Scaridæ*. STEINDACHNER, in the above-cited memoir, Denk. Ak. Wien, xli. Abth. i. pp. 16–20.

W. MACLEAY mentions some fishes from the Solomon Islands, and describes a *Mesoprion*. P. Linn. Soc. N. S. W. iv. pp. 60–64.

The *Cestraciontidæ* of the Pacific. See *infrà*, p. 8, CHONDROPTERYGII.

North America.

Report of U. S. Commission of Fish and Fisheries, v., for 1877. Washington: 1879, large 8vo, 981 pp. Consists of, A., Inquiry into the decrease of food-fishes. B. The propagation of the food-fishes in the waters of the United States. Some of the sections which are of Ichthyological interest will be referred to below.

JEFFERSON, J. On the mortality of Fishes in the Gulf of Mexico. P. U. S. Nat. Mus. i. pp. 363 & 364.

——, PORTER, J., & MOORE, T. On the Destruction of Fish in the vicinity of the Tortugas during September and October, 1878. *L. c.* pp. 244–246.

JORDAN, in Notes on a Collection from Clackamas River, Oregon, describes in full several species of *Salmonidæ* and *Cyprinidæ* which were imperfectly known. P. U. S. Nat. Mus. i. pp. 69–85.

JORDAN, —, & GILBERT, —. A Synopsis of the Fishes of Beaufort Harbour, North Carolina. P. U. S. Nat. Mus. i. pp. 365–388.

Notices of 50 species of East Coast Fishes; a brief summary of recent coast investigations of the U. S. Fish Commission. Some species are not yet identified. Descriptions of the new species are in many cases with-

held also, but will appear later. G. B. Goode & T. H. Bean, Am. J. Sci. (3) xvii. pp. 39–48.

Goode & Bean have also compiled a List of the Fishes of Essex County, including those of Massachusetts Bay, according to the latest results of the work of the U. S. Fish Commission. Bull. Essex Inst. xi. 38 pp.

Gill, T. Synopsis of the Pediculate Fishes of the Eastern Coast of Extra-tropical North America. P. U. S. Nat. Mus. i. pp. 215–221.

Followed by short Notes on the *Antennariidæ*. L. c. pp. 221 & 222.

Fishes of Montana are noticed by Cope, Am. Nat. xiii. pp. 439–441. Also briefly, Fishes of Klamath Lake, Oregon. *Id. l. c.* p. 784.

A series of notes on a number of Fishes observed in the markets of San Francisco is published by W. Lockington in Am. Nat. xiii. pp. 299–308.

South America.

Steindachner has made extensive contributions to the La Plata, Amazon, and other South American River Fish Faunas in the memoir already referred to. Denk. Ak. Wien, xli. Abth. i. pp. 20–50, part of the plates.

Steindachner has produced an extensive monograph on the Fish Fauna of the Magdalena river, which appears to have been unworked scientifically since the publication of Humboldt's "Recueil d'Observations," &c., in 1811 & 1833. In 1876 & 1877 a collection of 200 fishes was received by the author, and furnished the materials for the present memoir. They were referable to 45 species, of which 30 are exclusively freshwater forms, the remaining 15 being marine and procured from the brackish waters of the Cienaga at the mouth of the Magdalena. Denk. Ak Wien, xxxix. pp. 19–78, pls. i.–xv.

In another memoir the same author gives accounts of several collections of freshwater fishes from the following South American localities:

1. From the Orinoco at Ciudad Bolivar.
2. From the river Mamoni, near Chepo, a tributary of the Bayano, which falls into that river only fifteen miles from its mouth.
3. From Peru; the collection of Stolzmann.

Denk. Ak. Wien, xli. Abth. 1, pp. 151–172.

The late C. Sachs, in his work "Aus den Llanos" (Leipzig: 1879, 8vo, pp. 369, pls.), refers to various fresh-water fishes of the Orinoco and its tributaries, of which such as were new were described by Peters in SB. Berl. Ak. 1877. He figures the 'Caribe' fish, *Serrasalmo irritans*, Pet., p. 147, *Gymnotus electricus*, p. 149, *Chætostomus nigrilineatus*, Pet., p. 227, and *Stenarchus sachsi*, Pet., p. 279. One of the author's chief objects in visiting Venezuela was to study the *Gymnotus* in its natural haunts. See *Gymnotidæ*.

Kerguelen.

The few fishes observed by T. Studer in Kerguelen Island are enumerated in Arch. f. Nat. xlv. p. 130.

PALÆICHTHYES.

Blanchard, R. Mittheilungen über den Bau und die Entwicklung der sogenannten fingerförmigen Drüse bei den Knorpelfischen. MT. Embryol. Inst. Schenk, iii. pp. 179–192. [See Zool. Rec. xv. *Pisces*, p. 1.]

Hasse, C. Ueber den Bau und über die Entwickelung des Knorpels bei den Elasmobranchiern. Zool. Anz. ii. pp. 325–329, 351–355, & 371–374.

Lankester, E. R. On the Hearts of *Ceratodus*, *Protopterus*, and *Chimæra*, with an account of the undescribed Pocket Valves in the Conus arteriosus of *Ceratodus* and of *Protopterus*. Tr. Z. S. x. pp. 493–506, pls. lxxxiii. & lxxxiv.

Metschnikoff, O. Zur Morphologie des Becken- und Schulterbogens der Knorpelfische. Z. wiss. Zool. xxxiii. pp. 423–438, pl. xxiv.

Mivart, St. G. Notes on the Fins of Elasmobranchs, with considerations on the nature and homologues of vertebrate limbs. Tr. Z. S. x. pp. 439–484, pls. lxxiv.–lxxix.

Parker, W. K. On the Structure and Development of the Skull in Sharks and Skates. Tr. Z. S. x. pp. 189–234, pls. xxiv.–xlii.

For summary see P. Z. S. 1876, p. 699.

Pawlow, H. A Study of the Teeth in the Sterlet. Arb. Petersb. Ges. No. 9, pp. 494–508.

Salensky, W. The Developmental History of *Acipenser ruthenus*. I. The Embryonal Stage. Arb. Ges. Kasan, vii. pt. 3, 226 pp. 9 pls. [See Zool. Rec. xv. *Pisces*, p. 10.]

Solger, B. Neue Untersuchungen zur Anatomie der Seitenorgane der Fische. I. Die Seitenorgane von *Chimæra*. Arch. mikr. Anat. xvii. pp. 95–113.

The "Pori abdominales in some Sharks," viz., *Scyllium*, *Lamna*, and *Carcharias*, have been further studied by W. Turner, J. Anat. Phys. xiv. pp. 101 & 102.

GANOIDEI.

Lepidosteus osseus. Development of the Garpike; Wright, Nature, xix. p. 101.

Amia. Notes on the development of *Amia* (abstract). A short paper consisting of partial descriptions of specimens from 20 to 30 mm. long. P. Am. Ass. (1878) 1879, pp. 296–298.

Ompax, fam., g., & sp. nn., see *antea*, p. 5.

CHONDROPTERYGII.

Cutlirrhynchus. Several species besides the one mentioned by Hutton are found in New Zealand seas. *C. dasycaudatus*, sp. n., W. Colenso, Tr. N. Z. Inst. xi. pp. 298–300, pl. xvii.

Selache maxima. On the structure of the comb-like branchial appendages and of the teeth of the Basking Shark. W. Turner, J. Anat. Phys. xiv. pp. 273–286, pl. xii. [See Zool. Rec. xiv. *Pisces*, p. 8, & xv. *Pisces*, p. 12.]

A critical study of the statements made by Fabricius in the "Fauna Grœlandica," and in his posthumous MS. papers, shows that the introduction of *Selache maxima* into the Greenland fauna was only founded upon arbitrary interpretations of fabulous stories by the Eskimo. It must, therefore, be erased from that fauna. Only a single specimen is recorded as captured in Iceland during the last half-century. Lütken, Vid. Medd. 1879–80, pp. 62-64.

Carcharias (*Eulamia*) *nicaraguensis*, Gill. The figure left by the late S. Örsted, who observed this fresh-water shark, lately so designated by Bl, in the river St. Juan de Nicaragua, is reproduced as a woodcut, by itken, Vid. Medd. 1879-80, pp. 65–68.

Læmargus rejected in favour of *Somniosus*, the first name being preoccupied by Krφyer in *Crustacea*. The propagation of *S. microcephalus*, the Greenland Shark, or "Haakal," must be different from that of all other Selachians. While *S. rostratus* and *Scymnus lichia* are known to be viviparous in the ordinary way, this mode of parturition is entirely unknown in *S. microcephalus*. No fœtus of it exists in any museum, nor has ever been described; it is unknown also to the Eskimo residents and shark-hunters in Greenland, Iceland, Faroë, or Danish Greenland. Fabricius's statement "est vivipara" must, therefore, be entirely rejected. No egg enclosed in a corneous egg-case, like that of *Scyllium*, *Raia*, &c., has been found in the abdomen of a "Haakal"; but only a large number of great, soft, globular eggs without any hard shell. It might have been supposed, from the earlier accounts of the anatomy of this shark, that these eggs were dropped into the abdomen, carried outwards through pori abdominales, and fecundated after deposition, but the discovery of the oviducts now leaves it questionable whether fecundation takes place outside or inside the body. Indubitably, however, the eggs are deposited without any solid covering in the soft mud at the bottom of the deep sea, and this fact agrees with the apparent want of any uterine dilatation, shell-secreting glands, &c., in the oviducts of the great northern shark. Lütken, Vid. Medd. 1879–80, pp. 56–61.

Cestracion. Under the heading, "Plagiostomata of the Pacific, Part I.," Miklucho-Maclay & W. Macleay have redescribed and figured the following species of this genus, for which they prefer using the name *Heterodontus*, Bl.: *H. philippii*, p. 309, *galeatus*, Gthr., p. 313, *francisci*, Gir., p. 315, *quoyi*, Frém., p. 316. "Anatomical remarks" are appended to these notices: on the dentition of young and adult *Cestracion philippii*,

pp. 320–323; on that of *C. galeatus*, pp. 323–326; of *C. francisci*, p. 326; on the external genital organs of the male *C. philippii*, p. 327. P. Linn. Soc. N. S. W. iii. pp. 306–334.

Raia batis, L. *Propterygia hyposticta*, Otto (1820), and *Raia alata*, Reinh. (1825), are both monstrosities of *R. batis*. The original hitherto unpublished figure of *R. alata* reproduced as a woodcut, side by side with Otto's. An analogous stage in the development of *Torpedo* was described by Leuckart, but can scarcely be regarded as normal when compared with what is otherwise known as to the evolution of *Raia* and *Torpedo*. Lütken, Vid. Medd. 1879–80, pp. 45–55.

Raia hyperborea, sp. n., Collett, Forh. Selsk. Chr. 1878 (1879), No. 4, p. 7, Spitzbergen.

Tæniura magdalenæ, Dum., described; not identical with *Trygon hystrix*. Steindachner, Denk. Ak. Wien, xxxix. p. 72, pl. xv.

Cephaloptera rochebruni, sp. n., Vaillant, Bull. Soc. Philom. (7) iii. p. 187, Senegal.

TELEOSTEI.

Bellonci, G. Ricerche intorno all' intima tessitura del Cervello [illegible] *Teleostei*. Atti Acc. Rom. (3) Mem. Sci. Fis. iii. pp. 258–270, pl. i.–vi.

Researches into the internal structure of the brain of Teleosteous fishes prosecuted in the Laboratory of the University of Bologna.

Brock, J. Beiträge zur Anatomie und Histologie der Geschlechtsorgane der Knochenfische. Morph. JB. iv. pp. 505–572.

Carlet, G. Sur les écailles des Poissons osseux. CR. lxxxviii. p. 396.

Goette, A. Beiträge zur vergleichenden Morphologie des Skeletsystems der Wirbelthiere. II. Die Wirbelsäule und ihre Anhänge. 5. Die Teleostier. Arch. mikr. Anat. xvi. pp. 117–142, pls. vii.–ix.

Klein, —. Beiträge zur Osteologie des Schädels der Knochenfische. JH. Ver. f. vaterl. Naturk. xxxv. pp. 66–126, 1 pl.

New points in relation to the lymphatic system of Teleosteous fishes. Also contribution to the study of the lymphatic system of *Teleostei*. Part i. On the lymphatic system in *Lophius piscatorius*. F. Trois, Atti Ist. Venet. (5) iv. [1878] pp. 579 & 765–780, pls. ix.–xii.

ACANTHOPTERYGII.

Percidæ.

Perca flavescens. Note by G. B. Goode, P. U. S. Nat. Mus. i. p. 243.

Megaperca, g. n. Differing from *Percalabrax* in having D. 12, Vert. $\frac{16}{19}$; from *Trachypoma* in having a double dorsal. *M. ischinagi*, sp. n., Hilgendorf, SB. nat. Fr. 1878, p. 155, Japan.

Anthias margaritaceus and *berycoides*, spp. nn., *id. l. c.* pp. 78 & 79, Japan.

Neoanthias guentheri, g. & sp. nn., Castelnau, P. Linn. Soc. N. S. W. iii. p. 366.

Epinephelus playfairi, Blkr. A fish from Mauritius supposed to be *Serranus sonnerati*, Playf., is described under this name. Bleeker, Verh. Ak. Amst. xviii. p. 2.

Epinephelus drummond-hayi, sp. n., Goode & Bean, P. U. S. Nat. Mus. i. p. 173, Bermudas and Florida.

Epinephelus nigrita, Holbr. Note on this species ; *iid. l. c.* p. 182.

Lutjanus blackfordi, the Red Snapper of the Southern Atlantic, and *L. stearnesi*, spp. nn., Goode & Bean, Am. J. Sci. (3) xvii. p. 45, and P. U. S. Nat. Mus. i. p. 176, Florida, Gulf Coasts.

Mesoprion aureo-vittatus, sp. n., Macleay, P. Linn. Soc. N. S. W. iv. p. 61, Solomon Islands.

Priacanthus schlegeli and *supra-armatus*, spp. nn., Hilgendorf, SB. nat. Fr. 1879, p. 79, Japan.

Therapon unicolor, Gthr. Note on specimens found in a dam near Warialda, ova supposed to have been conveyed by birds; Macleay, P. Linn. Soc. N. S. W. iii. p. 15.

Pristipoma andrei, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 204, Rio Guayas, Ecuador.

Pristipoma branickii, sp. n., *leuciscus*, Gth., var. n. from S. America, pl. ix. figs. 1 & 2, and other species described ; Steindachner, Denk. Ak. Wien, xli. Abth. 1, pp. 28–35.

Diagramma giganteum, sp. n., Günther, Ann. N. H. (5) iv. 1879, p. 136, Ponapé.

Agenor modestus, g. & sp. nn., Castelnau, *l. c.* p. 371.

Aphareus roseus, sp. n., *id. l. c.* p. 373.

Gerres jonesi, sp. n., Günther, Ann. N. H. (5) iii. p. 150, Bermudas. Said to be the same as *Diapterus lefroyi*, G. B. Goode, P. U. S. Nat. Mus. i. p. 463. This disputed by Günther in a further note, Ann. N. H. (5) iii. p. 390.

Gerres brevirostris, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 208, Rio Guayas, Ecuador.

Squamipinnes.

Toxotes chatareus, H. B., described by Steindachner from S. Australia, Denk. Ak. Wien, xli. p. 3.

Sparidæ.

Sargus helenæ, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 205, St. Helena. *S. holbrooki*, sp. n., Bean, Am. J. Sci. (3) xvii. p. 44, and P. U. S. Nat. Mus. i. p. 198, Carolina.

Sphærodon euanus, sp. n., Günther, Ann. N. H. (5) iv. p. 137, Friendly Islands.

Haplodactylus obscurus, sp. n., Castelnau, P. Linn. Soc. N. S. W. iii. p. 374.

Cirrhitidæ.

Chilodactylus fuscus and *annularis*, spp. nn., Castelnau, *l. c.* p. 377.

Zeodrius restitus, g. & sp. nn., *id. ibid.* The writer states that *Chilodactylus restitus*, Garr. & Gthr., a different species, belongs also to this genus, and yet he gives the same specific name to the new one!

Scorpænidæ.

Sebastes inermis, Schleg., *nec* C. V., renamed *S. schlegeli*, Hilgendorf, SB. nat. Fr. 1879, p. 80, Japan.

Sebastes, sp. without name, Collett, Forh. Selsk. Chr. 1879, No. 1, p. 10, Norway.

Agriopus melanosoma, sp. n., Bleeker, Verh. Ak. Amst. xviii. p. 6, pl. iii. Mauritius.

Micropus muelleri, sp. n. Steindachner, Denk. Ak. Wien, xli. p. 7, S. Australia.

Teuthididæ.

Teuthis. On the horny covering of the jaws in this genus; Hilgendorf, SB. nat. Fr. 1879, p. 121.

Berycidæ.

Hoplostethus japonicus, sp. n., Hilgendorf, SB. nat. Fr. 1879, p. 78, Japan.

Monocentris japonicus, Houtt. On the method of fixation of the spines; *id. l. c.* pp. 22–25.

Sciænidæ.

Sciæna surinamensis, Blkr., described; Steindachner, Denk. Ak Wien, xxxix. p. 22, pl. i. fig. 1, Magdalena river.

Sciæna muelleri, sp. n., *id. op. cit.* xli. p. 1, S. Australia.

Pseudosciæna polyactis, p. 5, pl. i. fig. 1, China, *acanthodes*, p. 29, pl. i. Japan, spp. nn., Bleeker, Verh. Ak. Amst. xviii.

Otolithus stolzmanni, pl. ii. fig. 1, Tumbez, W. Coast of S. America, *microps*, pl. viii. fig. 2, Brazil, *Otolithus* or *Ancylodon bairdi*, pl. i. fig. 2, Brazil, spp. nn. and other species described; Steindachner, Denk. Ak. Wien, xli. pp. 35–42.

Otolithus obliquatus (Val. MS.), sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 209, Martinique.

Isopisthus affinis, sp. n., Steindachner, Denk. Ak. Wien, xli. p. 43, pl. ii. fig. 2, Brazil.

Xiphiidæ.

Histiophorus indicus. A remark by Lütken, Vid. Medd. 1877 (1878), p. 243.

Trichiuridæ.

Lepidopus elongatus, sp. n., F. Clarke, Tr. N. Z. Inst. xi. p. 294, pl. xiv. New Zealand.

Carangidæ.

Parequula, g. n. Body oblong, moderately compressed, covered with large toothed scales; mouth protractile, teeth in jaws slender, pointed, none on palate; præoperculum denticulated; operculum without spines; dorsal continuous, without notch between the spinous and soft parts, spines extremely strong; anal with three spines; branchiostegals 5; pseudobranchiæ present. *P. bicornis*, sp. n., Steindachner, Denk. Ak. Wien, xli. Abth. i. p. 8, S. Australia.

Equula novæ-hollandiæ, sp. n., *id. l. c.* p. 11.

Capros aper. Numerous notices of the Boar-fish taken on various parts of the English coasts in Zool. 1879.

Cyttidæ.

Zeus. On *Z. pungio* and *faber*; Ninni, Atti Ist. Venet. (5) iv. pp. 1058–1067.

Coryphænidæ.

Discus aureus, g. & sp. nn., founded on possibly young specimens; W. Campbell, Tr. N. Z. Inst. xi. p. 297, fig. p. 298, Hokitika, New Zealand.

Scombridæ.

Chriomitra, g. n. Differs from *Scomber* in more numerous finlets and want of uniform covering of scales; from *Orcynus* and *Sarda* by wanting corselet. No teeth on vomer or palatines. *C. concolor*, sp. n., Lockington, P. Ac. Philad. 1879, p. 133, California.

Scomber pneumatophorus, De la Roche, described from Hobson's Bay, Victoria; F. McCoy, Prodr. Zool. Vict. iii. p. 43, pl. xxviii.

Thynnus peregrinus, sp. n., Collett, Forh. Selsk. Chr. 1879, No. 1, p. 20, pl. fig. 1 : = *Pelamys unicolor*, Geoff., which has vomerine teeth; *id. l. c.* No. 15.

Auxis ramsayi, sp. n., Castelnau, *l. c.* p. 382.

Cybium. Notes on the American species; Poey, P. U. S. Nat. Mus. i. pp. 3–5.

Echeneis. Some remarks supplementary to his paper on *Echeneis* in 1875; Lütken, Vid. Medd. 1877 (1878), p. 242.

Trachinidæ.

Percis gilliesi, sp. n., Hutton, Ann. N. H. (5) iii. p. 53, New Zealand.

Caulolatilus microps, sp. n., Goode & Bean, P. U. S. Nat. Mus. i. p. 43, Florida.

Pediculati.

Lophius. On the lymphatic system of *L. piscatorius* ; Trois, Atti Ist. Venet. (5) iv. pp. 765–780.

Synopsis of the Pediculate fishes of Eastern Extra-tropical North America ; Gill, P. U. S. Nat. Mus. i. pp. 215–222.

Antennarius marmoratus. Gill discusses the specific names applied to this fish, and comes to the conclusion that it should be called *Pterophryne histrio*; P. U. S. Nat. Mus. i. pp. 223–226.

Note (with synopsis) on the *Ceratiidæ* ; id. *l. c.* pp. 227–231.

Note on the *Maltheidæ* ; id. *l. c.* p. 231.

Chaunax fimbriatus, sp. n., Hilgendorf, SB. nat. Fr. 1879, p. 80, Japan.

Himantolophus reinhardti, Ltk. Lütken protests against the new generic name wantonly invented by Gill for this species; Vid. Medd. 1879–80, p. 65.

Cottidæ.

Cottus reinni, p. 105, *dybowskii*, p. 106; Hilgendorf, SB. nat. Fr. 1879, Japan: spp. nn.

Platycephalus malabaricus, Gthr., = *carbunculus*, Cant., renamed *P. cantori*, p. 26. Revision of the Indopelagic species; Bleeker, Verh. Ak. Amst. xix.

Lepidotrigla guentheri, p. 106, *serridens*, p. 107 ; Hilgendorf, SB. nat. Fr. 1879, Japan : spp. nn.

Trigla. Remarks on *T. pœciloptera* and *hirundo*, the former is to be regarded as the young of the latter ; Day, P. Z. S. 1879, p. 179, pl. xvii.

Discoboli.

Liparis (*Paraliparis*) *bathybii*, sp. n., Collett, Forh. Selsk. Chr. 1879, No. 14, p. 32.

Gobiidæ.

Gobius urotænia, p. 107, *dolichognathus* and *geneionema*, p. 108, *lactipes*, p. 109, *heptacanthus*, p. 110; Hilgendorf, SB. nat. Fr. 1879, Japan : spp. nn.

Triænophorichthys squamistrigatus, sp. n., *id. l. c.* p. 111, Japan.

Revision of the Callionymiform Gobioids of the Indian Archipelago. *Callionymus enneactis*, sp. n., p. 95, Singapore. Bleeker, Versl. Ak. Amst. (2) xiv. pp. 79–107.

On *Callionymus*, with notices of six species belonging to the Venetian fauna ; Ninni, Atti Ist. Venet. (5) iv. pp. 1043–1057.

Cepolidæ.

Acanthocepola oxylepis, sp. n., Bleeker, Verh. Ak. Amst. xviii. p. 8, pl. ii. fig. 1, China.

Blenniidæ.

Anarrhichas leopardus, Ag., = the Icelandic *A. minor*, Olafs; J. Steenstrup, Vid. Medd. (1877) 1878, pp. 109–114.

Anarrhichas latifrons, Steenstrup, described at great length and figured; Collett, Forh. Selsk. Chr. 1879, No. 1, p. 46, pl. fig. 2.

A young specimen noticed as *Anarrhichas*, sp.; *id. l. c.* p. 58.

Blennius unicornis, sp. n., Castelnau, P. Linn. Soc. N. S. W. iii. p. 384, feeds upon oysters.

Cristiceps macleayi and *aurantiacus*, spp. nn., *id. ibid.*

Tripterygium dorsalis [*-le*], p. 291, pl. xv. *decem-digitatus*[*-tum*] and *robustum*, p. 292, pl. xv.; F. Clarke, Tr. N. Z. Inst. xi., New Zealand: spp. nn.

Stichæus punctatus (Fabr.), Krøyer, at St. Michael's, Alaska; Bean, P. U. S. Nat. Mus. i. p. 279.

Pseudoblennius. Remark on its position in the system: Hilgendorf, nat. Fr. 1879, p. 78.

Acanthoclinidæ.

Acanthoclinus taumaka, sp. n., F. Clarke, *l. c.* p. 293, pl. xv., New Zealand.

Mastacembelidæ.

Mastacembelus marchii and *niger*, spp. nn., Sauvage, Bull. Soc. Philom. (7) iii. pp. 94 & 95, Ogôwé.

Mugilidæ.

Mugil longimanus, Gthr., described, and *M. australis*, sp. n., Port Jackson; Steindachner, Denk. Ak. Wien, xli. p. 5.

Mugil incilis, Gthr. (*M. guentheri*, Steind., olim, *nec* Gill) noticed; *M. guentheri*, Gill, probably = *M. rammelsbergi*, Tsch.); Steindachner, Denk. Ak. Wien, xxxix. p. 26.

Mugil grandis, Castelnau, sp. n., *l. c.* p. 386.

Ophiocephalidæ.

Ophiocephalus. Bleeker describes the Indo-pelagic species, numbering 13 or 14; Verh. Ak. Amst. xix. pp. 30–56.

Ophiocephalus heterolepis, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 205 (no locality given).

Ophiocephalus africanus, sp. n., Steindachner, *l. c.* xli. p. 15, pl. iii. fig. 2, Lagos, West Africa.

Labyrinthici.

Bleeker, in a revision of the Indopelagic species of this family reduces their number to 10 or 11 by the usual process of cancelling his own superfluous species. In most cases it had already been done by Günther. *Anabas macrocephalus*, Blkr., = *A. testudineus*, Cuv.; *Polyacanthus cinthoveni* and

helfrichi, Blkr., = *P. hasselti*, C. V.: *Trichopus leeri*, Blkr., = *T. trichopterus*, Lac.; *Betta anabatoides*, Blkr., = *B. picta*, Blkr., = *B. trifasciata*, Blkr., = *B. pugnax*, Gthr.: Verh. Ak. Amst. xix. pp. 1–29.

Micracanthus, g. n. Body rounded, fusiform, no points or denticulations on the operculum; opening of the mouth small and transverse, teeth fixed in the jaws, none on palate; dorsal and anal spines in very small number; soft anal, much longer than dorsal; caudal not notched; ventrals with a feeble spine and four rays, the outer one somewhat prolonged; no lateral line. *M. marchii*, Sauvage, Bull. Soc. Philom. (7) iii. p. 95, Ogowé.

Trachypteridæ.

Trachypterus. In a paper upon the characters of the different species of this genus, and especially on the metamorphoses of *T. tænia*, C. Emery draws the conclusion that *T. filicauda*, Costa, *spinolæ*, C. V., *tænia*, Bl., and *iris*, Walb., are names given to successive stages of one and the same species, viz., *T. tænia*. He gives particulars of 23 specimens examined. Atti Acc. Rom. (3) Mem. Sci. Fis. iii. pp. 390–395, pl. figs. 1–6, and MT. z. Stat. Neap. i. p. 581.

Regalecus pacificus, Haast. Notes on the anatomy of this fish; Llewellyn Powell, Tr. N. Z. Inst. xi. pp. 269 & 270.

Centriscidæ.

Amphisile komis, sp. n., Macleay, P. Linn. Soc. N. S. W. iii. p. 165, pl. xix. *b*, Palau Islands.

Notacanthidæ.

Notacanthus nasus (*Campylodon*, Fabr.). A paper on this species, with list of the known species of the genus; Lütken, Vid. Medd. 1877 (1878), pp. 145–153.

ACANTHOPTERYGII PHARYNGOGNATHI.

Pomacentridæ.

Eupomacentrus (*Brachypomacentrus*) *ater*, Blkr., supposed to be *Pomacentrus ater*, Lién., described and figured; Bleeker, Verh. Ak. Amst. xvii. p. 5, pl. ii.

Pomacentrus vitianus, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 206, Fiji.

Pomacentrus sanctæ-helenæ, sp. n., *id. l. c.* p. 207, St. Helena.

Glyphidodon filholi, sp. n., *id. ibid.*, Fiji.

Labridæ.

Duymæria japonica. On coloured scales in this fish, an exception to the usual methods of colouring in fishes; Hilgendorf, SB. nat. Fr. 1879, p. 121.

Scaridæ.

A monograph of the dentition of the *Scaridæ*; J. Boas, Z. wiss. Zool. xxxii. pp. 189–215, pl. x., and Vid. Medd. 1877 (1878), pp. 315–350, pls. vii. & viii.

Scarus perspicillatus, sp. n., Steindachner, Denk. Ak. Wien, xli. Abth. i. pp. 16–19, pl. iv. fig. 1, Sandwich Islands.

Pseudoscarus spilonotus, Kner, described and figured by Bleeker, from Mauritius; Verh. Ak. Amst. xviii. p. 4, pl. i.

Olistherops brunneus, sp. n., Macleay, P. Linn. Soc. N. S. W. iii. p. 36, pl. v. fig. 1, Port Jackson.

Chromidæ.

Acara cæruleo-punctata, Kn., Steind., var. n. *latifrons*, Steindachner, Denk. Ak. Wien, xxxix. p. 27.

Petenia kraussi, sp. n., *id. l. c.* p. 28, pl. i. figs. 2 & 3, & pl. ii. fig. 1, Magdalena river.

ANACANTHINI.

Gadopsidæ.

Gadopsis gracilis, p. 39, pl. xxvii. fig. 2, Yarra river, *gibbosus*, p. 41, Gippsland, spp. nn., F. McCoy, Prodr. Zool. Vict. iii.

Lycodidæ.

Lycodes pacificus, sp. n., figured, Japan. Probably a new genus, distinguished by absence of vomerine and palatine teeth, *Lycodopsis*, Collett. Collett, P. Z. S. 1879, p. 381.

Lycodes frigidus, p. 45, *pallidus*, p. 70, spp. nn., Collett, Forh. Selsk. Chr. 1878, No. 14.

Lycodes muræna, sp. n., *id. l. c.* No. 4, p. 15, North Sea.

Lycodes turneri, sp. n., Bean, P. U. S. Nat. Mus. i. p. 463, Alaska.

Gadidæ.

Geographical Distribution of the *Gadidæ*. U. S. Comm. Fish and Fisheries, part v. pp. 531–557. By Karl Dambeck; translated and revised by T. H. Bean.

Gadus. Species found in the Adriatic: *G. minutus*, *euxinus*, and *poutassou*. Ninni, Atti Ist. Venet. (5) iv. pp. 1191–1198.

Morrhua macrocephala. Day records and notices a fish captured at the mouth of the Thames, and referred to *Gadus macrocephalus*, Tiles., probably Yarrell's "Lord fish," and considered to be distinct from *G. vulgaris*. J. L. S. xiv. pp. 689–692, pl. xiv.

Physiculus japonicus, sp. n., Hilgendorf, SB. nat. Fr. 1879, p. 80, Japan.

Phycis chesteri, sp. n., Goode & Bean, Am. J. Sc. (3) xvii. p. 40, and P. U. S. Nat. Mus. i. p. 256, East Coast North America.

Haloporphyrus viola, sp. n., Goode & Bean, Am. J. Sci. (3) xvii. p. 41, and P. U. S. Nat. Mus. i. p. 257, Le Have Bank.

Brosmius americanus, Gill, = *Brosmius brosme* (Müller), White; Goode & Bean, P. U. S. Nat. Mus. i. p. 362.

Motella. *Rhinonemus caudacuta* (Storer), Gill, = *Gadus cimbrius*, L.; *iid. l. c.* p. 348.

Ophidiidæ.

Genypterus australis, Cast., redescribed; F. McCoy, Prodr. Zool. Vict. iii. p. 37, pl. xxvii. fig. 1.

Rhodichthys regina, g. & sp. nn., Collett, Forh. Selsk. Chr. 1878, No. 14, p. 99, Hammerfest.

Macruridæ.

Krohnius, Cocco. New form of diminutive fish of this genus described offering great resemblance with the genus *Macrurus*, and considered to be the larval state of *M. trachyrrhynchus*; C. Emery, Atti Soc. Ital. xxi. p. 37. This fish figured; *id.* Atti Acc. Rom. (3) Mem. Sci. Fis. iii. p. 395, pl. fig. 8. Two small specimens of *K. filamentosus*, Cocco, noticed and figured, fig. 7, and this form referred to *Coryphanoides*, or *Malacocephalus*, rather than to *Macrurus*; id. *l. c.* p. 395.

Macrurus. D. Vinciguerra has written a paper on the *Macruri* found in the Gulf of Genoa, describing *M. trachyrrhynchus*, Risso, *cælorrhynchus*, Risso, and *sclerorrhynchus*, Val., figured. He enumerates the 13 species of the genus already known. Ann. Mus. Genov. xiv. pp. 609–627, pl. ii.

Macrurus bairdi, sp. n. (no description), Goode & Bean, Am. J. Sci. (3) xvii. p. 40, U. S. east coast.

Pleuronectidæ.

The synonymy of certain Californian species is given in a letter from W. Lockington to L. Vaillant, in anticipation of a paper to be published in P. U. S. Nat. Mus. Three new species are indicated in advance by name only, viz., *Hippoglossus jordani*, *Glyptocephalus pacificus*, and *G. zachirus*. Lockington, Bull. Soc. Philom. (7) iii. p. 242.

Platessa vulgaris new to the Italian coasts, for the first time observed in the Adriatic F. Trois, Atti Ist. Venet. (5) iv. [1878] p. 321.

Platessa rostrata, St., = *Pleuronectes ferrugineus*, St.; Goode & Bean, P. U. S. Nat. Mus. i. p. 361.

Pleuronectes cynoglossus, L., on North American coast; *iid. l. c.* p. 19.

Pleuronectes elongatus, Yarr., described and figured from a specimen taken in Cornwall; Day, P. Z. S. 1879, p. 755, pl. lxi.

Euchalarodus putnami, Gill, = *Pleuronectes glaber* (Storer), Gill; Bean, P. U. S. Nat. Mus. i. p. 345.

Solea fischeri, Steindachner, Denk. Ak. Wien, xli. Abth. i. p. 161, pl. ii. fig. 8, Mamoni river, near Chepo.

Synaptura muelleri, sp. n., *id. l. c.* p. 4, Australia.

Aphoristia orientalis, sp. n., Bleeker, Verh. Ak. Amst. xviii. p. 31, pl. ii. fig. 1, Japan.

PHYSOSTOMI.

Siluridæ.

Doumea, g. n. Body elongate, flattened beneath, tail long; mouth almost terminal, transverse, inferior; upper lip verrucose; six barbels, two mandibular; nostrils rather apart; head covered with skin; dorsal and anal short, adipose short; pectorals and ventrals horizontal; no teeth on palate; eyes covered with the skin. *D. typica*, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 96, Ogowé.

Clarias buthupogon [*bythi-*], sp. n., *id. l. c.* (= *C. gabonicus*, Gthr.).

Liobagrus, g. n. (*Bagrina*). Adipose fin long and low, dorsal short, with one stiff unserrated, and six soft rays, anal short, caudal rounded, ventral six-rayed; eight barbels; patches of hooked teeth on intermaxillary and mandible only, none on vomer or palatines; eye beneath the skin without fold; gill-membrane free quite to the front. *L. reini*, sp. n. Hilgendorf, SB. nat. Fr. 1878, p. 155, Japan.

Rita sacerdotum, sp. n., Anderson, Yunnan, p. 864, pl. lxxix. fig. 3, Irawady.

Pimelodus balayi, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 98, Ogowé.

Atopochilus, g. n. (*Ariina*). Nostrils placed one against the other, the posterior with a valve; head osseous above: mouth wholly inferior, in the form of a longitudinal slit; teeth silk-like, moveable, and disposed in several rows on the mandible; fine, short, moveable teeth forming a broad band in the upper jaw, a transverse series of setiform teeth on the vomer; lower lip thick, pendant, verrucose; a barbel at the union of upper and lower lips; branchial opening small; isthmus very wide; a spine at the dorsal which is short, and one at the pectoral: adipose very short. *A. savorgnani*, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 96, Ogowé.

Ariopsis milberti?. On the breeding habits of the Sea Cat-fish; Lupton, P. U. S. Nat. Mus. i. p. 278.

Ælurichthys longispinis, Gthr., = *marinus*, Mitch.; Steindachner, Denk. Ak. Wien, xli. Abth. 1, p. 159.

Ageniosus pardalis, Ltk., described and figured; *id. op. cit.* xxxix. p. 33, pl. iii. fig. 1.

Auchenipterus insignis, p. 35, pl. iii. fig. 2, and *magdalenæ*, p. 36, pl. iv. fig. 1, spp. nn., *id. l. c.*, Magdalena river.

Doras longispinis, sp. n., *id. l. c.* p. 39, pls. iv. fig. 2, & v. fig. 1, Magdalena river.

Corydoras marmoratus, sp. n. ?, *id. op. cit.* xli. Abth. 1, p. 26, pl. v fig. 1, La Plata.

Malapterurus electricus. On its habits observed in captivity; A. Stirling, J. Anat. Phys. xiii. pp. 350–352. Var. n. *oguensis*, Sauvage, Bull. Soc. Philom. (7) iii. p. 99, Ogowé.

Plecostomus tenuicauda, sp. n., p. 40, pl. vi., Magdalena River, and note on *P. villarsi*, Ltk., p. 42, pl. vii., Steindachner, Denk. Ak. Wien, xxxix.

Chætostomus undecimalis, sp. n., *id. l. c.* p. 43, Magdalena River.

Chætostomus fischeri, sp. n., *id. op. cit.* xli. Abth. i. p. 162, pl. iv. fig. *a*, Mamoni River, near Chepo.

Loricaria lima, Kner, = *uracantha*, ♂, Kner & Steind., p. 163; some points in Günther's description of *L. rostrata*, Spix, corrected, p. 165; *L. variegata*, sp. n., p. 163, pl. iii., from Mamoni River, near Chepo. Steindachner, *l. c.*

Loricaria filamentosa, p. 45, pl. ix., *magdalenæ*, p. 74, *id. op. cit.* xxxix., Magdalena River; *L. teffeana*, p. 44, pl. vi., *konopickii*, p. 45, pl. vii. *id. op. cit.* xli. Abth. i., Amazons: spp. nn.

Loricaria magdalenæ figured; *id. l. c.* pl. vii. figs. 2 & 3.

Hypoptopoma thoracatum, Gthr., *bilobatum*, Cope, and *carinatum*, sp. n., Amazons, described and figured; *id. l. c.* pp. 47–49, pls. iv.–vi.

Stegophilus maculatus, sp. n., *id. l. c.* p. 25, pl. iv. fig. 2, La Plata.

Characinidæ.

Curimatus mivarti, p. 48, pl. xiii. fig. 1, *magdalenæ*, p. 50, spp. nn., Steindachner, *id. op. cit.* xxxix., Magdalena River.

Prochilodus laticeps, sp. n., *id. op. cit.* xli. p. 152, Orinoco.

Parodon affinis, sp. n., *id. l. c.* p. 20, pl. iii. fig. 3, La Plata. *P. hilarii*, Rhdt. & Ltk., is scarcely different from *P. suborbitalis*, C. V., ? = *nasus*, Kn.; *id. ibid.*

Anostomus orinocensis, sp. n., *id. l. c.* p. 154, pl. ii. fig. 7, Orinoco.

Leporinus. On *L. elongatus*, Val., p. 53, with characters figured, pl. x. figs. 3-5, and *striatus*, Kner, var., p. 55, pl. x. fig. 1; *L. eques*, sp. n., p. 56, pl. x. fig. 2, Magdalena River: *id. op. cit.* xxxix.

Tetragonopterus. Steindachner remarks that Günther's divisions of the genus, based upon the number of anal rays, are not trustworthy, *T. argenteus* belonging equally to group A and B, p. 155. He describes *T. panamensis* (*fischeri*, Steind., olim), p. 166, and *branickii*, sp. n., from Peru, p. 169, pl. i. fig. 3. Denk. Ak. Wien, xli. Abth. i.

Brycon insignis, Steind., = *Chalceus devillii*, Casteln.; *id. l. c.* p. 50.

Brycon longiceps, p. 156, pl. i. fig. v., Orinoco, *stolzmanni*, p. 170, pl. ii. fig. 6, Peru, *id. l. c.*; *B. moorii*, id. *op. cit.* xxxix. p. 58, pl. v. fig. ii., Magdalena: spp. nn.

Chalcinus magdalenæ, sp. n., *id. op. cit.* xxxix. p. 60, pl. xi.

Gasteropelecus maculatus, sp. n., *id. op. cit.* xli. p. 168, pl. i. fig. 4, Mamoni River.

Anacyrtus argenteus, Val., described, p. 21; *A.* (*Rhæboides*) *bonariensis*, sp. n., p. 23, pl. viii. fig. 1, Buenos Ayres; *Rhæboides rubrivertex*, Cope, = *A. affinis*, Gthr., and is closely related to *A.* (*Rhæboides*) *myersi*, Gill, which is also described, p. 50. *Id. l. c.*

Anacyrtus (*Cynopotamus*) *kneri*, sp. n., = *C. humeralis*, Kner, ? *nec* Val., pp. 64 & 65; *A.* (*Rhæboides*) *dayi*, p. 61; *A.* (*Rhastes*) *alatus*, p. 65; *A.* (*Cynopotamus*) *magdalenæ*, p. 62 (see Postscr. p. 77), pl. xii. fig. 2: spp. nn., Magdalena River. *Id. op. cit.* xxxix.

Luciocharax, g. n. Snout and shape of body as in *Xiphostoma*; intermaxillary and lower jaw very long, the first with two rows of larger

teeth anteriorly; palatine teeth numerous, very small; dorsal and anal very far backward. Scales of body conspicuously larger than in *Xiphostoma*. Lateral line is completely developed. *L. insculptus*, sp. n. *Id. l. c.* p. 67, pl. xiii. fig. 2, Magdalena River.

Scopelidæ.

On the eye-like spots, or accessory eyes, see Ussow.

Saurida australis; Castelnau, *l. c.* p. 393.

Salmonidæ.

Salmo. On the Brown Trout introduced into Otago; W. Arthur, Tr. N. Z. Inst. xi. pp. 271–290, pl. xiii.

Salmo arcturus, Gthr. Particulars with reference to the lakes in which this Charr was found; Feilden, Zool. 1879, p. 22.

Distinctness of *Salmo salar* and *S. quinnat*. Note; C. Jackson, Nature, xix. p. 460.

Salmo leptosoma and *pomatops*, spp. nn., Bleeker, Verh. Ak. Amst. xviii. pp. 14–16, pl. ii. figs. 2 & 3, China.

Salmo macrostoma, Gthr., is the young of *Oncorrhynchus perryi*, Hilgendorf, MT. Ges. Ostas. xi. [1876] p. 28. The separation of *Salmo* and *Oncorrhynchus* is purely artificial; Hilgendorf, SB. nat. Fr. 1878, p. 156.

Thymallus brevirostris, sp. n., Kessler, Bull. Pétersb. xxv. p. 305, Streams south of Altai Mountains.

Argentina decagon, sp. n., F. E. Clarke, Tr. N. Z. Inst. xi. p. 295, pl. xiv., Hokitika, New Zealand. The first of its genus found in the seas of the Southern hemisphere, said to resemble almost exactly the Hebrides variety.

Argentina syrtensium, sp. n., Goode & Bean, P. U. S. Nat. Mus. i. p. 261, Nova Scotia.

Argentina elongata, sp. n., Hutton, Ann. N. H. (5) iii. p. 53, New Zealand.

Mormyridæ.

Petrocephalus marchii, *simus*, and *affinis*, spp. nn., Sauvage, Bull. Soc. Philom. (7) iii. pp. 100 & 101, Ogowé.

Mormyrops sphekodes [*spheco-*], sp. n., *id. l. c.* p. 101, Ogowé.

Scombresocidæ.

Belone saigonensis, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 208, Cochin China and Me Kong, in freshwater.

Belone jonesi, sp. n., Günther, Ann. N. H. (5) iii. p. 151, Bermudas, = *Belone jonesi*, Goode, *id. tom. cit.* p. 390.

Belone latimanus, Poey, in Buzzard's Bay, Massachusetts; G. B. Goode, P. U. S. Nat. Mus. i. p. 6.

Remarks on the flight of fishes of the genus *Exocœtus*; J. Jullien, Bull. Soc. Zool. iii. [1878] pp. 109–112.

Exocœtus sp., Collett, Forh. Selsk. Chr. 1879, No. 1, p. 95, Norway.

Cyprinidæ.

Chasmistes luxatus and *brevirostris*, spp. nn., Cope, Am. Nat. xiii. pp. 784 & 785, Klamath Lake, Oregon.

Barynotus compinici, sp. n., Sauvage, Bull. Soc. Philom. (7) iii. p. 102, Ogowé.

Barbodes camptacanthus, Blkr., noticed by Sauvage, *l. c.* p. 103.

Barbus margarianus, sp. n., Anderson, Yunnan, p. 867, pl. lxxix. fig. 1, Kakhyen.

Schizothorax lacustris, p. 294, Lob-Nor, *tarimi*, p. 296, and *microlepidotus*, p. 297, River Tarim, Kessler, Bull. Pétersb. xxv., spp. nn.

Diptychus prezewalskii, p. 291, Juldus and Balgantaigol rivers, *gymnogaster*, p. 293, Juldus, and Kungès rivers, *id. l. c.* spp. nn.

Phoxinus milnerianus, sp. n., Cope, Am. Nat. xiii. p. 440, Montana.

Phoxinus poljakowii, sp. n., and *P. lævis*, *baldraschana*, var. n., Kessler, *l. c.* p. 283, River Ajagus.

Chondrostoma potanini, sp. n., *id. l. c.* p. 306, streams south of the Altai Mountains.

Acanthorrhodeus taniana lis, Gthr., figured by Bleeker, Verh. Ak. Amst. xviii. p. 12, pl. i. fig. 3.

Danio kakhienensis, sp. n., Anderson, Yunnan, p. 868, pl. lxxix. fig. 2, Kakhyen.

Aspior[r]hynchus, g. n., near *Aspius*. A groove commencing on each side behind the ventral fins, bordered by two rows of broad scales, extends to the posterior end of the anal fin; hooked pharyngeal teeth in three rows, 5-3-2—2-3-5; large head much flattened towards the snout, so that the lower jaw reaches somewhat beyond the upper, and appears much thickened at the end; a pair of barbels at the angle of the mouth. *A. prezewalskii*, sp. n., Tarim river and Lob-Nor; Day's *Ptychobarbus laticeps* and *longiceps* probably belong to this genus, and the latter is perhaps identical with *A. prezewalskii*: Kessler, Bull. Pétersb. xxv. pp. 289–291.

Nemachilus dorso-notatus, p. 285, River Kungès, and variety, p. 309, Chami, *tarimensis*, p. 300, Lower Tarim and Lob-Nor, *id. l. c.*, spp. nn.

Diplophysa. Kessler, *l. c.*, criticizes Day's fusion of this genus with *Nemachilus*, p. 303, and describes *D. kungessana*, p. 286, River Kungès, *papilloso-labiata*, p. 299, Upper and Lower Juldus and Balgantaigol rivers, *microphthalma*, p. 308, river at Chami, spp. nn.

Clupeidæ.

Engraulis australis, sp. n., Steindachner, Denk. Ak. Wien, xli. Abth. i. p. 14, S. Australia.

Notes on *Dorosoma cepedianum heterurum* (Raf.), Jord.; S. Wilmot, P. U. S. Nat. Mus. i. p. 263.

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Clupea tyrannus, Latrobe. *Clupea menhaden*, Mitch., is undoubtedly this fish, which should, therefore, be called *Brevoortia tyrannus*. Some remarks on the species; G. B. Goode, P. U. S. Nat. Mus. i. pp. 5 & 30.

A revision of the American species of *Brevoortia*, pp. 30–42. *B. patronus*, sp. n., p. 39, *id. l. c.* A further note on the latter; S. Stearns, *l. c.* p. 181.

Clupea pilchardus and *sprattus* figured, with air-bladder, stomach, and cæcal appendages. The writer cannot regard *C. sagax*, Jen., as a climatal variety of *C. sprattus*. Day, P. Z. S. 1879, p. 759, pl. lxii.

Clupea neopilchardus and *macrolepis*, spp. nn., Steindachner, Denk. Ak. Wien, xli. Abth. i. pp. 12 & 13, South Australia.

Clupea richmondia, sp. n., Macleay, P. Linn. Soc. N. S. W. iv. p. 380, Australia.

Clupea vel *Alausa advena*, sp. n., Philippi, Arch. f. Nat. xlv. p. 161, pl. x., Chili.

Bathythrissidæ.

[See Zool. Rec. xiv. *Pisces*, p. 28.] *Bathythrissa dorsalis*, Gthr., = *Pterothrissus gissu*; Hilgendorf, Leopoldina, xiii. p. 127. The writer regards it as questionable whether the absence of the oviduct is sufficient to constitute it a distinct family. On account of its close affinity to *Albula*, it may eventually be united with that genus as a separate family, or ranged among the *Clupeidæ*. Hilgendorf, SB. nat. Fr. 1878, p. 156.

Gymnotidæ.

Gymnotus electricus. C. Sachs, in his work, "Aus den Llanos," above mentioned (p. 6), describes the habits and electrical apparatus of this species, especially in Chapter V., pp. 133–171. He figures it, p. 149, and a section of its body showing the electric organs, p. 154. An analysis of his observations is given in J. de l'Anat. 1879, p. 614. See also Marey, *suprà*, p. 2.

Sternopygus æquilabiatus, Humb., noticed, p. 69, pl. xiv. fig. 1, heads of *carapo*, L., and *virescens*, Val., figured, pl. xiv. figs. 2 & 4. *S. humboldti*, sp. n., p. 71, pl. xiv. fig. 3, Magdalena River. Steindachner, Denk. Ak. Wien, xxxix. Abth. i.

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Conger japonicus, sp. n., Bleeker, Verh. Ak. Amst. xviii. p. 32, pl. ii. fig. 2, Japan.

—— *australis*, —— *labiata*, Castelnau, *l. c.* p. 396 [*sic*!].

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On the occurrence of *Hippocampus antiquorum* or an allied form on St. George's Banks; G. B. Goode, P. U. S. Nat. Mus. i. p. 45.

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BY

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

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Anatomy and Physiology.

1. *General Morphology.*

The flexure of the intestine is downwards, "pedal," in the Cephalopods and Pteropods ; upwards, "cerebral," in all other *Mollusca*, except Nudibranchs and Tectibranchs, which have scarcely any flexure at all. The heart lies on the cephalic side of the intestine in the Nudibranchs, Cephalopods, and Pteropods, but on the pedal side of it in the Heteropods (*Atlanta*), Pulmonates, and Pectinibranchs. The arms of the Cephalopods are homologous to the ventral part of the original circular velum or architroch, the valve within the funnel to the foot of the Gastropods, the funnel itself to the epipodium. The six or eight trunks on which the tentacles of *Nautilus* are placed are homologous to the arms of the Dibranchiate Cephalopods, one of those processes being modified in the male to the spadix, as one arm of the latter is hectocotylised. The hood of *Nautilus* is homologous either to the two anterior arms, or more probably to the neck-plates of the Dibranchiates. Only the mucro of the bone of *Sepia* is homologous to the shell of *Nautilus*. Blake, Ann. N. H. (5) iv. pp. 303–312 ; abstract in Rep. Brit. Ass. 1879 (Sheffield), p. 370.

A. S. Packard, jun., in "Zoology for Students and General Readers" (New York : 1879, cr. 8vo), pp. 275–278, fig. 213, describes and figures the general anatomy of the common Squid (*Loligo*).

2. *Muscular System and Movement.*

H. Simroth has published a second paper on the locomotion of snails, in which he maintains and details his former statements [see Zool. Rec. xv. *Moll.* p. 9] as to the extensile muscular fibres, the fluid contents of which are said to be coagulated by nervous influence, the coagulation advancing from behind and causing an extension of the fibre towards the front. The movement, if once excited, continues without further nervous influence until stopped by nervous action. Both these actions are exercised by a peculiar net of nervous fibres, which contains many cells, and is situated within the foot. Z. wiss. Zool. xxxii. pp. 284–322, pls. xvi. & xvii.; abstract in J. R. Micr. Soc. ii. pp. 399–401.

3. *Digestion.*

The mechanism of the radula (odontophore), with its cartilages and muscles, in *Loligo*, *Patella*, and *Buccinum*, is described by P. Geddes. He thinks that it is more simple and primary in the Cephalopods, and highly specialized in *Buccinum*; a "chain-saw-like" travelling of the radula over the cartilages is, according to him, impossible in the Cuttle-fish, and highly improbable in *Buccinum*. Tr. Z. S. x. pp. 485–491, pl. lxxx.–lxxxii.

Jousset de Bellesme states that in the Cephalopods the secretion of the liver only transforms the albuminoid matter, having no effect on the grease and amylon, and therefore rather resembles the pancreatic secretion of the Vertebrates. C. R. lxxxviii. pp. 304–306, 428 & 429. This is also stated by L. Frédericq, Rev. Int. 1879, pp. 263 & 271; abstract in J. R. Micr. Soc. ii. pp. 406 & 407.

Cadiat gives some notes on the lobular structure of the liver in the Gastropods, and on its secretion, which is decolorised and dissolved by nitric acid, and regarded as a derivate of hæmatoidin. C. R. Soc. Biol. 1877 (1879), p. 217.

C. F. W. Krukenberg states that the hepato-intestinal vessels of the *Æolididæ* contain really an enzymotic fluid, and have, therefore, digestive functions; Untersuch. physiol. Inst. Univ. Heidelb. ii. pp. 351–353. He also confirms the view that the digestive faculties of the liver in the *Mollusca* include also that of the pancreas in *Vertebrata*; l. c. pp. 403–423, and in his work, "Vergleichende physiologische Studien an den Küsten der Adria," pp. 57–76, with 1 pl.; abstract in Arch. Z. expér. vii. p. xxxi.

4. *Circulation.*

Blood-cells of the Bivalves: abstract of Flemming's observations (Arch. mikr. Anat. xv. [1878] p. 243) in J. R. Micr. Soc. ii. p. 398.

'Hæmocyanin' in the blood of Cephalopods: L. Frédericq's paper [Zool. Rec. xv. *Moll.* p. 10], also in Bull. Ac. Belg. xiv. [1878]; abstract in J. R. Micr. Soc. ii. p. 164.

S. Jourdain states that the small arteries in *Arion rufus* and other *Mollusca* open at the surface of the organs into the general cavity of the

body by distinct funnel-shaped orifices; he thinks that the supposed aquiferous orifices of the Bivalves, &c., are of the same nature, and that Alder and Hancock have already figured these orifices in their anatomy of *Doto*, pl. iv. fig. 10. C. R. lxxxviii. pp. 186 & 187; abstract in Ann. N. H. (5) iii. p. 243, and in J. R. Micr. Soc. ii. p. 164.

S. Trinchese defends his statement as to the existence of a special system of vessels, perhaps lymphatic, in the hepatic lobes of *Ercolania* (*Æolidida*), against the objections made by Bergh; these vessels contain chlorophyll. The hepatic cells are provided with cilia. Rend. Acc. Bologn. 1878–79, pp. 166–171.

5. *Respiration.*

S. Jourdain states that a Mexican species of *Ampullaria* has a distinct pulmonary division of the respiratory cavity [already described in this genus by Troschel, Arch. f. Nat. xi. 1845] and atrophied gills; also that a large number of veins ramify in the walls of the pulmonary pouch, whilst the blood from the atrophied gill returns to the vessels of the mantle, from which it reaches the pulmonary chamber. C. R. lxxxvii. pp. 981–983; abstract in J. R. Micr. Soc. ii. p. 716.

A. Sabatier describes the afferent vessels of the lung and renal organ in *Ampullaria*, and shows how more blood is driven by a valvular spur, at the junction of the afferent vessel of the gills and the special afferent vessel of the lung, into the lung when the gills are collapsed, and into the gills when the lung is collapsed. C. R. lxxxviii. pp. 1325–1327; abstract in Ann. N. H. (5) iv. pp. 323–325, and in J. R. Micr. Soc. ii. pp. 857–859.

Van Haren-Noman describes the structure of the gills in *Pecten grœnlandicus*, *Lima elliptica*, *Modiola discors*, *Cardium islandicum*, and *Astarte sulcata*; he also gives a list of the different structures observed in 28 species of Bivalves, viz., (1) composed of free filaments in *Anomia*, *Pecten grœnlandicus*, *Mytilus edulis*, *Modiola discors*, and *Arca noæ*; (2) in form of a fenestrated plate, in *Dreissena polymorpha*, *Unio pictorum* and *margaritifer*, *Anodonta*, *Kellia*, *Astarte sulcata*, and *Macra stultorum*; (3) in form of a plaited plate, in *Ostrea hippopus*, *Lima elliptica*, *Pinna nobilis*, *Chamostrea albida*, *Venus* [*Cytherea*] *chione* and *V. gallina*, *Cardium edule* and *islandicum*, *Myochama anomioides*, *Cochlodesma*, *Solen vagina*, *Donax trunculus*, *Mya arenaria*, *M. truncata*, and *Pholas dactylus*; (4) in form of side-pieces only, in *Pecten jacobæus*. Tijdschr. Nederl. Dierk. Ver. iv. pp. cxi.–cxvi.

6. *Excretion and Secretion.*

J. W. Vigelius (*suprà*) describes the excretory organs of *Sepia officinalis*, *Sepiola rondeleti*, *Rossia macrosoma*, *Loligo vulgaris*, *Ommastrephes sagittatus*, *Thysanoteuthis rhombus*, *Octopus macropus*, *tuberculatus*, and *heterocirrus*, *Eledone moschata* and *aldrovandi*, *Tremoctopus violaceus*, *Argonauta argo*, and *Nautilus pompilius*; he also describes separately both sexes of most of them. The so-called venous appendages are really the renal organs; they produce a solid, not fluid excretion. In

all Dibranchiate Cephalopods there are two special cavities within the general abdominal cavity—(1) the urinary sac, being an invagination of the peritoneum, and containing the venous appendages and hepatic ducts; (2) the viscero-cardial cavity, containing the heart, branchial veins and branchial accessory hearts, and the ovary or testicle. The latter communicates with the former by a cleft on each side; the former opens into the pallial cavity by a hole on each side. The venous appendages are more developed and more free in the Octopods, whereas they form a spongiose mass in the ten-armed Cephalopods. A distinct aquiferous apparatus exists only in the Octopods. *Nautilus* has four urinary sacs. A part of these observations, on *Octopus* and *Eledone*, is also published in Tijdschr. Nederl. Dierk. Ver. iv. pp. lix.–lxiii. [a German translation in Niederl. Arch. Zool. v. 1880, pp. 115–184].

O. Nüsslin, "Beiträge," &c., pp. 1–17, describes and figures a communicating channel between the cavity of the renal organ and that of the pericardium in *Helix pomatia* and *hortensis*; he denies the existence of a communication between the pericardium and sanguiniferous sinus in the body, and thinks it probable that the renal vessels open into the cavity of the kidney, stating (pp. 45–47) that this channel has already been observed by Von Ihering (Z. wiss. Zool. xxxix.; see Zool. Rec. xiv. *Moll.* p. 11), and Semper (Arb. Inst. Würzb. iii.).

A channel leading directly from the outer surface of the skin in front of the gill into the atrium of the heart, detected in *Pleurobranchæa*, by H. v. Ihering, Zool. Anz. ii. p. 138; abstract in J. R. Micr. Soc. ii. p. 548.

Some observations on the urticating cells in the *Æolididæ*, and an opening of the intestinal branch into the sting-sac, and thereby indirectly to the outer surface, in *Fascelina punctata* and *Rizzolia peregrina*; id. *l. c.* p. 137; abstract in J. R. Micr. Soc. *l. c.*

Note on the excretory organ of *Janus cristatus* (Chiaje), *Æolididæ*; S. Trinchese, Rend. Acc. Bologn. 1878–79, pp. 76 & 77.

M. Hartog thinks that the external communication of the "organ of Bojanus," or kidney, in the *Anodonta*, does not serve to receive water from without, but to flush the renal organs, which are filled with solid excreta. J. de l'Anat. Phys. xiii. [1879] p. 400; abstract in J. R. Micr. Soc. ii. p. 551.

J. Carrière has published a paper on the glands in the foot of the Bivalves; he comes to the conclusion that a byssal gland exists originally in all; but becomes rudimentary in many. Arb. Inst. Würzb. v. p. 56; abstract in J. R. Micr. Soc. ii. pp. 859 & 860 [*Cf.* Zool. Rec. xv. *Moll.* p. 10.]

T. Barrois, Bull. Sci. Nord. (2) ii. pp. 1–7, opposes some of Carrière's statements [Zool. Rec. xv. *Moll.* p. 10]; he avers (pp. 278–285) that there are two sorts of glands in the foot of the Bivalves, opening into the furrow at its under side; in front, brown coloured glands, secreting agglutinative matter, and behind, white glands secreting filamentous matter. His observations have been made on *Arca tetragona* (Poli) and *Pecten maximus* (L.). He also describes a true byssal gland in *Saxicava rugosa* (L.); pp. 314–318.

7. *Nervous System.*

E. Heckel has studied the action of strychnine on some Gastropods; *Helix aspersa* succumbed to ·025 grammes of sulphate of strychnia, but *Zonites algirus* and *Helix pomatia* perfectly resisted doses of ·045 grms., the weight of the snails themselves being only 6–9 grms. They enjoy, therefore, a remarkable immunity from the effects of that alkaloid. Specimens of small size are distinctly more sensible to it, and the action is finally tetanizing, as in other animals. C. R. lxxxviii. pp. 918–921; abstract in J. R. Micr. Soc. ii. p. 705, and M. Journ. Sci. i. p. 514.

Vulpian's experiments with cardiac poisons on *Helix pomatia* show that their action is similar to that in the frog, the movement of the heart becoming irregular, and often ceasing for 5–6 minutes; C. R. lxxxviii. p. 1293; abstract in J. R. Micr. Soc. ii. p. 857.

Experiments on the respiratory innervation in *Octopus*; L. Frédericq, C. R. lxxxviii. pp. 346 & 347.

The nervous system in the Clam, *Mya arenaria*, described and figured by A. S. Packard, jun., in "Zoology for Students and General Readers" (New York: 1879), pp. 246 & 247, figs. 165 & 166.

8. *Organs of Sense.*

S. Richiardi states, as the result of numerous experiments, that the eye of *Sepia officinalis* is provided with a choroidea, iris, and true ciliar processes; and that, therefore, the homology of the parts of the eye in the Cephalopods and Vertebrates is not as supposed by Hensen and others, as the front cover of the eye is not a cornea, but only a fold of the skin, extraordinarily developed in the *Myopsidæ* in order to defend the eye against the pressure produced by retraction of the tentacular arms. Atti Soc. Tosc. 1879; abstract in Ann. N. H. (5) iii. pp. 243 & 244, and Zool. Anz. ii. pp. 138 & 139.

An abstract of Schöbl's paper on the eye of the Cephalopods (Arch. mikr. Anat. xv. 1878), in J. R. Micr. Soc. ii. p. 705.

Eyes of the Cephalopods discussed by F. Dorcum; Am. Nat. xii. [1878] p. 591.

Note on the eyes of *Patella*; M. Braun, Tageblätt d. 52, Versaml. deutsch. Naturf.

An abstract of Claus's paper on the auditory organ of the Heteropods (Arch mikr. Anat. xv. 1878, pp. 341–348), in J. R. Micr. Soc. ii. p. 401.

Todaro describes the organ of taste in *Pterotrachea*, consisting of budlike prominences (bottoni) of the epithelium in the oral cavity; *Atti* Acc. Rom. (3) iii. Transunti, pp. 251 & 252.

9. *Organs of Generation.*

Note on the sexual relations of some Mollusks; G. Canestrini, Bull. Soc. Veneto-Trent. i. p. 22.

An abstract of Brock's paper on the generative organs of the Cephalopods [Zool. Rec. xv. *Moll.* p. 11], in J. R. Micr. Soc. ii. p. 549.

On the development of the spermatozooids in *Paludina vivipara*; M. Duval, Rev. Montp. (2) i. pp. 211–231, 3 pls.

Note on genital organs and copulation of *Arion rufus*, *Limax cinereus*, *agrestis*, and *gagates*; S. Jourdain, Rev. Montp. vii. pp. 411–423, with a pl.

Description of the epithelium in the genital organs of *Helix* and *Limax*; A. Butelli, Atti Soc. Tosc. (proc. verb.) ii. pp. 12 & 13.

Preliminary note on the spermatophores of *Helix* from India; H. Godwin-Austen, Rep. Brit. Assoc. 1879 (Sheffield), p. 377.

An abstract of Pfeffer's paper on spermatophores of *Naninidæ* [Zool. Rec. xv. *Moll.* pp. 11 & 12), in J. R. Micr. Soc. ii. p. 304.

The "sagitta amatoria" of *Helix nemoralis* is, according to the observations of C. Arndt, reproduced within a week; it is thrown out normally at the beginning of the copulation and acts as a stimulant on the genital organs of the partner. Arch. Ver. Mecklenb. xxxii. pp. 87–97.

A. Kowalewsky gives some very interesting observations on the reproduction and development of *Chiton polii* (Philippi), *olivaceus*, *caietanus* (Poli), and *Acanthochætes discrepans* (Browne); the males eject the sperma into the seawater, the females their eggs on the outer skin above the gills, where they are fecundated; in *C. caietanus* they remain agglutinated until the development of the larva. He further describes the cleaving of the yelk, the first formation of the gastrula, by invagination, the origin of the mesoderm from the endoderm, and its transformation to the free larva with a ciliated belt, and the appearance of the spicula and shell-plates, the former first occurring in the young state of all observed species. Zool. Anz. ii. pp. 469–473.

10. *Embryology.*

Ussow's paper (*suprà*) on the development of the Cephalopods has not been seen by the Recorder.

The development of *Planorbis marginatus* and *carinatus* within the egg, with supplementary references to *Limnæus*, *Physa*, *Ancylus*, *Succinea*, *Helix hortensis*, *Paludina*, and *Bithynia*, is the subject of an elaborate paper by C. Rabl; after describing his own observations, he comes to the following general remarks on the development of the *Mollusca*. The ectoderm is always formed by the small clear-coloured cells of the yelk, the endoderm by the large dark-coloured cells. In the *Pulmonata-Dermatobranchia*, some *Heteropoda*, and *Paludina*, there is a true blastosphæra, the endodermal half of which is invaginated into the ectodermal (embolic); in the *Pteropoda*, *Pleurobranchia*, and most *Prosobranchia*, the blastosphæra is very elongated and not really invaginate (epibolic). The development of *Natica* is somewhat intermediate, these differences seeming to depend on the scarcity or abundance of the nutritive part of the yelk. The mesoderm originates from a few cells, situated where the ectoderm passes over into the endoderm, but more closely allied to the latter. The definitive mouth in all *Mollusca* is either directly the transformed orifice of the gastrula (archæostome), or at least is situated exactly on the same spot; the contradictory statements by Bütschli and Ray Lankester are

regarded by the author as very probably erroneous. The velum really exists in the embryo of the *Limnæidæ*, as first stated by Ray Lankester. The organ called "shell-gland" by Ray Lankester and "tube rectal" by Lereboullet, is rudimentary, and its physiological function is not known. The primordial kidneys, first seen in the *Limnæidæ* by Stiebel, and first correctly described by Bütschli, are formed of perforated cells, and are really homologous to the segmental organs of the *Annelida*, as stated by Fol in 1875. The embryos of Gastropods belonging to very different Orders and Sub-orders are very often quite similar; for instance, those of *Limnæa* and *Torgipes*, *Planorbis* and *Bithynia*, *Hyalæa* and *Firoloides*. The nervous system really originates from the ectoderm, as in other animals, although Bobretzky states the contrary; the definite kidney originates from the mesoderm, though all former observers derive it from the ectoderm. The first appearance of lateral asymmetry in the embryo and its further consequences, are discussed at large. Morph. JB. v. pp. 562–660, pls. xxxii.–xxxviii.

The changes before segmentation in the egg of *Helix aspersa* observed by J. Perez, J. de l'Anat. Phys. xv. pp. 329–401, 2 pls.; abstract in Rev. Int. iii. p 280, and in J. R. Micr. Soc. ii. pp. 405 & 834–836.

L. Mark publishes a summary account of his observations on the early development of *Limax campestris* (Say), Zool. Anz. ii. pp. 493–496; W. Mayzel, some on the nucleus of the egg-cells in *Limax variegatus* (Dr.), *l. c.* p. 282.

Ovo-viviparity of *Helix studeriana*, *inæqualis*, and *Partula* stated by Viguier, C. R. lxxxix. pp. 866–868. [This already observed by Dufo, Ann. Sc. Nat. xiv. 1840, and H. Crosse, Nachr. mal. Ges. i. 1869, p. 4.]

Development of *Urosalpinx cinerea* and [*Columbella*] *Astyris lunata*, from the segmentation of the egg to the hatching, by W. H. Brooks, Chesapeake Zool. Laborat. 1878, pp. 121–142, pl. viii.

On development of *Chiton*, by Kowalewsky, *suprà*.

S. Lovén has published in German (*suprà*) his observations on the development of several Bivalves, chiefly *Modiolaria marmorata* (Forbes), *Cardium exiguum* (Gmel.), *Montacuta ferruginosa* and *bidentata* (Mont.), and *Mytilus edulis* (L.), with the original figures: these appeared first in Sv. Ak. Handl. 1848, in Swedish.

W. H. Brooks gives a preliminary abstract of his observations on the development of *Ostrea virginiana*; Zool. Anz. ii. pp. 659 & 660.

Note on the embryology of *Mytilus edulis* by T. Barrois; Bull. Sci. Nord. (2) ii. pp. 137–146, 1 pl. On that of *Pholas*; id. Assoc. Franc. vii. (Nantes) p. 302.

11. *Biology.*

O. Nüsslin has made numerous experiments on the evaporation of fluids of land-shells, and on their power of re-absorption of water from without; he comes to the conclusions that if slugs are exposed to dryness, the evaporation is greatest at the beginning and eventually diminishes; about 87 per cent. of their weight in a normal state is water, and they perish when they have lost about 17 per cent. of their own

weight, or 20 per cent. of the water they contain ; snails with a shell lose by evaporation much more slowly than naked slugs ; both, after having been exposed to dryness for some time, eagerly take water also by the mouth. Beiträge, &c., pp. 17–42.

Experiments on the absorption of water in *Helix pomatia* have also been made by Mer. The water is absorbed not only by the skin, but also by the walls of the pulmonary sac and the digestive tube. If immersed in water the experiment may be continued for three days; the quantity of absorbed water exceeds the snail itself in weight ; it is very rapid at first, but continually decreases, though without altogether ceasing, until the moment of death. CR. Soc. Biol. 1877 (1879), p. 186 ; abstract, J. R. Micr. Soc. ii. p. 856.

Wiedersheim has observed that 13 specimens of *Limnæa auricularia* remained alive for more than two months in fresh moss, wet, but not surrounded by water ; Zool. Anz. ii. p. 573.

On vital tenacity of *Succinea putris* (L.) ; T. Gough, Zool. (3) iii. p. 62.

Helix aspersa lived nearly a year in a closed flower-pot ; J. Ward, Nature, xx. p. 363.

Tenacity of life in *Litorina muricata* (L.) ; Hassler, P. Ac. Philad. 1873, p. 284.

J. Carrière describes mode of regeneration of the tentacles and eyes in *Helix*, and states that if the supra-pharyngeal ganglion is ruptured, no regeneration occurs, but the animal dies [this has also been observed by Spallanzani, 1769, and more distinctly stated by Schweigger, 1820. Tageblatt d. 52 Versaml. d. deutschen Naturf. pp. 225 & 226.

Cave-fauna. See in the special part, *Hydrobia quenstedti*, *Hyalina raddii*.

Depth of lakes. See in the special part, *Pisidium abditum*.

12. *Abnormities.*

A double monstrosity in the embryo of *Philine aperta* (L.) described by Lacaze Duthiers, Arch. Z. expér. iv. [1875] pp. 482–492, pl. xv.

Sinistral specimens of *Vitrina pellucida*, Brot, Proc. verb. Soc. mal. Belg. vi. [1877] p. xlvii. Of *Hyalina nitidula* (Drap.) ; Gredler, Nachr. mal. Ges. 1879, p. 107. Of *Zonites nitidus* ; Gassies, Bull. Soc. Bord. 1878. Of [*Azeca*] *Cochlicopa tridens* ; Taylor, J. of Conch. ii. p. 221.

Scalarid monstrosity of *Helix aspersa* ; J. de Guerne, Bull. Sci. Nord, (2) ii. pp. 321 & 322. Of *Clausilia nigricans* and *biplicata*, *Limnæa stagnalis*, *Planorbis albus*, *rotundatus*, and *Bithynia tentaculata* ; Hesse, JB. zool. sect. Westf. Mus. 1879, pp. 95 & 96, pl. ii. figs. 1–4.

Abnormity of *Paryphanta hochstetteri* (Pfr.), total absence of calcareous deposit in the shell ; E. A. Smith, Zool. (3) ii. [1878] p. 61.

Albino varieties of *Limax variegatus* ; Fries, Zool. Anz. ii. p. 155. *Helix rotundata*, several specimens, and *H. hispida* ; J. Butterell & H. Pollard, Naturalist, iv. [1878] pp. 25 & 170, Taylor, J. of Conch. ii. p. 282, and Hesse, JB. zool. sect. Westf. Mus. 1879, p. 95. *Helix alternata*, *palliata*, *multilineata*, and *profunda*, in Michigan ; Walker, J. of Conch. ii. pp. 328 & 329. *Cionella lubrica* in Silesia ; Jordan, JB. mal. Ges. vi.

p. 343. *Clausilia laminata*; H. Pollard, Naturalist, iv. p. 170. *Clausilia rugosa*; Nelson, J. of Conch. ii. p. 185. *Clausilia biplicata* and *Pupa doliolum*; Hesse, *l. c.* p. 95. *Ancylus fluviatilis*, small colony; Nelson, J. of Conch. ii. p. 282. Several other examples; Brot, Proc. verb. Soc. mal. Belg. vi. [1877] p. xlviii.

Planorbis corneus. Specimens of a bright flesh or pink colour in the animal, and with thin diaphanous shell, found near Leeds; W. Nelson, J. of Conch. ii. p. 150.

Albino, melanotic, and yellow varieties observed in 49, 15, and 12 species of marine shells of the Mediterranean, in specimens found in sponges; A. de Monterosato, Bull. Soc. mal. Ital. v. pp. 231–233.

Some remarkable deformities in *Helix*, *Clausilia*, and *Pupa*, incomplete repair of fractured shell in *Helix* and *Clausilia*, abnormal narrowness or bending of some of the first whorls in *Clausilia*, &c., described, and most of them figured by P. Hesse, JB. zool. sect. Westf. Mus. 1879, pp. 96–98, pl. ii. figs 5–10.

Specimen of *Clausilia dubia* (Dr.) with abnormal second aperture described; Böttger, JB. mal. Ges. vi. pp. 98–101, pl. ii. fig. 2.

Deformities of *Limnæa limosa* (L.), *Physa acuta* (Dr.), and *Planorbis paladilhi* from a lake of brackish water in the Landes, chiefly caused by interruption of growth; Folin, Faune lacustre de l'ancien lac d'Ossegor, J. de Conch. xxv. p. 185, 2 pls.; abstract, JB. mal. Ges. vi. pp. 190 & 191.

Deformity of *Limnæa peregra* at the base of the columella, caused by *Hydra viridis*; Brot, Proc. verb. Soc. mal. Belg. vi. [1877] p. xlviii.

Keeled deformity of *Limnæa limosa* (L.) from Northumberland; J. Purves, *tom. cit.* p. xlvii., with woodcut.

Deformity of *Cardium edule* (L.), in which the ribs are dislocated probably by a former damage; Martens, SB. nat. Fr. 1879, p. 74.

Malformed teeth in the radula of [*Helix*] *Leptaxis undata* (Lowe); Binney, Bull. Mus. C. Z. v. p. 337, pl. i. fig. *e*.

Abnormal outgrowth on the edge of the shell in *Mactra solidissima*; Leidy, P. Ac. Philad. 1879, p. 198.

J. B. Gassies has bred hybrids of the French and Algerian races of *Rumina decollata* (L.) at Bordeaux; they form a new variety, with dentiform callosity at the aperture, not before known in France. Actes Soc. L. Bord. xxxiii., with a plate; abstract, J. de Conch. xxxv. pp. 565 & 566; translated in Q. J. Conch. ii. pp. 356–358.

GEOGRAPHICAL DISTRIBUTION.

a. Land and Freshwater Mollusca.

Several instances of land-snails, which occur at very distant geographical points, but not in the intermediate countries, are adduced by Paulucci, Bull. Soc. mal. Ital. v. pp. 189 & 190 [some of them appear rather improbable].

Note on the conchological fauna in the alluvial deposits of rivers, how to

procure the various species, and their comparative numbers; R. SCHARFF, J. of Conch. ii. pp. 322–325. [See also *infrà*, Waldach, Würtemberg, and Garonne.]

1. *Arctic Region and Scandinavia.*

Greenland and Iceland. The species of *Limnæa* of the former are American, of the latter European; STEENSTRUP, Mal. Bl. (2) i. pp. 17–19. *Limnæa*, *Succinea*, and *Pisidium* found in Iceland, species not determined; ROUGEMONT, Bull. Soc. Neuch. xi. p. 189.

Norway. Some land and freshwater shells mentioned, but no special localities given; P. GODET, Bull. Soc. Neuch. xi. p. 218. Eight species from Drontheim; ROUGEMONT, *tom. cit.* p. 235, including *Vitrina diaphana*, *Helix pulchella* and *hispida*, *Balea perversa*, and *Pupa muscorum* var. *edentula*, not before mentioned from that locality. Land and freshwater shells from several localities enumerated, and a new species of *Hyalina* described, by (Miss) B. ESMARK, N. Mag. Naturv. 1879, p. 215.

2. *British Fauna.*

Scotland. Fifteen land shells from Glen Tilt; F. B. WHITE, Scot. Nat. iv. [1878] pp. 246–248, & J. of Conch. iii. p. 78.

Whitby. Some land and freshwater shells mentioned by H. CROWTHER, Naturalist, iv. [1878, & January, 1879], pp. 40, 73, 74, 80–85.

Yorkshire. 43 terrestrial and 29 freshwater species from Hull and its vicinity enumerated by J. D. BUTTERELL, Naturalist, iv. [1878] pp. 70–72. Additions by H. F. PARSONS, *tom. cit.* [Jan. 1879] p. 90. 42 land and 29 freshwater shells observed near Redcar, North Riding; C. ASHFORD, J. of Conch. ii. pp. 236–241. 44 land and 36 freshwater species, including *Helix cantiana*, *virgata*, *caperata*, *ericetorum*, and *Cochlicopa tridens*; W. C. HEY, J. of Conch. ii. pp. 310–314. 14 species of freshwater shells with 14 more varieties; W. NELSON & J. W. TAYLOR, Tr. Yorksh. Nat. Union, series C, i. pp. 2–16.

Hertfordshire. Seven terrestrial and 6 freshwater species from Berry Wood mentioned by H. LAVIS, Tr. Watford Soc. 1876, p. xvii.

Sussex. 37 terrestrial and 21 freshwater species from Hastings and St. Leonards enumerated by A. W. LANGDON, "Natural History of Hastings and St. Leonards," 1878.

Dorsetshire. 21 terrestrial and 19 freshwater species mentioned in C. W. DALE'S History of Glanville's Wootton (London: 1878), pp. 331–334.

Ireland. 41 terrestrial and 23 freshwater shells from Mayo and Sligo enumerated by A. WARREN, Zool. (3) iii. pp. 25–29.

Testacella maugei (Fér.) found in Jersey; M. BULL, J. of Conch. ii. p. 98.

Limax tenellus (Müll.), Ayrshire and island of Bute; J. CONACHER, Naturalist, iii. [1878] pp. 177 & 178.

Helix lamellata (Jeff.) and *fusca* (Mont.) near Redcar; Ashford, J. of Conch. ii. pp. 128 & 209.

English varieties of [*Azeca*] *Cochlicopa tridens* (Pult.); Taylor, J. of Conch. ii. pp. 220 & 221.

New British varieties of *Pupa secale* (Dr.); *id. l. c.* p. 5.

Valvata cristata (Müll.) in the vale of York; Nelson, J. of Conch. ii. p. 185.

Anodonta cygnea var. *incrassata*, Ayrshire; J. Conacher, Naturalist, iii. [1878] pp. 177 & 178.

3. *Middle Europe.*

Belgium. 27 terrestrial and 17 freshwater shells from Walcourt, river Sambre, enumerated by E. Colbeau, Bull. Soc. mal. Belg. 1876, pp. lxiii.–lxvii. 11 terrestrial and 10 freshwater species from Ghent by H. Roffiaen, *tom. cit.* p. xlix. 34 terrestrial and 13 freshwater species at Waulsort in the Meuse Valley; *id. op. cit.* 1877, pp. xci.–xciii.

Soissons and Valenciennes. Malacological excursions by T. Lefèvre, Bull. Soc. mal. Belg. 1876, pp. lxxxv.–xcviii.

Paris. F. Jousseaume has continued his paper on the land-snails of the environs of Paris in Bull. Soc. Zool. Fr. ii. [1877] pp. 71, 99, & 403, & iii. [1878] pp. 5, 147, & 203. He distinguishes the species very minutely, enumerating 11 spp. of *Succinea*, divided into two genera, *Neritostema* and *Succinea*, 11 of *Oxychilus* [*Hyalina*] and 1 of *Polita* [*Conulus*], 2 of *Discus* [*Patula*], 26 of *Helix*, 2 of *Cochlicopa* [*Cionella*], 1 of *Ena*, and 1 of *Balea*. Among them are some southern species recently acclimatized (see below). The critical and new species only will be mentioned in the special part.

New species of land-snails in France, by J. Mabille, Bull. Soc. Z. Fr. ii. [1877] pp. 304–306.

Northern Germany. 48 terrestrial and 51 freshwater species observed near Bremen and discussed by R. Kohlmann, Abh. Ver. Brem. vi. pp. 48–98. *Helix granulata* (Alder) found near Hamburg by Petersen, Verh. Ver. Hamb. 1879, pp. 244 & 245.

Westphalia. P. Hesse, after mentioning the previous papers on the subject (see also Zool. Rec. xv. *Moll.* p. 16), describes more particularly the known slugs of this province, giving new localities for many species of shells, and a list of the species found as yet at Pyrmont. JB. zool. sect. Westf. Mus. 1879, pp. 73–99.

Lusatia (western part of Silesia), chiefly environs of Görlitz. 78 terrestial and 67 freshwater species enumerated, with interesting observations concerning varieties, occurrence, and distinction, and analytical table for each genus; a new species of *Vitrina* and some new varieties. H. Jordan, JB. mal. Ges. vi. pp. 291–384, pl. viii.

Hesse, Homberg (S. of Cassel). 27 terrestrial and 14 freshwater species enumerated by O. Böttger, Nachr. mal. Ges. 1879, pp. 83–86.

Eichsfeld (S.W. of the Harz). 28 terrestrial species on limestone,

including *Helix candidula* (Stud.) and *striata* (Müll.), *Pupa secale* (Drap.), and *Azeca tridens* (Pult.); *id. l. c.* pp. 86–89.

Terrestrial Mollusks from the principalities *Meiningen* and *Coburg*; id. *l. c.* pp. 1–4.

Rhön Mountains. 5 species of *Clausilia*; id. *l. c.* pp. 51 & 52.

Odenwald. 16 terrestrial and 1 freshwater species, *Planorbis albus*; id. *l. c.* pp. 81 & 82.

Darmstadt. 17 terrestrial species; *id. l. c.* pp. 82 & 83.

Alsace. 49 terrestrial and 18 freshwater species; A. ANDREÆ, Nachr. mal. Ges. 1879, pp. 93–95.

The numerical relations of specimens of land shells drifted ashore by the rivulet Waldach, confluent of the Nagold, *Würtemberg*, have been made out by BUCHNER, J. H. Ver. Württ. xxxv. p. 350. There were 26,000 specimens of 32 species, more than half of them (14,000) *Helix pulchella*, 4,200 *H. hispida*, 2,500 *Cionella lubrica*, 1,500 *Pupa muscorum*, 1,000 *Carychium minimum*.

Subalpine parts of *Würtemberg* and *Bavaria.* 37 terrestrial and only one freshwater species, *Limnæa truncatula*; O. BÖTTGER, Nachr. mal. Ges. 1879, pp. 89–91.

The distribution of land shells near *Reichenhall* and *Salzburg*, and the difference of their calcareous and primitive Alpine mountains, discussed by E. v. MARTENS, JB. mal. Ges. vi. pp. 67–71. Some additions by O. BÖTTGER, *tom. cit.* pp. 413–415.

17 terrestrial and 1 freshwater species, from *Schaffhausen*, *Switzerland*, and *Constance*; by E. GAUCHER, Bull. Soc. mal. Belg. 1879, p. lxxvi.

Switzerland. Numerous terrestrial species noticed by J. WOOD, Naturalist, iii. [1878] pp. 113 & 114; and by F. ROFFIAEN, Proc. verb. Soc. mal. Belg. 1879, p. xcix. *Helix ruderata* (Stud.), found on the Jura, at Creux-du-Van; ROUGEMONT, Bull. Soc. Neuch. xi. p. 210.

Tirol. List of terrestrial *Mollusca* of the northern part; by GREMBLICH (*suprà*). Additions to a former list, by V. GREDLER, Nachr. mal. Ges. 1879, pp. 105–116. 149 terrestrial and 63 freshwater species enumerated; *id.* Ber. Ver. Innsbr. vii. pp. 22–32.

Styria. Localities of *Clausilia styriaca* (A. Schmidt) and *grimmeri* (Parr.); TSCHAPECK, Nachr. mal. Ges. 1879, pp. 28–31.

4. *South-western Europe.*

Land and freshwater shells from *Bordeaux*, *Arcachon*, *Biarritz*, and *San Sebastian*, in Northern Spain; VON HEIMBURG, Nachr. mal. Ges. 1879, pp. 24–28.

J. B. GASSIES has given a new supplement to his list of the land- and freshwater *Mollusca* of Dept. *Lot-et-Garonne*, adding 22 species to the 155 already known. Bull. Soc. Bord. 1878.

List of land and freshwater shells collected in the neighbourhood of *Bordeaux*; R. SCHARFF, J. of Conch. ii. p. 183.

Alluvial deposits of the *Garonne.* 44 terrestrial and 13 freshwater species, enumerated by R. SCHARFF, J. of Conch. ii. pp. 315 & 316. 14

species of *Pupa* and *Vertigo*, and their relative abundance, stated by O BÖTTGER, Nachr. mal. Ges. 1879, pp. 49–51 & 65–68.

The ancient lake of Ossegor, in the Landes, 600–700 mètres from the sea, contained chiefly freshwater *Mollusca*, but also two characteristic of brackish water: *Hydrobia ulvæ* and *Scrobicularia piperata*. The size of the freshwater species was remarkably small [as in the Baltic Sea]. FOLIN, Faune lacustre de l'ancien lac d'Ossegor; J. de Conch. xxv. pp. 183–185. See also "Abnormities."

E. DUBREUIL continues his paper on the land and freshwater *Mollusca* of the Dept. *Hérault;* Rev. Montp. (2) i. 44.

Pyrenees. 43 terrestrial species, including 9 of *Pupa* and 3 freshwater-shells observed at and near the hot springs of La Preste, in the valley of the Tech, Dept. Pyrénees Orientales, 1,000 mètres above the sea. *Helix canigonensis* (Boubée) and *pyrenaica* (Drap.) are most characteristic for the Eastern Pyrenees; no species of the genus *Pomatias* has been found. DUPUY, Bull. Soc. Toulouse, 1879, 28 pp.; abstract in J. de Conch. xxv. pp. 280–282.

Note on the habitat of *Helix constricta* (Boubée), *quimperiana* (Fér.), *Clausilia pauli* (Mabille), &c., in the mountains of the *Basses Pyrénées*; by G. WATTEBLED, Actes Soc. L. Bord. xxxii. [1878] P. v. pp. 81–83.

5. *Italy.*

Piedmont. Varieties of *Helix hispida* and species allied to it; by LESSONA, Att. Acc. Torin, xv.

Apuan Mountains, N. Tuscany. 68 terrestrial and 10 freshwater shells enumerated, and their hypsographical distribution pointed out by R. DEL PRETE. These contain several varieties of *Helix cingulata* (Stud.), some peculiar species of *Pomatias*, *Belgrandia thermalis* (L.), several varieties of *Bythinella opaca* (Ziegl.) and *Hydrobia aponensis* (Martens). The species found only in the more elevated regions are *Vitrina pellucida*, *brevis*, *Hyalina subrimata*, *cellaria*, *hydatina*, *fulva*, *Helix vallisnierii*. *ciliata*, two varieties of *H. cingulata*, *Buliminus quadridens*, *Pupa secale*, var. *sarratina*, *cylindracea* var. *sempronii*, *P. biplicata*, *doliolum*, *Balea perversa*, *Clausilia laminata*, *Carychium minimum*, *Acme lineata*, *Pomatias montanus* and *gualfinensis*, and two varieties of *Bythinella opaca*. Bull. Soc. mal. Ital. v. pp. 70–91, pl. i.

Middle Italy. 51 terrestrial and 7 freshwater species found in the basin of the Toronto (Ascoli Piceno), enumerated by E. VALENTINI, Bull. Soc. mal. Ital. v. pp. 22–37. New species from Tuscany, &c.; C. DE STEFANI, *tom. cit.* pp. 38–48.

Southern Italy. Malacological excursions into the Matese and Gargano Mountains, and to Sorrento and Capri, described by W. KOBELT, JB. mal. Ges. vi. pp. 126–150.

Calabria. 88 terrestrial and 9 freshwater species (including some new species of *Helix*, *Clausilia*, and *Pomatias*, but only one Bivalve, *Pisidium casertanum*) observed and discussed by Mme. PAULUCCI, Faun. Malac. Calabriæ, 1879, 223 pp. 9 pls.

Sicily. Malacological excursions in the Madonie and Mount Eryx, by W. Kobelt, *l. c.* pp. 225–255.

Malta. Land and freshwater *Mollusca*, by H. W. Feilden, Zool. (3) iii. pp. 193–199.

6. *South-east Europe and Asia Minor.*

Dalmatia, Greece, and *Russia.* Some new species of *Unio* and *Anodonta* described by Drouet, J. de Conch. xxvii. pp. 140–142 & 327–333.

Galicia. Some new varieties by Clessin, Mal. Bl. (2) i. pp. 7–12, pl. i. figs. 5–8.

Z. Krol has published a list of 62 species of Gastropods and 13 Bivalves from Eastern Galicia, in the Report of the Physiographical Commission of the Academy of Science at Cracow (in Polish) xii. [1878] pp. 163–176, 1 pl.; and J. Radowski, three lists of Mollusks found at Strzyzow, on the Bug river, near Kamionka-Strumilowa, and at Bobrka and Przemyslany, *tom. cit.* pp. 15–23, 23–26, and xiii. pp. 130–138. [The Polish titles are to be found in Zool. Anz. iii. pp. 363 & 364.]

Croatia. 37 terrestrial and 6 freshwater species (2 apparently new), collected by Von Heyden, enumerated by S. Clessin, Nachr. mal. Ges. 1879, pp. 116–125.

Herzegovina. 10 terrestrial and 2 freshwater species, collected by A. Schletterer, enumerated by V. Gredler, Nachr. mal. Ges. 1879, p. 57.

Greece. C. A. Westerlund & H. Blanc discuss the malacological fauna, chiefly from the rich collections made by the latter during several travels, chiefly in Attica, Eubœa, and Crete, but with full consideration of the scattered previous literature on that subject. They enumerate 269 species of land shells, and only 57 of freshwater shells. The prominent feature of this fauna, compared with that of Italy, is the large number of white or pale blue *Clausiliæ*, subgenus *Albinaria*. Several of the more interesting new species are figured in Kobelt's Iconography.

Freshwater shells, new species or varieties, described by Clessin, Mal. Bl. (2) i. pp. 1–7, pl. i. figs. 1–4.

Caucasus. 51 terrestrial and 1 freshwater species from various parts, chiefly Kasbeck, including several new, collected by H. Leder, described, with critical remarks, by O. Böttger, JB. mal. Ges. vi. pp. 1–42, pl. i. 40 species of small land shells, collected by G. Sievers in Transcaucasia, determined; *id. l. c.* pp. 388–412, pl. x.

Troas. 10 terrestrial and 4 freshwater species, collected by R. Virchow, enumerated by Von Martens, SB. nat. Fr. 1879, pp. 86 & 87.

7. *Northern and Central Asia.*

Central Asia. Some land shells collected by Dr. Regel at Kuldja, including several new, and freshwater shells from the Tarim river, collected by Prejewalsky, including varieties of the European *Limnæa auricularia* and *stagnalis*, exhibited by E. v. Martens, SB. nat. Fr. 1879, pp. 122–126.

Lake Baikal. The results of B. Dybowski's researches (Zool. Rec. xiii. *Moll.* p. 12) are recorded, some statements taken from Gerstfeldt

(1859), and a few general remarks on the Siberian fauna added by H. Crosse & P. Fischer, J. de Conch. xxvii. pp. 145–168. The changes proposed by them in the generic arrangement of some of these shells will be mentioned *infrâ*, family *Rissoidæ*.

Japan. Kobelt, "Fauna mollusc. extramar. Japoniæ," enumerates and describes 138 terrestrial and 55 freshwater species, chiefly from the collections made by Prof. Rein, completing the number from the collections and publications of A. Adams, Martens, Hilgendorf, and others; only those will be mentioned in the special part as to which new information is given, or which are figured for the first time. 12 terrestrial and 5 freshwater species are identical with, or nearly allied to, circumpolar species; 4 terrestrial and 7 freshwater species are Indian, occurring also in the Philippines, the Malayan Archipelago, &c.; 2 terrestrial, *Clausilia aculus* and *Cyclotus fortunii*, and 6 freshwater are also found in China, or at least very nearly allied to Chinese species, and probably much more will be found on future researches in Middle China and in Korea; the remainder are peculiar to Japan (pp. 160–165).

Japan, Loo-choo Islands, and *Formosa.* General remarks and list of their land and freshwater *Mollusca*; Kobelt, JB. mal. Ges. vi. pp. 198–200 & 213–216.

China. New species of *Anodonta*; Heude, Conchyl. fluv. de Nanking, fasc. v. pls. xxxv.–xl.

8. *Africa.*

Tripoli. 8 terrestrial and 1 freshwater species collected by E. v. Bary, enumerated by E. v. Martens, SB. nat. Fr. 1879, pp. 70–73; *Helix gyrostoma* (Fér.) and *H. leachi* (Fér.) are peculiar among them.

Victoria Nyanza. 8 species of freshwater shells (2 new) collected by Emmin Effendi, described by E. v. Martens, SB. nat. Fr. 1879, pp. 103–105.

Valuable notes on the occurrence and habits of several land shells at *Mozambique, Zanzibar,* and neighbouring coral islets, by J. S. Gibbons, J. of Conch. ii. pp. 138–145.

Bagamoyo. 5 terrestrial and 4 freshwater species (several new), collected by Fischer, enumerated by E. v. Martens, *l. c.* pp. 102 & 103.

Mozambique. 16 terrestrial and 18 freshwater species, collected by W. Peters, enumerated; *id.* MB. Ak. Berl. 1879, pp. 733, 734, 736, 737, 742, & 743; most of them have not been found elsewhere.

Johanna Island (*Comoros*). List of known species, 32 inoperculated, 7 operculated land shells, 10 freshwater shells, 5 submarine, and descriptions of some new (*Helix*, *Ennea*, *Pupa*, and *Neritina*, see below), by A. Morelet, J. de Conch. xxvii. pp. 308–312.

Madagascar. 2 new species of *Eurycratera* [rather *Helicophanta*] described by G. F. Angas, P. Z. S. 1879, pp. 728 & 729, pl. lvii.

Rodriguez Island. 16 terrestrial and 6 fluviatile species, collected during the 'Transit of Venus' Expedition, enumerated by Edgar A. Smith, Phil. Tr. clxviii. pp. 476 & 477. An Indian species, *Stenogyra gracilis* (Hutt.), is among them.

South Africa. Localities for some land and freshwater species given by Gibbons, J. of Conch. ii. p. 283.

9. *Southern Asia.*

Malayan Peninsula. Some new terrestrial shells, collected by Dr. E. Townsend, described by H. Crosse, J. de Conch. xxvii. pp. 198–208. List of 5 inoperculate and 13 operculate land shells from thence ; *id. l. c.* pp. 336–340. Several new small land shells from Perak, described by Godwin-Austen & Nevill, P. Z. S. 1879, pp. 734–740, pls. lix. & lx.

Andaman Islands. L. de Folin begins a publication on the Mollusks of these islands, not seen by the Recorder.

Philippines. General remarks and lists of their land and freshwater *Mollusca* ; by Kobelt, JB. mal. Ges. vi. pp. 195–197 & 205–212.

10. *Australian Region.*

New Guinea. 28 species of terrestrial, 12 of freshwater, 11 of submarine Gastropods (*Auriculidæ*), and 1 freshwater Bivalve, collected by Raffray, at Port Dorey, enumerated by Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] pp. 264–267, 269–274, & 276. New species, by Brazier, P. Linn. Soc. N. S. W. ii. pp. 25 & 120 ; by J. E. T. Woods, *op. cit.* iv. pp. 24 & 25 ; and by Cox, *tom. cit.* p. 114.

New Ireland and *Duke of York Island.* Some land shells, indicated by E. P. Ramsay, P. Linn. Soc. N. S. W. 1876, p. 577.

New Caledonia. New land and freshwater shells, by J. B. Gassies & R. P. Montrouzier, J. de Conch. xxvii. pp. 125–136.

Pelew, Caroline, Ladrone, and *Sandwich Islands, Tahiti, Paumotus, Marquesas,* and *Gambier Islands, Rapa* (or *Opara*), *Pitcairn, Cook's, Tonga, Samoa, Ellice,* and *Kingsmill Islands.* General remarks, and lists of their land and freshwater *Mollusca,* by Kobelt, JB. mal. Ges. vi. pp. 201–205 & 216–224.

Rurutu (*Tubuai or Austral Group*). 23 species of land shells (8 new), by A. Garrett, P. Ac. Philad. 1879, pp. 17–30.

Australia. New species, by Brazier, P. Linn. Soc. N. S. W. ii. p. 25, iii. pp. 77–80, pl. viii. ; by R. Tate, *op. cit.* ii. p. 290 ; and by J. E. T. Woods, *op. cit.* iii. pp. 123–125.

Tasmania. W. F. Petterd has published a monograph of the land shells, enumerating and describing 68 species of *Helix*, two of which, *H. cellaria* (Müll.) = *sydneyensis* (Cox) and *H. pulchella* (Müll.) = *alexandræ* (Cox), are introduced from Europe ; also 2 *Bulimus* [subg. *Caryodes* (Albers)], 2 *Succinea*, 3 *Vitrina*, and 6 *Truncatella* ; no species of *Pupa, Tornatellina, Pupina,* or *Helicina* has been found, although these genera are well represented even in South Australia.

Critical note on pretended Tasmanian *Helix*, by W. Legrand, J. of Conch. ii. p. 95.

A former previous paper by Legrand, "Collections for a Monograph of Tasmanian Land Shells" [published about 1871 ?], has never been seen by the Recorder, but the very numerous new species contained in it will be mentioned below, as they can be gathered from Petterd's work.

Lists of Tasmanian freshwater shells, mostly new, by J. E. T. Woods,

P. R. Soc. Tasm. 1875, pp. 66–82, abstract in J. of Conch. ii. p. 203; and by PETTERD, J. of Conch. ii. pp. 80–87, viz., 19 *Limnæidæ*, 1 *Assiminea*, 1 *Ampullaria*, 1 *Valvata*, 9 *Rissoidæ* and *Paludinidæ*, 1 *Anodonta*, 1 *Unio*, 3 *Sphæriidæ*. *L. peregra* (Müll.) and *stagnalis* (L.) in Tasmania; NELSON & LEGRAND, J. of Conch. ii. pp. 4 & 95.

New Zealand. List of species of *Physa* by J. E. T. WOODS, P. Linn. Soc. N. S. W. iii. [1878] pp. 135–139.

Auckland Islands. Some land shells mentioned by VON MARTENS, SB. nat. Fr. 1879, p. 38.

Kerguelen Island. *Helix hookeri* (Reeve) is the only land shell, and is common on *Azorella* and moss to an elevation of 2000 feet; the living animal described by A. E. Eaton. STUDER, Arch. f. Nat. xlv. p. 111, and E. A. SMITH, Phil. Tr. clxviii. p. 183 [see Zool. Rec. xiv. *Moll.* p. 8, footnote].

11. *North America.*

Michigan. 52 species of inoperculate (no operculate) land shells, 43 *Limnæidæ*, 28 operculate (*Valvata*, *Paludinidæ*, and *Melaniidæ*), 64 *Unionidæ*, and 20 *Sphæriidæ*, in all 209 species, enumerated by BRYANT WALKER, J. of Conch. ii. pp. 322–325. They include the European *Zonites cellarius*, *nitidus*, *viridulus*, and *fulvus*. *Pisidium abditum*, var. n. *abyssorum*, in Lakes Michigan and Superior, 159 fath. deep; *id. l. c.* p. 337.

Iowa. 16 terrestrial and 13 freshwater species mentioned by W. H. PRATT, P. Davenp. Ac. ii. [1877] pp. 10, 13, 18, 21, & 26. Five more species added; D. S. SHELDON, *l. c.* p. 143.

San Francisco. Note on some land shells by W. N. LOCKINGTON, Am. Nat. xii. [1878] pp. 505–512.

Lower California. BINNEY gives some account of the land shells of the island of Guadelupe, mentioning *Arionta rowelli* and *facta* (Newc.) and *Binneya notabilis* (Coop.) as inhabitants. P. Ac. Philad. 1879, p. 16; abstract in J. R. Micr. Soc. ii. p. 861.

12. *West Indies.*

Valuable notes on the habits and distribution of some West Indian land and freshwater *Mollusca* by J. S. GIBBONS, J. of Conch. ii. pp. 129–137 & 284.

Cuba. 27 species of *Choanopoma*, 26 *Ctenopoma*, 1 *Diplopoma*, 1 *Adamsiella*, 1 *Licina*, 4 *Cyclostomus*, 7 *Tudora*, 13 *Cistula*, 57 *Chondropoma*, 2 *Cyclotus*, 11 *Megalomastoma*, 6 *Truncatella*, 3 *Blandiella*, 20 *Trochatella*, 54 *Helicina*, 9 *Alcadia*, 2 *Proserpina*, 5 *Melampus*, 1 *Pedipes*, 1 *Plecotrema*, 1 *Blauneria*, 2 *Leuconia*, 87 *Helix*, 3 *Bulimus*, 34 *Macroceramus*, 2 *Pineria*, 1 *Pupoides*, 7 *Melaniella*, 1 *Balea*, 1 *Pseudobalea*, 14 *Stenogyra*, 3 *Spiraxis*, 2 *Achatina* [*Liguus*], 17 *Oleacina*, 3 *Streptostyla*, 6 *Subulina*, 1 *Euspiraxis*, 2 *Cæcilianella*, 16 *Pupa* [*Strophia*], 4 *Vertigo*, 105 *Cylindrella*, 11 *Succinea*, 2 *Vaginulus*, 2 *Limnæa*, 3 *Physa*, 6 *Planorbis*, 1 *Segmentina*, 5 *Ancylus*, 3 *Gundlachia*, 1 *Poeya*, 3 *Ampullaria*, 1 *Paludina*, 2 *Paludi-*

nella, 1 *Amnicola*, 4 *Melania*, 3 *Neritina*, 1 *Pisidium*, 1 *Sphærium*, and 2 *Unio*, enumerated by Arango & Molina, Fauna mal. Cubana, pp. 1–144.

San Domingo. 17 species of land shells found at Puerto Plata, during a short search, by Gibbons, J. of Conch. ii. p. 209.

13. *Central and South America.*

Mexico. H. Strebel publishes Part iv. of his work on the Mexican land and freshwater *Mollusca*, describing 9 genera and 7 species of *Vitrinidæ* (including *Hyalina* and *Limax*), 1 *Tebennophorus*, 2 *Xanthonyx*, 29 of *Helicidæ* subdivided into 11 "groups," 9 species of *Cælocentrum*, 17 of *Eucalodium*, 12 of *Cylindrella* subdivided into 5 groups, 2 of *Macroceramus*, and 1 *Pupa*. Many of them are anatomically described by G. Pfeffer, and almost all figured. The shells are photographed on seven plates (very well done, especially the flat *Morcletiæ* and the turreted larger *Eucalodium*); the radula, other anatomical figures, and some shells, are drawn on six other plates.

Central America. Some new species of *Planorbis* by Crosse & Fischer, J. de Conch. xxvii. pp. 341 & 342.

Guatemala. 38 species exhibited by Boucard in the Paris Exposition of 1878 enumerated by F. Jousseaume, Bull. Soc. Z. Fr. iii. pp. 169 & 170.

Costa Rica. 42 species of land shells, collected by the late Dr. W. M. Gabb, are enumerated by G. F. Angas; several are new, and figures of living animals of some are given. P. Z. S. 1879, pp. 475–486, pl. xl.

Ecuador. K. Miller adds to his former paper [Zool. Rec. xv. *Moll.* p. 23] a number of land shells (including several new) chiefly found in the province Loja and at Guayaquil by T. Wolf; and enumerates 38 other species of freshwater shells, also with many new species. He gives a general list, according to which 26 land and 15 freshwater species are known from the low Pacific coast region, 49 land and 4 freshwater from the middle region of the western slope of the Andes, 47 land and 5 freshwater from the middle region of the eastern slope, 59 land and 8 freshwater from the highlands between the chief chains of the Andes, and 12 land shells (*Otostomus*, *Bulimulus*, chiefly subg. *Scutalus*, and 1 *Cyclotus*) from the high mountains above 2800 mètres. Mal. Bl. (2) i. pp. 117–203, pls. iv.–xv.; list, pp. 183–191.

Upper Peru. 43 species of land shells (4 new *Nenia*), collected by Jelski and Stolzmann, enumerated by L. Lubomirski, P. Z. S. 1879, pp. 719–728, pls. lv. & lvi.

Argentine Republic. A. Döring continues his review of the land snails, enumerating and describing 17 species of *Bulimulus*, 2 *Otostomus*, 1 *Stenogyra*, 1 *Cionella* (*Acicula*), and 5 *Pupa*; Bol. Ac. Cordoba, iii. pp. 63–81.

b. Marine Mollusca.

The Pteropods collected in the Atlantic, Indian, and Pacific Oceans during the voyage of the Prussian corvette 'Gazelle,' and some time ago

by Dr. F. Jagor, are reviewed, and several new species among them described, by G. Pfeffer, MB. Ak. Berl. 1879, pp. 230–247, 1 pl.

The *Dentaliidæ* and new *Trochidæ* collected during the 'Challenger' Expedition are enumerated and described by B. Watson, J. L. S. xiv. pp. 506–529, 586–605, 692–716. They are from the West Indies, Middle and South Atlantic, Southern Indian Ocean up to 60° S. lat., North Australia, New Zealand, Mid Pacific, and Japan, from a few fathoms below the surface to depths of 2160 fath.

Fifteen species of *Cæcidæ* from the 'Challenger' Expedition, including a new genus and another hitherto only known as fossil, described by Folin, P. Z. S. 1879, pp. 806–812.

A part of the Bivalves collected during the 'Lightning' and 'Porcupine' Expeditions, 1868–70, viz., the *Anomiidæ*, *Ostreidæ*, *Pectinidæ*, *Aviculidæ*, *Mytilidæ*, and *Arcidæ*, altogether 101 species, are enumerated and discussed by J. G. Jeffreys, P. Z. S. 1879, pp. 553–587, pls. xlv. & xlvi.; only new species and those figured for the first time will be mentioned below.

1. *Arctic Seas.*

Spitzbergen. 47 Bivalves, 83 Gastropods, 2 Pteropods, and 3 Cephalopods, collected by the Norwegian Arctic Expedition (several new), enumerated by H. Friele, JB. mal. Ges. vi. pp. 264–286.

List of shells collected by W. J. A. Grant in various localities between Spitzbergen and Novaya Zemlya given by D'Urban, J. of Conch. ii. pp. 88–94.

Novaya Zemlya. Abstract of Leche's paper on the marine *Mollusca* [Zool. Rec. xv. *Moll.* p. 23], with list of observed species, in JB. mal. Ges. vi. pp. 287–290, pl. iv. List of 67 species from the Swedish Expeditions in 1875 and 1876 exhibited at the Paris Exposition, 1878, by F. Jousseaume, Bull. Soc. Z. Fr. iii. pp. 170–172.

Jeffreys gives some corrections to a list of shells, procured during the Arctic expedition of the 'Fox' in 1858–59: (J. R. Dubl. Soc. iii. pp. 70–72) P. R. Dubl. Soc. (2) ii. pp. 125–128.

2. *Seas of Northern Europe.*

Norway. Several marine-shells mentioned, with hints on their geographical distribution, by P. Godet, Bull. Soc. Neuch. xi. pp. 215–217. *Mya arenaria* and *Mytilus edulis* found at Drontheim; Rougemont, *tom. cit.* p. 234. Several shells from the Porsangerfjord near Hammerfest; *id. l. c.* p. 241. List of 257 species dredged in the fjords near Bergen, and notes on their geographical distribution elsewhere by T. A. Norman, J. of Conch. ii. pp. 8–77.

East Coast of England. Note on marine *Mollusca* from Whitby by H. Crowther, Naturalist, iv. [1878–79] pp. 73 & 74, 81–85. 91 marine species from the Norfolk coast enumerated by F. W. Harmer, Tr. Norw. Soc. i. [1869–74] p. 42.

Torbay. 721 Gastropods and 88 Bivalves enumerated by D. Pidgeon, Tr. Devon Assoc. 1875, 22 pp.

Sussex. 5 *Cephalopoda*, 2 *Nudibranchiata*, 48 *Prosobranchiata*, 1 *Dentalium*, and 67 *Conchifera* enumerated by A. W. Langdon, "Natural History of Hastings and St. Leonards," 1878.

Note on the stations of *Pholas* [see infrà], *Modiola modiolus* and *Purpura lapillus* on the coast of Boulogne, by Bouchard Chantereaux, J. de Conch. xxvii. pp. 122–124.

Notes on the original specimens of Montagu's collection by J. G. Jeffreys, J. of Conch. ii. pp. 1–4.

Oceanic coast of France. P. Fischer states that 561 species of Mollusks live on these coasts, and about 1000 on the Mediterranean coast; 418 are common to both; 427 are also British; 60, including several *Nudibranchia*, are not hitherto known either from England or the Mediterranean. He admits three sub-regions of the oceanic coasts of France, (1) reg. Normande, or the Channel; (2) reg. Armoricaine, to the mouth of the Loire; (3) reg. Aquitanique ou Vasconienne. Act. Soc. L. Bord. xxxii. [1878]; abstract in J. de Conch. xxvii. pp. 377–379, and J. of Conch. ii. pp. 350 & 351.

3. *Mediterranean Sea.*

List of shells dredged off Marseilles by A. F. Marion, with a short sketch of the distribution of vegetable and animal life in this part of the Mediterranean; Ann. Sc. Nat. (6) viii. art. 7, pp. 2–4, 6, 7, 11–13. List of shells from the shore of Cette by Granger, Act. Soc. L. Bord. iii. pp. 235–256.

One hundred and twenty marine species found in sponges collected on the coast of North Africa enumerated by A. de Monterosato, Bull. Soc. mal. Ital. v. pp. 213–233; albino specimens observed in 49 of these species, melanism in 15, yellow varieties in 12. Note on a few marine shells from Tripoli by Von Martens, SB. nat. Fr. 1879, p. 73.

Twenty-eight marine species (all well known as Mediterranean) collected on the coast of the Troas by R. Virchow, enumerated by Von Martens, SB. nat. Fr. 1879, pp. 88 & 89.

Sixteen species of *Chitonidæ* of the Mediterranean, enumerated and discussed by T. A. Monterosato, Enumerazione e sinonimia delle conchiglie Mediterranee, pt. ii. No. 1 (Giorn. Sc. Palerm. xiv. pp. 9–31).

4. *East Coast of North America.*

Maine. Several new or little-known marine *Mollusca* by Verrill; Am. J. Sci. (3) xvii. pp. 241–243, 311–315.

Virginia. 1 Cephalopod, 13 Gastropods, and 17 Bivalves observed at Fort Wool, enumerated by P. R. Uhler, Chesapeake zool. laborat. 1878, pp. 18–24, with notes on their occurrence.

5. *West Indies and Brazil.*

Florida. 5 species of Cephalopods, 144 marine Gastropods, 126 Bivalves, and 13 *Auriculidæ* and *Truncatellidæ* from brackish water, enumerated, chiefly from his own collections (three among them new), by W. W. CALKINS, P. Davenp. Ac. ii. [1878] pp. 232–252, pl. viii. [Zool. Rec. xiv. *Moll.* p. 25].

R. STEARNS opposes the identity of some Floridan and Pacific species, as proposed by Calkins, stating that the pretended *Ranella muriciformis*, from Florida, = *caudata* (Say) var., *Tritonidea ringens* = *tincta* (Conrad), and *Leucozonia cingulata* = *cingulifera* (Lam.) = *nassa* (Gmel.), Science News, April, 1879, p. 181. W. CALKINS maintains his determinations; *l. c.* p. 255 [which however appear rather improbable].

Numerous species (two new) from several islands, indicated by H. HIGGINS & F. P. MARRAT, *Mollusca* of the 'Argo' Expedition to the West Indies, 1876, Liverpool Museum Report, No. 1, 19 pp. and 1 pl. [not seen by the Recorder].

Gulf of Paria. 4 species of Cephalopods, 88 Gastropods, and 102 Bivalves enumerated by R. J. LECHMERE-GUPPY, P. Sc. Ass. Trinid. xi. [1877] 164 pp.

Rio Janeiro. Some marine univalve shells mentioned by G. HIDALGO, Moluscos del Viaje al Pacifico, pt. iii.

6. *Indo-Polynesian Seas.*

Mozambique. 4 species of Cephalopods, 118 marine Gastropods, and 82 marine Bivalves collected by W. Peters, in 1843–47, are enumerated by E. v. MARTENS: 137 of them are also found in the Red Sea, 56 on the coast of Natal, 165 on the Mascarene or Seychelle Islands, 180 in the Malayan Archipelago, 136 in the Pacific. About 20 more species mentioned by previous authors from Mozambique are mentioned. MB. Ak. Berl. 1879, pp. 727–749. The new species will be mentioned below.

Rodriguez Island. 78 marine species, 61 Gastropods and 17 Bivalves, nearly all widely distributed in the Indo-Pacific Seas, a few new, are enumerated by E. A. SMITH, Phil. Tr. clxviii. pp. 473–484, pl. li.

A preliminary note on some Nudibranchiates from the Eastern seas by COLLINGWOOD, J. L. S. xiv. pp. 737 & 738.

New Guinea. 2 species of Cephalopods, 231 of marine Gastropods (1 new), and 24 marine Bivalves, collected by Raffray at Port Dorey, enumerated by TAPPARONE-CANEFRI, Bull. Soc. Z. Fr. iii. pp. 244–277.

New Guinea, Torres Straits, and *N.E. Australia.* Marine-shells collected during the 'Chevert' Expedition enumerated by J. BRAZIER, P. Linn. Soc. N. S. W. ii. pp. 1–7, 20–25, 41–53, 55–59, 74–89, 128–135, 143–145, 1877, and 368 & 369, 1878; iii. p. 155, 1878. 73 species of marine Gastropods and only 4 Bivalves collected on Fitzroy Island, N. Australia, during a few hours' stay, with notes on their geographical range; *id.* J. of Conch. ii. pp. 186–199.

New Caledonia. New species by SOUVERBIE & R. P. MONTROUZIER, J. de Conch. xxvii. pp. 25–33, p. 136, pl. iii. Some shells enumerated by

Kittel, Bericht der naturwissenschaftlichen Vereins der technischen Hochschule in Wien, iii. [1878] p. 50.

List of species of *Marginellidæ*, *Columbellidæ*, *Turbinellidæ*, *Ovulidæ*, *Cypræidæ*, and *Ranellidæ* found on several groups of the Polynesian Islands by T. D. E. Schmeltz, Verh. Ver. Hamb. iii. pp. 158–174.

Several marine shells from various islands of the Pacific enumerated by the same in Catalogue vii. of the Museum Godeffroy at Hamburg, 1879, pp. 87–89.

75 species of *Cypræidæ* observed in the South Sea Islands; 53 of them in Western, 56 in Eastern Polynesia, 34 common to both, 36–45 species in the respective groups of the Viti, Tonga, Society, and Paumotu Islands, 31 in the Sandwich Islands. Garrett, J. of Conch. ii. pp. 105–128.

7. *Northern Pacific and West Coast of America.*

27 species of Nudibranchs, collected by Dall, show quite a northern facies, being identical with, varieties of, or nearly allied to, N. Atlantic forms; R. Bergh, P. Ac. Philad. 1879, pp. 71–132.

Japan. 89 species of small marine shells (many new) dredged by Capt. H. C. St. John at 32 stations, chiefly Goto Islands and south of Korea, are enumerated by E. A. Smith, with corrected synonymy; P. Z. S. 1879, pp. 181–219, pls. xix. & xx.

San Francisco. Note on some marine shells by W. N. Lockington, Am. Nat. xii. [1878] pp. 505–510.

Many marine Univalves from the West Coast of America mentioned by G. Hidalgo, Moluscos del Viaje al Pacifico, pt. iii. *Fusus sulcatus* (Lam.) appears to be common to Chili and Australia.

8. *Australian and Antarctic Seas.*

Gould's descriptions of Australian sea-shells reprinted in P. Linn. Soc. N. S. W. ii. [1878] pp. 250–261.

35 Australasian species of *Voluta* enumerated, and their geographical distribution indicated by W. F. Petterd, J. of Conch. ii. pp. 340–345.

36 species of Australian *Marginellidæ*, 8 from South Australia; Tate, Tr. Phil. Soc. Adelaide, 1878.

On Australian *Trochidæ* and *Litorinidæ*, &c., J. E. T. Woods, P. Linn. Soc. N. S. W. ii. pp. 89–96, iii. pp. 55–71, iv. pp. 21–23, 108–110.

Some notes on Australian *Nudibranchiata* by R. Bligh Read, P. Linn. Soc. N. S. W. iv. pp. 291 & 292.

Moreton Bay, Queensland. 27 species of *Cypræa*, mostly well-known, from the Indian Seas, collected by C. Coxen, enumerated by J. Brazier, J. of Conch. ii. pp. 317–322.

Port Jackson. Note on marine shells by J. Brazier, P. Linn. Soc. N. S. W. ii. pp. 6, 369–371, and iii. p. 81.

Tasmania. New marine species by Petterd, J. of Conch. ii. pp. 102–105.

Auckland Islands. *Trochus nigerrimus* (Gm.) and a new species of *Mesodesma*; Von Martens, SB. nat. Fr. 1879, p. 37.

Kerguelen Island. The known *Mollusca*, 13 marine Bivalves, 26 marine Gastropods, and 1 Cephalopod enumerated, and their topographical and bathymetrical distribution pointed out by E. A. Smith, Phil. Tr. clxviii. pp. 167–192, and T. Studer, Arch. f. Nat. xlv. pp. 127–129.

Palæontology of Recent Species.

A. Locard has compared the quaternary and the recent malacological fauna of the environs of Lyons. 114 terrestrial and 56 freshwater species now live in that district, 33 and 26 of which respectively existed there during the quaternary period; among these 33 terrestrial species, 20 live also in the higher Alpine districts. Most of the small and middle-sized species of *Helix*, nearly all the species of *Bulimus*, including *B. detritus*, *Pupa muscorum*, and some species of *Clausilia*, nearly all the species of *Planorbis*, *Limnæa*, *Bithynia*, *Valvata*, *Neritina*, and *Pisidium*, existed in the quaternary period; but *Helix pomatia* and *aspersa*, the whole subgenus *Torquilla*, *Planorbis corneus*, *Paludina fasciata*, and all species of *Anodonta* and *Unio*, are of more recent origin. Ann. Soc. Agric. Lyon (5) i. [1878] pp. 343–350.

23 species found in peat and calcareous tufa beds near Pyrmont, all recent, and most of them still living in the same region, are enumerated by P. Hesse, JB. zool. Sect. Westf. Mus. 1879, p. 99.

Helix fœtens, var. *duffti*, and *Zonites verticillus*, contemporaneous with *Felis spelæa* and *Elephas primigenius* in the valley of the Saale, Thuringia; Richter, SB. nat. Fr. 1879, p. 6, & Nachr. mal. Ges. 1879, p. 31; also Z. geol. Ges. 1879, p. 282.

List of 24 land and 18 freshwater shells found in the "travertins" (calcareous tufa) of Tuscany by D. Pantanelli, Bull. Soc. mal. Ital. v. pp. 152–163; they are all still living in the same country, but *Unio* is quite absent, and *Clausilia* very scarce. 32 terrestrial and 10 freshwater species from the same formation at Ascoli, Piceno; E. Valentini, *tom. cit.* pp. 234–236.

V. Hilber enumerates and figures 12 land shells from diluvial (plistocene) beds in the valley of Amphissa, Lokris, and 6 from diluvial beds south of Larissa, Thessaly; they are all species still living in Greece, most even in the same districts. Denk. Ak. Wien, xl. pp. 209-212, pl.

Four terrestrial species from the Löss, in Northern China, province Honan, collected by Baron Richthofen, determined by E. v. Martens, SB. nat. Fr. 1879, p. 73 (three still living in China, one new and perhaps extinct).

Subfossil freshwater shells from the Fayoom (Egypt), above the present level of Birket-el-Kerun (Lake Mœris), collected by Dr. Schweinfurth, all still living in the Nile; *id. l. c.* pp. 100 & 101.

Subfossil freshwater shells found in the Colorado desert, viz., *Physa humerosa* (Gould), *Tryonia protea* (Gould; 300 in a lump of earth about the size of a man's fist), *Amnicola longinqua* (Gould), *Planorbis gracilentus* (Gould), and *Anodonta californiensis* (Lea); Stearns, Am. Nat. xiii. pp. 141–154.

Historical Changes of Fauna.

The lake of Ossegor, Dept. Landes, 600–700 mètres from the sea, and formerly fresh with a slight admixture of brackish water, has been invaded by an irruption of the sea, the freshwater animals being suddenly destroyed and a new marine fauna growing up. Folin, "Faune lacustre de l'ancien lac d'Ossegor"; J. de Conch. xxv. pp. 183 & 184.

Several instances of southern species of land shells extending their range gradually towards the environs of Lyons are pointed out by A. Locard, Ann. Soc. Agric. Lyon (4) x. [1877] pp. 93–116.

Dreissena polymorpha (Pallas) made its appearance in the side canal of the Garonne in September, 1863; Gassies, Bull. Soc. L. Bord. 1878, & J. de Conch. xxvii. p. 374.

Successful introduction of *Helix villosa* (Dr.) from Switzerland to Durham, of *Parmacella* near Newcastle, and of *H. lapicida* from the south of England on the banks of the Wear, but vain attempts to acclimatize African and Syrian *Clausiliæ* and *Helices* at Durham, by H. B. Tristram, Zool. (3) i. [1877] p. 260.

Helix limbata (Drap.) acclimatized for some years in the woods of Meudon and Clamart, near Paris; *H. pisana* (Müll.) at Charenton, near Paris, since 1870; and *H. virgata* (Dacosta) = *variabilis* (Drap.), at St. Denis, Grenelle, and other localities on the borders of channels and railways: Jousseaume, Bull. Soc. Z. Fr. iii. [1878] pp. 33, 217, & 214.

Pupa umbilicata (Drap.) introduced about Cape Town; Gibbons, J. of Conch. ii. p. 282.

Helix aspersa (Müll.), *costata* (Müll.), *similaris* (Fér.), and [*Hyalina*] *cellaria* (Müll.), and *Bulimus acutus* (Müll.), acclimatized in several localities of Australia, the second (*pulchella*) also at Norfolk Island, *cellaria* in New Zealand; Petterd, Mon. of Tasm. Land Shells (not seen by the Recorder), & J. of Conch. ii. pp. 96 & 97; Legrand & Nelson, *tom. cit.* pp. 95, 281, & 282.

Planorbis lacustris (Mont.) and *Limnæa stagnalis* (L.) introduced into Australia; Petterd, *l. c.* p. 97.

Limnæa peregra (Müll.), and probably also *stagnalis* (L.), in Tasmania; Nelson & Legrand, *l. c.* pp. 4 & 95. Eggs probably introduced with fish-eggs; Petterd, *l. c.* p. 81.

Helix cellaria (Müll.) found in a greenhouse at Detroit, Michigan, not before known in the country; Walker, *tom. cit.* p. 327.

Bulimus decollatus (L.) and *Helix lactea* (Müll.) are introduced in Cuba; Arango y Molina, Faun. mal. Cubana, p. 131.

Unio rubiginosus (Lea) and *gibbosus* (Barnes), western species, introduced to the east by the Erie Canal, also *U. pressus* (Lea) found in New York State; P. E. Call, Am. Nat. xii. [1878] pp. 472 & 473.

Supposed recent extinction of *Cyclostoma elegans* in North Herts; H. G. Fordham, P. Watford Soc. i. [1877] pp. 172, 173, & 187 (J. of Conch. ii. p. 297).

Cyclostomus calcareus (Sow.) extinct in Mozambique; GIBBONS, J. of Conch. ii. p. 145.

Partula destroyed at Raiatea Island; H. D. HARTMAN, Science News, i. p. 127.

Helix alternata (Say) and *elevata* (Say) have apparently died out entirely near Ann Arbor, Michigan; WALKER, J. of Conch. ii. pp. 328 & 329.

Destruction of shell-fish by sea-birds, and general diminution of both, observed in Morecambe Bay and in the estuary of the Duddon by W. A. DURNFORD, Zool. (3) ii. [1878] pp. 223–225.

USE BY MAN.

Note on the utility and noxiousness to man of various North American *Mollusca*, from W. Dall's Catalogue of the *Mollusca* in the Philadelphia Exposition, by KOBELT, Nachr. mal. Ges. 1879, pp. 52–55.

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18 species of marine shells found in the remains of ancient Troy by Virchow and Schliemann; most of them are edible. *Murex trunculus* and *Purpura hæmastoma* were, perhaps, used for dyeing. E. v. MARTENS, SB. nat. Fr. 1879, pp. 89–93.

List of shells (used as ornaments or edible) found at Pompeii, 36 marine and 4 terrestrial species still living near Naples, and 4 exotic marine species, *Cypræa pantherina* and *erosa*, *Conus textilis*, and *Meleagrina margaritifera*; N. Tiberi, Bull. Soc. mal. Ital. v. pp. 139–151. Abstract by J. G. JEFFREYS in Nature, xx. p. 624.

Two instances of former authors mentioning Pompeian shells by A. DE MONTEROSATO, Bull. Soc. mal. Ital. v. pp. 201–203 [to which may be added that by the Recorder in Mal. Bl. 1857, p. 139]; abstract in J. R. Micr. Soc. ii. p. 861.

Purpura lapillus and *Helix aspersa* in the refuse heaps of the ancient British town of Cissbury, in Sussex, B. HOLGATE, J. of Conch. ii. p. 286.

Anodonta agricolarum eaten by peasants in China; HEUDE, Conchyl. fluv. de Nanking, fasc. v. pl. xxxix.

Mounds along the Gulf Coast of North America, containing chiefly *Rangia cyrenoides* (Desm.) = *Gnathodon cuneatus* (Gray); CALKINS, P. Davenp. Ac. ii. p. 347.

Pieces of shells from graves of the aborigines in California, *Dentalium*, *Olivella biplicata*, and *Haliotis*; E. v. MARTENS, SB. nat. Fr. 1879, p. 99.

Shells from kitchen-middens in Costa Rica, collected by Messrs. Flint and Bransford; DALL, P. U. S. Nat. Mus. 1878, pp. 23 & 24.

COLLECTING.

D. DUPUY has published a paper on collecting land and freshwater shells, recommending the use of a brush and an umbrella. Bull. Soc. Toulouse, 1878.

Note on collecting small shells, marine or freshwater and terrestrial, in

mud, moss, on the rough shells of larger *Mollusca*, &c.; by F. DE FOLIN, J. R. Micr. Soc. ii. p. 861, also Verh. z.-b. Wien, xxix. pp. 36–38, and Bull. Mosc. lv. p. 202.

MISCELLANEOUS PUBLICATIONS.

IHERING'S proposed "natural system" of the *Mollusca* [Zool. Rec. xiii. *Moll.* p. 19] is extracted in J. of Conch. ii. pp. 276–278.

W. KOBELT has published a very incomplete Synopsis of the new genera, species, and varieties of testaceous Mollusks for the year 1878, copying the diagnosis of them, but limiting himself to nine periodicals and a few separate publications.

Parts 6 & 7 of KOBELT'S popular treatise on the *Mollusca*, "Illustrirtes Conchylienbuch," discuss the *Scutibranchia*, *Tectibranchia*, *Nudibranchia*, and *Pulmonata*.

R. STEARNS criticizes an exaggerated description of a large Cephalopod in the "Popular Science Monthly," January, 1879; and several incorrect statements in "Harper's Magazine" and Webster's "Dictionary" concerning *Mollusca*. P. Cal. Ac., April, 1879, 10 pp.

CEPHALOPODA.

The first volume of TRYON'S Manual of Conchology gives a very full account of the present state of our knowledge concerning the *Cephalopoda*, recent and fossil, anatomical, biological, and systematic; it contains descriptions and figures of all known recent genera (27) and species (241), taken from the original works, and a separate chapter on gigantic Cephalopods, containing the essential matter of all published accounts of them. An alphabetical index of all specific names, with quotation of author, title, and year of publication, adds to the utility of this treatise. The plates, 112 in number, are well done, and contain both anatomical particulars and figures of the whole animal, shells, and radula.

AGNES CRANE has given a general review of recent and fossil *Cephalopoda*; Geol. Mag. (2) v. [1878] pp. 487–499.

J. BROCK tries to make out the pedigree of recent Cephalopods, taking into consideration the symmetry or asymmetry of the oviducts, the cartilages in the mantle, the communications of the ganglion stellatum and the buccal ganglions, presence or absence and the size of the ink-bag, and the nidamental glands, &c.; he comes to the conclusion that the oldest dibranchiate Cephalopods were rather similar to the recent *Ægopsidæ*, but provided with a shell like *Belemnites*, and that they had ten essentially equal arms; that the Octopods form the first lateral ramification of them; that afterwards the *Myopsidæ* separated themselves from the common stock, and that in the latter the shell was still further reduced, *Spirula* and *Sepia* being older forms than *Loligo*. As to *Nautilus*, he thinks that it is rather near the common primitive form of the *Di-* and *Tetra-branchiata*; a pair of gills was, according to him, lost by the *Dibranchiata*, not added by the *Tetrabranchiata*; the symmetry of the

oviducts is primitive, and their asymmetry an independent new acquition in *Nautilus* and the *Myopsidæ*, &c. SB. Soc. Erlang. xi. 1878–79, pp. 114–141.

Frédericq comes to the conclusion that the changes of colour in the skin of *Octopus* do not generally correspond with mimetic facts, but express the different emotions, especially anger or fear, and might rather be classed with the changes which the vasomotors produce in the human face. The skin is dark coloured when the radiant muscles of the chromatophores are contracted in consequence of any irritation; it is pale when they are released. C. R. lxxxvii. [1878] p. 1042; J. R. Micr. Soc. ii. pp. 165 & 166.

Frédericq's observations on the structure and physiology of *Octopus* [Zool. Rec. xv. *Moll.* p. 8] are also given in Bull. Ac. Belg. xlvi. [1878] p. 710: abstract in J. R. Micr. Soc. ii. pp. 402–404 & 854.

C. F. W. Krukenberg gives notes on the mechanism of the chromatophores in *Eledone moschata*, in his work "Vergleichende physiologische Studien an den Küsten der Adria" (also as a separate pamphlet).

An abstract of Klemensiewicz's paper on the chromatophores of the Cephalopods [Zool. Rec. xv. *Moll.* p. 30], in J. R. Micr. Soc. ii. pp. 701–703.

DIBRANCHIATA.

Octopoda.

Struggle between an *Octopus* and a lobster, the former conquering and devouring the latter, described by Kobelt, Nachr. mal. Ges. 1879, p. 32.

Octopus punctatus (Gabb) figured from specimen, by Tryon, Manual, i. p. 117, pl. xxxiv. fig. 43, California.

Octopus piscatorum, sp. n., Verrill, Am. J. Sci. (3) xviii. p. 470, Nova Scotia, 120 fath.

Stauroteuthis, g. n., allied to *Cirroteuthis*, but mantle united to the head all round, and to the dorsal side of the sipho. Fins triangular, in advance of the middle of the body. Body flattened, soft, bordered by a membrane. Webs great, but not reaching the tips of the arms; suckers in one row; two slender cirri between the suckers, in the greater part of the length of the arms, absent at the basis and at the tip. Right arm of second pair altered at the tip in the male. *S. syrtensis*, sp. n., East of Sable Island, New England, 250 fath., Verrill, *l. c.* pp. 468 & 469.

Argonauta nouryi (Lorois) figured from specimen, by Tryon, Manual, i. p. 138, pl. l. fig. 127, Pacific.

Ægopsidæ.

Histoteuthis collinsi, sp. n., Verrill, Am. J. Sci. (3) xvii. p. 241, off Nova Scotia, in the stomach of *Alepidosaurus*; Tryon, Manual, i. p. 166.

Taonius hyperboreus (Steenstrup) ? from the northern edge of the Gulf Stream; Verrill, *l. c.* p. 243.

Architeuthis megaptera, sp. n., Verrill, *op. cit.* xvi. [1878], p. 207, Halifax, 43 inches: Tryon, Manual, i. p. 187.

Mouchezia, new generic name for the gigantic Cephalopod from the Island St. Paul [Zool. Rec. xiv. *Moll.* p. 28]; no sufficiently distinctive character given; Vélain, Arch. Z. expér. vi. [1877] p. 83.

Myopsidæ.

Sepiola leucoptera, sp. n., Verrill, *l. c.* xvi. p. 378, Gulf of Maine. Immature state, genus uncertain; Tryon, Manual, i. p. 158.

Rossia hyatti and *sublævis*, spp. nn., Verrill, *l. c.* pp. 208 & 209, Massachusetts Bay; Tryon, Manual, i. pp. 160 & 161.

Spirula australis (Lam.), anatomically described by R. Owen. Its faculty of retrograde natation by the funnel and the basal web of the arms is higher than in *Nautilus*, but lower than in other Dibranchiates; Rumph's assertion that it "hangs to the rocks by a thin and small door" [*rectè* spine, in Dutch "dooren"] may mean by the terminal suctorial disk, and only temporarily. The retractors of the funnel and of the head arise from the circumference of the terminal part of the inner surface of the last chamber, as in *Nautilus*; the siphon is ventral and entomarginal. Ann. N. H. (5) iii. pp. 1–16, pls. i.–iii.; abstract in Arch. Z. expér. viii. pp. xx.–xxiii., xlv. & xlvi.

Spirula, from a depth of 950 fathoms, in the West Indies; Al. Agassiz, Bull. Mus. C. Z. v. No. 14, p. 298.

TETRABRANCHIATA.

Nautilus ambiguus (Sow.), Cape Greenville, N. Australia, and *stenomphalus* (Sow.), Darnley Island, Torres Straits, and Aneiteum, New Hebrides; Brazier, P. Linn. Soc. N. S. W. ii. pp. 143 & 144.

PTEROPODA.

Lacaze-Duthiers's treatise on the development of the *Pteropoda*, the chief contents of which are indicated in Zool. Rec. xii. p. 137, is published in Arch. Z. expér. iv. [1875], pp. 1–214, pls. i.–xi. The genera which have been the subject of his observations are *Cavolinia* (*Hyalæa*), *Hyalocylis* (infrà), *Cleodora*, *Cymbulia*, and *Clio*.

Hyalæa. G. Pfeffer describes the finer sculpture of the shell in many species of this and the following genera, in which it is important for the distinction of species; MB. Ak. Berl. 1879, pp. 231–240.

Hyalæa quadridentata, var. n. *costata*, Pfeffer, *l. c.* p. 235, fig. 9, Indian Ocean.

Pleuropus (Esch.) is distinguished from *Hyalæa* by the embryonal part of the shell being distinctly discernible also in the adult; type, *P. trispinosus* (Lesueur, as *Hyalæa*) = *Cleodora compressa* (Souleyet), *id. l. c.* p. 236, fig. 6.

Triptera (Quoy & Gaim.) = *Curieria* (Rang); *T. cancellata*, sp. n., very near *columella* (Rang), New Guinea and Solomon Archipelago, *id. l. c.* pp. 243 & 244, figs. 18 & 19; the author observed one adult specimen in which the embryonal shell was preserved as a long needle-like point, instead of the usual decollation.

Cleodora, 7 species arranged into 3 natural groups, *C. sulcata*, sp. n., very near *striata* (Rang), South Atlantic and near Kerguelen Island, *C. flexa*, sp. n., very near *virgula* (Rang), Pacific, near the Southern Tropic; *id. l. c.* pp. 237, 240 & 241, figs. 10–16. Embryonal part of the shell in *C. pyramidata* (Péron), *australis* (Rang), and *subulata* (Q. & G.); *id. l. c.* pp. 238 & 242, figs. 8, 9, & 17.

Hyalocylis, g. n., for *Cleodora striata* (Rang), distinguished from the other *Cleodora* by the short duration of the larval stage and the early loss of the embryonal shell; Lacaze-Duthiers, Arch. Z. expér. iv. [1875] p. 177.

Clio aurantiaca, sp. n., *id. l. c.* p. 178, pl. x. fig. 10, Messina.

Cirrifer, g. n., distinct from *Pneumoderma* by the tentacles ending in two curved thickened branches, without suckers. *C. paradoxus*, sp. n., Pfeffer, MB. Ak. Berl. 1879, p. 246, fig. 9, Tropical Atlantic.

GASTROPODA.

PECTINIBRANCHIA.

Kobelt has published separately lists of known species of *Harpa*, *Murex*, *Vitularia*, *Typhis*, *Bullia*, *Eburna*, *Hindsia*, *Cyllene*, *Canidia*, *Clea*, *Voluta*, *Oliva*, *Olivella*, *Cominella*, *Pseudoliva*, *Adamsia*, *Euthria*, *Oniscia*, *Struthiolaria*, *Triton*, *Persona*, *Trophon*, *Volutharpa*, *Northia*, *Lyria*, and *Ringicula*, previously or contemporaneously published in JB. mal. Ges. iv.–vi. [1877–79].

Muricidæ.

Murex. Sowerby, Thesaur. Conch. parts xxxiii. & xxxiv. pls. ccclxxx.–cccciii., gives a monograph of this genus, containing 230 species, described in Latin, and all figured; he arranges them in 9 sections, with some subdivisions. The following are apparently new species: *M. tenuis*, p. 37, fig. 175, Western Africa, *cuspidatus*, p. 36, fig. 203, Japan, *interserratus*, p. 39, fig. 204, locality unknown, *jamaicensis*, p. 39, fig. 223, Jamaica, *cyacantha* (? Brit. Mus.), p. 11, fig. 160, Red Sea. The following are apparently not before figured: *M. speciosus* (A. Adams), fig. 125, Japan, *acanthophorus* (A. Adams, 1862), fig. 151, *liratus* (A. Adams, 1851), fig. 173, Western Africa, *macgillivrayi* (Mörch, P. Z. S. 1862), fig. 162, *alabastrum* (A. Adams, 1873), fig. 191, West Indies, *stimpsoni* (A. Adams, 1865), fig. 196, Japan, *coronatus* (A. Adams), fig. 199, Japan, *yoldi* (Mörch), fig. 210, *endermonis* (E. A. Smith, 1875), fig. 213, Japan, *asper* (A. Adams), fig. 244, California, *solidus* (A. Adams, 1851), fig. 246. *M. octogonus* (Sow., 1859, *nec* Q. & G.) is renamed *obtusus*, p. 30, fig. 113.

Purpura (Aldrovàndi) [ante-Linnean] substituted for *Murex* (L., Lam.); Jousseaume, Le Naturaliste, April, 1879, p. 5.

Murex clausi, sp. n., Dunker, J. de Conch. xxvii. p. 213, pl. viii. fig. 6, Guinea.

Murex (*Chicoreus*) *imbricatus*, sp. n., Higgins & Marrat, Moll. of the 'Argo' Expedition, 1876, Grenada Island, West Indies.

Murex sobrinus (A. Adams), Japan, E. A. Smith, P. Z. S. 1879, p. 199, pl. xx. fig. 30. *M. rorifluus* (Adams & Reeve) = *monachus* (Crosse) and *cirrosus* (Hinds) var., Japan; *id. l. c.* p. 200.

Murex noduliferus (Reeve, *nec* Sow.) from New Guinea, Tapparone-Canefri, Bull. Soc. Z. Fr. iii. p. 245.

Murex (*Pteronotus*) *bednalli*, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877], p. 6, Port Darwin, N. E. Australia; allied to *eurypteron* (Ad. & Rv.).

Murex (*Pteronotus*) *lœbbeckii*, *percoides*, and (*Chicoreus*) *benedictinus*, spp. nn., Kobelt & Löbbecke, JB. mal. Ges. vi. pp. 78 & 79, localities unknown.

Trophon. 55 species with citations and localities enumerated by Kobelt, JB. mal. Ges. vi. pp. 168–174.

Urosalpinx innotabilis, sp. n., E. A. Smith, P. Z. S. 1879, p. 201, pl. xx. fig. 32, Japan.

Purpura lapillus makes holes in the shells of *Mytilus edulis* within 3–5 minutes, applying its muzzle and excluding the contact of sea water by the front lobes of the foot. Bouchard Chantereaux, J. de Conch. xxvii. pp. 124 & 125.

Rhizochilus (*Coralliophila*) *squamosissimus* (E. A. Smith, 1876), E. A. Smith, Phil. Tr. clxviii. p. 483, pl. li. fig. 8.

Metzgeria, new generic name for *Latirus albus* (Jeffr.), *Meyeria* (Dunker) being pre-occupied; Norman, J. of Conch. ii. p. 56.

Buccinidæ.

Tritonidea ringens, quoted from Florida by Calkins, is *T. tincta* (Conrad); Stearns, Science News, April, 1879.

Tritonidea subruginosa, sp. n., E. A. Smith, P. Z. S. 1879, p. 306, pl. xx. fig. 40, Japan.

Euthria ferrea (Reeve) = *viridula* (Dunker), Japan; *id. ibid.* fig. 39.

Siphonalia spadicea (Reeve) = *fusoides* (Reeve), Japan; *id. l. c.* p. 205, pl. xx. fig. 38.

Siphonalia pulchra (Woods) = *Pleurotoma philomenæ*, immature; Petterd, J. of Conch. ii. p. 353.

lyrifo[illegible]ptunea. Kobelt continues his monograph, including *Siphonalia* and *Sipho*, in Küster's Conch. Cab. pt. 281, pp. 89–116, pls. xl.–xlvi. *N. brunnea* (Dall, MS.), sp. n., p. 121, pl. xl. fig. 9, Behring Sea. *N. pfaffi* (Mörch, 1876), p. 124, pl. xli. fig. 45, Greenland; *producta* (Beck), p. 125, p. xli. figs. 6 & 7, Beechy Straits, figured for the first time.

Neptunea ossiania, sp. n., Friele, JB. mal. Ges. vi. p. 279, Spitzbergen, 459 fath.

Neptunea (*Sipho*) *hanseni*, 40 fath., *virgatus*, 123 fath., and *danielsseni*, 1333 fath., spp. nn., all three from Spitzbergen, and *togata* (Mörch) = *pfaffi* (Mörch) = *sabinii* (Jeffr., Leche), with transitions to *stimpsoni* (Mörch); *id. l. c.* pp. 281 & 282.

Buccinum undatum (L.). The number of cuspids in the median plate of the radula varies from 5–9 (in the majority of specimens it is 5–6), and in the lateral plates from 3–5 (in the majority, 4); similar variations exist in other allied species. *Id. l. c.* pp. 256–263, pls. v.–vii.

Buccinum undatum (L.) from Honington, Connecticut; P. E. Call, Am. Nat. xii. [1878] p. 397.

Buccinum totteni (Stimps.) = *donovani* (Reeve) = *undatum* var. *clathratum* (S. Wood, Crag Moll.), = *Tritonium terræ-novæ* (Beck, Mörch, & Leche), Spitzbergen, common; Friele, *l. c.* pp. 278 & 279.

Volutharpa. 6 species enumerated by Kobelt, JB. mal. Ges. vi. p. 175.

Northia. 3 species enumerated; *id. l. c.* p. 176.

Nassidæ.

Nassa. F. P. Marrat discusses the specific characters, and comes to the conclusion that there are numerous intermediate forms between species hitherto admitted as distinct by most authors; many special instances are mentioned by him; P. Liverp. Soc. 1879. He also compares many recent and fossil species, with the conclusion that many of the latter are only sculptural varieties of the former; P. Liverp. Geol. Soc. 1879. [The author may be right in many instances, but the Recorder fears that he goes too far in his views; for instance, he has never found among large numbers of Mediterranean shells specimens intermediate between *N. reticulata* and *cuvieri*.]

Nassa trifasciata (Gmelin, as *Buccinum*) = *unicolor* (Kiener) = *rutilans* (Reeve); Marrat, J. of Conch. ii. p. 78. *N. elegans* (Reeve, *nec* Kiener, *nec* Sow.) = *fossata* (Gould) = *moreleti* (Crosse); *id. l. c.* pp. 78 & 79.

Nassa (*Hima*) *acutidendata* [*dent-*] and *luteola*, spp. nn., *siquijorensis* (A. Adams), and *varicifera* (A. Adams) var., all from Japan, E. A. Smith, P. Z. S. 1879, pp. 210–212, pl. xx. figs. 45–47. *N. stigmaria* (A. Ad.) = *densegranata* (A. Ad.), *N. festiva* (Powis) = *lirata* (Dkr.), *fraterculus* (Dkr.) = ? *plebecula* (Gould), and *tenuis* (E. Smith) = *japonica* (Lischke), all from Japan: *id. l. c.* p. 211.

Nassa peritrema, sp. n., J. E. T. Woods, P. Linn. Soc. N. S. W. iv. p. 21, pl. iv. fig. 5, Port Jackson.

Olividæ.

Oliva (*Olivella*) *spreta* (Gould), E. A. Smith, *l. c.* p. 216, pl. xx. fig. 55, Japan.

Ancillaria inornata, sp. n., *id. l. c.* p. 217, pl. xx. fig. 56, Japan.

Fasciolariidæ.

Fusus nigrirostratus, niponicus, simplex, coreanicus, and *pachy* [*r*] *raphe,* spp. nn., *id. l. c.* pp. 202–205, pl. xx. figs. 33–37, Japan. *F. sulcatus* (Lam.) from Chile; Hidalgo, Molusc. Viaj. Pacif. iii.

Fasciolaria aurantiaca (Lam.) from Rio Janeiro; Hidalgo, *ibid.*

Latirus robillardi, sp. n., Tapparone-Canefri, J. de Conch. xxvii. p. 318, Mauritius.

Peristernia castanoleuca, sp. n., = *Turbinella philberti* (Reeve & Kobelt, *nec* Recluz), *kobeltiana,* new name for *zeelandica* (A. Adams, Kobelt), which is from Mauritius, *crenulata* (Küster) = *chlorostoma* (Kobelt), *carolinæ* (Kiener) = *bella* (Reeve) [= *fragaria,* Wood, 1828, oldest name], *elegans* (Dunker) = *pulchra* (Reeve, as *Ricinula*) with var. n. *papuensis,* Port Dorey, and *paulucciæ,* sp. n., Mauritius; Tapparone-Canefri, J. de Conch. xxvii. pp. 316–327.

Leucozonia cingulifera (Lam.), nec *cingulata* (Lam.), occurs at Florida, Stearns, Science News, April, 1879, p. 181.

Mitridæ.

[*Turricula*] *Mitra jucunda,* Dunker, J. de Conch. xxvii. p. 212, pl. ix. fig. 1, Saigon.

Mitra (*Costellaria*) *fusco-apicata, gotoensis,* and (*Pusia*) *æmula,* spp. nn., (*C.*) *collinsoni* (A. Adams), and (*P.*) *inermis* (Reeve), all from Japan; E. A. Smith, P. Z. S. 1879, pp. 214–216, pl. xx. figs. 49–53.

Mitra (*Callithea*) *stigmataria* (Lam.) var. n. *immaculata,* Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 255, Port Dorey, New Guinea.

Volutidæ.

Voluta. The number of pillar folds is variable in several species; Dohrn, JB. mal. Ges. vi. pp. 154 & 155.

Thirty-five Australasian species, with several varieties, enumerated by F. W. Petterd, J. of Conch. ii. pp. 340–345.

Voluta bednalli, sp. n., Brazier, P. Linn. Soc. N. S. W. iii. [1878] p. 81, Port Darwin, N. E. Australia. Very near *coniformis* (Cox), J. de Conch. xxv. p. 359.

Voluta harfordi (Cox) = *canaliculata* (McCoy), Broad Sound, N. E. Australia, Brazier, P. R. Soc. Tasm. 1876.

Voluta cleryana (Petit, Nov. 1856) = *americana* (Reeve, Jan. 1856); Crosse, J. de Conch. xxvii. pp. 1 & 2. *V. prevostiana* (Crosse, 1878) = *lyriformis* (Kiener, *nec* Swainson); *id. l. c.* p. 41, pls. i. & ii. fig. 1, Japan.

Voluta junonia (Chemn.), good specimens sometimes washed ashore in Florida; Calkins, P. Davenp. Ac. ii. p. 238.

Voluta dubia (Brod., 1828) redescribed from Florida specimens; H. Dohrn, JB. mal. Ges. vi. pp. 150–155, pl. iv. figs. 2–4.

Voluta musica (L.). Animal described, operculum small and narrow, only one transversely broad multicuspidate plate in each transverse row

of the radula, whereas in *Cymbium*, *Melo*, *Lyria*, and *V. respertilio* and *aulica*, this plate is tricuspidate, in *Amoria* unicuspidate and arcuate; the author proposes to adopt for it the genus *Musica* (Humphrey). P. Fischer, J. de Conch. xxvii. pp. 97–106, pl. v.

Lyria. 15 species enumerated by Kobelt, JB. mal. Ges. vi. pp. 176–178.

Columbellidæ.

Columbella (*Atilia*) *lischkii*, *niveo-marginata*, (*Zafra*) *subvitrea*, spp. nn., and (*Amycla*) *varians* (Dkr.), E. A. Smith, P. Z. S. 1879, pp. 207–210, pl. xx. figs. 41–44, Japan.

Columbella alba, sp. n., Petterd, J. of Conch. ii. p. 104, Tasmania.

Marginellidæ.

Marginella. H. C. Weinkauff continues and finishes his monograph, describing and figuring 148 species, in Küster's Conch. Cab. pts. 279, 282, & 286, pp. 41–144, pls. xi.–xxiv. (several copied from Reeve). The following are figured for the first time:—*M. sex-plicata* (Dunker, 1871) = *obtusa* (Sow., 1870, *nec* Thes.) = *Persicula grisea* (Jouss.), p. 85, pl. xvi. figs. 6 & 7, Japan and Mazatlan; *verdensis* and *medio-cincta* (E. A. Smith, 1875), p. 122, pl. xxiii. figs. 7–10, Cape Verde Islands; *pellicula* (Marr.), p. 123, pl. xxiii. figs. 11 & 12, Natal; *delessertiana* (Recl.), p. 126, pl. xxiv. figs. 7 & 8, Mauritius and Réunion. 32 species are indicated, but not figured.

Marginella sub-bulbosa, *cymbalum*, *denticulata*, *tridentata*, and *albida*, spp. nn., Tate, Tr. Phil. Soc. Adelaide, 1878, South Australia.

Marginella minutissima, *allporti*, and *tasmanica*, spp. nn., J. E. T. Woods, P. R. Soc. Tasm. 1875, p. 28, Tasmania.

Conidæ.

Conus magus (L.). Synonymy; Brazier, J. of Conch. ii. p. 191.

Conus lividus (Hwass) and var. *flavidus* (Lam.), *C. balteatus* (Sow.) var., *rattus* (Hwass) var., and *catus* (Hwass) var., from Rodriguez; E. A. Smith, Phil. Tr. clxviii. pp. 477 & 478, the three latter figured, pl. li. figs. 11–13.

Conus macleayanus (Woods) = *rutilus* (Mke.), Petterd, J. of Conch. ii. p. 353.

Pleurotomidæ.

Remarks on the genera accepted by Weinkauff & Bellardi (Zool. Rec. xii. p. 160, and xiii. *Moll.* p. 24] by F. E. Koch, Arch. Ver. Meckl. xxxii. pp. 40–46.

Pleurotoma vertebrata, *niponica*, *difficilis*, *tri-porcata*, and *consimilis*, spp. nn., *patruelis* (E. A. Smith, 1875) and *fusca* (Homb. & Jacq.) var., all from Japan, E. A. Smith, P. Z. S. 1879, pp. 186–188, the first five figured, pl. xix. figs. 6–11.

Pleurotoma raffrayi, sp. n., Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 246, pl. iv. fig. 1, Port Dorey, New Guinea.

Drillia peradmirabilis, nagasakiensis, longispira, subobliquata, candens, varicostata, intermaculata, humilis, flavo-nodulosa, fortilirata, and *subauriformis*, spp. nn., *japonica* (Lischke), *obliquata* (Reeve) var., and *gracilenta* (Reeve) var., all from Japan, E. A. Smith, pp. 189–195, pl. xix. figs. 12–24.

Drillia mastersi, New Guinea, and *spaldingi*, Torres Straits, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 151.

Bela willii (Friele, 1877), Spitzbergen, = *tenuicostata* (Sars), var.; Friele, JB. mal. Ges. vi. p. 276, pl. iv. fig. 4. *B. bicarinata*, var. n. *gemino-lineata*, Spitzbergen, and *B. simplex* (Middend.) = *gigas* (Verkrüzen), with var. *schantarica* (Middend.); *id. l. c.* pp. 277 & 278. *B. ovalis* (Leche), Novaya Zemlya; pl. iv. fig. 5.

Clathurella (*Homotoma*) *papuensis*, sp. n., Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 247, pl. iv. figs. 5 & 6. *C. rubida* var., or sp. n., *bertiniana*; id. *ibid.* figs. 7 & 8, New Guinea.

Clathurella darnleyi, Torres Straits, *ramsayi*, New Guinea, *barnardi*, *macleayi*, and *tricolor*, N. E. Australia, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 151.

Defrancia gracilispira, sp. n., E. A. Smith, *l. c.* p. 196, pl. xix. fig. 25, Japan.

Mangilia robusticostata, sp. n., *id. l. c.* p. 198, pl. xix. fig. 28, Japan.

Cithara maccoyi, sp. n., Petterd, J. of Conch. ii. p. 103, Tasmania.

Daphnella fusco-balteata and *subzonata*, spp. nn., E. A. Smith, *l. c.* pp. 196 & 197, pl. xix. figs. 26 & 27; *D.? saturata* and *fragilis* (Reeve) = *limnæiformis* (Reeve, *nec* Kiener), *id. l. c.* pp. 197 & 198, all from Japan.

Daphnella kingensis, sp. n., Petterd, *l. c.* p. 102, Tasmania.

Lachesis japonica (A. Adams), Japan; E. A. Smith, *l. c.* p. 198, pl. xx. fig. 29.

Terebridæ.

Terebra gotoensis, jeffreysi, and *subtextilis*, spp. nn., and *tantilla* (E. A. Smith) = *pumilio* (E. A. Smith); *id. l. c.* pp. 183–185, pl. xix. figs. 1–4, Japan.

Terebra venilia, sp. n., J. E. T. Woods, P. Linn. Soc. N. S. W. iv. p. 23, pl. iv. fig. 2, Port Jackson; *T. brazieri* (Angas), *id. l. c.* fig. 1.

Cancellariidæ.

Cancellaria stimpsoni, sp. n., Calkins, P. Davenp. Ac. ii. [1878] p. 250, pl. viii. figs. 4 & 5, Florida.

Cancellaria japonica, sp. n., E. A. Smith, *l. c.* p. 216, pl. xx. fig. 54, Japan.

Admete contabulata, sp. n., Friele, JB. mal. Ges. vi. p. 276, Spitzbergen, 146 fath., and varieties of *A. viridula* (Fabr.), p. 275.

Cassididæ and Ranellidæ.

Dolium galea (L.) queried as eatable; Monterosato, Bull. Soc. mal. Ital. v. p. 203. It is eatable; Tiberi, *tom. cit.* p. 265.

Dolium fimbriatum (Sow.), var. n. *parvulum*, Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 257, pl. iv. fig. 4, New Guinea.

Cassis nana, sp. n., J. E. T. Woods, P. Linn. Soc. N. S. W. iv. p. 108, Moreton Bay.

Sconsia barbudensis, sp. n., Higgins & Marrat, Moll. of the 'Argo' Expedition, 1876, Barbuda Island, West Indies.

Triton hirsutus (Fabius Columna, 1616 [ante-Linnæan]). This name preferred to *parthenopeum* (Salis) or *succinctum* (Lam.); Tiberi, Bull. Soc. mal. Ital. v. pp. 266–269.

Triton reliei, sp. n., Calkins, P. Davenp. Ac. ii. [1878] p. 235, pl. viii. figs. 1 & 2, Florida.

Epidromus reticulatus (Blainv.): varieties of colour; Monterosato, Bull. Soc. mal. Ital. v. p. 225. *E. gladiolus*, sp. n., *id. l. c.* p. 226, Tunis and Alexandria.

Biplex (Perry, 1811) preferred to *Ranella* (Lam., 1812); Jousseaume, Le Naturaliste, April, 1879, p. 5. [Theoretically correct, but of no use for science.]

Ranella clathrata (Gray), Cedar Keys, Florida; Calkins, Am. Nat. xii. [1878] p. 124. This is not the true West Coast species, but a var. of *caudata* (Say); Stearns, Science News, April, 1879, p. 181.

Ranella rhodostoma (Reeve), var. n. *xanthostoma*, Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 249, Port Dorey, New Guinea.

Cypræidæ.

Notes on the occurrence, rarity, colours of the living animal, &c., of many species in the South Sea Islands, by A. Garrett, J. of Conch. ii. pp. 108–128. List of 27 species collected at Moreton Bay, Queensland; Brazier, *tom. cit.* pp. 317–322.

Cypræa umbilicata (Brod.) found near Montague Island, N. S. Wales, at a depth of 1900 fath.; Brazier, P. R. Soc. Tasm. 1876. White variety of the same from Circular Head, Tasmania; Cox, P. Linn. Soc. N. S. W. iv. p. 386.

Cypræa guttata (Brod.) from New Britain; Hobson, P. Linn. Soc. N. S. W. iv. p. 243.

Trivia (*Pustularia*) *consobrina* (Garrett) distinct from *staphylæa* (L.); Garrett, J. of Conch. ii. p. 122.

Erato. 17 species described and figured, 2 more mentioned, by H. C. Weinkauff, in Küster's Conch. Cab., part 286, pp. 145–156, pls. xxv. & xxvi.

Erato bimaculata, sp. n., Tate, Tr. Phil. Soc. Adelaide, 1878, South Australia.

NATICIDÆ.

Natica intricata (Donovan), varieties in size and colours; Monterosato, Bull. Soc. mal. Ital. v. p. 224.

Natica bathybii [-*a* ?], sp. n., Friele, JB. mal. Ges. vi. p. 272, Spitzbergen, 1200 fath.

VELUTINIDÆ.

Narica montrouzieri, sp. n., Souverbie, J. de Conch. xxvii. p. 136, Lifu Island, New Caledonia.

TRICHOTROPIDÆ.

Trichotropis inflata, sp. n., Friele, JB. mal. Ges. vi. p. 275, Spitzbergen, 223 & 656 fath.

Trichotropis tricarinata and *gracilenta*, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 311, North Australia.

STROMBIDÆ.

-urex (Aldrovandi [ante-Linnæan]) substituted for *Strombus* (L., Lam.); Jousseaume, Le Naturaliste, April, 1879, p. 5.

Strombus elegans (Sow.), short var. from Rodriguez; E. A. Smith, Phil. Tr. clxviii. p. 479.

XENOPHORIDÆ.

Xenophora crispa (König) not recognizable; *crispa* (Philippi), fossil from Sicily, = *trinacria*, new name; *crispa*, var. (Martens) = *senegalensis* (Fischer); Fischer, J. de Conch. xxvii. pp. 210–212.

CERITHIIDÆ.

Cerithium nigrescens (Mke.), var. n. *minor*, Calkins, P. Davenp. Ac. ii. [1878] p. 239, Florida.

Cerithium abbreviatum, *bicanaliferum*, and *minimum*, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 320, North Australia.

Vertagus martinianus (Reeve), var., Tapparone-Canefri, Bull. Soc. Z. Fr. iii. p. 264, pl. iv. figs. 2 & 3, Port Dorey, New Guinea.

Triforis tasmanica, sp. n., J. E. T. Woods, P. R. Soc. Tasm. 1875, p. 28, Tasmania.

Inella, substituted for *Ino* (Hinds, 1843), preoccupied in entomology by Samouelle (1817); E. Bayle, J. de Conch. xxvii. p. 35.

MELANIIDÆ.

A. Brot concludes his highly valuable monograph in Küster's Conch. Cab. pts. 280 & 283.

Melania pleurostriata (Say) and *marmocki*, sp. n., Weatherby, Am. Nat. xii. [1878] p. 254, Texas.

Melania rodericensis (E. A. Smith, 1876), E. A. Smith, Phil. Tr. clxviii. p. 481, pl. li. figs. 9 & 10, nearly allied to *tuberculata* (Müll.), Rodriguez Island.

Melania limborgi, sp. n., Hanley, J. L. S. xiv. p. 580, Tenasserim.

Melania libertina (Gould), varr., including *japonica* (Reeve) and *reiniana* (Brot), common in Southern Japan, *M. retifera* (Tryon), probably a young state of the same, *M. biwæ*, sp. n., Japan, and *niponica*, (E. A. Smith), both from Lake Biwa, *læbbeckii* (Brot), Japanese origin doubtful; Kobelt, Faun. Jap. pp. 128–132, pl. xviii. figs. 2–8, pl. xix. figs. 2–14.

Melania oncoides, J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878] p. 5, Bourke, Darling River, Australia, and *M. daktulios* [sic], *wilkinsoni*, and *scalariformis*, id. *op. cit.* iv. pp. 24 & 25, New Guinea, the first two figured, pl. iv. figs. 3 & 4: spp. nn.

Hemisinus osculatii (Villa) = *fusco-punctata* (Busch.) = *binneyi* (Tryon) var. *guayaquilensis* (Petit), var. n. *saladensis*, *nigra*, and *minuta*, Miller, Mal. Bl. (2) i. pp. 160–166, various rivers in Ecuador, var. *saladensis*, pl. vii. fig. 6.

Melanopsis. 20 species from the countries round the Mediterranean Sea, including *buccinoidea* (Olivier), distinguished from *prærosa* (L.), both from Syria, Greece, and Algeria, *mingrelica* (Bayer), Transcaucasia, *charpentieri* (Parreyss), sp. n., Shiraz; 19 from New Caledonia, including *fulminata*, sp. n., and *elongata*, *aurantiaca*, *brotiana*, and *fragilis* (Gassies), figured for the first time; and 2 from New Zealand, described and figured by Brot in Küster's Conch. Cab. pts. 280 & 283, pp. 416–466, pls. xlv.–xlix.

Melanopsis prærosa (L.) and *costata* (Olivier), numerous varieties; Kobelt, Iconogr. vii. pp. 13–18, pls. clxxxvii. & clxxxviii. figs. 1875–1907.

Faunus (Montf.). *F. ater* (L.), *Melanopsis princeps* (Lea), *Pirena pagodus* (Reeve), monstr., *F. nitidus* (Busch, 1856), Philippines, *nanus* and *cantori* (Reeve, as *Pirena*), described and figured by Brot, in Küster's Conch. Cab. pt. 280, pp. 410–415, pl. xliv.

Melanatria. 5 species described and figured; *id. l. c.* pp. 401–407, pls. xlii. & xliv.; *M. goudotiana*, sp. n., *id. l. c.* p. 405, pl. xliv. fig. 1, Madagascar.

Pirenopsis, g. n., shell near that of *Melanatria*, spines situated in the under part of the whorls, and directed outwards; operculum subspiral, with submarginal nucleus as in *Melania*. *P. costata* (Q. & Gaim., as *Melania*) = *Pirena lamarei* (Brot); *id. l. c.* pp. 408 & 409, pl. xliv. fig. 2, Vanikoro.

Litorinidæ.

Tectaria montrouzieri (Fischer, 1878), J. de Conch. xxvii. p. 31, pl. iii. fig. 6, Art Island, New Caledonia.

Echinella gaidii, sp. n., Montrouzier, J. de Conch. xxvii. p. 26, pl. iii. fig. 3, Lifu and Loyalty Islands, New Caledonia.

Litorina. The white line which occurs in many species at the base of the aperture, is connected in some way with the organs of respiration;

L. mauritiana (Lam.) probably = the European *neritoides* (L.) [? ?], and *ziczac*, *unifasciata*, and *undulata*, are merely varieties of it [? ?]; J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878], pp. 59 & 65–69; abstract in J. R. Micr. Soc. ii. p. 401.

Litorina litorea (L.) found on the coast of North America; A. Gray, Science News, i. p. 111.

Risella (Gray). A number of species reduced, *R. lutea* (Q. & G.) being a sexual variety of *plana* (Q. & G.), and *melanostoma* (Gm.), *aurata* (Q. & G.), and *nana* (Lam.), sexual or accidental varieties; J. E. T. Woods, *op. cit.* i. [1876] pp. 242–249. All species hitherto described pass one into the other, and form only one very variable species; *id. op. cit.* iii. [1878] pp. 62–64.

Plesiotrochus souverbianus (Fischer, 1878), fully described and figured by the author; J. de Conch. xxvii. p. 29, pl. iii. fig. 4, Lifu, Loyalty Islands, New Caledonia.

Fossarina legrandi, sp. n., Petterd, J. of Conch. ii. p. 104, Tasmania.

Rissoidæ.

Rissoina efficata, *teres*, *pulchella*, *inermis*, *cardinalis*, and *conspicua*, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 365, North Australia.

Fenella reticulata (A. Ad.), from Rodriguez; E. A. Smith, Phil. Tr. clxviii. p. 478, pl. li. fig. 6.

Rissoa griegi and *semipellucida*, spp. nn., Friele, JB. mal. Ges. vi. p. 274, Spitzbergen, 1333 fath.

Rissoa thomsoni (Leche), from Novaja Zemlya, copied; JB. mal. Ges. vi. pl. iv. fig. 6.

Cingula jammayeni (Friele, as *Rissoa*), *arcolata* (Stimps., as *Turritella*), and *castanea* (Möller, as *Rissoa*), found at Maine; Verrill, Am. J. Sci. (3) xvii. pp. 311 & 312.

Paludestrina ecuadorina and *boetzkesi*, spp. nn., Miller, Mal. Bl. (2) i. pp. 153–155, pl. viii. figs. 3 & 4, River Guayaquil.

Hydrobia quenstedti (Wiedersheim) = *vitrea* (Dr.), var.; Fries, Zool. Anz. ii. p. 153.

Hydrobia declinata (Frauenfeld), var. n. *sonella*, Westerlund, Faun. mal. Grèce, p. 139, Eubœa.

Hydrobia pedrina, sp. n., Miller, Mal. Bl. (2) i. p. 155, pl. vi. fig. 7, Rio Pedro, val Chillo, Ecuador.

Thermydrobia thermalis (L.) = *Bythinia saviana* (Issel), hot springs of San Giuliano, near Pisa [already stated by the Recorder in 1867], distinct from *Belgrandia*, sp. from Lucca; M. Paulucci, JB. mal. Ges. vi. pp. 64–67.

Amnicola longinqua (Gould), living in Utah, range of variation in the shape of the shell; Stearns, Am. Nat. xiii. p. 147, woodcut.

Amnicola carolii, sp. n., with var. *scalarina*, Mme. Paulucci, Faun. mal. Calabr. pp. 202–204, pl. ix. figs. 7 & 8, Calabria; *A. vestita* (Benoit), *ead. l. c.* p. 201, Sicily and Calabria.

Baikalia (Martens, 1876) restricted to *Hydrobia angarensis* (Gerstf.), *Leucosia angarensis*, var. *elata* and *pulla* (Dyb.), which are regarded as

distinct species, *L. flori* and *oviformis* (Dyb.); *Liobaikalia* (Martens, 1876), to *Leucosia stiedæ* (Dyb.); *Trachybaikalia* (Martens, 1876) to *Ligea carinato-costata, costata, carinata, wrzesnowskii*, and *contabulata* (Dyb.); Crosse & Fischer, J. de Conch. xxvii. pp. 152–158 [Zool. Rec. xiii. *Moll.* p. 31, & xiv. *Moll.* p. 41].

Godlewskia, g. n., proposed for the *Hydrobia*-like shells of Lake Baikal, which are provided with varices, like *Ranella* and *Tritonium*: *Ligea turriformis, godlewskii*, and var. *pulchella*, which last is considered as a distinct species; *iid. l. c.* pp. 152 & 155–157.

Tryonia protea (Gould). Subfossil varieties from the Colorado desert; Stearns, Am. Nat. xiii. p. 142, woodcut.

Bythinella opaca (Ziegl.), varr. *isseli* (Gentil.), *etrusca* (Palad.), and *siemoniana* (Targ.), Apuan Mountains; Del Prete, Bull. Soc. mal. Ital. v. pp. 84–86.

Bythinella heydeni, sp. n., Clessin, Nachr. mal. Ges. 1879, p. 123, Croatia.

Bythinella corolla (Gould), New Zealand; note by J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878] p. 136, pl. xiii. figs. 2–5.

Pyrgula thiesseanea (Godet, MS., Kobelt, 1878), Kobelt, Iconogr. vii. p. 19, pl. clxxxix. fig. 1910, Missolunghi.

Belgrandia thermalis (L.), var. *controversa* (Paulucci), Apuan Mountains; Del Prete, *l. c.* p. 83, pl. i. figs. 16–18.

Belgrandia bonelliana, sp. n., Stefani, Bull. Soc. mal. Ital. v. p. 45, Near Siena.

Lithoglyphus multicarinatus, sp. n., Miller, Mal. Bl. (2) i. p. 157, pl. xv. fig. 4, Rio Cayapas, Ecuador.

Paludinidæ.

Vivipara hellenica, sp. n., Clessin, Mal. Bl. (2) i. p. 1, pl. i. fig. 1, Missolunghi.

Paludina japonica (Martens), *sclateri* (Frauenf.), *stelmaphora* (Bourg.), *oxytropis* (Bens.), and *ingallsiana* (Reeve), all from Japan; Kobelt, Faun. jap. pp. 120–125, pl. xi. figs. 1–6, pl. x. figs. 14–18.

Paludina rubicunda, sp. n., Martens, SB. nat. Fr. 1879, p. 104, Lake Victoria.

Vivipara alisoni, sp. n., Brazier, P. Linn. Soc. N. S. W. iii. [1878] p. 221, Diamantina river, Queensland.

Cleopatra auro-cincta, sp. n., Martens, SB. nat. Fr. 1879, p. 203, Bagamoyo, Eastern Africa.

Bythinia leachi (Sheppard), var. n. *italica* and var. *producta* (Gentiluomo); Mdme. Paulucci, Faun. mal. Calabr. p. 197, pl. ix. figs. 4–6, Calabria and Tuscany.

Bythinia graca, sp. n., Westerlund, Faun. mal. Grèce, p. 137, Epirus and Attica.

Bithynia stanleyi (E. A. Smith), var. n. *humerosa*, Martens, SB. nat. Fr. 1879, p. 104, Lake Victoria.

Bythinia legrandi, pontvillensis, dulvertonensis, huonensis, unicarinata, dunrobinensis, tasmanica, spp. nn., J. E. T. Woods, P. R. Soc. Tasm. 1875, pp. 76 & 77; Petterd, J. of Conch. ii. p. 85, Tasmania.

VALVATIDÆ.

Valvata minuta (Drap.) bibliographically reviewed; it is, perhaps, the young state of another species: Westerlund, Nachr. mal. Ges. 1879, pp. 17–24.

AMPULLARIIDÆ.

On their respiration by lungs and gills, see above, in General Subject, Respiration, p. 14.

Ampullaria sp. near *columbiensis* (Phil.), sp. near *cumingi* (Phil.), *A. quinindenensis* and *expansa*, spp. nn., Miller, Mal. Bl. (2) i. pp. 150–152, pl. viii. figs. 1 & 2, pl. xv. figs. 5 & 6, Ecuador.

Lanistes plicosus, sp. n., locality unknown, and *intortus* (Lam.), Congo; Martens, in Pfeiffer's Novitat. v. p. 191, pl. clvi. figs. 3–5, pl. clvii. figs. 1–3.

CÆCIDÆ.

Cæcum lineicinctum, St. Thomas, W. Indies, 390 fath., *attenuatum*, *subplanum*, *succineum*, and *microcyclos* [*-lus*], all Cape York, 7 fath., *exile*, Tongatabu, 18 fath., *crystallinum*, reefs off Honolulu, 40 fath., spp. nn., and *sepimentum* (Folin), var. *arcuata*, Tongatabu and Tahiti, 18–20 fath.; Folin, P. Z. S. 1879, pp. 808–812, from the 'Challenger' Expedition.

Parastrophia challengeri, sp. n., *id. l. c.* p. 806, Cape York, 8 fath.

Strebloceras subannulatum, sp. n., *id. l. c.* p. 807, Reefs off Honolulu. The first living representatives of the genus.

Watsonia, g. n. "Testa probabiliter primum nucleosa, postea tubularis, decollata, vix bicurvata, conica; apertura orbicularis, valde obliqua, valide circumdata." *W. elegans*, sp. n., Cape York, 8 fath. *Id. l. c.* p. 808.

CALYPTRÆIDÆ.

Crepidula aculeata (Gmelin) widely distributed in the tropical and subtropical seas; Mazyck, J. of Conch. ii. p. 79.

SOLARIIDÆ.

Seguenzia is to be placed here; Jeffreys, J. L. S. xiv. pp. 605 & 606.

SCALARIIDÆ.

Acirsa costulata (Mighels, 1841, as *Turritella*) = *eschrichti* (Möller, 1842); Verrill, Am. J. Sci. (3) xvii. p. 312, Maine.

EULIMIDÆ.

Eulima nitens and *amabilis*, sp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 283, North Australia.

Eulima tasmanica, sp. n., J. E. T. Woods, P. R. Soc. Tasm. 1875, p. 29, Tasmania.

Pyramidellidæ.

Pyramidella mediterranea (Monterosato), coast of N. Africa, differentiated from *minuscula* ; Monterosato, Bull. Soc. mal. Ital. v. p. 224.

Odostomia alba, sp. n., Calkins, P. Davenp. Ac. ii. p. 239, pl. viii. fig. 3, Florida.

Odostomia tasmanica, sp. n., Woods, *l. c.* p. 29, Tasmania.

Mathilda semperi (Brusina, 1877) preoccupied by Turnouer, 1874, fossil ; J. de Conch. xxvii. p. 36.

SCUTIBRANCHIA.

Neritidæ.

Nerita umlaasiana (Krauss) var. from Mozambique ; Martens, MB. Ak. Berl. 1879, p. 734.

Neritina. E. v. Martens finishes his monograph of this genus in Küster's Conch. Cab. pt. 285, pp. 209–303, pls. xx.–xxiii, discussing first *N. fluviatilis* (L.) with its numerous local and geographical varieties, and 18 further more or less allied species from Southern Europe, N. Africa, or W. Asia, including *hispalensis*, sp. n., p. 230, pl. xxii. figs. 20 & 21, Seville, *heldreichi* (Schwerzenbach, MS.), sp. n., p. 225, pl. xxii. figs. 9 & 10, Asia Minor, and *pallida* (Dunker, 1861) p. 239, pl. xxiii. figs. 11 & 12, Persepolis, figured for the first time.

Neritina, subg. *Neritilia* (Martens, 1869), *succinea* (Reel.), Guadelupe, *consimilis*, sp. n., p. 244, pl. xxiii. figs. 25 & 26, Mauritius, *rubida* (Pease), Tahiti, Upolu, Viti, and *manoeli* (Dohrn), Prince's Island, W. Africa, *id. l. c.* pp. 241–245, pl. xxiii. figs. 19–26.

Neritina, subg. *Smaragdia* (Issel) *viridis* (L.), West Indies and Mediterranean, *rangiana* (Recluz), from the Red Sea, &c., Australia, and the Philippines, *souverbiana* (Montrouz.), Port Jackson and New Caledonia, and *glabrata* (Sow.), W. Africa, the three first truly marine ; *id. l. c.* pp. 245–253, pl. xxiii. figs. 27–34.

The monograph is concluded by a list of dubious species, some additions to the previous parts, two tables on the geographical distribution of the species of this genus, which are remarkably more copious on islands and peninsulas than on the mainlands of the great continents, and a plate representing some living animals with the radula and opercules of the subgenera.

Neritina sulculosa, sp. n., distinguished from *spiralis* (Reeve), which = *obtusa* (Bens.), *id. l. c.* p. 278, pl. viii. figs. 23–26, Larentuka.

Neritina zigzag (Lam.) belongs to *lineolata* (Lam.) ; *id. l. c.* p. 280, pl. xxiii. figs. 35 & 36.

Neritina (*Neripteron*) *marmorata*, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877] p. 22, Katow River, New Guinea.

Neritina salmacida, sp. n., Morelet, J. de Conch. xxvii. p. 312, pl. xii. fig. 5, Anjouanna Island, Comoros.

Neritina suavis, sp. n., Gassies, J. de Conch. xxvii. p. 134, Lifou, Loyalty Islands, New Caledonia.

Neritina pulligera var. n. *sulcata*, J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878] p. 3, Northern Queensland.

Neritina picta (Sow.), colour-varieties, and *intermedia* (Brod.) = *globosa*, Brod., with var. n. *minima*, distinct from *latissima*; Miller, Mal. Bl. (2) i. pp. 166–171, Ecuador.

Navicella nana, sp. n., Montrouzier, J. de Conch. xxvii. p. 135, New Caledonia.

Trochidæ.

Jaws have been found in the following genera or subgenera:—*Cookia*, *Bolma*, *Rotella*, *Delphinula*, *Livona*, *Euchelus*, *Gibbula*, and *Zizyphinus*, but none in *Tectus*, *Polyodonta*, *Clanculus*, *Monodonta*, *Omphalius*, *Oxystele*, *Diloma*, and *Elenchus*; Troschel, Gebiss d. Schnecken, ii. pt. 6.

Phasianella delicatula (Woods) = *tritonis* (Chemn.) immature, Petterd, J. of Conch. ii. p. 353.

Turbo transenna, sp. n., R. B. Watson, J. L. S. xiv. p. 714, Japan, 565 fath.

Turbo simsoni (Woods) = *undulatus* (Born), young, Petterd, *l. c.* p. 353.

Turbo supra-granosus (Smith, as *Trochus*), Torres Straits and Solomon Archipelago; operculum shelly; Brazier, P. Linn. Soc. N. S. W. iii. [1878] p. 155, and J. of Conch. ii. p. 197.

Turbo (*Collonia*) *indutus*, sp. n., Watson, J. L. S. xiv. p. 715, St. Thomas, W. Indies, 390 fath.

Cookia sulcata (Martyn), radula; Troschel, *l. c.* p. 217, pl. xx. fig. 71.

Bolma rugosa (L.), radula; *id. ibid.* pl. xxi. fig. 1.

Calcar sp. ?, radula; *id. l. c.* p. 218, pl. xxi. fig. 2.

Turbo (*Calcar*) *henicus*, sp. n., Watson, *l. c.* p. 713, Fiji Islands, 315 fath.

Astralium pagodus, sp. n., J. E. T. Woods, P. Linn. Soc. N. S. W. iv. p. 110, Moreton Bay.

Trochus niloticus (L.) and (?) *spinosus* (Chemn.), radula; Troschel, *l. c.* pp. 224 & 225, pl. xxi. fig. 11, and pl. xxii. fig. 1.

Tectus fenestratus (Gmel.), radula; *id. l. c.* p. 225, pl. xxii. fig. 2.

Polyodonta maculata (L.), *turboides* (Bolten) [*Erythræa*, Koch], and sp. indet., radula; *id. l. c.* p. 226, pl. xxii. figs. 3–5.

[*Polyodonta*] *Trochus subincarnatus*, new name for *T. incarnatus* (Reeve, nec Philippi); Fischer, J. de Conch. xxvii. p. 24.

Carinidea tasmanica (Woods) = *aurea*, juv.; Petterd, J. of Conch. ii. p. 353.

Clanculus pharaonis (L.), *vieilloti* (Payr.), and *jussieui* (Payr.), radula; Troschel, *l. c.* pp. 227 & 228, pl. xxii. figs. 6 & 7.

Clanculus jussieui (Payr.), varr. *striata* and *roseo-carnea*; Monterosato, Bull. Soc. mal. Ital. v. p. 221.

Clanculus granosus, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877]

p. 43, Barnard Islands, N. E. Australia. *C. undatoides*, sp. n., J. E. T. Woods, *op. cit.* iv. p. 22, pl. iv. fig. 7, Port Jackson.

Craspedotus limbatus (Phil.) dredged near Sarterö and in Korsfjord, Norway, perhaps fossil; Norman, J. of Conch. ii. pp. 51 & 52.

Monodonta (Lam.) = *Trochocochlea* (H. & A. Adams), including parts of *Oxystele* and *Diloma* (Phil.), *labio* (L.), *canalifera* (Lam.), *turbinata* (Gmel.), = *articulata* (Lam.), *tessellata* (Born) = *fragarioides* (Lam.), *listeri* (Gray), *mutabilis* (Phil.), *colubrina* (Gmel.), *tabularis* (Krauss), *impervia* (Menke), *striolata* (Q. & G.), *æthiops* (Gmel.) *constricta* (McL.), and *zebra*, (Wood), radula in all essentially similar; Troschel, *l. c.* pp. 228–232, pl. xxii. figs. 9–14, pl. xxiii. figs. 1–7.

Oxystele tigrina (Chemn.), radula somewhat different from the preceding; *id. l. c.* p. 235, pl. xxiv. fig. 1.

Trochocochlea constricta (Lam.) = *multicarinata* (Q. & G.) = *porcata* (A. Adams), *T. taniata* (Q. & G.) can only be doubtfully separated from it, and *T. australis* (Lam.) = *striolata* (Q. & G.) = *concamerata* (Gray), both subject to great variation of colour and form, the first is larger in Tasmania and smaller in South Australia; J. E. T. Woods, P. Linn. Soc. N. S. W. ii. [1877] pp. 89–96. [*Australis* (Chemnitz, Lam.) is a South African *Labio*, quite distinct from *Trochocochlea striolata* (Q. & G.), and erroneously considered by Chemnitz as coming from Australia.]

Omphalius, including *Tegula* and *Chlorostoma*, *carinatus* (Koch), *excavatus* (Lam.), *brasilianus* (Menke), *quadricarinatus* (Gray), *microstoma* (Orb.), *coronulatus* (C. B. Adams), *ater* (Less.), *carpenteri* (Dunker), *funebralis* (A. Ad.), and *pellis-serpentis* (Wood), radula essentially similar; Troschel, *l. c.* pp. 232–235, pl. xxii. figs. 8–16.

Monilea lifuana (Fischer, 1878), Fischer. J. de Conch. xxvii. p. 31, pl. iii. fig. 5, Lifu, Loyalty Islands, New Caledonia.

Diloma nigerrina (Gmel.) = *araucana* (Orb.), radula somewhat different from that of *Monodonta* by a median cuspid in the median plate; Troschel, *l. c.* p. 236, pl. xxiv. fig. 2.

Euchelus atratus (Gmel.), radula near that of *Diloma*, in which the jaw is wanting: *id. l. c.* p. 237, pl. xxiv. fig. 3.

Zizyphinus conulus (L.), *canaliculatus* (Martyn), *granulatus* (Born). *laugieri* (Payr.), *annulatus* (Martyn), and *costatus* (Martyn), radula ver[illegible] characteristic; *id. l. c.* pp. 244–246, that of the first 4 figured, pl. [illegible] figs. 16–19.

Trochus (*Zizyphinus*) *stirophorus*, St. Thomas, W. Indies, 39 [illegible] addibution *tiara* [pre-occupied in *Trochus* generally], Bermudas, 1075 fa[illegible] islands *transenna*, Philippines, 102 fath., spp. nn., R. B. Watson, J. L. & [illegible] plate pp. 695–698.

Trochus spratti (Forbes) = *pictus* (Philippi) = *alveolatus* (Philippi) = *nivosus* (A. Adams), coast of N. Africa and Malta, Monterosato, Bull. Soc. mal. Ital. v. p. 218. *T. exasperatus* (Pennant) and *striatus* (L.) varieties; *id. l. c.* pp. 219 & 220.

Thalotia maculata, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877] p. 42, Torres Straits and Cape York. *T. marginata*, sp. n., J. E. T. Woods, *op. cit.* iv. p. 109, Moreton Bay.

Trochus gilberti (Fischer, 1878), Montrouzier, J. de Conch. xxvii. p. 33, pl. iii. fig. 7, Art Island, New Caledonia.

Elenchus badius (Wood), radula; Troschel, *l. c.* p. 237, pl. xxiv. fig. 4.

Livona pica (L.), radula; *id. l. c.* p. 223, pl. xxi. fig. 10.

Trochiscus norrisi (Sow.), radula copied from Dall [1872]; *id. l. c.* p. 243, pl. xxiv. fig. 15.

Gibbula, including *Korenia* (Friele) and *Forskalia* (Ad.), *cineraria* (L.), *divaricata* (L.), *adriatica* (Phil.), *magus* (L.), *varia* (L.), *villica* (Phil.), *canaliculata* (Lam.) [probably *ardens* (Salis)], *umbilicaris* (L.), *tumida* (Mont.), and *declivis* (Forsk.), radula somewhat similar to that of *Monodonta*; id. *l. c.* pp. 238–243, pl. xxiv. figs. 5–14.

Trochus smaltatus, sp. n., Fischer, J. de Conch. xxvii. p. 22, locality unknown.

Trochus (*Gibbula*) *glyptus*, sp. n., R. B. Watson, J. L. S. xiv. p. 694, Sydney, 410 fath.

Gibbula tasmanica, sp. n., Petterd, J. of Conch. ii. p. 103, Tasmania.

Gibbula multicarinata (Woods) = *Clanculus nodiliratus* (Ad.); *id. l. c.* p. 354.

Trochus (*Minolia*) *semi-ustus*, New Caledonia, and *unicarinatus*, Australia, spp. nn., Fischer, J. de Conch. xxvii. pp. 23 & 24.

Trochus (*Margarita*) *brychius*, South Indian Ocean, 60° 52′ S. lat., 1260 fath.; *charopus*, Kerguelen, 150 fath., with var. *cæruleus*, Heard Island, 75 fath.; *pompholugotus*[*-lyg-*], *æglees*, *clavatus*, and *scintillans*, St. Thomas, West Indies, 390 fath.; *lima* and *azorensis*, Azores, 1000 & 450 fath.; *rhysus*, Setubal and West Indies, 470 and 450 fath.; *infundibulum*, Bermudas, 1075 fath., and Marion Island, Southern Indian Ocean, 1375 fath., *Globigerina*-ooze, alive; *pachychiles*, Philippines, 102 fath.; *dnopherus*, off Pernambuco, 350 fath.: spp. nn., R. B. Watson, J. L. S. xiv. pp. 699–712

Bembix, g. n. "Testa conica, alta, carinata, basi inflata, umbilicata, tenuis, margaritacea, epidermide tenui membranacea induta." *B. æola*, sp. n. (height, 0·82; breadth, 0·63), *id. l. c.* pp. 603 & 604, Japan, 345 fath.

Chrysostoma paradoxum (Born) = *nicobaricum* (Gmel.), radula very different from that of *Rotella*; Troschel, *l. c.* p. 221, pl. xxi. fig. 7.

Rotella elegans (Beck), radula; *id. l. c.* p. 220, pl. xxi. fig. 6.

Delphinula atrata (Chemn.) and *laciniata* (Lam.), radula; *id. l. c.* pp. pp.? & 223, pl. xxi. figs. 8 & 9.

Tecclostrema, radula copied from Friele (1877); *id. l. c.* p. 219, pl. xxi. *Poly* & 4.

indet., *Pstrema profundum*, sp. n., Friele, JB. mal. Ges. vi. p. 272, Spitz- [*Pol.*, 1333 & 120 fath. *C. peterseni* (Lecke), Novaya Zemlya, copied, nec. *l. c.* pl. iv. fig. 7.

Gaza, g. n. "Testa trochiformis, plane margaritacea, eleganter cælata, labio retroverso calloque margaritaceo incrassato; columella torta, directa, antice mucrone angulata, postice a labio penitus disjuncta, ad regionem autem umbilicalem in pulvinum margaritaceum complanata. Operculum rotundum, membranaceum, tenue, multispirale." *G. dædala*, sp. n. (height 0·65, breadth 0·87), Fiji Islands, 610 fath., *Globigerina*-ooze. Watson, *l. c.* pp. 601–603.

Haliotididæ.

Pleurotomaria. Several specimens dredged during the Survey of the 'Blake' in the West Indies; A. Agassiz, Bull. Mus. C. Z. v. No. 14, p. 298. *P. rumphi*, sp. n., Schepman, Tijdschr. Nederl. Dierk. Ver. iv. pp. 162–167, the fourth recent species from the Moluccas (170 mm. high, 190 in diameter, slit 2½ mm. broad).

Seguenzia (Jeffr.). A sinus at the carina and another on the base besides the known infra-sutural sinus, found in all species examined; *S. ionica*, St. Thomas and west of the Azores, 390 & 1000 fath., and *trispinosa*, Pernambuco, 675 fath., spp. nn., Watson, *l. c.* pp. 586–592. This genus is placed among the *Solariidæ* by Jeffreys, J. L. S. xiv. pp. 605 & 606.

Basilissa, g. n. "Testa conica, carinata, umbilicata, margaritacea, anfractu ultimo superne sinuato; columella recta, parum obliqua, tenuis, superne excavata, inferne vix dentata, ad basin autem valde angulata; apertura rhomboidea, labiis nec conniventibus, nec callo palatali junctis." *B. lampra* (height 0·3, breadth 0·48), Mid Pacific, 2050 fath., *simplex*, off mouth of La Plata, 1900 fath., *munda*, off Palma, Canaries, 1125 fath., *alta* and *costulata*, St. Thomas, 390 fath., the former also Pernambuco, 672 fath., and *superba* (height 0·75, breadth 0·65), E. of Cape York, Australia, 1400 fath., spp. nn., Watson, *l. c.* pp. 593–601. Also *B. oxytropis*, sp. n., *id. l. c.* p. 693, Ascension Island, 420 fath.

Stomatella ornata, sp. n., Brazier, P. Linn. Soc. N.S.W. ii. [1877] p. 47, Barnard Islands, N.E. Australia.

Schismope tasmanica, sp. n., Petterd, J. of Conch. ii. p. 104, Tasmania.

Haliotis parva (L.) from New South Wales; Brazier, *l. c.* p. 369.

Broderipia iridescens (Brod.) from New Caledonia; *id. l. c.* p. 370.

Fissurellidæ.

[*Parmophorus*] *Scutus* (Montf.). E. A. Smith discusses the mistakes made by former authors as to the species of this genus, admitting three as distinct: *unguis* (L.), Indian Seas, *ambiguus* (Chemn.), New Zealand, with woodcut, and *anatinus* (Donovan), Australia; J. of Conch. ii. pp. 252–264.

CYCLOBRANCHIA.

Acmæidæ.

Acmæa mitra (Esch.) varr., Prybiloff and Aleutian Islands; *A. insessa* (Hinds) and *instabilis* (Gould) also belong to the restricted subgenus *Acmæa*: Dall, Bull. U. S. Nat. Mus. i. pp. 118 & 119.

Acmæa (*Collisella*) *pelta* (Esch.), with var. *nacelloides* (Dall), *cassis* (Esch.), *A. persona* (Esch.), with var. *digitalis* (Esch.), Aleutian Islands, *testudinalis* (Müll.), with varr. *patina* (Esch.), *alveus* (auctt.), *cumingi* (Reeve), and var. n. *ochracea*, Aleutian Isles and Sitka; *A. peramabilis*

(Dall), Shumagin Islands, *sybaritica* (Dall), Prybiloff Islands, *triangularis* (Dall), Sitka to Monterey, and *apicina*, sp. n., Prybiloff and Aleutian Islands: Dall, *l. c.* pp. 119–123.

Patellidæ.

Nacella ? rosea (Dall), Aleutian and Shumagin Islands; Dall, *l. c.* p. 124.

Lepeta cæca (Müll.), Alaska; *id. l. c.* p. 116.

Cryptobranchia concentrica (Middend.), Alaska, var. *instabilis* (Dall), Sitka, and *C. alba* (Dall), Plover Bay and Aleutian Islands; *id. l. c.* pp. 116 & 117.

Chitonidæ.

W. H. Dall recapitulates our knowledge concerning the structure and development of this family, with special regard to the radula, and adopts the classification proposed by the late Dr. Carpenter (in MS.), as follows:

A. Regular Chitons.

Leptoidea: **Leptochiton*, **Hanleyia*, *Deshaysiella*, *Microplax*, *Hemiarthrum*.

Ischnoidea: **Trachydermon*, **Tonicella*, **Schizochiton*, **Chætopleura*, **Maugerella*, *Trachyradsia*, *Callichiton*, *Stereochiton*, *Spongiochiton*, **Ischnochiton*, **Stenoradsia*, **Stenoplax*, **Ischnoplax*, **Ischnoradsia*, **Lepidopleurus*, **Lepidoradsia*, **Callistochiton*, **Pallochiton*.

Lophyroidea: **Chiton*, **Tonicia*, *Radsia*, *Fannyia*, *Eudoxochiton*, *Craspedochiton*.

Acanthoidea: **Acanthopleura*, **Lucia*, **Corephium*, **Nuttallina*, **Phacelopleura*, *Sclerochiton*, *Francisia*, *Dinoplax*, *Dawsonia*, *Beania*, and *Arthuria*.

B. Irregular Chitons.

Schizoidea: *Lorica*, *Aulacochiton*, *Schizochiton*, *Enoplochiton*, *Onithochiton*.

Placiphoroidea: **Placiphora*, *Euplaciphora*, *Fremblyia*, *Guildingia*.

Mopaloidea: **Mopalia*, **Placiphorella*, **Katharina*, **Acanthochiton*, **Macandrellus*, *Stectoplax*, *Notoplax*.

Cryptoidea: **Cryptoconchus*, **Amicula*, **Cryptochiton*, **Chitonellus*, *Chlamydochiton*, *Choneplax*, *Chitoniscus*, and *Cryptoplax*.

The radula of all genera marked with an asterisk (*) is described and
Bull. U. S. Nat. Mus. i. pp. 63–84, pls. i.–v.

Abstract on Ihering's paper on the anatomy of *Chiton* (Morph. JB. iv. p. 128) in J. R. Micr. Soc. ii. pp. 404 & 405.

Monterosato describes the Mediterranean species of *Chitonidea* as follows:—*Chiton olivaceus* (Spengl., 1797) = *squamosus* (Poli) = *siculus* (Gray) = *polii* (Desh.); *corallinus* (Risso) = *pulchellus* (Phil.); *phaseolinus* (Monter., 1872); *rissoi* (Payraudeau) = *meneghinii* (Capellini) =

mediterraneus (Gray, Reeve); *furtivus* (Monter., 1872); *polii* (Philippi) = *cinereus* (Poli) = *crenulatus* (Risso) = *caprearum* (Scacchi) = *cu[illegible]* (Costa) = *decipiens* (Tiberi); *minimus* (Monter., 1878), Palermo [illegible] of the *lasmæ* (Monter., 1878), Messina, on *Pachylasma giganteum*; *a[illegible]* (Capellini); *caietanus* (Poli); *lævis*, var. *doriæ* (Capell.), *stigma* (Costa) is the young state of it; *Acanthopleura hanleyi* (Thomps., Jeffr.); *Acanthochætes fascicularis* (L., Jeffr.); *A. discrepans* (Browne, Jeffr.) = *fascicularis* (Phil.); *A. æneus* (Risso). Giorn. Sc. Palerm. xiv. pp. 9–21.

Chætopleura (Shuttl., H. & A. Ad. pt.): type, *Chiton peruvianus* (Lam.), *Ch. hartwegi* and *nuttalli* (Coop.), Alaska; Dall, *l. c.* pp. 111 & 112; radula, pl. i. fig. 10.

Leptochiton cancellatus (Sow.) = *asellus* (Middend.) = *alveolus* (Jeffr.), Seas of Northern Europe, Alaska, Unalaska, and Sitka, and *belknapi* (Dall, 1878), N. Pacific, 53° N. lat., 1006 fath., and also Kerguelen, 20–60 fath., compared with *alveolus* (Sars, Lovén) and some other allied species; Dall, *l. c.* pp. 97–99; radula of the first, pl. i. fig. 1.

Deshayesiella (Carp., MS.), subg. n. of *Leptochiton*: no insertion plates, only sutural plates; for *L. curvatus* (Carp.). *Id. l. c.* p. 96.

Trachydermon ruber (L.) = *lævis* (Lovén), Alaska and Arctic, *T. albus* (L.) = *aselloides* (Lowe) = *sagrinatus* (Couth.), Arctic and boreal, south to the Shumagin Islands; *id. l. c.* pp. 101–104, radula pl. i. figs. 3 & 4.

Trachyradsia (Carp., MS.), subg. n. of *Trachydermon*, central valves with two or more clefts; type, *Chiton fulgetrum* (Reeve), and also *T. aleutica* (Dall, 1878), Western Aleutian Islands; *id. l. c.* p. 105.

Tonicella marmorea (Fabr.), Aleutian Islands and Arctic Seas, *lineata* (Wood), from Behring Strait to Japan and Monterey, and *saccharina* (Dall, 1878), Aleutian and Shumagin Islands; *id. l. c.* pp. 106–109, radula, pl. i. figs. 5–7.

Schizoplax (Dall, 1878), *brandti* (Midd.), Aleutian Islands to Sitka; *id. l. c.* p. 110, radula, pl. i. fig. 8.

Maugerella (Carp., MS.), for *M. conspicua* (Carp.), California, radula; *id. l. c.* p. 78, pl. ii. fig. 11.

Ischnochiton (Gray, 1847) = *Lepidopleurus* (H. & A. Ad.), type *Chiton longicymba* (Q. & G.). Dall (from Carpenter's MS.), *l. c.* pp. 112–114, & 78, 79, distinguishes the following subgenera:—

Stenoplax (n.); body elongate, scales elongate, chaff-like, striated, irregular, crowded. *C. limnæiformis* (Sow.), radula, pl. ii. fig. 13.

Stenoradsia (n.); like *Stenoplax*, with numerous side slits. *C. magdalenensis* (Hinds), radula, pl. ii. fig. 12.

Ischnoplax (n.); occasional large scales rising above the rest, and very many short striated bristles; mucro raised, subposterior. *C. pectinatus* (Sow.), radula, pl. iii. fig. 23.

Heterozona (n.); body elongate; two kinds of rather solid, [illegible] scales. *H. cariosa* (Carp., MS.), California.

Ischnochiton (restricted); scales transverse, flattened, somewhat imbricated, generally striated. *C. longicymba* (Q. & G.), *I. interstructus* (Gould), *regularis* and *cooperi* (Carp.), radula, pl. ii. figs. 14, 15, 16.

Ischnoradsia (Shuttl. pt., Carp.); scales striated; central valves, with

many slits. *C. dispar* (Sow.) and *I. trifida* (Carp.), radula of the last, pl. ii. fig. 17.

Lepidopleurus (Carp., MS., *nec* Risso) ; scales solid, imbricated, smooth. *C. nicaënsi* (Middend.), radula pl. ii. fig. 18.

Lepidoradsia (n.) ; similar to the last, with many slits in central valves. *C. australis* (Sow.), radula pl. ii. fig. 19.

Callistochiton (Carp., MS.), g. n., for *C. palmulatus* (Carp.), California; Dall, *l. c.* p. 79, pl. ii. fig. 20.

Pallochiton, g. n., = *Hemphillia* (Carp., MS., preoccupied), *P. lanuginosus* (Carp.), California, radula ; *id. l. c.* p. 79, pl. iii. fig. 21.

Chiton (L. restrict., Carp., *nec* Adams), type *C. tuberculatus* (L.), also *articulatus* (Sow.), *stokesi* (Brod.), *cumingi* (Frembly), and *assimilis* (Reeve), radula ; *id. l. c.* p. 79, pl. iii. figs. 22–26.

Nuttallina (Carp., MS.), g. n. "Lorica elongata, valvis antice projectis, mucro posticus, elevatus; laminæ acutæ, læves, elongatæ ; valvæ centrales bifissæ ; sinus haud laminatus, planatus; zona spinosa." *N. scabra* (Reeve), Vancouver district and Monterey. *Id. l. c.* pp. 115 & 80, radula pl. iv. fig. 31.

Mopalia ciliata (Sow., *Chiton*) = *collici* (Reeve) = *mucosus* (Gould), subsp. : *lignosa* (Gould) = *mereki* and *eschholtzi* (Midd.) = *montereyensis* (Carp.) = *vespertinus* (Gould), and var. : *hindsi* (Sow.) ; *M. wosnessenskii* (Midd.) = *C. cælatus* (Reeve) = *kennerleyi* (Carp.), with var. *swani* (Carp.), Alaska ; *id. l. c.* pp. 85–88 ; radula of both, pl. iv. figs. 34 & 35.

Placiphorella (Carp., MS.), subg. n. of the preceding, bristles of the mantle-margin fasciculate, *M. sinuata* and *imporcata* (Carp., 1865), California, *velata* (Carp.) : *id. l. c.* pp. 80, 87–89, radula pl. iv. fig. 36.

Katharina tunicata (Woods), Alaska and Aleutian Islands ; *id. l. c.* p. 95, radula pl. iv. fig. 37.

Macandrellus (Carp., MS.), ? *Chiton costatus* (Adams & Angas), Port Jackson, radula ; *id. l. c.* p. 81, pl. iv. fig. 40.

Amicula vestita (Pall.), with ? var. *emersoni* (Gray) and *A. pallasi* (Middend.), Unalaska and Aleutian Islands ; *id. l. c.* pp. 89–91, radula pl. v. figs. 42 & 43.

Chlamydochiton, subg. of the former, distinct by the row of gills extended round the body. *C. stelleri* (Middend.) = *sitkensis* and *chlamys* (Reeve). Aleutian Islands, and from Japan unto California ; *id. l. c.* pp. 89, 93 & 94.

TECTIBRANCHIA.

Tornatellidæ.

Tornatella minuta, sp. n., Petterd, J. of Conch. ii. p. 105, Tasmania.

Ringicula. List of 25 species, copied from Morlet, in JB. mal. Ges. vi. pp. 179–191.

Ringicula abyssicola, sp. n., Darnley Island, Torres Straits, 20 fath., and *angasi*, new name for *australis* (Crosse, 1865, *nec* Hinds, 1844), Brazier, P. Linn. Soc. N. S. W. ii. [1877] p. 78.

Bullidæ.

Atys darnleyensis, *cheverti*, *pulchra*[*-er*], *densa*, and *dubiosa*[*-us*], spp. nn., Brazier, *l. c.* pp. 85 & 86, Darnley Islands, Torres Straits, 30 fath.

Cylichna minuta, sp. n., *id. l. c.* p. 80, Darnley Island, Torres Straits, 30 fath.

Mnestia granosa, sp. n., *id. l. c.* p. 81, same locality.

[*Haminea*] *Bulla orbigniana* (Férussac, Dict. class. 1822), Rochelle, = *Haminea dilatata* (Leach); Fischer, J. de Conch. xxvii. p. 21.

Haminea petersi, sp. n., Martens, MB. Ak. Berl. 1879, p. 737, Mozambique.

Haminea decora, sp. n., Brazier, *l. c.* p. 83, North East Australia and Cape York.

Scaphander lignarius (L.), var. *minor*, Marseilles, 105 mètres; Marion, Ann. Sc. Nat. (6) viii. art. 7, p. 12.

Scaphander multistriata[*-us*], sp. n., Brazier, *l. c.* p. 84, Torres Straits, 20 fath.

Doridium cyaneum and *nigrum*, spp. nn., Martens, MB. Ak. Berl. 1879, p. 738, Coast of Mozambique.

NUDIBRANCHIA.

Pleurophyllidiidæ.

Pleurophyllidia loveni (Bergh) = *lineata*, Lovén, Jeffr., Forbes and Hanley, Kattegat and British Seas; full anatomical description by Bergh, Mal. Bl. (2) i. pp. 77–87.

Doridiдæ.

R. Bergh, Arch. f. Nat. xlv. pp. 341 & 354, divides this family into two subdivisions:—

1. Doridid.æ cryptobranchiat.æ, with retractile gills: *Archidoris*, *Diaulula*, *Cadlina*, *Jorunna*, *Aldisa*, *Rostanga*.
2. D. eleutherobranchiat.æ, gills not retractile, a suctorial proventriculus, one or several lateral plates in the radula: *Aciodoris*, *Acanthodoris*, *Adalaria*, *Lamellidoris*, *Goniodoris*.

Doris arbutus (Angas), described by Read, P. Linn. Soc. N. S. W. iv. p. 291, pl. xvii., Congee.

Archidoris (Bergh, 1878), type *tuberculata* (Cuv.), three species known; Bergh, *l. c.* pp. 342 & 343. *A. montereyensis* (Coop.): Bergh, P. Ac. Philad. 1879, p. 107, pl. xvi. figs. 6 & 7, Monterey to Sitka; perhaps a var. of *tuberculata* (Cuv.).

Diaulula, g. n. Back minutely shaggy; tentacles finger-shaped; gill-leaves tripinnate; radula without median plate, lateral plates many-toothed. Only one species, *Doris sandiegensis* (Cooper, 1863); Bergh, in Semper's Reise Philippin. ii. pt. 13, 1878, p. 567, Nudibr. N. Pacific, pl. v. figs. 5–9, and Arch. f. Nat. xlv. p. 343.

Cadlina, g. n. Back granulated, gill formed by a few tripinnate leaves; tentacles flattened, triangular; lips armed by minute hooklets; radula with a median toothed plate, many-toothed lateral plates; male organ armed by hooklets. *Doris repanda* (Ald. & Hanc.), *glabra* (Friele & Hans.), *planulata* (Stimps.), and *pacifica*, sp. n., N. Pacific; Bergh, *l. c.* pt. 13, p. xxxiv.; Nudibr. N. Pacific, pl. vii. figs. 19 & 20, pl. viii. figs. 7–18; Arch. f. Nat. xlv. pp. 344 & 345; and P. Ac. Philad. 1879, pp. 114–125, pl. v. fig. 15, pl. vi. figs. 21 & 22, pl. vii. figs. 9–20, & pl. viii. figs. 3–18.

Doris repanda (Ald. & Hanc.) = *planulata* (Stimps.), also radula perfectly identical; Verrill, Am. J. Sci. (3) xvii. p. 312.

Jorunna, g. n. Back minutely granulated; gill-leaves tripinnate; tentacles finger-shaped; radula without median plate; lateral plates many-toothed; male organ armed with a sting. Only one species, *Doris johnstoni* (Ald. & Hanc.); Bergh, Nudibr. N. Pacific, pl. ix. figs. 1–11, and pp. 1[illegible] *villea*, Ib. Nat. xlv. pp. 346 & 347; already indicated in Semper's Reis. *Melibe* [illegible]n. ii. pt. 10, 1875–76, p. 414, footnote.

Querimusa, g. n. Back almost shaggy, soft; gills compound of six tri[illegible]te leaves; tentacles wart-shaped. Radula without median plate, [illegible]al plates many-toothed, teeth erect, staff-like, denticulate externally. Only one species, *Doris zetlandica* (Ald. & Hanc.) Bergh, Arch. f. Nat. xlv. pp. 348–353, pl. xix. figs. 1–9; preliminary note in Semper's Reis. Philippin. ii. part 14, p. xxxviii.

Rostanga, g. n. Back minutely granulate, gills compound of 16 bipinnate leaves; tentacles finger-shaped; radula without median plate, lateral plates many-toothed, teeth bifid at the tips. For *Doris coccinea* (Forbes). Bergh, Arch. f. Nat. xlv. p. 353.

Acanthodoris (Gray, Ald. & Hanc.). Generic characters described; *A. pilosa* (Müll., Cuv.), with varr. *albescens* and *purpurea*, from the Pacific, *A. subquadrata* (Ald. & Hanc.), and *cærulescens*, sp. n., N. Pacific: *id. l. c.* pp. 358–360, pl. xix. figs. 10–14, & Nudibr. N. Pacific, pl. xiii. figs. 6 & 7.

Acanthodoris inornata and *citrina*, spp. nn., Verrill, Am. J. Sci. (3) xvii. p. 309, East Coast of N. America. *A. stellata* (Gmelin, as *Doris*) = *pilosa* (Ald. & Hanc.) = *bifida* (Verrill), Maine; *id. l. c.* p. 313.

Adalaria, g. n. Like *Lamellidoris*, but radula with small flat (spurious) median plates and a large hook-shaped lateral tooth. For *Doris proxima* and *loveni* (Ald. & Hanc.), and *A. pacifica*, *virescens*, and *albo-papillosa*, spp. nn., N. Pacific. Bergh, Arch. f. Nat. xlv. pp. 360–362, & Nudibr. N. Pacific, pl. ix. figs. 12–16, pl. x. figs. 1–11.

Lamellidoris (Ald. & Hanc.). Generic characters detailed; 17 species enumerated, including *bilamellata* (L.) and *muricata* (Müll.): *id. l. c.* pp. 362–365. *L. varians* and *hystricina*, spp. nn., *id.* Nudibr. N. Pacific, pl. xi. figs. 3–14, North Pacific.

Akiodoris [*Acio-*], g. n. General form like *Lamellidoris*, but suctorial proventricle simple, and 12–13 lateral teeth on the radula; male organ armed with simple or forked hooks. *A. lutescens*, sp. n., N. Pacific. *Id.* Arch. f. Nat. xlv. pp. 354 & 355; Nudibr. N. Pacific, pl. iv. fig. 13, pl. v. figs. 11–14, pl. vi. figs. 1–20, pl. vii. figs. 1–8, pl. viii. figs. 1 & 2; and P. Ac. Philad. 1879 (no text), pls. vi. figs. 1–20, vii. figs. 1–8, & viii. figs. 1 & 2, anatomical figures.

Chromodoris. List of known species brought up to 98; *C. iheringi*, sp. n., = *Doris luteo-rosea* (Rapp), blue when alive, Trieste, *pantharella*, sp. n., Formosa, *mærchi* and *gonatophora*, spp. nn., West Indies, and *glauca*, sp. n., California. Bergh, Mal. Bl. (2) i. pp. 87–107, pl. iii. figs. 1–26, the first four also anatomically described; *C. pantharella* and *mærchi* also in J. Mus. Godeffr. xiv. pp. 3 & 4, pl. ii. figs. 21 & 22, pl. iii. figs. 18–21.

Chromodoris dalli, Puget Sound, and *californiensis*, California, spp. nn., Bergh, Nudibr. N. Pacific, p. 165, pl. xiii. figs. 1–7, pl. xiv. figs. 1–15, and P. Ac. Philad. 1879, pp. 109–114, pls. xii. figs. 5–15, xiii. figs. 1–7, xiv. figs. 1–4.

Aphelodoris, g. n. Somewhat like *Chromodoris*, but mantle and foot narrow; tentacles truncate, canaliculate; gills retractile, consisting five tripinnate leaves. Labial disk unarmed. Radula without m[illegible]a and plate, lateral plates with many hooked teeth. *A. antillensis*, sp[illegible] Thomas, W. Indies. Bergh, Mal. Bl. (2) i. pp. 107–113, with ana[illegible] Marion, description.

Goniodoris (Forbes, 1840). Generic characters detailed, 8 species [illegible]raits, merated; Bergh, Arch. f. Nat. xlv. pp. 365–368.

Goniobranchus albo-punctatus, sp. n., Garrett, P. Ac. Philad. 1879, p. 31, Huahine, Society Islands.

Doriopsidæ.

Doriopsis krebsi (Mörch), var. n. *pallida*, West Indies, and *D. atropos*, sp. n., Rio Janeiro, Bergh, JB. mal. Ges. vi. pp. 46–64, both anatomically described.

Polyceridæ.

Polycera. Monograph by R. Bergh, Verh. z.-b. Wien, xxix. pp. 599–623, pls. ix. x. & xi. figs. 1–8, pl. xii. figs. 1–6. *P. quadrilineata* (O. F. Müller), including *ornata* (Orb.) and var. *mediterranea* = *lineata* (Risso); *P. lessoni* (Orb.) = *modesta* (Lovén) = *illuminata* (Gould), its young state, *citrina* (Alder), a variety = *ocellata* (Ald. & Hanc.); *P. holbœlli* (Möller), Greenland, all anatomically described; *pallida* (Bergh), Aleutian Islands, externally described. The three latter belong to subg. *Palio* (Gray). A few more doubtful species enumerated.

Euplocamus. Monograph by R. Bergh, *l. c.* pp. 623–639, pl. xi. figs. 9–12, pl. xii. figs. 7–17, pl. xiii. figs. 1–17, pl. xiv. figs. 1–10. *E. croceus* (Philippi) = *ramosus* (Cantr.), Mediterranean, and *japonicus*, sp. n., anatomically described. No other species known.

Plocamophorus (Leuck., 1828) = *Peplidia* (Lowe, 1842) = *Histiophorus* (Pease, 1860): *P. tilesii* (Bergh, 1877), Japan, anatomically described; seven more species enumerated. Bergh, *l. c.* pp. 639–647, pl. xiv. figs. 11–24.

Ægirus punctilucens (Orb.): part of the radula figured; *id. l. c.* pl. xiii. fig. 18.

TRITONIIDÆ.

The family restricted to *Tritonia* (Cuv.), including *Candiella* (Gray, 1850) and *Nem[at]ocephala* (Costa, 1869), and characterized; R. Bergh, P. Ac. Philad. 1879, pp. 95 & 96.

Tritonia. History of the genus, 18 known species enumerated, and *T. tetraquetra* (Pallas), Kurile and Aleutian Islands, described; *id. l. c.* pp. 95–105, anatomical figures, pls. iii. figs. 13–16, iv. figs. 5–12, v. figs. 1 & 2.

Marionia, g. n. Externally near *Tritonia*; stomach armed with knife-like teeth; liver divided into two separate portions. *M. berghi*, sp. n. Vayssière, C. R. lxxxv. [1877] p. 299, & J. de Conch. xxvii. [1879] pp. 106–117, pl. vii., Gulf of Marseilles, 50 mètres (? = *Tritonia blainvillea*, Risso, 1826).

Melibæa lonchocera, sp. n., Martens, MB. Ak. Berl. 1879, p. 739, Querimba Islands, Coast of Mozambique.

DENDRONOTIDÆ.

A new family proposed by R. Bergh, containing the two known genera *Dendronotus* and *Campaspe* (Bergh, 1863); P. Ac. Philad. 1879, pp. 88 & 89.

Dendronotus. 4 known species enumerated, with *D. purpureus*, Alaska, and *dalli*, Behring's Strait, spp. nn., *id. l. c.* pp. 89–94, pls. i. figs. 18–21, ii. figs. 9–12, iii. figs. 2–12.

Dendronotus arborescens (Müll.), var. n. *aurantium*; Friele, JB. mal. Ges. vi. p. 284, Spitzbergen.

ÆOLIDIDÆ.

S. Trinchese has observed that in *Amphorina cærulea* (Mont.) the contents of the hepatic ducts are carried back to the stomach by periodical extension of the latter; Rend. Ac. Bologn. 1878–79, p. 170.

Æolis papillosa (L.): typical form from the Shumagin Islands, var. n. *pacifica*, Alaska, Bergh, *l. c.* p. 75, pl. i. figs. 1–6, jaw and radula.

Æolis bicincta, sp. n., Martens, MB. Ak. Berl. 1879, p. 739, Ibo, Coast of Mozambique.

Flabellina. 6 known species enumerated; *F. iodinea* (Coop.), Eastern Pacific, San Diego to Puget Sound, described by Bergh, *l. c.* p. 79; radula, pls. i. figs. 15–17, ii. fig. 16.

Hermissenda (Bergh, 1878) *opalescens* (Coop.), San Diego to Sitka, fully described; *id. l. c.* pp. 81–85, anatomical particulars, pls. i. fig. 9, ii. figs. 1–6.

Coryphella sp.: buccal part described; *id. l. c.* p. 78, pls. i. figs. 13 & 14, ii. figs. 7 & 8, Aleutian Islands.

Coryphella rutila, sp. n., Verrill, Am. J. Sci. (3) xvii. p. 314, Eastport, Maine.

Cuthona stimpsoni, sp. n., *id. ibid.*, Eastport.

Fiona. 4 known species enumerated, including *F. marina* (Forsk.), var. n. *pacifica*, Bergh, *l. c.* pp. 85–88; radula, pl. i. figs. 7 & 8.

Trinchesia, g. n. Near *Galvina*, but only one plate in each transverse row of the radula. H. v. Ihering, Zool. Anz. ii. p. 137, footnote; several species found at Naples.

TELOBRANCHIA.

Koren & Danielssen's paper on *Solenopus* [Zool. Rec. xiv. *Moll.* p. 54] translated; Ann. N. H. (5) iii. pp. 321–328.

Neomenia. Note by H. v. Ihering, Morph. JB. iv. [1878] p. 147; abstract in J. R. Micr. Soc. ii. p. 404.

Neomenia (Tullberg, 1875, first accurate description) = *Solenopus* (Sars, 1868, name only; Kor. & Daniels., 1878); *N. carinata* (Tullb.) = *S. nitidulus* (Sars), Shetland, and *dalyelli* (K. & D.) = ? *Vermiculus crassus* (Dalyell), ? Scotland: Norman, Ann. N. H. (5) iv. p. 165.

PULMONATA.

S. Clessin has commenced to publish the enumeration of all known species of *Helicea* left unfinished by the late L. Pfeiffer, arranged in genera and subgenera according to their natural affinities; nearly the whole, six parts, pp. 1–384, was published in 1879 [dated 1878 on the wrappers]. The families and genera are arranged as follows:—

Series I.—AGNATHA.

Fam. Testacellidæ: *Testacella* 17 spp., *Daudebardia* 13 spp., *Strebelia* 1 sp., *Oleacina* 4 subgg., 142 spp., *Streptostyla* 3 subgg., 49 spp.

Fam. Streptaxidæ: *Streptaxis* 6 subgg., 75 spp., *Ennea* 9 subgg., 58 spp., *Streptostele* 5 spp., *Gibbulina* 4 subgg., 43 spp., *Ravenia* 1 sp.

Fam. Helicoidea: *Rhytida* 31 spp., *Diplomphalus* 13 spp., *Guppya* 1 sp., *Acrope* 1 sp.

Sect. II.—GNATHOPHORA.

Fam. Vitrinea: *Vitrina* 93 spp., *Pfeifferia* 2 spp., *Helicarion* 95 spp., *Laconia* 1 sp., *Mariaella* 5 spp., *Parmella* 1 sp., *Vitrinoidea* 1 sp., *Vitrinopsis* 2 spp., *Vitrinoconus* 8 spp., *Nanina* 19 subgg., 503 spp., *Trochonanina* 12 spp., *Rotula* 20 spp., *Stenopus* 5 spp., *Sesara* 11 spp., *Zonites* 3 subgg., 23 spp., *Macrocyclis* 2 subgg., 21 spp., *Hyalinia* 15 subgg., 276 spp., *Anostoma* 5 spp., *Sagda* 13 spp., *Leucochroa* 17 spp., *Trochomorpha* 165 spp., *Patula* 13 subgg., 327 spp., *Helix* 137 subgg. and sections, 2012 spp., *Cochlostyla* 11 subgg., 214 spp., *Bulimus* 20 subgg. or sections, 323 spp.

Fam. Bulimulidæ: *Binneya* 1 sp., *Gœotis* 3 spp., *Peltella* 1 sp., *Xanthonyx* 4 spp., *Simpulopsis* 20 spp., *Amphibulima* 3 subgg., 8 spp., *Lithotis* 3 spp., *Bulimulus* 19 subgg., 545 spp.

Fam. ORTHALICIDÆ: *Porphyrobaphe* 12 spp., *Orthalicus* 5 subgg., 32 spp., *Liguus* 6 spp.

Fam. ACHATINIDÆ.

Subfam. ACHATININÆ: *Perideris* 18 spp., *Limicolaria* 31 spp., *Achatina* 2 subgg., 73 spp., *Pseudachatina* 7 spp., *Carelia* 8 spp., *Columna* 4 spp.

Subfam. BERENDTIEA: *Berendtia* 1 sp.

Subfam. EUCALODIEA: *Holospira* 14 spp., *Eucalodium* 2 subgg, 28 spp.

Fam. CYLINDRELLIDÆ: *Lia* 8 spp., *Pineria* 4 spp., *Macroceramus* 51 spp., *Cylindrella* 8 subgg., 193 spp.

Fam. BULIMINIDÆ: *Bulimina* 16 subgg., 347 spp., *Partula* 104 spp., *Auriculella* 18 spp., *Achatinella* 13 subgg., 288 spp., *Stenogyra* 9 subgg., 248 spp., *Rhodea* 3 spp.

Fam. CIONELLIDÆ: *Glessula* 59 spp., *Cionella* 6 subgg., 106 spp., *Agraulina* (incl. *Azeca*) 3 subgg., 17 spp., *Tornatellina* 35 spp.

Fam. PUPIDÆ: *Boysia* 1 sp., *Hypselostoma* 3 spp., *Pupa* 22 subgg. or sections, 377 spp., *Zospeum* 10 spp., *Strophia* 35 spp., *Megaspira* 2 spp., *Temesa* 3 spp., *Cœliaxis* 2 spp., *Clausilia* (Böttger's arrangement [Zool. Rec. xv. *Moll.* p. 70] adopted).

This is more a repertorium of names than a natural arrangement. Nearly all the subgenera or sections proposed by other authors are adopted; there is very little original work, and the species are often placed very unnaturally, as neither Pfeiffer or Clessin had sufficiently extensive material, often relying upon descriptions only. The work contains some important mechanical faults: *e. g.*, the heading of a new family, *Helicidæ*, is evidently omitted between *Trochomorpha* and *Patula*, and the commencement of the genus *Bulimus* is not marked on p. 212, but supplied in the next part.

List of species of land shells, the jaw or radula of which has been described and mostly figured by Binney in various works; Bull. Mus. C. Z. v. No. 16, pp. 339–350.

Binney reviews the known genera of slugs and arranges them according to the jaw as follows, with short description of each:—

AGNATHA: *Testacella*, *Daudebardia*, *Vaginulus*, *Chlamydephorus*, *Onchidium*, *Onchidella*, *Peronia*, *Buchanania*.

HOLOGNATHA VITRINEA: *Limax*, *Parmacella*, *Tennentia*, *Parmarion*, *Urocyclus*, *Dendrolimax*, *Vitrinoidea*.

HOLOGNATHA HELICEA: *Tebennophorus*, *Oopelta*, *Anadenus*, *Arion*, *Ariolimax*, *Prophysaon*, *Veronicella*, *Binneya*, *Hemphillia*, *Geomalacus*, *Letourneuxia*, *Peltella*, *Cryptostracon*, *Gaotis*.

ELASMOGNATHA: [*H*] *Omalonyx*, *Hyalimax*, *Athoracophorus* = *Janella*. L. c. pp. 357–368.

A posthumous second part of the late R. J. Shuttleworth's "Notitiæ malacologicæ" has been published [1878] by T. Studer & P. Fischer; it contains 15 coloured plates, with figures of several species of *Paryphanta*, *Retinella*, *Mesomphix*, *Macrocyclis*, *Patera* [*Mesodon*], *Columna*, *Streptostyla*, *Rhynchochila*, and *Trochatella*. As good figures of most of these

species already exist, only those which have not been before figured in easily-accessible works and those created by Shuttleworth himself will be mentioned *infrà*, the figures of the latter kind representing the original specimens.

Agnatha.

Chlamydephorus [rectius *-dophorus*: pre-occupied in *Mammalia*], g. n. Mantle covering the whole body, with an orifice on the centre of the back near the tail, enclosing at the same part a solid internal shelly plate; no caudal mucus pore; no jaw; teeth as in *Glandina*. *C. gibbonsi*, sp. n., Binney, Bull. Mus. C. Z. v. 15, pp. 331 & 332, pl. ii. figs. A & B, Natal.

Testacella stabilii, sp. n., Pini, Atti Soc. Ital. xxii. p. 10.

Daudebardia tarentina, sp. n., Stefani & Pantanelli, Bull. Soc. mal. Ital. v. p. 11, Taranto.

Daudebardia heydeni, sp. n., Böttger, JB. mal. Ges. vi. p. 3, pl. i. fig. 1, Kasbek, Caucasus.

Daudebardia heydeni (Böttg.), *hassiaca* (Clessin), and *sardoa* (Issel); Kobelt. Iconogr. vii. pl. cxci. figs. 1937–1939.

Pseudolibania, subg. n. of *Daudebardia*. "Testa haliotiformis, spira brevissima, tenue rimata, labro columellari breviter reflexo, rimam obtegente." Including *D. langi*, *transylvanica*, &c., Stefani, Bull. Soc. mal. Ital. v. p. 12.

Glandina dilatata (Ziegl.), Corfu, *intermedia* (Martens, as var.), Crete, and *compressa* (Mouss.), Cephalonia and Epirus, Westerlund & Blanc, Faun. mal. Grèce, pp. 21 & 22.

Glandina lignaria (Reeve): living animals described by Gabb, P. Z. S. 1879, p. 480: living specimen of *aurata* (Morelet) figured, *id. l. c.* pl. xl. fig. 1.

Glandina aurantiaca, *anomala*, *mitriformis*, and *strebeli*, spp. nn., Angas, P. Z. S. 1879, p. 481, pl. xl. figs. 8–11, Costa Rica.

Spiraxis (*Streptostyla*) *nicoleti*, *mitriformis*, *lurida*, *irrigua*, *coniformis*, *flavescens*, and *lymnæiformis* [*limn-*], (Shuttl. 1852), figured in Shuttleworth's Not. malac. ii. pl. v. figs. 1–8, all from Cordova, Veracruz, Mexico.

Streptostyla viridula, sp. n., Angas, P. Z. S. 1879, p. 482, pl. xl. fig. 12, Costa Rica.

Ennea taylori, sp. n., Gibbons, J. of Conch. ii. p. 141, pl. i. fig. 5, Zanzibar.

Ennea hordeum, sp. n., Morelet, J. de Conch. xxvii. p. 310, Anjoanna Island.

Ennea perakensis, sp. n., Godwin-Austen & Nevill, P. Z. S. 1879, p. 735, pl. lix. fig. 2. Perak.

Oxygnatha.

Strebel & Pfeffer, Mexik. Land- und Süssw. Conch. iv. pp. 1–4, 17, 21, & 23, distinguish the following subfamilies in their restricted family of *Vitrinidæ* [see Zool. Rec. xv. *Moll.* p. 61]:—

1. *Neozonitinæ*. Mucous pore present; mantle not extended on the surface of the shell; outer cuspid of lateral teeth of radula situated

gradually higher in the teeth, which are more distant from the middle tooth, until it becomes quite obsolete; genital organs simple; all American: *Moreletia*, *Zonyalina*, and *Patulopsis*.

2. *Hyaliniinæ*. No mucous pore. Lateral teeth as in the preceding. *Hyalinia*, *Chanomphalus*, *Pycnogyra*.

3. *Limacinæ*. Sole distinctly tripartite; outer cuspid nearly of the same height in all the lateral teeth, very small in the outermost. *Limax*.

4. *Conulinæ*. Marginal teeth with two cuspids; outer cuspid of the lateral teeth gradually situated more below and nearer the tip, in the teeth which are more distant from the middle tooth (the same as in the *Vitrininæ* and *Nanininæ*). *Habroconus*.

The Recorder's account of previous observations on Spinning Slugs abstracted in J. R. Micr. Soc. ii. p. 305.

Eimer repeats his observations on a Spinning Slug (Zool. Anz. i. p. 123) in J. H. Ver. Württ. xxxv. pp. 50–52.

Limax stenurus, *jalapensis*, and *berendti*, spp. nn., Strebel & Pfeffer, Mexik. Land-Conch. iv. pp. 21–23, pl. x. figs. 3–5; radula, pl. ix. figs. 10, 11, & 15; jaw, pl. xv. fig. 3, Mexico.

Limax semitectus (Mörch). Figure of living animal and radula; Binney, Ann. N. York Ac. i. p. 260, pl. xi. figs. o–q, Costa Rica.

Aspidoporus flavescens (Keferstein, as *Parmarion*) and *fasciatus*, sp. n., Martens, MB. Ak. Berl. 1879, p. 736, Mozambique.

Urocyclus (? *kirki*, Gray), from Mozambique, with caudal mucous pore, and peaked prolongation above it; jaw smooth, central tooth of the radula tricuspid, laterals bicuspid (as in *Zonites*), marginals aculeate, bifid. Binney, Bull. Mus. C. Z. v. pp. 333 & 334, pl. ii. figs. D & E.

Urocyclus flavescens (Keferst., as *Parmarion*), with var. n. *pallida*, Mozambique, and *kirki* (Gray), Delagoa Bay and Natal, Gibbons, J. of Conch. ii. pp. 138 & 139.

Vitrina lusatica, sp. n., Landskrone at Görlitz, Silesia, *diaphana* (Dr.) and *elongata* (Dr.), Silesia, Jordan, JB. mal. Ges. vi. pp. 376, 375–378, pl. viii. figs. 2–4. The first also figured by Kobelt, Iconogr. vii. pl. cxci. fig. 1943.

Vitrina (*Phenacolimax*) *komarowi*. sp. n., Alagös, Transcaucasia, and *annularis* (Stud.); Tiflis, Böttger, JB. mal. Ges. vi. pp. 392 & 393, pl. x. figs. 3 & 4. The first also figured by Kobelt, *l. c.* fig. 1941.

Vitrina servainiana (St. Simon) = *subglobosa* (Mich.); Dupuy, Bull. Soc. Toulouse, 1879.

Vitrina bonellii (Targioni-Tozzetti), figured; Kobelt, *l. c.* pl. cxci. fig. 1942, Tuscany.

Oligolimax, subg. n. of *Vitrina*, comprising some small sculptured perforate European species; mantle not much extended beyond the shell in front. *V. annularis* (Studer) and *pauluccia*, sp. n., P. Fischer, in Paulucci's "Matériaux pour servir à l'étude de la faune malacologique de l'Italie," 1878, p. 23. *V. pauluccia* (Fischer), figured by Mme. Paulucci, Fauna mal. Calabr. p. 37, pl. i. fig. 1, Aspromonte.

Vitrina subconica, sp. n., Böttger, JB. mal. Ges. vi. p. 4, pl. i. fig. 3, Kasbek, Caucasus. Near *V. conoidea* (Martens). Also figured by Kobelt, Iconogr. vii. pl. cxci. fig. 1940. [Belongs to the preceding subgenus.]

Lampadia lederi, sp. n., Böttger, *l. c.* p. 7, pl. i. fig. 2, Transcaucasia. [Appears to be a keeled *Vitrina*.]

Vitrinozonites, g. n. Shell like that of *Vitrina*. A caudal mucous pore with longitudinal furrow. No appendiculate mantle process. Marginal teeth of the radula simple, not bifid. Type, *Vitrina latissima* (Lewis), from Tennessee, radula described; Binney, Bull. Mus. C. Z. v. p. 333, pl. ii. fig. 11.

Velifera, g. n. Shell as in *Helicarion*; mantle with one or more accessory processes which cover most of the shell; a simple longitudinal mucous pore, without horn-shaped process. Jaw with smooth anterior surface, and beak-like projection on the cutting edge. Radula like that of *Zonites*, the first lateral teeth with an inner side cutting point, marginal teeth aculeate, with wide spur. *V. gabbi*, sp. n., Binney, Ann. N. Y. Ac. i. pp. 257 & 258, pl. xi. figs. A–G, Pico Blanco, Costa Rica, 3000 ft.

Helicarion fumosa[*-us*], sp. n., allied to *Helix atramentaria* (Shuttl.), J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878], p. 123, pl. xii. fig. 3, Tasmania.

Microcystis punctifera, sp. n., Gabb, P. Ac. Philad. 1879, p. 17, Rurutu.

Nanina (*Paryphanta*) *atramentaria* (Shuttl., 1852), figured; Shuttleworth, Notitiæ Mal. ii. pl. i. fig. 2, Port Philip, Australia.

Nanina herklotsiana (Dorn), Java, *densa*, (A. Ad.), var. *ignobilis* and *lowiana* (Martens), Borneo, and *trochus* (Müll.), Southern Celebes, Martens, in Pfeiffer's Novitat. v. pp. 175–177, pl. cl. figs. 4–6, pl. cxlix. figs. 7–10 & 1–6.

Nanina (*Microcystis*) *townsendiana*, sp. n., Godwin-Austen & Nevill, P. Z. S. 1879, p. 736, pl. lix. fig. 1, Perak.

Nanina mozambicensis (Pfr.), habits and living animals described; Gibbons, J. of Conch. ii. p. 142.

Stenopus guildingi and *micans*, spp. nn., Angas, P. Z. S. 1879, pp. 484 & 485, pl. xl. figs. 14 & 15, Costa Rica.

Habroconus (Crosse & Fischer) *elegans*, sp. n., and *selenkai* (Pfr.), Mexico, Strebel & Pfeffer, Mexik. Land-Conch. iv. pp. 23 & 24, pl. iv. figs. 15 & 1, radula pl. ix. fig. 9.

Zonites pergranulatus (Godet MS., Kobelt, 1878), Amorgo Island, and *verticillus* var. *eubœica* (Kob.), Eubœa, Kobelt Iconogr. vii. pp. 2 & 3, pl. clxxix. figs. 1809 & 1810.

Zonites cretensis, sp. n., Blanc, Faun. Mal. Grèce, p. 31, Canea, Crete.

Moreletia (Gray) *angiomphala* and *dohrni*, spp. nn., Mexico, also *Helix caduca* (Pfr.), *fuliginosa* (Griffith), *lucubrata* (Say), and *zonites* (Pfr.) referred to this genus. The first three anatomically described, and their shells and that of *M. caduca* photographed. Strebel & Pfeffer, Mexik. Land-Conch. iv. pp. 4–11 & 92 & 93; shells, pls. i. & ii. figs. 4, 6, & 7, pl. viii. figs. 7–9, pl. xv. figs. 8 & 9; anatomy, pl. viii. figs. 1–5; radula, pl. ix. figs. 1–5; jaw, pl. ix. figs. 16 & 17.

Zonyalina (Martens) distinguished by the want of the outer cervical lobe of the mantle from *Moreletia*; *Z. venusta* and *jalapensis*, spp. nn., the former = *bilineata*, varr. β and γ of Crosse & Fischer, and *veracruzensis* (Pfr., *Helix*); *bilineata* and *jalapensis* anatomically described.

Strebel & Pfeffer, *l. c.* pp. 11–16 ; shell, pl. ii. figs. 3, 11–14, pl. xv. fig. 1 ; anatomy, pl. viii. figs. 4 & 5 ; radula, pl. ix. figs. 5–7.

Patulopsis, g. n., shell nearly flat, keeled, ribbed, with wide umbilicus, *P. carinatus* [-*a*], sp. n., Jalapa, Mexico ; *iid. l. c.* pp. 16 & 17, shell, pl. iv. fig. 15, anatomy, pl. viii. fig. 6, radula, pl. ix. fig. 8 ; jaw, fig. 20.

[*Mesomphix*] *Zonites subplanus* (Binney), radula as in *inornatus* (Say) ; Binney, Bull. Mus. C. Z. v. p. 332.

Retinella, subg. n. of *Zonites*, in the posthumous second part of Shuttleworth's Notitiæ Malacologicæ [1878], p. 5, type *H. olivetorum* (Gmelin) [= *Ægopina*, Kobelt, published in the same year]. *Z.* (*R.*) *balmii* (Potiez & Mich., *infrà*), Sicily, *oppressa*, sp. n., Sardinia, and *daboisi* (Charp.), Transcaucasia, figured, pl. ii. figs. 3–5.

Hyalina balmii (Shuttlw. Notit. Malac. ii., *nec* Potiez & Mich.) = *opaca* (Shuttl.), *oppressa* (Shuttl., l. c., = *balmii*, Pfeiffer, Chemn., ed. nov.), and *libysonis*, sp. n., = *opaca* (Paulucci, Matériaux), all three from Sardinia, Mme. Paulucci, J. de Conch. xxvii. pp. 15–21.

Hyalina icterica (Tiberi, 1878) is distinct from *olivetorum* (Gmel.) ; Tiberi, Bull. Soc. mal. Ital. v. pp. 49–52. Is only a variety of it ; Paulucci, *tom. cit.* pp. 180–183.

[*Hyalina*] *Oxychilus lucidus* (Drap.), *septentrionalis* (Bourg.), *subglaber* (Bourg.), *navarricus* (Bourg.), *pudiosus* (Ziegl.) = *nitens* (Mich.), *subnitens* (Bourg.), *parisiacus* (Mabille), environs of Paris, Jousseame, Bull. Soc. Z. Fr. ii. [1877] pp. 403–425, described and figured, pl. i. figs. 30–48, and pl. ii. figs. 1–4, 9, & 10.

Hyalinia lucida (Drap.) var. n. *calabrica*, *H. ercica* (Benoit), *carotii* and *fragrans* (Paulucci, 1878), Calabria, figured by Mme. Paulucci, Faun. mal. Calabr. pp. 44, 45, 52, & 53, pl. i. figs. 2–5.

Hyalinia cellaria var. n. *sieversi*, Ratscha, Transcaucasia, Böttger, JB. mal. Ges. vi. p. 394, pl. x. fig. 8.

Hyalinia petronella (Charp.) with var. *jaccetanica* (Bourg.), and *H. contortula* (Kryn.), from the same locality ; *id. l. c.* p. 395.

Hyalinia mariannæ, Westerlund (1878) redescribed, JB. mal. Ges. vi. p. 156.

Hyalina denatale (Benoit), Sicily, and *uziellii* (Issel), Tuscany, distinct, De Stefani, Bull. Soc. mal. Ital. v. pp. 66–69.

Hyalina scotophila, sp. n., *id. l. c.* p. 38, Siena.

Hyalinia lamellifera, sp. n., Blanc, Faun. malac. Grèce, p. 25, Crete.

Hyalina pura (Alder) and *radiatula* (Alder), difference and resemblance ; Jordan, JB. mal. Ges. vi. pp. 367 & 368, Silesia.

Hyalina norvegica, sp. n., Esmark, N. Mag. Naturv. 1879, p. 215.

[*Hyalina*] *Zonites whitneyi* (Newc.), radula figured ; Binney, Bull. Mus. C. Z. v. pp. 332, pl. i. fig. F.

Hyalinia permodesta, sp. n., Mirador, Mexico, *tehuantepecensis* (Crosse & Fischer) and *subhyalina* (Pfr.), Strebel & Pfeffer, Mexik. Land-Conch. iv. pp. 18 & 19, pl. iv. figs. 9, 4, & 14.

Hyalina wolfi, sp. n., Miller, Mal. Bl. (2) i. p. 117, Guayaquil.

[*Hyalina*] *Zonites savesi*, sp. n., Gassies, J. de Conch. xxvii. p. 126, Thio, New Caledonia.

Hyalinia (*Vitrea*) *effusa*, sp. n., Böttger, JB. mal. Ges. vi. p. 11. pl. 1,

fig. 4, Mamudly, Caucasus; pre-occupied and renamed *subeffusa*, p. 290. Figured by Kobelt, Iconogr. vii. pl. cxci. fig. 1944.

Conulopolita, subg. n. of *Hyalinia*. No umbilicus as in *Conulus*, otherwise more like subg. *Polita* [*cellaria*]. *H.* (*C.*) *raddii*, sp. n., Böttger, JB. mal. Ges. vi. p. 97, pl. ii. fig. 1, Abkhasia, Caucasus, in a cave.

Hyalina (*Conulus*) *tenera* and *acutangula* (A. Adams): Kobelt, Faun. moll. Japon. pp. 14 & 15, pl. i. figs. 7 & 9, Hakodade and Yedo.

[*Zonitoides*] *Zonites excavatus* (Bean) in a bleak, stony wood at Newlay; Taylor, J. of Conch. ii. p. 286.

Chanomphalus, g. n. Shell flat, umbilicate, ribbed, of pale colour, moderately glossy. *C. minusculus* (Binney, as *Helix*) and *elegantulus* (Pfr., *Helix*), Mexico, Strebel & Pfeffer, Mexik. Land-Conch. pp. 19 & 20, pl. iv. figs. 10 & 11; radula, pl. ix. fig. 12 [= *Pseudohyalina*, Morse].

Pycnogyra, g. n. Shell many-whorled, flatly conical, umbilicate, ribbed, pale-coloured. *P. berendti* (Pfr., *Helix*); iid. *l. c.* p. 20, pl. iv. fig. 5.

Selenites, new name proposed for *Macrocyclis* as restricted by Binney and Bland, type, *Helix concava* (Say), the type of *Macrocyclis* (Beck) being *Helix laxata* (Fér.), which probably rather belongs to *Helix*; P. Fischer, J. de Conch. xxvii. pp. 118–121.

Aulacognatha.

Tebennophorus crosseanus, sp. n., Mexico, Strebel & Pfeffer, *l. c.* p. 25, pl. x. fig. 6; radula, pl. ix. fig. 13; jaw smooth, fig. 22.

Tebennophorus sp. from Costa Rica, living animal figured; Binney, Ann. N. Y. Ac. i. p. 261, pl. xi. figs. *m* & *n*.

Arion empiricorum (Fér.): variation in the colour of the sole; Jordan, JB. mal. Ges. vi. p. 360. Silesia. Eimer discusses the colour differences; J. H. Ver. Württ. xxxv. pp. 48 & 49.

Xanthonyx cordovanus and *salleanus* (Pfr., *Simpulopsis*), Mexico. Anatomy of the first by Strebel & Pfeffer, *l. c.* pp. 26–28; shell and its embryonal part of both, pl. ii. fig. 1, pl. x. figs. 7 & 8; anatomy of the first, pl. x. fig. 7 *a–g*; radula, pl. ix. fig. 21. The authors propose a new family, *Xanthonycidæ* [*-chidæ*], for it, with the jaw and radula as in the *Helicidæ*, but lobes of the mantle, tripartite sole, and horn-like appendage at the hinder end of the foot, as in *Nanina*.

Binneya notabilis (Coop.). Living specimens from Guadelupe Island, Mexico; *Xanthonyx*, 1867, probably = *Binneya*, 1863: Binney, P. Ac. Philad. 1879, p. 16.

Hemphillia glandulosa (Binn.). Shell quite covered by the mantle; Binney, Bull. Mus. C. Z. v. p. 337, pl. ii. fig. *f*.

Cryptostrakon [*-con*], g. n. Shell like that of *Gæotis*, membranaceous, entirely concealed by the mantle. Jaw arched, with a few stout ribs. Radula long and narrow, central teeth tricuspid, laterals bicuspid, marginals quadrate, irregularly bicuspid. *C. gabbi*, sp. n., Binney, Ann. N. Y. Ac. i. pp. 259 & 260, pl. xi. figs. *h–k*, Pico Blanco, Costa Rica, 5000–7000 feet.

Helix. European species :—

[*Patula*] *Helix bellovacina*, Compiegne, France, *steneligma* and *claverana* (Bourguignat, MS.), Pyrenees and Paris, and *goossensi*, France, spp. nn., Mabille, Bull. Soc. Z. Fr. ii. [1877] p. 305.

Helix vallisnierii, sp. n., Stefani, Bull. Soc. mal. Ital. v. pp. 39 & 40, Valley of Serchio ; allied to *rupestris* (Drap.).

Helix rupestris, subsp. *chorismenostoma*, Blanc, Faun. mal. Grèce, pp. 32 & 33, Mount Macolessos, Bœotia [scalarid specimens].

Patulastra, subg. n. of *Patula*, for *Helix pygmæa* (Dr.), Pfeiffer-Clessin nomenclator, p. 87.

Helix balmii (Potiez & Mich., 1838) = *flavida* (Ziegl., Rossm., 1839) ; Paulucci, J. de Conch. xxvii. pp. 7–15.

[*Caracollina*] *Helix lens*, varr. *lentiformis* (Ziegl.), and *barbata* (Fér. ?), and varr. nn. *piligera* and *call-juncta*, Blanc, *l. c.* pp. 35 & 36, Greece.

[*Fruticicola*] *Helix granulata* (Alder) = *rubiginosa* (Ziegl.) ; Jordan, JB. mal. Ges. vi. p. 353, Silesia, in the plain.

Hygromia sericea (Müll., Drap.), from the environs of Paris ; Jousseaume, Bull. Soc. Z. Fr. iii. [1878] p. 158, pl. iii. figs. 32 & 33.

Helix saporosa, Soissons, and *axonana*, Aisne, spp. nn., both allied to *sericea*, Mabille, *op. cit.* ii. [1877] pp. 305 & 306.

Helix pseudosericea (Benoit), from Eubœa ; Westerlund, Faun. mal. Grèce, p. 38.

Helix treluiniaca, sp. n., J. Mabille, Guide du Naturaliste, 1879, p. 10, France ; allied to *H. hispida*.

H. globus and *segrisina*, spp. nn., Lessona, Atti Acc. Torin. xv., figured ; allied to *H. hispida*.

Helix matronica, sp. n., near Paris, allied to *incarnata* (Müll.), Mabille, Bull. Soc. Z. Fr. ii. [1877] p. 306 ; the same described and figured by Jousseaume, *op. cit.* iii. [1878] p. 153, pl. iii. figs. 28 & 29.

Helix (*Trichia*) *globula*, var. n. *nana*, Böttger, JB. mal. Ges. vi. p. 14, Mamudly and Kasbek, Caucasus.

Helix (*Eulota*) *anonyma*, sp. n., Westerlund, JB. mal. Ges. vi. p. 157, Civita Vecchia.

Helix (*Eulota*) *interpres*, sp. n., *id.* Faun. Mal. Grèce, p. 45, Eubœa and Phthiotis.

Helix (*Eulota*) *ravergiensis* (Fér.), var. *transcaucasia* (Mouss.), Böttger, JB. mal. Ges. vi.

Helix (? *Monacha*) *schuberti* (Roth), different varieties from Asia Minor and the Caucasus, *id. l. c.* p. 16.

Hygromia cinerea (Poiret), = *Helix strigella* (Drap.), "la grande striée de Geoffroy," Jousseaume, Bull. Soc. Z. Fr. iii. [1878] p. 25, *vide infrà*.

Helix pantanellii, sp. n., Stefani, Bull. Soc. mal. Ital. v. p. 40, Spoleto ; allied to *H. strigella* (Drap.).

Helix orsinii (Porro), several varieties, including *parreyssi* (Pfr.), Central Apennines, Martens, in Pfeiffer's Novitat. v. pp. 184 & 185, pl. cliv. figs. 12–19 ; Valentini, Bull. Soc. mal. Ital. v. p. 25 ; Tiberi, *tom. cit.* p. 127. Paulucci thinks *H. parreyssi* (Pfr.) quite distinct from *orsinii* (Porro) ; *tom. cit.* p. 198.

Helix martensiana (Tiberi) = *apennina* (Mühlfeld), and *H. suborbicularis*, sp. n., Central Apennines, Martens, in Pfeiffer's Novitat. v. p. 183, pl. cliv. figs. 1–5 & 6–8. E. Valentini and Paulucci also distinguish these two species, but name the latter *H. apennina* (Porro), Bull. Soc. mal. Ital. v. pp. 26, 197 & 198; Tiberi unites *apennina* (Porro) with *martensiana*; the first name was never published with a description, *tom. cit.* p. 126.

Helix cantiana, var. n. *messenica*, Blanc, Faun. Mal. Grèce, p. 41, Kalamata, Messenia.

Helix olivieri (Fér.), forma *major* et *nana*; Paulucci, Faun. mal. Calabr. p. 71, pl. i. figs. 6 & 7.

Helix olivieri, var. *ocellata* (Roth), Constantinople, Martens, in Pfeiffer's Novitat. v. p. 182, pl. clix. figs. 1–3.

Helix carthusiana var. n. *arvensis*, Pini, Atti Soc. Ital. xxii. p. 10.

Helix (*Frutico-campylæa*) *eichwaldi* (Pfr.) and *narzanensis* (Kryn.), Caucasus, Böttger, JB. mal. Ges. vi. p. 15; the latter is referred to the group *Eulota*.

[*Xerophila*] *Theba unifasciata* (Poiret) = *candidula* (Stud.), *rugosiuscula* (Mich.), *intersecta* (Mich.) = *costulata* (Dupuy), *striata* (Müll.) = *fasciolata* (Poiret) = *intersecta* (Brard), all distinguished, described, and figured by Jousseaume, Bull. Soc. Z. Fr. iii. [1878] pp. 217–226, iv. pl. iii. figs. 13–24.

Historical note on "la grande striée de Geoffroy," which appears to be a species of the group *Xerophila* by P. Fagot, Bull. Soc. Z. Fr. iii. [1878] pp. 329–332. Jousseaume persists that it is *H. strigella* (Drap.), the only species hitherto found near Paris which has two sagittæ amatoriæ, *tom. cit.* p. 333.

Helix subprofuga (Stabile), *lallemantiana* (Bourg.), and *pyramidata*, var. *nova*, Paulucci, Fauna mal. Calabr. pp. 101, 104, & 109, pls. vi. & vii. fig. 1, Calabria.

Helix heripensis, *solaciaca*, *thuillieri*, and *loroglossicola*, spp. nn., Mabille, Bull. Soc. Z. Fr. ii. [1877] pp. 304 & 305, France; all allied to *terveri* (Mich).

Theba ericetella, sp. n., = *ericetorum*, northern var. (Dupuy), Fontainebleau, Jousseaume, Bull. Soc. Z. Fr. iii. [1878] p. 229, pl. iii. figs. 11 & 12.

Helix bathyomphala (Charp.), Central Apennines, = *spada* (Kobelt, *nec* Calcara), Martens, in Pfeiffer's Novitat. v. p. 185, pl. clv. figs. 1–5. Very near *H. ammonis* (Schm.) and *destituta* (Charp.); Valentini, Bull. Soc. mal. Ital. v. pp. 31 & 32. Distinct from both; Tiberi, *tom. cit.* pp. 112 & 113. Paulucci tries to prove that it is a variety of the Transylvanian *H. instabilis* (Ziegl.), *tom. cit.* pp. 189–191 & 204–212.

Helix discrepans (Tiberi) distinct both from the preceding and from *ammonis* (Schm.), which = *candicans* (Ziegl.); Tiberi, Bull. Soc. mal. Ital. v. pp. 63–65. Contradicted by Paulucci; *tom. cit.* pp. 188 & 189.

Helix spada (Calcara) = *destituta* (Sharpe) = *ocellus* (Villa), Central Apeninnes, Martens, in Pfeiffer's Novitat. v. p. 186, pl. clv. figs. 6–9. The two latter are somewhat distinct; Valentini, Bull. Soc. mal. Ital. v. pp. 31 & 32. They are united and also identified with *nubigena* (Charp., Saulcy)

from the Pyrenees, distinguished from *bathyomphala*; Tiberi, *tom. cit.* pp. 113–119.

Pseudoxerophila, subg. n., allied to *Xerophila*, but provided with fine spiral striæ and rows of punctiform impressions, for *Helix instabilis* and *proteus* (Ziegler) and the three following: Westerlund, Faun. mal. de Grèce, p. 55. *Helix bathytera*, Crete, and *suspecta*, Mount Jouctas, spp. nn., *id. l. c.* pp. 55 & 60; *H. vulgarissima* (Mousson, as var. of *cricetorum*), Epirus, *id. l. c.* p. 59.

Helix (*Xerophila*) *instabilis* var. n. *bakowskiana*, and *obvia* var. n. *kroli*, Clessin, Mal. Bl. (2) i. pp. 9 & 10, the first pl. i. fig. 9.

Helix (*Xerophila*) *cauta*, sp. n., = *cretica* (Roth, *nec* Fér.), from Attica, *chalcidica* var. n. *didyma*, *mesostena*, sp. n., Crete, Westerlund, Faun. mal. Grèce, pp. 63, 65, & 71.

[*Campylæa*] *Helix cingulata* (Stud.) var. *carrarensis* (Porro), *appelii* (Kobelt), and *frigidescens* (n.), Apuan Mountains, the two latter in the higher elevations, and var. *apuana* (Issel), Del Prete, Bull. Soc. mal. Ital. v. pp. 74–77, the three former pl. i. figs. 1–9. *H. nicatis* (Costa) = *preslii* (Schmidt) var.; Paulucci, *tom. cit.* p. 188.

Helix nicatis (Costa) = *frigida* (Tiberi, *nec* Jan); Tiberi, *l. c.* pp. 61 & 62, Mount Majella, Middle Italy.

Helix planospira (Lam.). Mme. Paulucci (Faun. mal. Calabr. pp. 73–93, with geogr. map and pls. ii.–v.) discusses at length its varieties, admitting as type specimens from Tuscany, and distinguishing—

(1.) Direct descending line of varieties: var. *pubescens* (Tiberi), *casertana*, n., *depilata* (Orsini) = *calva* (Kobelt), *setulosa* (Briganti). = *setipila* (Ziegl.), and *calabrica*, n., all in the Apennines of Middle and Southern Italy.

(2.) Collateral descending line: var. *neapolitana* and *cassinensis*, nn., environs of Naples and Monte Cassino.

(3.) Direct ascending line: var. *stabilii*, n., *euganea* (Stabile), *ullepitschi* (Westerl.), *illyrica* (Stabile), and *padana* (Stabile), all in Northern Italy.

Helix setulosa (Briganti, 1825) from the environs of Salerno, = *setipila* (Ziegler, Rossm. 1835), and *H. pubescens* (Tiberi) = *planospira* (Lamarck), Middle and Southern Italy, not *umbilicaris* (Brumati) = *planospira* (Rossm.) = *hispana* (Pfr.); Tiberi, Bull. Soc. mal. Ital. v. pp. 53–60. (The two latter re-united as one species by Paulucci, *tom. cit.* pp. 187 & 188.)

Helix setipila (Ziegl.), varieties; Valentini, Bull. Soc. mal. Ital. v. p. 27.

Helix tetrazona (Jan) var. *alba*, from Ascoli Piceno; *id. l. c.* p. 29.

Helix picena (Tiberi) distinct from *tetrazona*; Tiberi, *l. c.* pp. 120–123.

Helix (*Campylæa*) *olympica* (Roth) var. n. *sciara*, Westerlund, Faun. mal. Grèce, p. 47, Mount Olympus, Thessaly.

Helix westerlundi, sp. n., Blanc, *tom. cit.* p. 48, Crete.

Helix lapicida var. n. *medelpadensis*, Clessin, Mal. Bl. (2) i. p. 15, Prov. Medelpad, Sweden, 62° N. lat.

Helix arbustorum var. n. *septentrionalis*, id. *l. c.* p. 14, same locality.

Helix nemoralis (L.). Number of specimens for 21 differently banded varieties, collected at Tharand, Saxony, stated by M. Kunze, Nachr. mal. Ges. 1879, pp. 55 & 56.

Helix hortensis (Müll.) and *nemoralis* (L.). Varieties in colour, size, &c., differences in the localities; Jordan, JB. mal. Ges. vi. pp. 356–358.

Helix hortensis, var. *arenicola* (Macq.) found at Bristol; Gibbons, J. of Conch. ii. p. 264.

Helix codringtoni (Gray), several varieties, and *crassa* (Pfr.), Corfu; Kobelt, Iconogr. pp. 3–6, pls. clxxx.–clxxxii. figs. 1811–1827.

Helix alonensis (Fér.) anatomically described by H. Strebel, Verh. Ver. Hamb. iii. pp. 150–158, pls. i. & ii.; genital organs, pl. i. fig. 5; arrow, fig. 6; jaw, pl. ii. fig. 9; teeth of radula, figs. 1–3, 16, 25, 33 & 43.

[*Macularia*] *Helix mariannæ*, sp. n., Apulia, *strigata* (Fér.) var., Terni, *carseolana* (Fér.), Cerreto and Pietra Raja, Samnium, *signata* (Fér.), Monte Cassino, *nebrodensis* (Pirajno), Monte Madonia, Sicily, *huetiana* (Benoit) var. from Cephalonia, and *ascheræ*, sp. n., Monte Giuliano, Sicily; Kobelt, Iconogr. vii. pp. 8–12, pls clxxxiii. & clxxxiv. figs. 1832–1857.

Helix persianii, sp. n., Abruzzi, with critical notes on *H. marrucina* (Tiberi, 1878) and *carsoliana* (Fér.); Tiberi, Bull. Soc. mal. Ital. v. pp. 124–126. *H. marrucina* declared to agree perfectly with the types of Férussac's *carsoliana*, and *persianii* to be *carsoliana* var. *uzielliana* (Paulucci), with remarks concerning other varieties of the same; Paulucci, *tom. cit.* pp. 194–196.

Helix gyrostoma (Fér.) from Tripoli; Martens, SB. nat. Fr. 1879, p. 70. Allied to *H. sicana* (Fér.).

Helix muralis, var. n. *alutacea*; Paulucci, Faun. mal. Calabr. p. 116, pl. vii. figs. 2–4, Calabria.

[*Iberus*] *Helix scabriuscula* (Desh.), several varieties, including *segestana* (Phil.); Kobelt, Iconogr. vii. pp. 12 & 13, pls. clxxxv. & clxxxvi. figs. 1858–1871.

[*Pomatia*] *Helix thiesseana* (Kobelt, 1878), Eubœa; *id. l. c.* p. 1, pl. clxxix. figs. 1805 & 1806. Varr. nn. *pronuba* and *nupta*, Westerlund & Blanc, Faun. malac. de la Grèce, pp. 80–82, Crete.

Helix godetiana (Kobelt, 1878), Amorgos and Santorin Islands; Kobelt, *l. c.* p. 1, pl. clxxvii. figs. 1807 & 1808. *H. late-cava* (Mousson, MS.), Pfeiffer, Novitat. v. p. 182, pl. cliii. figs. 7 & 8, from Amorgos, is the same species.

Helix cincta (Müll.), var. n. *calabrica*, Paulucci, Faun. mal. Calabr. p. 120.

Helix schæfli (Mouss.), var. n. *præstans*, Blanc, Faun. mal. de Grèce, p. 83, Corfu.

Helix nucula (Parr.), var. from Crete; Kobelt, *l. c.* p. 7, pl. clxxxii. fig. 1828.

Helix vermiculosa (Morelet); *id. l. c.* p. 7, pl. clxxxii. fig. 1829, Sus, Morocco.

Helix aspersa (Müll.), varr. nn. *solidissima*, *conoidea*, *depressa*, and *minor*, Paulucci, Faun. mal. Calabr. p. 119.

Helix. Species from the Atlantic Islands:—

Janulus stephanophora (Desh.) and *bifrons* (Lowe): jaw and radula; Binney, Bull. Mus. C. Z. v. pp. 332 & 333.

Ochthephila tiarella (W. B.) and *objecta* (Lowe): jaw and radula; *id. l. c.* p. 336.

Tectula lincta (Lowe) is viviparous; *id. l. c.* p. 337.

Plebecula lurida (Lowe): jaw and radula; *id. l. c.* p. 337, the latter pl. i. fig. *l.*

Leptaxis undata (Lowe): malformed radula; *id. ibid.* & fig. *c.*

Helix. Species from the Islands of Eastern Africa:—

Helix duponti (Morelet, 1866) = *Nanina sulcifera* (Barclay, 1868), Mauritius; Martens, in Pfeiffer's Novitat. v. p. 179, pl. clii. figs. 1 & 3.

[*Rotula*] *Helix rodericensis* [*rodriguezensis*] (Crosse) described from more perfect specimens, by E. A. Smith. Phil. Tr. clxviii. p. 479.

Helix mica and *circumfilaris*, spp. nn., Morelet, J. de Conch. xxvii. pp. 308 & 309, pl. xii. figs. 1 & 2, Anjoanna Island, Comoros.

Helix (*Ampelita*) *novacula*, sp. n., and *sepulchralis*, var. n. *funebris*, and *cerina* (Morelet), all from Madagascar; Martens, in Pfeiffer's Novitat. v. pp. 180 & 181, pl. clii. figs. 4–6, pl. cliii. figs. 1–6.

Helix (*Macrocyclis*) [?] *covani* and (*Ampelita*) *shovi*, spp. nn., E. A. Smith, J. of Conch. ii. pp. 338 & 339, Madagascar.

Helix (*Eurycratera*) *bestileoensis* and *ibaraoensis*, spp. nn., Angas, P. Z. S. 1879, pp. 728 & 729, pl. lvii. figs. 1–4, Madagascar; allied to *H. cornu-giganteum* (Chemn.) and *magnifica* (Pfr.).

Helix. Species from Central and Eastern Asia:—

Helix paricincta (with varr. *bis-bicincta*, *ambicincta*, *incincta*, and *bilaticincta*), *duplocincta*, and *cavimargo*, spp. nn., Martens, SB. nat. Fr. 1879, pp. 125 & 126, Kuldja.

Helix orythia, sp. n., *id. l. c.* p. 73, Province Honan, China, in the Löss.

Helix (*Patula*) *pauper* (Gould), from Japan; Kobelt, Faun. Jap. p. 15, pl. i. fig. 12.

Helix (*Plectotropis*) *mackensii* (Ad. & Rv.) from Japan; *id. l. c.* p. 19, pl. ii. figs. 1 & 2.

Helix (*Ægista*) *blakii* (Newcomb), *id. l. c.* p. 23, pl. vii. figs. 10 & 11, Hakodade.

Helix (*Fruticicola*) [*Satsuma*] *japonica* (Pfr.), *patruelis* (A. Ad.), *sphinctostoma* (A. Ad.) in several varieties, and *cardiostoma*, sp. n., *id. l. c.* pp. 47–51, pl. ii. figs. 3–7 & 11–16, pl. vii. fig. 15, Japan.

Helix (*Frut.*) *hilgendorfi*, *macrocycloides*, and *lischkeana*, spp. nn., *goodwini* (E. A. Smith), and *conulina* (Martens), *id. l. c.* pp. 52–56, pl. ii. figs. 9 & 10, pl. vii. figs. 16–18, Japan.

Helix (*Acusta*) *sieboldiana* (Pfr.), with variety; *id. l. c.* p. 58, pl. ii. figs. 8 & 12, Japan.

Helix (*Camena*) *senckenbergiana* (Kob.), *luhuana* (Sow.), *peliomphala* (Pfr.), *nimbosa* (Crosse), *nipponensis* (Kob.), *amaliæ* (Kob.), *callizona* (Crosse), *brandti* (Kob.), *sandai*, sp. n., *eoa* (Crosse), *myomphala* (Mart.), *papilliformis* (Kob.), and *quæsita* (Fér.), all very nearly allied, Japan; *id. l. c.* pp. 24–43, pls. iii. iv. v. vi. pl. vii. figs. 1–9.

Helix herklotsi (Martens, 1861) = *sandai* (Kob., 1879), and *quæsita* (Desh.), var. n. *montium*, both from Japan; Martens, in Pfeiffer's Novitat. Conch. v. pp. 177 & 178, pl. cl. figs. 1–3, pl. cli. figs. 1–3.

Helix. Species from India :—

Helix (*Plectopylis*) *minor*, Darjeeling Hills, and *hanleyi*, Sikkim ?, spp. nn., Godwin-Austen, Ann. N. H. (5) iv. p. 164.

Helix (*Geotrochus*) *perakensis*, sp. n., Crosse, J. de Conch. xxvii. p. 199, pl. viii. fig. 4, Perak. [Rather more allied to *Helix leucophlœa* and *conulus* (Martens), from Celebes and Sumatra, subg. *Trochomorphoides* (Nevill), than to *Geotrochus*, from New Guinea, Solomon Archipelago, and adjacent islands.]

Helix. Austro-Malayan species :—

Helix (*Thalassia*) *annulus* and *sappho*, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876], p. 100, New Guinea.

Helix (*Discus*) *lomonti*, sp. n., *id. l. c.* p. 101, New Guinea.

Helix berlierii and *derbesiana* (Crosse, 1875), Crosse, J. de Conch. xxvii. pp. 43–45, pl. ii. figs. 1 & 2, New Caledonia.

Helix (*Ochthephila* [?]) *dalbertisi*, sp. n., Brazier, *l. c.* p. 104, New Guinea.

Helix (*Polygyra* ?) *raffrayi* (Tapparone-Canefri, 1878), from New Guinea, figured by the author, Bull. Soc. Z. Fr. iv. pl. iv. figs. 13–15.

Helix (*Obba*) *anacardium*, sp. n., Dohrn, Nachr. mal. Ges. 1879, p. 68, locality unknown.

Helix (*Chloritis*) *lansbergiana*, sp. n., *id. l. c.* p. 69, probably from Celebes.

Helix (*Hadra*) *broadbenti*, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877] p. 25, New Guinea.

Helix hixsonis, New Guinea, and *diomedes*, Louisiade Archipelago, spp. nn., *id. l. c.* pp. 120–122.

Helix (*Phania*) *xanthostoma* (Herklots), Batchian, Martens, in Pfeiffer's Novitat. Conch. v. p. clxxix. pl. cli. figs. 4–6.

Helix (*Geotrochus*) *chapmani*, sp. n., Cox, P. Linn. Soc. N. S. W. iv. p. 115, Rossell Island, Louisiade Group.

Helix (*Geotrochus*) *yulensis*, p. 105, Yule Island, *strabo* and *siculus*, p. 106, *brazierœ* and *zeno*, p. 107, New Guinea, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876].

Helix (*Papuina*) *lituus* (Less.), varieties, Tapparone-Canefri, Bull. Soc. Z. Fr. iii. [1878] p. 269, New Guinea ; *H. vitrea* (Fér.), *id. l. c.* pl. iv. figs. 16 & 17, Port Dorey ; *H. lanceolata* (Pfr.), var. from Angate, *id. l. c.* pl. iv. figs. 9 & 10.

Helix (*Geotrochus*) *poirieri*, sp. n., *id. l. c.* p. 270, pl. iv. figs. 11 & 12, Port Dorey.

Helix (*Albersia*) *zonulata*, var. n. *minor*, id. *l. c.* p. 271, New Guinea.

Helix. Australian species :—

Helix (*Conulus*) *maino*, New Guinea, and *reedii*, Torres Straits, p. 101, *nepeanensis* and *darnleyensis*, Torres Straits, and *barnardensis*, N.E. Australia, p. 102, *starkii*, p. 103, Yule Island, spp nn., Brazier, P. Linn. Soc. N. S. W. i. [1876]. *H.* (*C.* ?) *porti*, N. Australia, and *grenvillii*, N.E. Australia, *id. l. c.* p. 104.

Helix fernshawensis, dandenongensis, and *otwayensis,* spp. nn., Petterd, J. of Conch. ii. pp. 355 & 356, Victoria, Australia.

Helix (*Patula*) *spaldingi,* sp. n., Brazier, *l. c.* p. 103, North Australia.

Helix induta, North Para river, *pictilis,* Cape Northumberland Cliffs, and *arenicola,* very near *rupestris* (Drap.), York's Peninsula and River Murray, spp. nn., Tate, P. Linn. Soc. N. S. W. ii. [1877] pp. 290 & 291.

Helix petterdiana, sp. n., Taylor, J. of Conch. ii. pp. 287, pl. i. fig. 3, Tasmania, Islands in Bass's Straits and Victoria.

Helix ramsayi (Cox) and *harriettæ* (Cox) distinct from *confusa* (Pfr.); J. E. T. Woods, J. de Conch. xxvii. pp. 333–335.

Helix mucoides [sic!], sp. n., *id.* P. Linn. Soc. N. S. W. iii. [1878] p. 125, pl. xii. fig. 5, Victoria, Australia.

Helix (*Rhytida*) *beddomii,* p. 98, N. Australia, *jamesi* and *hobsoni,* p. 99, N.E. Australia, spp. nn., Brazier, *l. c.*

Helix weldi (Woods) is the only sinistral species of Australia; Petterd, J. of Conch. ii. p. 358.

Helix (*Pitys*) *gunni,* new name for *assimilis,* Brazier (1871), *nec* Adams (1855) ; *H.* (*P.*) *luckmani,* new name for *neglecta,* Brazier (1870), *nec* Draparnaud (1866); *H.* (*P.*) *collisi,* new name for *minima,* Cox (1868), *nec* Adams (1867) : J. Brazier, P. R. Soc. Tasm. 1876 [1877], p. 168.

Helix (*Hadra*) *tomsoni* and *hanni,* spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 97, Queensland. *H.* (*H.*) *palmensis,* sp. n., *id. l. c.* p. 105, N.E. Australia.

[*Hadra*] *Helix bebias, zebina, bala, mazee, nicomede,* and *beddomii,* spp. nn., *id. op. cit.* iii. [1878] pp. 77–80, pl. viii. figs. 1 & 2 & 4–7, Queensland.

Helix (*Callicochlius*) *etheridgii,* spp. nn., *id. op. cit.* ii. [1877], p. 26, N.E. Australia.

Helix dubitans, vexanda, ruga, margatensis, quæstiosa,* stephensi,* cæpta, decani,* plexus,* irvinæ, spoliata, tabescens, petterdi, austrinus, medianus, helice, tranquilla,* trajectura,* mixta, vitrinaformis* [*vitrini-*],* *positura,* casus,* occultus, sitiens,* halli,* parvissima,* daveyensis, atkinsoni, thompsoni, camillæ, marchianæ,* fusco-radiata, ramsgatensis, limula,* derelicta, officeri,* macdonaldi,* iuliformis, gouldi, kingstonensis, agnewi, spectra, vigens,* and *fulgetrum,* spp. nn., Cox, apud Legrand, Collections for a Monograph of Tasmanian land-shells, not yet seen by the Recorder [1871 ?] ; all are mentioned, but only those marked with an asterisk (*) acknowledged as distinct species by Petterd, Land-Shells of Tasmania, pp. 5–40.

Helix wynyardensis, savesi, jungermaniæ,* trucanini,* henryana,* fourneauxensis,* spiceri,* mathinnæ,* kershawi,* tamarensis, stanleyensis, mimosa,* lottah,* roblini,* barenensis,* otwayensis,* and *dyeri,** spp. nn., Petterd, Land-Shells of Tasmania, pp. 8, 12, 17, 19, 21, 23, 26, 28, 30, 32, 33, 37, 38, & 40, [those marked * also, with *H. rosacea,* sp. n., in J. of Conch. ii. pp. 210–217], Tasmania. *H. buttoni,* new name for *vitriniformis* (Cox, see above), preoccupied; *id. l. c.* p. 55.

Helix pictilis, sp. n., Tate, P. Linn. Soc. N. S. W. ii. [1877] p. 290; Petterd, Land-Shells of Tasmania, p. 17, Tasmania.

Helix gadensis, *bischoffensis*, and *anti-alba*, spp. nn., Beddome [in P. R. Soc. Tasm., April, 1879, not published until 1880]; Petterd, *l. c.* pp. 29, 39, 41, Tasmania.

Helix hookeriana [pre-occupied as *H. hookeri*, by Reeve], sp. n., R. M. Johnston, P. R. Soc. Tasm., April, 1879 [1880]; Petterd, *l. c.* p. 38.

Helix. Polynesian species :—

Patula rurutuensis, sp. n., Garrett, P. Ac. Philad. 1879, p. 18, Rurutu.

Pitys degagii, sp. n., *id. ibid.*, Rurutu.

Helix. Species from North America, including Mexico :—

Microphysa stearnsi (Bland, as *Zonites*), jaw ribbed, radula with aculeate marginal teeth; Binney, Bull. Mus. C. Z. v. p. 335, pl. i. figs. *m* & *n*.

Microconus, subg. n.; shell turbinate, widely umbilicated, whorls rounded, irregularly plaited, brown coloured; aperture simple; for *M. wilhelmi* (Pfr., as *Helix*). Strebel & Pfeffer, Mexik. Land Conch. iv. p. 29, pl. iv. fig. 7, shell only. [Scarcely distinct from *Microphysa*, Albers.]

Patula hermanni and *mazatlanica* (Pfr.), Mexico, *iid. ibid.* the first pl. iv. fig. 8.

Thysanophora, subg. n.; shell flat or conical, widely umbilicated, brown, with longitudinal plaits and rows of epidermic fringes; aperture simple. *T. impura* (Pfr.) and *paleosa*, sp. n., Mexico. *Iid. l. c.* p. 30, pl. iv. figs. 2 & 3, shell only. *Helix conspurcatella* and *turbinella* (Morelet), and *almonteana* (Tristram) are also referred to this subgenus.

Trichodiscus, subg. n. [name preoccupied in *Protozoa*]; shell subdepressed, widely umbilicated, banded, beset with fine bristle-bearing warts; peristome shortly reflected. *T. cordovanus* (Pfr.), Mexico, anatomically described, jaw ribbed. *Iid. l. c.* pp. 32–35, pl. iii. fig. 5, pl. xi. figs. 1, 10, & 17. *Helix coactiliata* (Fér.), *pressula* (Morelet), and *oajacensis* (Koch) are also referred to this subgenus.

Acanthinula granum, sp. n., *iid. l. c.* p. 31, pl. ix. fig. 13, Mexico.

Strobila labyrinthica (Say), Mexican varieties and anatomical description; *iid. l. c.* pp. 43–45, pl. iv. fig. 6, pl. xv. fig. 7; radula, pl. xi. fig. 2.

Polygyra implicata (Beck), *plagioglossa* (Beck), *helictomphala* (Pfr.), *couloni* (Shuttl.), *texasiana* [*texana*] (Morelet), *oppilata* (Morelet), and *ariadnæ* (Pfr.), Mexico, shells, and the first also anatomically described; *iid. l. c.* pp. 45–50; shells, pl. iii. figs. 1–4, pl. xv. figs. 11–13; radula, pl. x. fig. 2.

Triodopsis vultuosa (Gould), radula; Binney, Bull. Mus. C. Z. v. p. 335, pl. ii. fig. c.

Mesodon sayi (Binn.), var. *chilhoweensis* and *M. devia* (Gould), genital system; *id. l. c.* p. 336, pl. ii. figs. *g* & *f*; radula of the former, pl. i. fig. *k*.

Helix chilhoweensis (Lewis), specifically distinct from *diodonta* (Say), Highlands of Kentucky and Tennessee; Weatherby, Am. Nat. xii. [1878] pp. 390–392.

[*Mesodon*] *Helix* (*Patera*) *ingallsiana* (Shuttl.), figured in Shuttleworth, Notitiæ Malacol. ii. pl. iii. fig.

Arionta intercisa (Binn.): jaw, radula, and genital systems; *A. redimita* is a variety of it; Binney, *l. c.* p. 357.

Helix tudiculata (Binn.): note on it by Jousseaume, Bull. Soc. Z. Fr. 1879, pp. 124–128.

Helix (*mormonum*) var. n. *circumcarinata*; Stearns, Ann. N. York Ac. i. Nov. 1879, with woodcut, Stanislaus County, near Turloch, California.

Praticola, subg. n. Shell globular, irregularly plaited, aperture expanded, thickened internally, concealing a part of the narrow umbilicus. *P. ocampi*, sp. n., Mexico, anatomically described; *H. ampla* (Pfr.) is probably its young state: Strebel & Pfeffer, *l. c.* pp. 38–40; shell, pl. ii. figs. 2 & 5; anatomy, pl. x. fig. 1 *a–f*. *H. flavescens* (Wiegm.), *griseola* (Pfr.), and *berlandieriana* (Meric.), are described and referred to this subgenus; *l. c.* pp. 41 & 42. [Name too near *Pratincola* (Koch), in *Aves*.]

Pomatia humboldtiana (Val.): genital system and radula; Binney, *l. c.* p. 336, pl. ii. figs. *j* & *k*. Referred with some doubt to the subgenus *Arionta* by Strebel & Pfeffer, Mex. Land. Conch. iv. p. 35.

Odontura eximia (Pfr.), *ghiesbreghti* (Ngst.), and *sigmoides* (Morelet). Notes on the shells, the last probably not adult; *iid. l. c.* pp. 36–38.

Corasia (?) *guillarmodi* (Shuttl.) and *bicincta* (Pfr.), Cordova and Oajaca, Mexico; *iid. l. c.* pp. 50 & 51, the latter pl. xiii. fig. 17.

Helix. Species from the West Indies:—

Plagioptycha duclosiana (Fér.): jaw as in *Hemitrochus milleri*, radula figured; Binney, *l. c.* p. 335, pl. i. fig. *c*.

Helix duclosiana, var. n. *abacoensis*, Abaco Island, Bahamas, Martens, in Pfeiffer's Novitat. v. p. 187, pl. cliv. figs. 9–11.

Hemitrochus milleri (Pfr.). Jaw with a single rib-like prominence, terminating into a median projection of the cutting edge; radula as in *H. varians* and *troscheli*: Binney, *l. c.* p. 335, pl. i. figs. *a* & *b*.

Helix picta (Born) and *alauda* (Fér.): distribution of the varieties in Cuba; Arango y Molina, Faun. malac. Cubana, pp. 62 & 73.

Helix. South American species:—

Guesteria branickii, sp. n., Lubomirski, Bull. Soc. Z. Fr. 1879, p. 113, with fig., Peru.

Helix (*Systrophia*) *pseudo-planorbis*, sp. n., *id.* P. Z. S. 1879, p. 719, pl. lv. figs. 1–3, Pujupe, Peru, 10,000 feet above the sea.

[*Lysinoe*] *Helix costaricensis* (Roth.): on its variability; Angas, P. Z. S. 1879, p. 476.

Helix (*Isomeria*) *stolzmanni*, sp. n., Lubomirski, *l. c.* p. 720, pl. lv. figs. 4–6, Montaña de Palto, Peru.

Isomeria loxensis, sp. n., Miller, Mal. Bl. (2) i. p. 118, pl. xii. fig. 1, Prov. Loja, Ecuador [= *Helix hartwegi* (Pfr.); Dohrn, JB. mal. Ges. vii. p. 86].

Helix (*Solaropsis*) *tiloriensis*, sp. n., Angas, *l. c.* p. 477, pl. xl. fig. 2, Costa Rica.

Helix (*Oxychona*) *zhorquinensis*, sp. n., *id. l. c.* p. 475, pl. xl. fig. 1, Costa Rica.

Bulimus (*Orphnus*) *jelskii*, sp. n., Lubomirski, *l. c.* p. 722, pl. lvi. figs. 1 & 2, Amable Maria, Peru.

Achatina pantheri (Fér.), Mozambique: habits and eggs; Gibbons, J. of Conch. ii. p. 143.

Achatina antourtourensis, sp. n., Crosse, J. de Conch. xxvii. p. 340, Nossi Be Island, Madagascar.

[*Caryodes*] *Bulimus dufresnii* (Leach): egg and varieties; J. E. T. Woods, P. Linn. Soc. N. S. W. iii. [1878] pp. 81–91, pl. vii. figs. 1–7, Tasmania. Six varieties from Tasmania; Petterd, Land-Shells of Tasm. pp. 44–46.

Bulimus macleayi, sp. n., Brazier, P. Linn. Soc. N.S.W. i. [1876] p. 108, Yule Island, New Guinea.

[*Rachis*] *Buliminus mozambicencis* (Pfr.): habits and eggs; Gibbons, J. of Conch. ii. p. 144.

Buliminus (*Rhachis*) *succinctus*, sp. n., Martens, SB. nat. Fr. 1879, p. 102, Bagamoyo.

[*Petraus*] *Bulimus lampodermus*, sp. n., Morelet, J. de Conch. xxvii. p. 315, pl. xii. fig. 6, Abyssinia.

Buliminus dirphicus, sp. n., Blanc, Faun. mal. Grèce, p. 90, Eubœa; *B. thiesseanus* (Mousson, MS.), sp. n., *id. l. c.* p. 92, Eubœa and Bœotia.

Bulimus quadridens (Müll.) var. n. *prolixus*, Pini, Atti Soc. Ital. xxii.

Chondrula galiciensis, sp. n., Clessin, Mal. Bl. (2) i. p. 7, pl. i. fig. 5, Galicia.

Buliminus (*Chondrula*) *tuberifer*, sp. n., Böttger, JB. mal. Ges. vi. p. 28, pl. i. fig. 9, Kasbek, Caucasus.

Buliminus (*Chondrula*) *retrodens*, sp. n., Martens, SB. nat. Fr. 1879, p. 126, Kuldja.

Cionella lubrica (Müll.) varr. *hyalina* and *exigua* (Menke), Jordan, JB. mal. Ges. vi. p. 343, Silesia.

[*Cionella*] *Cochlicopa collina* (Drouet) very near *C. lubrica*, environs of Paris, common; Jousseaume, Bull. Soc. Z. Fr. iii. [1878] pp. 235 & 236 (iv. pl. iii. figs. 42 & 43 ?).

Cochlicopa (*Zua*) *raddii*, sp. n., Böttger, JB. mal. Ges. vi. p. 25, pl. i. fig. 8, Mamudly, Caucasus.

Cionella gloynii, sp. n., Gibbons, J. of Conch. ii. p. 135, pl. i. fig. 1, St. Ann's, West Indies. Its radula, specimen from Curaçao; Binney, Bull. Mus. C. Z. v. p. 335, pl. i. fig. *h*.

[*Azeca*] *Cochlicopa tridens* (Pult.), type, var. *nouletiana* (Dup.), the common English form, var. *alzenensis* (Simon), and var. *crystallina* (Dup.); Taylor, J. of Conch. ii. pp. 220 & 221.

[*Cæcilianella*] *Achatina acicula* (Müll.) on the crest of an old chalk pit. Isle of Wight; Ashford, J. of Conch. ii. p. 267.

Cochlicopa (*Acicula*) *acicula* (Müll.), var. n. *nodosaria* and var. *liesvillii* (Bourg.), from Trancaucasia; Böttger, JB. mal. Ges. vi. p. 398, pl. x. figs. 9 & 10.

Cionella (*Acicula*) *pygmæa* (Pfr.) = *consobrina* (Orb.) = ? *sellowi* (Pfr.), under decayed leaves and rotten wood, Sierra de Tucuman, Cordoba and S. Luis; Döring, Bol. Ac. Cordoba, iii. p. 78.

[*Leptinaria*] *Cionella lamellata* (Pot. & Mich.) and *funcki* (Pfr.), dif-

ferences of the shells, both ovo-viviparous; Gibbons, J. of Conch. ii. p. 130.

Tornatellina affinis, *micans*, and *perplexa*, spp. nn., Garrett, P. Ac. Philad. 1879, pp. 23 & 24, Rurutu.

Tornatellina mastersi, p. 108, and *petterdi*, p. 109, Torres Straits, *terrestris*, p. 109, Yule Island, *grenvillii*, p. 109, and *eucharis*, p. 110, N.E. Australia, spp. nn., Brazier, P. Linn. Soc. N. S. W. i. [1876].

Spiraxis simplex (Guppy), eggs described, *S. dunkeri* (Pfr.), ovo-viviparous; Gibbons, J. of Conch. ii. pp. 130 & 131.

Spiraxis aequatoria, sp. n., Miller, Mal. Bl. (2) i. p. 127, pl. xiii. fig. 6, Guayaquil.

[*Stenogyra*, subg. *Clavator*] *Achatina* (*Columna*) *eximia* (Shuttl., 1852), figured in Shuttleworth's Notitiæ Malacol. ii. pl. iv. fig. 2, Madagascar.

Stenogyra lucida, sp. n., Gibbons, J. of Conch. ii. p. 144, pl. i. fig. 4, Bawri Island, Zanzibar.

Bulimus (*Stenogyra*) *gracilis* (Hutt.) from Rodriguez, E. A. Smith, Phil. Tr. clxviii. p. 480.

Stenogyra gutierrezi, sp. n., Arango, Faun. Mal. Cubana, p. 91, Cuba.

Stenogyra gabbiana, sp. n., Angas, P. Z. S. 1879, p. 485, pl. xl. fig. 17, Costa Rica.

Opeas dresseli, *acutius*, *rarum*, and *aciculæforme* [*aciculi-*], spp. nn., Miller, Mal. Bl. (2) i. pp. 123–125, pl. 14, figs. 1–4, Guayaquil.

Stenogyra micra (Orb.) and *octona* (Chemn.), eggs; Gibbons, J. of Conch. ii. p. 131.

Stenogyra octona (Chemn.), ? living animal; Angas (quoting Gabb), P. Z. S. 1879, p. 485, pl. xl. fig. 16, Costa Rica.

Subulina guayaquilensis, sp. n., Miller, Mal. Bl. (2) i. p. 126, pl. xiii. fig. 5, Guayaquil.

Bulimus (*Subulina*) *proniensis*, sp. n., Gassies, J. de Conch. xxvii. p. 126, Prony Bay, New Caledonia.

Eucalodium and *Cœlocentrum*. General anatomical description, the columellar muscles by which the animal is retracted into the shell, are peculiarly developed and subdivided; Strebel & Pfeffer, Mexik. Land Conch. iv. pp. 52–55.

Eucalodium subdivided into 3 groups:—(A) *mexicanum* (Cuming), *ghiesbreghti* (Pfr.) with var. (B) *blandianum* (Pfr.) with var., *moussonianum*, *neglectum*, and *walpoleanum* (Crosse & Fisch.) with var., *grande* and *splendidum* (Pfr.). (C) *edwardsianum* (Cr. & Fisch.), *boucardi* (Sallé) with var., *dense-costatum* and *cereum*, spp. nn., *martensi* new name for *truncatum* (Pfr., as *Bulimus*), Mexico; *iid. l. c.* pp. 62–73, shells figured photographically, pl. v. figs. 8–20, pl. vi. figs. 6–11, and pl. vii. figs. 1–5. Anatomical descriptions of *E. mexicanum*, *blandianum*, *edwardsianum*, and *martensi*, pp. 63, 66, 70, & 73, pl. xii. figs. 1–3, radula, pl. xi.

Eucalodium sumichrasti (Cr. & Fisch., 1878) and *E. blandianum*, var. n.; Crosse & Fischer, J. de Conch. 1878, pp. 46–48, the former, pl. ii. fig. 2.

Cœlocentrum subdivided into two groups:—(A) *turris* (Pfr.), *clava* (Pfr.), *tomacella* (Mor.), *fistulare* (Mor.), *arctispira* (Pfr.), *anomalum*, sp. n. (B) *crosseanum* (Pfr.) with var., and *filicosta* (Shuttl.), Mexico.

Strebel & Pfeffer, *l. c.* pp. 56–61, shells figured photographically, pl. v. figs. 10, 14, & 18, and pl. vi. figs. 1–5; columella, pl. xiv. figs. 1–5, 7 & 8; anatomical descriptions of *C. arctispirum*, p. 59, pl. xiii. fig. 10, radula and jaw, pl. xi. figs. 9 & 15.

Perrieria clausiliiformis (Tapparone-Canefri, 1878) fully described and figured by Crosse, J. de Conch. xxvii. pp. 39–41, pl. i. fig. 3, Port Dorey, New Guinea. Also by the author in Bull. Soc. Z. Fr. iii. [1878] p. 272, pl. iv. figs. 18 & 19.

Balia perversa at Grassington, Yorkshire; H. Pollard, The Naturalist (Huddersfield), 1877, p. 59.

Clausilia, general anatomical description by Strebel & Pfeffer, Mexik. Land Conch. iv. p. 53.

Clausilia. Note on the original localities of some of Férussac's species by E. v. Martens, Nachr. mal. Ges. 1879, pp. 125–127.

Clausilia dubia (Drap.) var. *obsoleta* (A. Schmidt), and var. *speciosa*, Tschapeck, Nachr. mal. Ges. 1879, p. 9, Styria.

Clausilia penchinati (Bourg.) = *rugosa* (Drap.); Dupuy, Bull. Soc. Toulouse, 1879.

Clausilia delpretiana and *pecchiolii*, spp. nn., Stefani, Bull. Soc. mal. Ital. v. pp. 41–45, mountains of Middle Italy, confounded by former authors with *rugosa* (Drap.) and *parvula* (Stud.). Statements by Pini concerning them disputed, and the first species kept distinct from *perexilis* (Bourg.); *id. l. c.* pp. 130–138.

Clausilia bonellii (Martens) = *delpretiana* (Stefani, pt.), *C. perexilis* (Fagot, Bourg.) = *delpretiana* (Stef. pt.) = *parvula* (Bonelli), *C. rugosa* var. *pinii* (Westerl.) = *pecchiolii* (Stef.) = *crenulata*, var. *minor* (Bonelli); Pini, Atti Soc. Ital. xxii. and Bull. Soc. mal. Ital. v. pp. 237–261.

Clausilia tenuistriata and *furvana*, spp. nn., and *plicatula* (Dr.) var. n. *plicatulina*, Pini, Atti Soc. Ital. xxii.

Clausilia itala (G. Martens) var. n. *epapillata*, Apuan Mountains, Del Prete, Bull. Soc. mal. Ital. v. p. 81.

Clausilia umbilicata, sp. n., Antivari, Albania, *callifera* (Küst.) var. n. *gigas*, Dalmatia, Böttger, JB. mal. Ges. vi. pp. 101–103, figs. 4 & 5.

Clausilia belone, sp. n., Asia Minor, *bourguignati* (Charp.) var. *systropha* (Böttg., 1878), *persica*, sp. n., Astrabad, *prægracilis*, sp. n., Beyrut, *imitatrix*, sp. n., Malta, *bathyclista* (Blanc, MS.), Eubœa, *strobeli* (Porro) var. *glabrata*, Southern Tirol; *id. l. c.* pp. 114–124, pl. iii. figs. 9–15.

Clausilia transitans and *deburghiæ*, spp. nn., *kobeltiana*, varr. nn. *furcata* and *contorta*, *punctulata* (Küst.), var. n. *albinella*; Paulucci, Faun. Mal. Calabr. pp. 144, 147, 151, & 152, pl. vii. figs. 6–8, and pl. viii. figs. 1 & 2.

Clausilia (*Albinaria*) *furcilla*, sp. n., Westerlund, Faun. mal. Grèce, p. 113, Patras, Morea.

Clausilia (*Euxina*) *gradata*, sp. n., Böttger, *l. c.* p. 409, pl. x. fig. 5, Transcaucasia.

Clausilia (*Euxina*) *aggesta* and *lederi*, spp. nn., *id. l. c.* pp. 34–36, pl. i. figs. 5 & 6, Cis- and Trans-caucasia.

Clausilia (*Cristataria*) *laodicensis*, Latakia, and (*Papillifera*) *delimæ-*

formis [*delimi-*], Dardanelles, spp. nn., *id. l. c.* pp. 385–387, pl. x. figs. 1 & 2.

Clausilia japonica (Crosse) = *kobensis* (E. A. Smith), with var. *nipponensis* (Kob.), *hilgendorfi* (Mart.), *eurystoma* (Mart.), *brevior* (Mart.), *martensi* (Herk.) = *reiniana* (Kob.), *yokohamensis* (Crosse) = *reiniana* var. (Kob., 1878), *validiuscula* (Mart.), *interlamellaris* (Mart.), *platyauchen* (Mart.), *platydera* (Mart.), *hyperolia* and *decussata* (Mart.), and several other species already figured, 1878, by Böttger [Zool. Rec. xv. *Moll.* p. 73]; Kobelt, Faun. Japon. pp. 64–100, pl. viii. figs. 1–21, pl. ix. figs. 1–14.

Clausilia aculus (Bens.), only from Middle and Southern China, = *shanghaiensis* (Pfr.); *C. labio* (Gredler), here figured, and *mollendorffi* (Martens), are varr. of it, but *C. proba* (A. Adams) = *aculus* (Mart. & Böttg., 1878), from Japan and Korea, is distinct; *C. fitzgeraldæ*, sp. n., nearly allied to *aculus*, locality unknown; Böttger, JB. mal. Ges. vi. pp. 107–112, pl. ii. figs. 7 & 8.

Clausilia schlueteri, sp. n., East Indies, and *cochinchinensis* (Pfr.), *id. l. c.* pp. 103–106, pl. ii. figs. 5 & 6.

Clausilia (*Nenia*) *bogotensis*, sp. n. (Dohrn, MS.), *id. l. c.* p. 125, pl. iii. fig. 16, Plateau of Bogota, Ecuador.

[*Nenia*] *Clausilia taczanowskii*, Bambamarca, *slosarskii*, Pumamarca, *filo-costulata*, Escalon, and *chacaensis*, Chaca (all in Peru), Lubomirski, P. Z. S. 1879, pp. 726 & 727, pl. lvi. figs. 3–15.

Pupa frumentum, var. n. *castanea*, Gredler, Nachr. mal. Ges. 1879, p. 110, Torbole, S. Tirol.

Pupa avenacea (Brug.), var. *apuana* (Issel), and var. *oligodonta* (Del Prete), Apuan Mountains, Del Prete, Bull. Soc. mal. Ital. v. pp. 80 & 81.

Pupa secale, var. n. *edentula*, Taylor, J. of Conch. ii. p. 5, Ingleton, Yorkshire.

Pupa muscorum (L.), var. n. *caucasica* = *triplicata*, var. *inops* (Reinhardt), *P. triplicata* (Stud.) = *signata*, var. *parvula* (Mouss.), and *P. signata* (Mouss.) = *cristata* (Martens), Transcaucasia, Böttger, *l. c.* pp. 399–402.

Pupa triplicata (Stud.), var. n. *suboviformis* and *cylindrata*, id. *l. c.* p. 26.

Pupa bifilaris (Mouss.) = *doliolum* (Brug.), var.; *id. l. c.* p. 31.

Pupa (*Pupilla*) *microdonta*, Entre Rios and Sierra de S. Luis, *dicrodonta*, Sierra de Cordoba, Mendoza and S. Luis, and *clessini*, Sierra de Cordoba and S. Luis, spp. nn., Döring, Bol. Ac. Cordoba, iii. pp. 82 & 83, with comparative list of 10 South American species of *Pupa*, pp. 80 & 81.

Reinhardtia, subg. n., for the species of *Pupa* in which the young shell has a parietal lamella, which disappears in the adult, e.g., *P. umbilicata* (Drap.), *semproni* (Charp.), *anglica* (Fér.), *superstructa* (Rossm.), and *caucasia* (Parr.); Böttger, JB. mal. Ges. vi. pp. 27–31. This is identical with *Charadrobia* (Lowe); *id. l. c.* p. 403.

Pupa, subg. *Isthmia*. O. Reinhardt, SB. nat. Fr. 1879, pp. 133–139, discusses the affinities and geographical distribution of the 19 known species, and arranges them as follows:—

Group 1.—*P. minutissima* (Hartm.), European, *atomus* (Shuttl.), *molecula* (Dohrn), and *linearis* (Lowe), African.

Group 2.—*P. strobeli* (Gredl.), *costulata* (Nilss.), *uni-armata* (Küst.), European, *micula* (Mouss.), Caucasian, *lardea* and *blanfordi* (Jick.), African.

Group 3.—*P. claustralis* (Gredl.), *opisthodon* (Reinh.), and *saturnensis* (Reinh.), European, *clavella* (Reinh.), Caucasian, *schilleri* and *similis* (Jick.), African.

Group 4.—Only *P. monodon* (Held.), European.

Pupa strobeli, var. n. *scharffi*; Böttger, J. of Conch. ii. p. 291 (without description), Bordeaux.

Pupa inornata (Michaud) is an Alpine species; *P. columella* (Bens.) = *gredleri* (Cless.) is a subfossil variety of it; *edentula* (Drap.) is a more or less imperfect form, in less elevated countries, originally of the same species; Gredler, Nachr. mal. Ges. 1879, pp. 5–8.

Pupa shuttleworthiana (Charp.), var. n. *mitis*; id. *l. c.* p. 112, Ampezzo, S. Tirol.

Pupa (*Vertigo*) *sieversi*, sp. n., = *pygmæa* var. *nitidula* (Mouss.), with var. n. *punctulum*, Transcaucasia; Böttger, JB. mal. Ges. vi. p. 407, [illegible] figs. 6 & 7.

Pupa (*Vertigo*) *macleayi*, sp. n., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 110, various islands in Torres Straits.

Pupa seignaciana, sp. n., Crosse & Fischer, J. de Conch. xxvii. p. 49, Nossi Be, Madagascar.

Pupa monas, sp. n., Morelet, J. de Conch. xxvii. p. 310, Anjoanna Island.

Pupa fallax (Say), local varieties; Gibbons, J. of Conch. ii. p. 131.

Pupa cincinnatiensis (Judge, 1878) = *contracta* (Say); Binney, Bull. Mus. C. Z. v. p. 335.

Pupa pellucida (Pfr.), Strebel & Pfeffer, Mexik. Land Conch. iv. p. 91, pl. iv. fig. 12, pl. xv. fig. 10, Mexico.

Pupa (*Leucochila*) *wolfi*, sp. n., Miller, Mal. Bl. (2) i. p. 127, pl. xiv. fig. 3, Guayaquil [= the preceding species].

Goniognatha.

[*Charis*] *Bulimus loialtyensis* [!], sp. n., Souverbie, J. de Conch. xxvii. p. 25, pl. iii. figs. 1 & 2, Ile Maré, Loyalty Islands.

Bulimus (*Porphyrobaphe*) *wrzesniowskii*, sp. n., Lubomirski, P. Z. S. 1879, p. 721, pl. lv. figs. 7 & 8, Tambillo, Peru.

Orthalicus undatus (Brug.), varieties and distribution on the north coast of South America; Gibbons, J. of Conch. ii. p. 130.

Zebra loxensis, sp. n., Miller, Mal. Bl. (2) i. p. 119, pl. xii. fig. 2, Prov. Loja, Ecuador [= *Bulimulus hartwegi* (Pfr.); Dohrn, JB. mal. Ges. vii. p. 87].

Otostomus (*Mesembrinus*) *pœcilus* (Orb.), jaw and occurrence on *Opuntia* in the Sierra de Catamarca; Döring, Bol. Ac. Cordoba, iii. p. 76.

Bulimulus exilis (Gmelin): local varieties; Gibbons, J. of Conch. ii. p. 130.

Bulimulus schiedanus (Pfr.), jaw and radula, *immaculatus* (Ad.), radula; Binney, Bull. Mus. C. Z. v. p. 338, pl. i. figs. *d* & *f*.

Bulimulus irazuensis (Angas): radula described; Binney, Ann. York Ac. i. p. 262, pl. xi. fig. *l*, Costa Rica.

Bulimus gabbi, *zhorquinensis*, and *citronellus*, spp. nn., Angas, P. Z. S. 1879, pp. 477–479, pl. xl. figs. 3–5, Costa Rica.

Thaumastus umbilicatus, sp. n., Miller, Mal. Bl. (2) i. p. 122, pl. xiii. fig. 1, Prov. Loxa, Ecuador.

Mormus catamayensis and *occidentalis*, spp. nn., *id. l. c.* pp. 120 & 121, pl. xii. fig. 2, pl. xiii. fig. 2, Prov. Loxa, Ecuador. [The first = *Bulimulus sachsi* (Albers), the latter = *nitidus* (Brod.); Dohrn, JB. mal. Ges. vii. pp. 88 & 89.]

Bulimulus (*Peronæus*) *famatinus*, Sierra de la Rioija, 2000 mètres, *calchaquinus*, Sierra de Belen, (*Scutalus*) *oxylabris*, Maldonado, *peristomatus*, Sierra de Pocho, *conospirus*, Sierra de Tucuman, (*Bulimulus* s. str.) *centralis*, Sierra de Cordoba, *monticola*, Sierra de los Grandillos and Cuesta de Tocina, 3300–4000 mètres, as high as the limits of the glacial region, *torturanus*, Sierra de Pocho, spp. nn., with notes on the differences, varieties, and occurrence of other known species, as *apodemetes* (Orb.), *sporadicus* (Orb.), including as variety *B. montevidensis* (Pfr.), and *stelzneri* (Dohrn), &c., all in the Argentine Republic; Döring, Bol. Ac. Cordoba, iii. pp. 63–74; the jaws of most are described.

Macroceramus pontificus (Gould), Mexico, *concisus* (Mor.), Guatemala, *kieneri* (Pfr.), Texas, and *gossii* (Pfr.), Jamaica; Strebel & Pfeffer, Mex. Land Conch. iv. pp. 89–91, pl. v. fig. 4 *a–d*, shells only.

Cylindrella. General remarks, chiefly on the radula, its differences, variations in single species, and abnormities, by Strebel & Pfeffer, *l. c.* pp. 74–77, pl. xiii. In *C. cylindrus*, *bagniana*, and *brevis*, the truncature of the first whorls is closed by a new vaulted piece; p. 78.

Cylindrella. 105 species from Cuba enumerated, and the plaits of the columella in most of them described; Arango y Molina, Faun. mal. Cubana, p. 104 *et seq.*

Cylindrella hidalgoi and *stearnsi*, spp. nn., Arango, *arangiana*, sp. n., Gundlach, *op. cit.* pp. 107, 113 & 114, Cuba.

Cylindrella trinitaria (Pfr.), varieties; Gibbons, J. of Conch. ii. p. 131.

Thaumasia rosea (Ad.): radula; Strebel & Pfeffer, *l. c.* p. 75, pl. xiii. figs. 6 & 7, with abnormities.

Anisospira, subg. n. of *Cylindrella*. Shell somewhat like *Eucalodium*, columella tubular, with external plait. *A. liebmanni* and *hyalina* (Pfr.), Mexico; Strebel & Pfeffer, *l. c.* pp. 77–79, pl. v. figs. 12 & 13, pl. xiii. fig. 16; columella, pl. xiv. fig. 9.

Metastoma, subg. n. Not truncated; last whorls partly free, turned horizontally inwards, concealing the perforation. For *M. rœmeri* (Pfr.). *Iid. l. c.* p. 80.

Bostrichocentrum, subg. n. Columella tubular, surrounded by a thick solid rope-like thickening. For *B. tryoni* (Pfr.), Mexico. *Iid. l. c.* p. 81; shell, pl. v. fig. 3; columella, pl. xiv. fig. 13.

Holospira pilocerei (Pfr.), *goldfussi* (Pfr.), *goniostoma* (Pfr.), and *pfeifferi* (Menke); *iid. l. c.* pp. 82–85; shells, pl. v. figs. 1 & 2, photographs,

pl. xiii. fig. 12; columella, pl. xiv. figs 6 & 17; anatomy of *H. goldfussi*, p. 83, pl. xv. fig. 2; radula, pl. xiii. figs. 3 & 5.

Epirobia, subg. n. of *Cylindrella*. Distinct from *Holospira* by the columella being perpendicularly costulated, but without spiral plait. For *E. berendti* (Pfr.), *polygyra* (Pfr.), *morini* (Morelet), and *apiostoma* (Pfr.), Mexico. *Iid. l. c.* pp. 85–88, pl. v. figs. 5–7, photographs; columella, pl. xiv. figs. 14, 15 & 18; radula, pl. xiii. figs. 1, 2 & 4; genital apparatus of *apiostoma*, p. 88, pl. xiii. fig. 11.

Casta gracilis (Wood): radula; *iid. l. c.* p. 106, pl. xiii. fig. 8. *C. chemnitziana* (Fér.): radula; Binney, Bull. Mus. C. Z. v. p. 338.

Simpulopsis corrugata (Guppy): radula; Binney, *l. c.* p. 338.

Elasmognatha.

Succinea stagnalis (Gassies, 1867) = *putris*, var. *vitrea* (Jeffreys, 1867), *S. pascali*, sp. n., Dép. Haute-Loire, *contortula* (Baudon, 1877), *elegans* (Risso), type described, distinct from *pfeifferi* (Rossm.), *elegans* var. n. *berilloni*, Dép. Basses-Pyrénées, and *putris* var. n. *charpii*, and *dentata*, Dép. Oise, and description of the parasitical *Leucochloridium paradoxum* (Carus), which has been only found on *S. putris*; Baudon, J. de Conch. xxvii. pp. 289–305, pls. x. & xi.

[*Succinea*] *Neritostoma vetula* (Klein) = *putris* (L.), *mabillii* and *hordeacea*, spp. nn., *pfeifferi* (Rossm.), *debilis* (Morelet), *ochracea* (Betta), *virescens* (Morelet), *Succinea oblonga* (Drap.), *arenaria* (Bouch.), *baudoni* (Drouet), and *humilis* (Drouet), distinguished, described, and figured by Jousseaume from specimens found near Paris; Bull. Soc. Z. Fr. ii. [1877] pp. 71–75, 99–113, pl. i. figs. 6–29.

Succinea evoluta, sp. n., Martens, SB. nat. Fr. 1879, p. 126, Kuldja.

Succinea lauta (Gould) and *horticola* (Reinh.); Kobelt, Faun. Jap. pp. 101 & 102, pl. vii. figs. 21 & 22, Japan.

Succinea peoriensis (Wolf), Walker, J. of Conch. ii. p. 329, Michigan.

Succinea barbadensis (Guilding): on its habits and ability to withstand drought; Gibbons, J. of Conch. ii. p. 132.

Succinea gyrata, sp. n., *id. l. c.* p. 136, pl. i. fig. 2, St. Ann's, W. Indies.

Succinea oregonensis (Gould) = *oblonga* (Drap.); Taylor, J. of Conch. ii. p. 184.

Succinea viridicata, sp. n., Gassies, J. de Conch. xxvii. p. 125, Bourail, New Caledonia.

Succinea degagii, sp. n., Garrett, P. Ac. Philad. 1879, p. 26, Rurutu.

Succinea legrandi, sp. n., Cox, apud Legrand, Collections for a Monograph of Tasmanian Land-Shells, spec. 2 [1871 ?]; Petterd, Land-Shells of Tasm. p. 48. *S. australis* (Fér.) varr. nn. *queenboroughensis* and *tamarensis*, Petterd, *l. c.* p. 49.

Homalonyx unguis (Orb.) from Bahia, and *felina* (Guppy), from Demerara. Shell and soft parts comparatively described by J. S. Gibbons, J. of Conch. ii. pp. 99–101. Habits of the latter; *id. l. c.* p. 132. Radula of *felina* described, and the identity of the two species averred, by Binney, Bull. Mus. C. Z. v. p. 338, pl. i. fig. *j*.

VAGINULIDÆ.

Vaginulus petersi, sp. n., Martens, MB. Ak. Berl. 1879, p. 736, Mozambique.

Vaginulus natalensis (Krauss), ? var. from Mozambique; Gibbons, J. of Conch. ii. p. 140.

Vaginula rodericensis (E. A. Smith, 1876); E. A. Smith, Phil. Tr. clxviii. p. 482, pl. li. fig. 4, Rodriguez Island.

Vaginulus sloanii (Fér.): eggs; Gibbons, J. of Conch. ii. p. 132.

Veronicella olivacea (Stearns): jaw and radula; Binney, Bull. Mus. C. Z. v. p. 337.

Veronicella arcuata, *teres*, *atro-punctata*, *complanata*, *bætzkeni*, *audensis*, *cephalophora*, *quadrocularis*, spp. nn., Miller, Mal. Bl. (2) i. pp. 130–138, pl. viii. fig. 5, pl. ix. figs. 1–3, pl. x. figs. 1–4 (all described from alcoholized specimens, without anatomy), Andes of Ecuador.

ONCHIDIIDÆ.

Onchidella carpenteri (Binn.): radula; Binney, Bull. Mus. C. Z. v. p. 332.

AURICULIDÆ.

The re-absorption of the internal septa between the whorls in the shells [already stated by Woodward, 1851] stated as of regular occurrence in a number of species; *Pedipes* alone does not exhibit this peculiarity. H. Crosse & P. Fischer, J. de Conch. xxvii. pp. 143 & 144.

Scarabus regularis, *intermedius*, and *lacteolus*, spp. nn., Gassies, J. de Conch. xxvii. pp. 129–131, Maré, Loyalty Islands.

Auricula helvacea (Phil.) from New Guinea; Tapparone-Canefri, Bull. Soc. Z. Fr. iii. p. 273.

Auricula (*Alexia*) *meridionalis*, sp. n., Brazier, P. Linn. Soc. N. S. W. ii. [1877] p. 26, S. Australia.

Melampus fraysii, sp. n., Montrouzier, J. de Conch. xxvii. p. 127, Lifu, Loyalty Islands.

Melampus viola (Lesson) = *caffer* var. *b* (Pfr.), Rurutu, described by Garrett, P. Ac. Philad. 1879, p. 26.

Melampus wolfi, sp. n., Miller, Mal. Bl. (2) i. p. 139, pl. xii. fig. 3, Guayaquil [= *globulus* (Fér.), Dohrn, JB. mal. Ges. vii. p. 90].

LIMNÆIDÆ.

Limnæa. Varieties of *stagnalis* (L.), *palustris* (Müll.), *ovata* (Dr.), and *auricularia* (L.), from Silesia, Jordan, JB. mal. Ges. vi. pp. 316–322, including *ovata* var. n. *amploides*, p. 321.

Limnæa limosa (L.), stunted in brackish water; Folin, Faune lacustre de l'ancien lac d'Ossegor, with pl.

Limnæa steenstrupi (Clessin), from Iceland, = *vulgaris*, var., in very warm springs only dead shells are found: the *Limnæa* found in Greec

land agree with North American species; those found in Iceland with European; Steenstrup, Mal. Bl. (2) i. pp. 16–19. Clessin defends the specific value of *L. steenstrupi*; tom. cit. p. 20.

Limnæa frigida, var. *nivalis*, and var. n. *glacialis*; Pini, Atti Soc. Ital. xxii.

Limnæa peregra, varr. nn. *bakowskiana*, Galicia, *tschapecki*, Stiria, and *raiblensis*, Carinthia; Clessin, Mal. Bl. (2) i. pp. 12 & 13, pl. i. figs. 8–10.

Limnæa jauoviensis, sp. n. (and a new var. of *L. ovata*), Krol, Sprawozd. Komm. Fizyiogf. xii. [1878] p. 170, pl. iii., Galicia. This regarded as a var. of *ovata* (Drap.), found also in Oldenburg; Clessin, Mal. Bl. (2) i. p. 11, pl. i. fig. 7.

Limnæa truncatula, var. n. *thiesseæ*, Clessin, *l. c.* p. 6, Eubœa. Its numerous varieties discussed; *id. l. c.* pp. 20–32, pl. ii. figs. 1–20.

Limnæa pervia (Martens) and *japonica* (Jay); Kobelt, Faun. Jap. pp. 105 & 106, pl. xv. figs. 6 & 2–5, Japan.

Limnæa tasmanica, *huonensis*, *hobartonensis*, *launcestonensis*, spp. nn., J. E. T. Woods, P. R. Soc. Tasm. 1875 [1876], pp. 70 & 71; Petterd, J. of Conch. ii. p. 81, Tasmania. *L. hobartonensis* = *peregra* (Müll.); *id. op. cit.* 1878 [1879], p. 72, *cf.* also Nelson, J. of Conch. ii. p. 4. *L. tasmanica* is very similar to, if not identical with, *L. stagnalis* (L.); Legrand, *tom. cit.* p. 95.

Limnæa cubensis (Pfr.) = *humilis* (Say), is very near *truncatula* (Müll.); Gibbons, J. of Conch. ii. p. 133.

[*Amphipeplea*] *Limnæa glutinosa* (Müll.) observed in King's County, Ireland; *involuta* (Harv.) is perhaps only a variety of it. Ashford, J. of Conch. ii. pp. 6 & 7.

Amphipeplea petterdi, sp. n., Nelson, J. of Conch. ii. p. 267, pl. i. fig. 6, Port Moresby, New Guinea.

Physa acuta (Dr.), with var. *fusca* (Rossm.), Spain, and var. n. *septentrionalis*, from Ostend, and *P. pisana* (Issel), Kobelt, Iconogr. vii. p. 21, pl. clxxxix. figs. 1913–1916.

Physa virgata (Gould); Nelson, J. of Conch. ii. p. 182, Iowa.

Physa perlucida, sp. n., Gassies, J. de Conch. xxvii. p. 133, Pine Island, New Caledonia.

Physa brisbanica and *beddomii*, Queensland, *fusiformis*, New South Wales, spp. nn., Nelson & Taylor, J. of Conch. ii. pp. 288 & 289, pl. i. figs. 7–9.

Physa huonensis, *legrandi*, *tasmanica*, *ciliata*, *tasmanicola*, and *huonicola*, spp. nn., J. E. T. Woods, P. R. Soc. Tasm. 1875 [1876], pp 74 & 75, and Petterd, J. of Conch. ii. pp. 81–83, Tasmania.

Physa guyonensis and *lirata*, spp. nn., Woods, P. Linn. Soc. N. S. W. iii. [1878], p. 138, pl. xiii. figs. 4 & 5, New Zealand.

Physa pilosa, p. 63, ? Victoria, *crebre-ciliata*, Melbourne, and *arachnoidea* (? = *P. dulvertonensis*, var.), Victoria, ibid., *yarraensis* and *kershawi*, p. 64, Upper Yarra, spp. nn., *id.* Tr. R. Soc. Vict. xiv. [1878].

Pyrgophysa, g. n., distinct from *Physa* by the slender turreted shell, which is not glossy, but has a dull periostracum, and by the narrowed aperture. *P. mariei*, sp. n., Nossi-Bé Island, Madagascar, Crosse, J. de Conch. xxvii. p. 209.

Physopsis nasuta, sp. n., Martens, SB. nat. Fr. 1879. p. 102, Bagamoyo.

Planorbis corneus (L.) var., *marginatus* (Dr.) var., *subangulatus* (Phil.), *atticus* (Bourg.), *græcus* (Cless.), *boissii* (Mich.), *pæteli* (Jick.), and *alexandrinus* (Ehrenb.); Kobelt, Iconogr. vii. pl. cxc. figs. 1926–1936.

Planorbis gredleri (Bielz), Tirol, distinct from *rossmæssleri* (Anersw.): Gredler, Ber. Ver. Innsbr. vii. (2) p. 31. *P. clessini* (Westerl. 1873) = *nitidus*, var. *distinguendus* (Gredler, 1859); *id. ibid.*

Planorbis subangulatus (Phil.) = *orientalis* (Ol.) = *græcus* (Cless.), Westerlund, Faun. Mal. Grèce, pp. 127 & 128, Attica and Eubœa.

Planorbis atticus (Roth.), var. n. *arethusæ*, Clessin, Mal. Bl. (2) i. p. 5, pl. i. fig. 3, Eubœa.

Planorbis nitidellus (Martens); Kobelt, Faun. Jap. p. 108, pl. ix. fig. 16, Japan.

Planorbis choanomphalus, sp. n., Martens, SB. nat. Fr. 1879, p. 103, Victoria Lake.

Planorbis trivialis and *crassilabrum* (Morel.), note on specimens from Anjouanna Island; Morelet, J. de Conch. xxviii. pp. 311 & 312.

Planorbis tasmanicus, sp. n., J. E. T. Woods, P. R. Soc. Tasm. 1875 [1876], p. 79, Tasmania; = *meridionalis*, Brazier, *id. op. cit.* 1878 [1879], p. 72.

Planorbis atkinsoni and *scottiana* [*-nus*], spp. nn., R. M. Johnston, *op. cit.* 1878 [1879], p. 26, Tasmania.

Planorbis ancylostomus, Vera Cruz, *belizensis*, Belize, *sumichrasti*, Tehuantepec, and *yzabalensis*, Prov. Tabasco and Guatemala; Crosse & Fischer, J. de Conch. xxvii. pp. 341–343.

Planorbis (*Taphius*) *pedrinus* and (*Gyraulus*) *bætzkesi*, spp. nn., Miller, Mal. Bl. (2) i. p. 148, Chillo, Rio S. Pedro, Ecuador.

Ancylus baconi (Bourg.); Kobelt, Faun. Jap. p. 108, pl. ix. fig. 17, Japan.

Ancylus tasmanicus, sp. n., J. E. T. Woods, P. R.Soc. Tasm. 1875 [1876], p. 70, and Petterd, J. of Conch. ii. p. 83, Tasmania.

Ancylus woodsi, sp. n., R. M. Johnston, *op. cit.* 1878 [1879], p. 25, with 3 varr., Tasmania.

Gundlachia petterdi, sp. n., *id. l. c.* p. 23, Launceston; J. of Conch. ii. p. 84, 137, & 181 [*Latia* ?].

Thalassophila.

Amphibola anatomically described by F. W. Hutton, Ann. N. H. (5) iii. pp. 181–186, pl. xxii. Pulmonary cavity completely closed in front, opening on the right side close to the anus; a large pectinate renal organ lying transversely on its roof; ventricle of the heart posterior to the auricle [as in the *Prosobranchiata*]. Radula with blunt median tooth, bilobed at the base, and on each side about fourteen simple strong curved lateral teeth [*cf.* Zool. Rec. xv. *Moll.* p. 77]. Stomach complicated, consisting of two pouches, the posterior the longer, and a globular muscular gizzard. The two cerebral ganglia far apart. Hermaphroditic gland (ovotestis) and hermaphroditic duct, albumen-gland composed of two parts, vas deferens and short penis with retractor and two accessory

glands, one of them filiform [? homologous to the stalked vesicle of *Helix*]. Eggs lodged on the exterior of the mantle, in a circular patch.

Anisomyon (Meek, 1860), subg. of *Siphonaria*, distinct by a thin flexible striated jaw, thin fragile shell with subcentral top, spiral in young individuals, and obliterated siphonal fold. To this subgenus, the type of which is a cretaceous fossil, belong also *Ancylus gussoni* (Costa), from the Mediterranean, *Allerya* (Mörch) = *Scutulum* (Monter.) [Zool. Rec. xiv. *Moll.* p. 36, and xv. *Moll.* p. 77], and *Nacella peltoides* (Carp.). Dall, J. de Conch. xxvii. pp. 285–288.

Scutulum (Mont., 1877), type *Ancylus gussoni* (Costa), preoccupied by Turnouer, 1869, in the fossil *Echinidæ* ; Tournouer, J. de Conch. xxvii. p. 36 [*cf.* the foregoing lines].

PULMONATA OPERCULATA.

Cyclophoridæ.

Cyclophorus herklotsi (Martens), Kobelt, Faun. Jap. p. 113, pl. x. figs. 6–9, Japan.

Cyclophorus (Ditropis) beddomii, sp. n., Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 113, Cape York, N. Australia. Name preoccupied, changed to *macleayi* ; id. *op. cit.* ii. [1877] p. 122.

Cyclophorus quitensis (Pfr.), Miller, Mal. Bl. (2) i. p. 140, pl. xv. fig. 2.

Cyclophorus nigro-fasciatus and *esmeraldensis*, spp. nn., Miller, Mal. Bl. (2) i. p. 142, pl. vii. figs. 5 & 6, Ecuador. [The first = *cumingi* (Sow.), the second = *purus* (Forbes) ; Dohrn, JB. mal. Ges. vii. p. 91.]

Leucoptychia tissotiana (Crosse, 1878) fully described and figured by the author, J. de Conch. xxvii. pp. 36–39, pl. i. fig. 2, New Guinea. [Scarcely distinct from *Leptopoma*.]

Lagochilus, list of known species, and *L. townsendi*, sp. n., Perak, Crosse, J. de Conch. xxvii. pp. 200–203, pl. viii. fig. 3.

Cyclotus bernsteini (Martens), Obi Islands, *batjanensis* (Pfr.), Batchian, and *angulatus* (Martens, 1874), Sulu Islands; Martens in Pfeiffer's Novitat. Conch. v. pp. 187 & 188, pl. clv. figs. 10–18.

Cyclotus irregularis (Pfr.), Costa Rica, varieties and deformity, the lower margin of the aperture being injured, apparently grazed by the animal itself ; Angas (quoting Bland), P. Z. S. 1879, p. 483.

Amphicyclotus, g. n. Operculum horny, multispirate, with a central wart-like projection inside. Type, *Cyclophorus boucardi* (Sallé). Crosse & Fischer, J. de Conch. xxvii. p. 46.

Cataponia japonicum (A. Ad.), Kobelt, Faun. Jap. p. 109, pl. x. fig. 1, Japan.

Alycæus perakensis, sp. n., and *gibbosulus* (Stoliczka), Crosse, J. de Conch. xxvii. pp. 206 & 339, pl. xii. figs. 7 & 8, Perak.

Pupinidæ.

Megalomastoma antillarum (Sow.). local variation; Gibbons, J. of Conch. ii. p. 133.

Pupinella rufa (A. Adams), Martens in Pfeiffer's Novitat. v. p. 190, pl. clvi. figs. 6–8, and Kobelt, Faun. Jap. p. 115, pl. x. fig. 11, Japan.

Pupinella crossii, sp. n., Brazier, P. Linn. Soc. N.S.W. i. [1876], p. 111, Yule Island, New Guinea.

Pupina japonica (Martens, 1860), Martens in Pfeiffer's Novitat. v. p. 189, pl. clvi. figs. 1 & 2, and Kobelt, Faun. Jap. p. 116, pl. x. fig. 10, Japan.

Pupina crossii, Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 110, Palm Island, *nitida*, id. *l. c.* p. 136, Barrow Island, N. E. Australia, spp. nn.

Diplommatinidæ.

Diplommatina crosseana, *mirabilis*, and *superba*, spp. nn., Godwin-Austen & Nevill, P. Z. S. 1879, pp. 738 & 739, pl. lx. figs. 3–5, Perak.

Palaina nevilli, sp. n., Crosse, J. de Conch. xxvii. p. 203, pl. viii. fig. 2, Perak.

Opisthostoma (Blanf.), 7 known species enumerated by H. Crosse, J. de Conch. xxvii. pp. 193–198.

Opisthostoma perakensis [*-se*], sp. n., and *pauluccia* (Crosse & Nev.). Nevill, P. Z. S. 1879, p. 738, pl. lx. figs. 1 & 2, Perak, the latter also J. de Conch. xxvii. pp. 205, pl. viii. fig. 1.

Cyclostomatidæ.

Cyclostomus zanguebaricus (Petit), var.; Gibbons, J. of Conch. ii. p. 145.

Cyclostoma desmazuresi (Crosse) = *articulatum* (Gray), juv.; E. A. Smith, Phil. Tr. clxviii. p. 480.

Tudora megachilus (Pot. & Mich.), varr.; Gibbons, J. of Conch. ii. p. 137.

Ctenopoma tryoni, sp. n., Arango y Molina, Faun. Mal. Cubana, p. 134, Cuba.

Chondropoma plicatulum (Pfr.) and *Tudora megachilus* (Pot. & Mich.) suspend themselves by fine strong silk-like threads, ⅓–½ inch long; Gibbons, J. of Conch. ii. p. 134.

Pomatias westerlundi, sp. n., and *adamii*, new name for *scalarinus* (Adami, *nec* Villa) with varr. *rudis* and *gilva* (n.), Calabria, Paulucci, Bull. Soc. mal. Ital. v. pp. 20 & 17, Faun. Mal. Calabr. pp. 186–189, pl. viii. fig. 7, & pl. ix. figs. 1–3, Calabria.

Pomatias elongatus, *elegantissimus*, and *turricula*, Apuan Mountains, *crosseanus*, Lucca, *fischerianus*, and *dionysi* [*-sii*], Sicily, spp. nn., *adamii* (Paul.) and *westerlundi* (Paul.), Calabria, Paulucci, *l. c.* pp. 13–19. *P. alleryanus* [*-ianus*], new name for *monterosati* (Bourg.), *cad. l. c.* p. 16. *P. gualfinensis*, Mozzanella or Corfino, Italy, p. 46, *lunense* [*-is*], p. 94, Monti della Spezia, and *isseli*, p. 101, Apuan Mountains, spp. nn., Stefani, tom. cit. *P. elegantissimus* var. n. *uziellii*, Apuan Mountains, *id. l. c.* p. 96. Some other species from Italy, already published by Benoit, Issel, Westerlund and Bourguignat, comparatively described by Paulucci and Stefani, *l. c.* pp. 17, 20, 21, & 94–104.

Pomatias scalarinus (Villa) var. *meridionalis*, Caserta, var. *calabricus*,

Monte Tiriolo, = *adamii* (Paul.), and var. *cassiniacus*, Monte Cassino; *P. pinianus* (Bourg., 1878) = *crosseanus* (Paul., 1879), *P. elongatus*, *elegantissimus*, and *turricula* (Paul.) are slight varieties (mutations) of *septem-spiralis* (Razoum) [*maculatus*, Drap.]; *P. affinis* (Benoit, pt. Paul.) = *euplcurus* (Bourg.). Pini, Atti Soc. Ital. xxii. (22 pp.).

Pomatias adamii (Paul.) defended as a species by the authoress; Bull. Soc. mal. Ital. v. pp. 165–168. *P. crosseanus* (Paul.) = *pinianus* (Bourg.), the latter name not duly published; *cad. l. c.* pp. 168–173; other critical observations on some species of *Pomatias*, pp. 173–177.

Pomatias westerlundi (Paulucci, MS.), Calabria, with var. *dionysi* [*-ii*], Syracuse, *tergestinus*, Westerl., 1878), Trieste, with var. n. *macrochilus*, Carinthia, Abruzzi, Dalmatia, and Greece, *gredleri*, sp. n., Val. Ampola, *elongatus* (Paul.), *elegantissimus* (Paul.), Mount Ferato, *turricula* (Paul.), Carrara, *allerianus* (Paul.), *montanus* (Issel), Apuan Mountains, *patulus* (Drap.), subsp. *adamii* (Paul.), Calabria, subsp. n. *agriotes*, Sardinia and Saorgia, subsp. n. *sospes*, Levigliani, subsp. *crosseanus* (Paul.), Lucchio and Cerreto Sannico, *P. fischerianus* (Paul.), Monte Cuccio and Palermo, *piragni* (Benoit), Island Favagnana, *plumbeus* (Westerl., 1878), and *nanus* sp. n., Croatia, all described by Westerlund, JB. mal. Ges. vi. pp 158–167.

Pomatias croaticus (Zelebor), *gracilis* (Küst.), var. n. *rudicosta*, and *elegans*, sp. n., Clessin, Nachr. mal. Ges. 1879, pp. 121–123.

Omphalotropis hamiliana (Crosse), Rodriguez; note on its coloration and sculpture by E. A. Smith, Phil. Tr. clxviii. p. 481.

Omphalotropis curta, sp. n., Garrett, P. Ac. Philad. 1879, p. 28, Rurutu.

Truncatellidæ.

Acme foliniana, sp. n., with varr. nn. *emaciata* and *pachystoma* (? sp. n.), 5 mm. long, from the Conglomerate Beds at Mentone; Nevill, Ann. N. H. (5) iv. pp. 341 & 342.

Acicula moussoni, sp. n., Böttger, JB. mal. Ges. vi. p. 41, pl. i. fig. 7, Kasbek, Caucasus.

Truncatella hermitii, sp. n., Bardin, Act. Soc. Linn. Bord. 1879, pt. v. p. xvi.

Truncatella micra, sp. n., J. E. T. Woods, Tr. R. Soc. Vict. xiv. [1878] p. 62, and Petterd, Land Shells of Tasm. p. 54, Victoria.

Blandiella (Guppy). The Cuban species *Truncatella elongata* (Poey), *lirata* (Poey), *filicosta* (Gundlach), and *wrighti* (Pfr.), belong to this genus; Arango y Molina, Faun. Mal. Cubana, pp. 40 & 41.

Assimineidæ.

Assiminea japonica, Martens. (Kobelt), Faun. Jap. p. 127, pl. ix. fig. 15.

Assiminea tasmanica, sp. n., Woods, P. R. Soc. Tasm. 1875 [1876], p. 79, Petterd, J. of Conch. ii. p. 84, Tasmania.

Acmella moreletiana and *rapstorffiana* (Nevill, 1878); Nevill, P. Z. S. 1879, p. 737, pl. lix. figs. 4 & 5, Nicobar Islands.

Helicinidæ.

Bourciera striatula and *viridissima*, spp. nn., Miller, Mal. Bl. (2) i. pp. 145 & 146, pl. v. figs. 6 & 5, Val de Pilaton, 1100–1200 mètres.

Helicina japonica (A. Adams) varieties; Kobelt, Faun. Jap. p. 118, pl. x. figs. 12 & 13, Japan.

Helicina coxeni, p. 111, and *maino*, p. 112, New Guinea, *macleayi*, p. 112, N.E. Australia, spp. nn, Brazier, P. Linn. Soc. N. S. W. i. [1876].

Helicina titanica (Poey), its perforation attributed rightly to the action of a hermit crab by Pfeiffer; Arango y Molina, Faun. Mal. Cubana, p. 47.

Helicina ochracea (Poey) = *silacea* (Morelet), varieties ; *id. l. c.* p. 48.

Helicina mestrii and *cisnerosi*, spp. nn., Arango y Molina, Faun. Mal. Cubana, pp. 133 & 134, Cuba.

Helicina beatrix, sp. n., Angas, P. Z. S. 1879, p. 484, Costa Rica. *H. funki* (Pfr.), large variety from the same country, living animal figured ; *id. l. c.* pl. xl. fig. 7.

Helicina ecuadoriana, sp. n., Miller, Mal. Bl. (2) i. p. 146, pl. v. fig. 4, Val de Pilaton, 1000 mètres, Ecuador [= *concentrica* (Pfr.) var. ; Dohrn, N. H. mal. Ges. vii. p. 91.

Helicina (*Trochatella*) *opima* and *chrysostoma* (Shuttl., 1852) figured in Shuttleworth, Notitiæ Malacol. ii. pl. xv. figs. 2 & 4, Hayti and Cuba.

Rhynchocheila [*-chila*], subg. n. of *Helicina*, in the posthumous part of Shuttleworth's Notitiæ Malacologicæ, ii. [1878] p. 15, for *H. regina* (Morelet) [= *Hapata*, Gray, 1856, = *Viana*, H. & A. Ad., 1858].

[*Hydrocena*] *Georissa monterosatiana* and *semisculpta*, spp. nn., Godwin-Austen & Nevill, P. Z. S. 1879, pp. 739 & 740, Perak.

SOLENOCONCHÆ.

Dentalium abyssorum (Sars) and *agile* (Sars) = *entalis* (L.), varr. ; Norman, J. of Conch. ii. pp. 47 & 48.

Dentalium panormium (Chenu), Marseilles, 100–200 mètres, = *dentalis* (L.), var. ; Marion, Ann. Sci. Nat. (6) viii. art. 7, p. 11.

Dentalium ægeum, off Kerguelen, 110 fath., *amphialum*, mouth of La Plata, 1000 fath., *ceras*, Middle and S. Pacific, 2050–2160 fath., *diarrhox*, N.E. of New Zealand, 700 fath., *leptosceles*, S. of Australia, 2600 fath., *circumcinctum*, Atlantic, 38° N.–10° S., 350–470 fath., *acutissimum*, Mid-Pacific, 1070–2050 fath., *compressum* and *didymum*, St. Thomas, W. Indies, 390 fath., *yokohamense*, Japan, 8–14 fath., *tornatum*, Fiji, 12 fath., spp. nn., and *entalis* (L.) var n. *obtusum*, Mid-Atlantic, 450–470 fath., and S. Atlantic, 150 fath. ; Watson, J. L. S. xiv. pp. 509–520.

Dentalium decem-costatum and *robustum*, Katow, New Guinea, 8 fath., *duodecim-costatum*, Torres Straits, 50 fath., *septem-costatum*, Evans' Bay, Cape York., *quadri-costatum*, *annulosum*, and *lævc*, Princess Charlotte Bay, N.E. Austr., 13 fath., spp. nn., Brazier, P. Linn. Soc. N. S. W. ii. [1877] pp. 55–59.

Dentalium lubricatum (Sow.) from New South Wales; Brazier, *id. l. c.* p. 370.

Siphonodentalium platamodes and *tytthum*, St. Thomas, 390 fath., *pusillum*, Palma, Canaries, 1125 fath., *tetraschistum*, Fernando Noronha, 7-25 fath., *dichelum*, Fiji, 12 fath., *prionotum* and *eboracense*, Cape York, Australia, the first 155, the latter 3–11 fath., spp. nn., Watson, *l. c.* pp. 519–523.

Cadulus colubridens, New Zealand, 700 fath., *vulpidens*, *rastridens*, *sauridens*, *curtus* with var. *congruus*, *C. obesus*, *exiguus*, and *ampullaceus*, St. Thomas, *gracilis*, Azores and Canaries, 1000–1125 fath., *Globigerina*-ooze, *simillimus*, Cape York, 6 & 155 fath., spp. nn., *id. l. c.* pp. 523–529.

BIVALVIA, Linn.

(Lamellibranchia, Cuv.)

Tubicola.

Aspergillum kobeltianum, sp. n., Löbbeke, Nachr. mal. Ges. 1879, pp. 95 & 96, locality unknown.

Pholadidæ.

Ovo-viviparity and young state of *Pholas* described; *P. candida* lives in the uppermost zone, *crispata* near low-water mark, *dactylus* still deeper. Bouchard-Chantereaux, J. de Conch. xxvii. pp. 122 & 123.

Barnea beccarii, sp. n., Tapparone-Canefri, Ann. Mus. Genov. vii. p. 1032, Key Islands, Malayan Archipelago.

Corbulidæ.

Neæra. Note on its occurrence in the northern seas; Norman, J. of Conch. ii. p. 46.

Neæra obesa (Lovén) var. *glacialis* (G. O. Sars), Spitzbergen; Friele, JB. mal. Ges. vi. p. 270.

Neæra tasmanica, sp. n., J. E. T. Woods, P. R. Soc. Tasm. 1875 [1876], p. 27, Tasmania.

Neæra late-sulcata, sp. n., *id.* P. Linn. Soc. N. S. W. ii. [1877] p. 123, Port Jackson, 16 fath.

Saxicavidæ.

Panopæa australis (Sow.), Port Jackson; Brazier, P. Linn. Soc. N. S. W. ii. p. 371.

Anatinidæ.

Lyonsiella (Sars, 1868) is distinct from *Pecchiolia* (Meneghini, 1852), fam. *Chamidæ*, with which it was united by Jeffreys, probably next to *Mytilimeria*. *L. jeffreysi*, sp. n. Friele, JB. mal. Ges. vi. pp. 268 & 269, Spitzbergen, 656 fath.

Myochama tasmanica, Petterd, J. of Conch. ii. p. 354. *Gouldia tasmanica* (Woods) is its fry; *id. ibid.*

Tellinidæ.

Sanguinolaria aureo-cincta, sp. n., Martens, MB. Ak. Berl. 1879, p. 744, Mozambique.

Tellina. V. Bertin gives a revision of this genus, chiefly from the material in the Paris Museum. He discusses first the geographical distribution, giving lists of the species known from the different seas, as Mediterranean, W. Indies, &c. [the two indicated for Magellan Straits, *T. virgata* and *dispar*, appear to the Recorder very doubtful]. Systematically, he adopts the following genera and subgenera:—*Tellina* (L., restricted), with subgg. *Tellinella* (Gray) 60 sp., *Peronæoderma* (Poli), 9 sp., *Pseudarcopagia* (n.) 2 sp., *Quadrans* (Klein) 3 sp., *Donacilla* (Gray) 9 sp., *Fabulina* (Gray) 29 sp., *Peronæa* (Poli) 13 sp., *Tellinides* (Lam.) 6 sp., and *Homala* (Mörch.) 2 sp.; also the genera *Strigilla* (Turt.) 8 sp., *Arcopagia* (Leach) 17 sp., *Tellidora* (Mörch) 1 sp., *Phylloda* (Schum.) 1 sp., *Metis* (H. & A. Ad.) 6 sp., *Macoma* (Leach) 34 sp., and *Gastrana* (Schum.) 7 sp. The number indicates the number of species represented in the Paris Museum and examined by the author; many of them are accompanied by critical notes and indications of new localities. 148 other spp. of the restricted genus *Tellina* and 119 of other genera only known to the author from descriptions, are enumerated. N. Arch. Mus. (2) i. [1878] pp. 201–361.

Tellina, subg. *Tellinella*, *staurella* (Lam.) discussed and figured, *derelicta*, locality unknown, *negrosiensis*, Negros Island, Philippines, *perrieri*, Japan, *bayleana*, Guadelupe, pp. 234, 245, 250, 255 & 256, pl. viii. figs. 1, 2, 5, 6 & 8, *basilaniensis*, Sulu Archipelago, and *clathrata* [name preoccupied], locality unknown, p. 309, pl. ix. figs. 7 & 12, *id. l. c.*, spp. nn.

Tellina, subg. *Donacilla* (Gray, 1851), = *Mœra* (H. & A. Ad., 1856), *parvula*, New Caledonia, and *gibba*, Japan, spp. nn., *id. l. c.* pp. 263 & 264, pl. ix. figs. 4 & 8.

Pseudarcopagia, subg. n. of *Tellina.* Shell orbicular, thick, inflated; pallial sinus elongate, united below with the pallial line. Type, *T. decussata* (Lam.). *Id. l. c.* p. 264.

Quadrans (Klein, 1753), subg. n. of *Tellina.* Shell oval, compressed, nearly equilateral, posterior dorsal margin toothed; ligament immersed; pallial sinus elongated, reaching the anterior muscular impression and united below with the pallial line. *T. gargadia* (L.), *inæqualis* (Hanl.), *spinosa* (Hanl.), and *minor*, sp. n., New Caledonia; *id. l. c.* pp. 265–267, pl. ix. fig. 5.

Tellina (*Peronæa*) *balansæ*, sp. n., *id. l. c.* p. 275, pl. ix. fig. 10, New Caledonia.

Tellina minima, sp. n., *id. l. c.* p. 310, pl. ix. fig. 6, locality unknown; subgenus not stated.

Strigilla elegantissima, sp. n., *id. l. c.* p. 313, pl. ix. fig. 9, China Sea.

Macoma rudis, Melbourne, *fallax*, locality unknown, and *californiensis*, California, spp. nn., *id. l. c.* pp. 335, 343, & 345, pl. ix. fig. 2, pl. viii. figs. 2 & 4.

Macoma galatea (Lam., as *Tellina*), locality unknown; Bertin, *l. c.* p. 344 pl. viii. fig. 7.

Macoma pseudocandida, new name for *T. candida*, Römer, *nec* Lam.; *id. l. c.* p. 343.

Paphiidæ.

Mesodesma aucklandicum, sp. n., Martens, SB. nat. Fr. 1879, p. 37, Auckland Islands.

Scrobicularia piperata (Gm.) formerly living in company with *Limnæa*, *Physa*, and *Planorbis*, in the lake of Ossegor, near Cape Breton; Folin, Faune Lacustre d'Ossegor, p. 6.

Leptomya gravida, sp. n., Hanley, J. L. S. xiv. p. 580, allied to *L. cochlearis* (Hinds, as *Neæra*), = *Scrobicularia adunca* (Gould), locality unknown.

Mactridæ.

Mactra. Weinkauff begins a monograph of this genus, describing 5 known species, and figuring 4 of them, in Küster's Conch. Cab. pt. 279, pp. 1–8, pls. i. & vi.

Mactra dissimilis var. n. *ochracea*, Martens, MB. Ak. Berl. 1879, p. 744, Inhambane, coast of Mozambique.

Veneridæ.

Cytherea rudis var. *mediterranea* (Tiberi), dwarf white var. 5–7 mm. in length, Marseilles, 105–108 mètres, Marion, Am. Sci. Nat. (6) viii. art. 7, p. 11.

Tivela hartvigi, sp. n., Dunker, J. de Conch. xxvii. p. 216, pl. ix. fig. 4, Cape of Good Hope.

Venus ovata (Penn), on muddy gravel, 45–105 mètres, and in the Port of La Joliette, only 8–10 mètres, at Marseilles; Marion, *l. c.* p. 11.

Venus (*Chione*) *macleayana*, sp. n., J. E. T. Woods, P. R. Soc. Tasm. 1878 [1879], p. 38, Bass's Straits.

Rupellaria amplectens, sp. n., Tapparone-Canefri, Ann. Mus. Genov. viii. p. 1032, Aru Islands.

Cyrenidæ.

Cyrena. 5 known species figured, 33 more only mentioned by S. Clessin, in Küster's Conch. Cab. part 283, pp. 227–244, pls. xliv. & xlv.

Batissa. Monograph by Clessin, *l. c.* pp. 206–223. 32 species are described, 14 figured, including *semperi* and *manilensis*, spp. nn., pp. 214 & 215, pl. xxxvii. figs. 1 & 2, Philippines [Reeve's monograph is not even mentioned].

Velorita. The 2 known species described and figured by Clessin, *l. c.* pp. 224 & 225, pl. xlii. figs. 3 & 4, pl. xxxvi. figs. 5 & 6.

Corbicula. Clessin finishes his monograph, *l. c.* pp. 201–205. *C. maxima* (Prime, 1860), p. 201, pl. xlii. fig. 1, not before figured; *regia* (Benson)

[?], p. 267, pl. xliii. fig. 5, *oblonga*, sp. n., p. 267, pl. xlvi. fig. 18, localities of all unknown.

Sphærium corneum (L.), *ovale* (Fér.) = *draparnaldi* (Cless.), and *mamillanum* (Westerl.), Silesia; Jordan, JB. mal. Ges. vi. pp. 309–311, pl. viii. figs. 5–7.

Sphærium wildi, sp. n., Clessin, Mal. Bl. (2) i. p. 6, pl. i. fig. 4, Eubœa.

Sphærium æquatoriale (Clessin, MS.), sp. n., Miller, Mal. Bl. (2) i. p. 176, pl. xi figs. 4–6, Rio Pedro, Ecuador.

Cyclas tasmanica, sp. n., Woods, P. R. Soc. Tasm. 1875, p. 82, & Petterd, J. of Conch. ii. p. 87, Tasmania.

Calyculina. 13 species described and figured by Clessin, in Küster's Conch. Cab. part 283, pp. 253–266, including *C. tasmaniæ*, sp. n., p. 261, pl. xli. figs. 1 & 2, Tasmania.

Calyculina lacustris (Müll.) var. *steini* (A. Schmidt); Jordan, JB. mal. Ges. vi. p. 311, pl. viii. fig. 8, Görlitz.

Limosina: 11 species described and figured, and 1 more mentioned, by Clessin, *l. c.* pp. 245–252, pl. xlvi.

Pisidium abditum, var. n. *abyssorum* (Stimpson, MS.), B. Walker, J. of Conch. ii. p. 337, Lake Michigan and Superior, in the last at the depth of fi59 fath.

J *Pisidium tasmanicum* and *dulvertonis* [!], spp. nn., Woods, P. R. Soc. bi asm. 1875 [1876], pp. 81 & 12, and Petterd, J. of Conch. ii. p. 87, Tas- pl ania.

Pisidium wolfi (Clessin), sp. n., Miller, Mal. Bl. (2) i. p. 178, pl. xi. figs. 7–9, Rio Pedro, Ecuador. Also in Clessin's monograph, Küster's Conch. Cab. pt. 283, p. 268, pl. xlii. figs. 6 & 7.

Pisidium alienum, sp. n., Clessin, *l. c.* p. 269, pl. xli. figs. 3–5, locality unknown.

Cardiidæ.

Lævicardium beechei (Adams & Reeve) occurs from the Corean Archipelago to N.E. Australia and New Caledonia; Brazier, P. Linn. Soc. N. S. W. i. [1876] p. 306.

Opisocardium, substituted for *Lunulicardium* (Gray, 1847), type *Cardium retusum* (L.), nec *Lunulicardium* (Münster, 1840); E. Bayle, J. de Conch. xxvii. p. 35.

Tridacnidæ.

Tridacna elongata (Lam.). On its variability in shape; *T. elongatissima* (Bianconi) is not sufficiently distinct from it: Martens, MB. Ak. Berl. 1879, p. 743.

Lucinidæ.

Axinus sarsi (Philippi) = *flexuosus* (Mont.), var.; Norman, J. of Conch. ii. p. 43.

Diplodonta lateralis (E. A. Smith, 1876): E. A. Smith, Phil. Tr. clxviii. p. 482, pl. li. fig. 7, Rodriguez Island.

Kelliidæ.

Decipula ovata (Jeffr.), Osterfjord, Norway, 400 fath.; Norman, J. of Conch. ii. p. 42.

Kelliella abyssicola (Sars) is probably not the young of *Isocardia cor*; *id. l. c.* p. 44.

Solemyidæ.

Solemya africana, sp. n., Martens, MB. Ak. Berl. 1879, p. 742, Querimba Islands, Coast of Mozambique.

Astartidæ.

Astarte sulcata (Dacosta). Structure of gills, see above in General Subject.

Astarte crenata (Gray) = *crebricostata* (Forbes); Norman, J. of Conch. ii. p. 44.

Astarte acuticostata (Leche), Novaya Zemlya, copied; JB. mal. Ges. vi. pl. iv. fig. 8.

Gouldia (C. B. Adams, Cat. of Gen. and Spec. of Shells, January, 1847) = *Thetis* (C. B. Adams, 1845, preoccupied) = *Eriphyla* (Gabb 1864) = *Crassinella* (Guppy, 1874, *nec* Conrad), and is anterior t *Gouldia* (Bonaparte, 1850) in Ornithology; Dall, P. Z. S. 1879, pp. 13. & 132.

Gouldia tasmanica (Woods) is the fry of *Myochama*; Petterd, J. of Conch. ii. p. 354.

Cardita atkinsoni, sp. n., Woods, P. R. Soc. Tasm. 1875 [1876], p. 27, Tasmania.

Unionidæ.

Unio pictorum (L.) and *tumidus* (Retz.). Differences in the teeth of the hinge described, with var. n. of the first, *pachyodon*, rivers Neisse and Queiss, Western Silesia, in strongly running water on gravelly and stony ground; Jordan, Nachr. mal. Ges. vi. pp. 300–306, pl. viii. fig. 1, pl. ix. *U. crassus* (Retz.), var. *normalis*, and var. *batavus* (Lam.); *id. l. c.* p. 307.

Unio kruperi, sp. n. (= *elongatulus* var., Rossmässler, Iconogr. figs. 1644 & 1645), Lake of Vrachori, Greece; *nitidosus*, Missolungi; *byzantinus* (Parreyss, MS.), river Sperchios; *dalmaticus*, Dalmatia; *robustus* (Villa, MS.), Lake of Como: *subtilis*,* England and France, spp. nn.,

* The description of this species is exceptionally copied here, in order that some English reader may eventually recognize this supposed species:—"Testa ovali-subreniformis, convexo-ventrosa, tenuis, fragiliuscula, striato-rugosiuscula, pallide olivacea, suprà convexo-arcuata, infrà subretusa, antice brevis, attenuata, postice attenuato-decurvata, in medio dilatata; umbones subtumidi, rugoso-tuberculati; dens tenuis, elongato-compressus, obscure triangularis, denticulatus; lamella exserta, breviuscula, incurvata; margarita albo-cærulea, nitida. Long. 35–40, alt. 21–25, diam. 13–15 mm. England, Col. Clark." No precise locality is indicated.—E. v. M.

Drouet, J. de Conch. xxvii. pp. 140–142. *U. lusitanus*, Guadiana, *kleciaki*, and *ceratinus*, Dalmatia, *ionicus* (Blanc, MS.), Santa Maura, Ionian Islands, spp. nn., *id. l. c.* pp. 327–329.

Unio byzantinus (Parr.), *lusitanus* (Drouet), and *elongatulus* (Mühlf.), figured by Kobelt, Iconogr. vii. pl. cxciii. figs. 1954–1957.

Unio bayon[n]ensis, sp. n., Folin & Berillon, Études malacolog. p. 29, pl. i. figs. 1-9, Drouet, J. de Conch. xxvii. p. 332, Lac de Négresse, near Bayonne.

Unio corrosus (Villa) = *elongatulus* (Mühlf.), var.; *molteni* (Adami) probably = *gargottæ* (Philippi), var.; *baudini* (Küster) = *capigliolo* (Payr.), var.; *turtoni* (Payraudeau) found also on the mainland of Italy: Mme. Paulucci, Bull. Soc. mal. Ital. v. pp. 107–111.

Unio cumensis, sp. n., Kobelt, Iconogr. vii. pl. cxcii. figs. 1952 & 1953, Cumæ, Italy.

Unio vezcoi (Bourg.), var. n. *conemenosi*, Epirus, *desectus* (Drouet, MS.), Peneus river, near Volo, and *vicarius*, Sperchios river, spp. nn., Westerlund, Faun. Mal. de Grèce, pp. 145–147.

Unio schlegeli and *oxyrrhynchus* (Martens, 1860), Japan, Martens, Novitat. Conch. v. pp. 192 & 193, pls. clviii. & clix. figs. 4-6, pl. clvii. figs. 4–6, and Kobelt, Faun. Jap. pp. 136 & 137, pl. xiv. pl. xiii. figs. 3 & 4, Japan. *U. nipponensis* (Martens, 1877), *japanensis* (Lea), *reinianus*, *biwæ*, and *brandti*, spp. nn., Kobelt, *l. c.* pp. 138–142, pl. xii. figs. 1–3, pl. xxiii. figs. 1–5, all from Japan.

Unio subrostratus (Say) = *nashvillensis* (Lea) = *mississippiensis* (Conrad); Dall, Am. Nat. xiii. p. 392.

Margaritana dahurica (Middend.), Kobelt, Faun. Jap. p. 143, pl. xiii. figs. 1 & 2, Doyimagawa river, Japan.

Margaritana dehiscens (Say). On its generic position; Weatherby, Am. Nat. xii. [1878] p. 254.

Microcondylus (Vest, 1866). Characters of the genus; type *bonellii* (Fér.), Carniolia, also *M. moreleti*, Piacenza and Parma, *squamosus* and *gibbosus*, Milan, and *crassulus*, Castelgioffredo, Upper Italy, spp. nn., Drouet, J. de Conch. xxvii. pp. 137–140.

[*Cristaria*] *Dipsas plicatus*[*-a*], (Lea) = *Anodonta herculea* (Middend.); Heude, Conchyl. fluv. d. Nanking, fasc. v. pl. 33, all the great lakes and rivers of the middle and lower basis of the Yangtse-kiang. *Dipsas plicata* (Solander), var. *clessini* and *japonica* [= *spatiosa* (Clessin)], Japan, Kobelt, Faun. Jap. pp. 145–147, pls. xvi. & xvii. pl. xviii. fig. 1.

Anodonta gravida, sp. n., Drouet, J. de Conch. xxvii. p. 142, Lake Copais, Greece. *A. falcata*, river Dnieper, near Wordkodnieprowsk, and *cymbalica*, Lake of Scutari, spp. nn., *id. l. c.* pp. 332 & 333.

Anodon cuscaphys[*-phus*], *tumida*, *subtetragonea*, *lineata*, *pumila*, *irregularis*, *melanochlorea*, *agricolarum*, and *mingorum*, spp. nn., Middle China (well figured, but insufficiently characterized); Heude, Conchyl. Fluv. d. Nanking, pls. xxxv.–xl.

Anodonta woodiana (Lea), *lata* (Martens, 1877), *calipygos* [better *callipyge*], sp. n., *japonica* (Martens), and *cellensis* (Gmel.) ?, juv., Kobelt, Faun. Jap. pp. 149–153, pl. xix. fig. 1, pl. xx. fig. 1, pl. xxi. fig. 1, pl. xxii. figs. 4 & 5, all from Japan.

Anodonta californiensis (Lea), varieties from several rivers in California and Utah ; Stearns, Am. Nat. xiii. pp. 145, 149, 151, woodcuts.

Anodonta pastasana (Clessin), sp. n., Miller, Mal. Bl. (2) i. p. 173; pl. xi. fig. 1, Rio Pastasa, Ecuador.

Mycetopus occidentalis (Clessin), sp. n., *id. l. c.* p. 174, pl. xi. figs. 2 & 3, Rio Pastasa.

Dreyssinidæ.

Praxis milleri and *ecuadoriana* (Clessin), spp. nn., Miller, *l. c.* pp. 179–181, pl. xv. figs. 7 & 8, Prov. Esmeraldas, Ecuador.

Mytilidæ.

Mytilus incurvatus (Philippi, as *Modiola*) = *Modiola martorellii* (Hidalgo), found living in the Mediterranean during the 'Porcupine' Expetion ; byssus very long. Jeffreys, P. Z. S. 1879, p. 566.

Modiola modiolus (L.). The byssus is composed of longitudinal bands ; young animal with expansions of the mantle which cause the horny bristles on the outside of the shell ; Bouchard-Chantereaux, J. de Conch. xxvii. pp. 123 & 124.

Lithodomus bipenniferus, sp. n., Guppy, P. Sc. Assoc. Trinidad, xi. [Dec., 1877] p. 154, Gulf of Paria.

[*Crenella*] *Modiola discors* (L.). Structure of gills ; see above in the General Subject.

Crenella australis, sp. n., Martens, MB. Ak. Berl. 1879, p. 742, Inhambane, coast of Mozambique.

Dacrydium vitreum (Holböll, Möller) = *Modiola pygmæa* (Philippi) = *D. hyalinum* (Monterosato), found in the North Atlantic during the 'Porcupine' Expedition ; it makes a nest, like *Modiolaria discors* and *Lima hians*. Jeffreys, *l. c.* p. 569.

Aviculidæ.

Avicula. W. Dunker continues his monograph [Zool. Rec. ix. p. 172] describing and figuring 25 more species, for the most part copied from Reeve. *A. jamaicensis*, new name for *cornea* (Reeve), preoccupied, p. 65 ; *A. japonica*, *coturnix*, *loveni*, spp. nn., Japan, *versicolor* and *undata*, spp. nn., locality unknown, pp. 66–68, pl. xxiii. figs. 2–6, pl. xxiv. figs. 1–6.

Avicula fusco-purpurea (E. A. Smith, 1876) ; E. A. Smith, Phil. Tr. clxviii. p. 483, pl. li. fig. 5, Rodriguez Island [probably = *A. ala-corvi*, Chemn.]

Vulsella spongiarum (Lam.). Note on young specimens ; Troschel, MB. Ak. Berl. 1879, p. 760.

Pinna muricata (L., Reeve), var. ?, from Rodriguez ; E. A. Smith, *l. c.* p. 479.

Arcidæ.

Arca frielii (Jeffreys & Friele, 1877), Novaya Zemlya, figured by Jeffreys from specimens found during the 'Porcupine' Expedition ;

P. Z. S. 1879, p. 573, pl. xlv. fig. 4; copied in JB. mal. Ges. vi. pl. vi. fig. 9.

Arca m'coyi, sp. n., J. E. T. Woods, Tr. R. Soc. Vict. xiv. [1878], p. 61, New South Wales.

Pectunculus flabellatus, sp. n., *id. ibid.*, Victoria and Tasmania.

Pectunculus cardiiformis, *aureo-maculatus*, and *taylori*, localities unknown, *orbicularis*, Bass's Straits, and *nova-guineensis*, New Guinea, spp. nn., Angas, P. Z. S. 1879, pp. 419 & 420, pl. xxxv. figs. 6–10.

Axinæa pulcherrima, *hanleyi*, and *bella*, localities unknown, *nova-caledoniensis*, New Caledonia, and *modesta*, Australia, spp. nn., *id. l. c.* pp. 417 & 418, pl. xxxv. figs. 1–5.

Limopsis cristata (Jeffr., 1876) and *minuta* (Philippi, as *Pectunculus*) = *borealis* (Woodward), Atlantic; Jeffreys, P. Z. S. 1879, p. 585, pl. xlvi. figs. 8 & 9.

Nuculidæ.

Nucula reticulata (Jeffreys, 1876) figured by the author, P. Z. S. 1879, pl. xlvi. fig. 7.

Leda subæquilatera, *insculpta*, and *pusilla*, spp. nn., *sericea* (Jeffr., 1876), *jeffreysi* (Hidalgo) = *lata* (Jeffr.), and *expansa* (Jeffr.), all found in the Atlantic during the 'Porcupine' Expedition; Jeffreys, *l. c.* pp. 579 & 580, pl. xlvi. figs. 1–6.

Leda acuta (Conrad, as *Nucula*, fossil) found at Cedar Keys, Florida, by Calkins, P. Davenp. Ac. ii. [1878] p. 244.

Yoldia arctica (Gray) = *glacialis* (Wood) = *portlandica* and *siliqua* (Reeve); Norman, J. of Conch. ii. p. 39.

Malletia cuneata (Jeffreys, 1876) figured by the author, *l. c.* pl. xlvi. fig. 10, Atlantic, off Cape Espichel. *M. excisa* (Philippi, as *Nucula*) found in the recent state during the 'Porcupine,' 'Valorous,' and 'Challenger' Expeditions in the Atlantic; *id. l. c.* p. 586.

Silicula, g. n. Shell oval or oblong, open at the anterior or longer end; cartilage internal, minute; teeth laminar, parallel with the hinge-line. *S. fragilis*, sp. n., found during the 'Porcupine' Expedition, 1869, station 16, 28; another tertiary species from Sicily, *S. ovata*, Jeffreys, *l. c.* pp. 573 & 574, pl. xlv. fig. 4.

Glomus nitens (Jeffreys, 1876) figured by the author, *l. c.* pl. xlv. fig. 5.

Trigoniidæ.

Trigonia lamarcki, var. n. *reticulata*, J. E. T. Woods, P. Linn. Soc. N. S. W. ii. [1877] p. 125, Port Jackson Heads, 45 fath.

Pectinidæ.

Pecten maximus (L.) producing pearls; J. Daniel, Sci. Goss. 1879, p. 161.

Pecten hoskynsi (Forbes). Synonymy and variation; Norman, J. of Conch. ii. pp. 36 & 37.

Pecten grœnlandicus (Sow.). Structure of gills, see above in General Subject.

Pecten fragilis (Jeffr., 1876), figured by the author, P. Z. S. 1879, pl. xlv. fig. 1.

Pecten multistriatus (Poli). Semi-distorted specimen; Monterosato, Bull. Soc. mal. Ital. v. p. 215.

Pecten pertenuis, sp. n., Dunker, J. de Conch. xxvii. p. 215, pl. ix. fig. 3, locality unknown.

Lima subovata (Jeffr., 1876) figured by the author, *l. c.* pl. xlv. fig. 2, 'Porcupine' Expedition.

Lima elliptica (Jeffr.). Structure of gills, see above in General Subject.

Ostreidæ.

Ostrea edulis (L.). A paper on the sexual relations of the Oyster by Gressy (Vannes: 1879, 8vo, 12 pp.), and another on the enemies and diseases of oysters in the basin of Arcachon by the brothers De Montaugé in Act. Soc. L. Bord. xxxii. [1878] pp. 217–245, have not been seen by the Recorder. For abstract of the latter, see J. of Conch. ii. p. 364. The chief enemies are *Carcinus mœnas*, *Polybius henslowi*, and *Asterias rubens*; the chief sickness an abnormal increase of fat, caused by the diminution of salt in the water.

Ostrea virginica (Gmel.). W. K. Brooks states that he has never found a fertilized egg or embryo inside the mantle-cavity of the American oyster, and comes to the conclusion that its eggs are fertilized outside the body of the parent, and that during the period which the European oyster passes inside the mantle-cavity of the parent, the young American oyster swims at large in the open ocean; he also gives a short sketch of the chief points in the development of the oyster. Am. J. Sci. (3) xviii. pp. 425–427. See also Science News, i. pp. 249–251.

Placenta. The known species enumerated, with *P. planicostata*, sp. n., locality unknown; Dunker, J. de Conch. xxvii. pp. 214 & 215, pl. ix. fig. 2.

MOLLUSCOIDA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

ALLMAN, G. J. Recent progress in our knowledge of the structure and development of the Phylactolæmatous *Polyzoa*. J. L. S. xiv. pp. 489–505.

——. On the relations of *Rhabdopleura*. Tom. cit. pp. 581–586.

BROOKS, W. K. The Development of *Lingula* and the Systematic Position of the *Brachiopoda*. Chesapeake Zool. Laborat. 1878 [1879] pp. 35–112, pls. i.–vi.

BUSK, G. *Polyzoa* of Kerguelen Island, in Phil. Tr. clxviii. pp. 193–200, pl. x.

HASWELL, W. A. On the Cyclostomatous *Polyzoa* of Port Jackson and neighbourhood. P. Linn. Soc. N. S. W. iv. pp. 350–356.

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JOLIET, L. Sur la presence d'un organ segmentaire chez les Bryozoaires endoproctes. C. R. lxxxviii. pp. 392 & 393.

LACAZE-DUTHIERS, H. Histoire des Ascidies simples des côtes de France. Arch. Z. expér. vi. [1877] pp. 457–676, pls. xiv.–xxvii.

MONTEROSATO, T. DE. Notes sur les espèces du genre *Platidia*. J. de Conch. xxvii. pp. 306 & 307, pl. xiii.

NORMAN, A. M. On *Loxosoma* and *Triticella*. Ann. N. H. (5) iii. pp. 133–140.

REPIACHOFF, W. Zur Embryologie der *Tendra zostericola*. Zool. Anz. ii. pp. 67–69.

——. Zur Embryologie der *Bowerbankia*. Tom. cit. pp. 660–664.

——. Bemerkungen über *Cyphonautes*. Tom. cit. pp. 517 & 518.

Smitt, F. A. Recensio animalium Bryozoorum, e mari arctico, quæ ad peninsulam Kola in itinere 1877, duce H. Sandeberg invenit F. Trybom. Œfv. Ak. Förh. xxxv. pp. 19–32.

Waters, W. On the *Bryozoa* of the Bay of Naples. Ann. N. H. (5) iii. pp. 28–43, pls. viii.–xi., pp. 114–126, pls. xii.–xv., pp. 192–202, pp. 267–281, pls. xxiii. & xxiv.

——. On the Occurrence of Recent *Heteropora*. J. R. Micr. Soc. ii. pp. 390 & 393, pl. xv.

BRACHIOPODA.

W. K. Brooks describes the free-swimming larva of *Lingula pyramidata* (Stimps.) and its metamorphosis into the adult form; he urges the resemblance of the larva to the adult Polyzoon, but acknowledges the resemblance of the adult *Lingula*, in a limited degree, to the type of Annelids, and comes to the conclusion that the *Rotifera*, *Polyzoa*, and *Mollusca* are three branches which diverged very early from a common "Vermian" stem; the *Brachiopoda* being the most highly specialized representatives of the Polyzoan branch. Chesapeake Zool. Laborat. 1878; pp. 35–112, pls. i.–vi.; abstract in Am. Nat. xiii. p. 45.

The geographical distribution of the Brachiopods on the French coasts discussed by P. Fischer, Act. Soc. L. Bord. xxxiii. [1878], also separately.

Norway. *Terebratula cranium* common, *Rhynchonella psittacea* rather rare at Hammerfest; Rougemont, Bull. Soc. Neuch. xi. pt. 2, p. 239. Norman has dredged 4 species of Brachiopods in the fjords near Bergen; J. of Conch. ii. p. 16.

Florida. 7 species of Brachiopods collected by W. W. Calkins, P. Davenp. Ac. ii. [1878] p. 242.

Kerguelen Island. Only 1 Brachiopod, *Waldheimia dilatata* (Lam.) known; Studer, Arch. f. Nat. xlv. p. 127, and E. A. Smith, Phil. Tr. clxviii. p. 192.

Terebratulidæ.

Kraussia atkinsoni (Woods) = *lamarckiana*, var.; Petterd, J. of Conch. ii. p. 354.

Platidia (O. G. Costa) = *Morrisia* (Eudes Deslongchamps). Three species distinct by the arrangement of the gills and apophyses, gills trilobate in *anomioides* (Scacchi) = *appressa* (Forbes), bilobate and sigmoidal in *davidsoni* (Eud. Desl.), circular in *seminulum* (Philippi), all three Mediterranean, the last figured. Monterosato, J. de Conch. xxvii. pp. 306 & 307, pl. xiii. fig. 3.

Argiope cistellula (S. Wood). A recent locality in Korsfjord, Norway, precisely stated; Norman, J. of Conch. ii. p. 35.

Rhynchonelliidæ.

Rhynchonella extends its arms somewhat beyond the shell; Morse, Am. J. Sci. (3) xvii. p. 257, with woodcut. Abstract in J. R. Micr. Soc. ii. p. 302.

TUNICATA.

A. S. Packard, Jr., in "Zoology for Students and General Readers" (New York: 1879, 8vo), pp. 197–199, fig. 136, describes and figures the internal anatomy of *Boltenia reniformis*, the branchial chamber, intestine, liver, and ovaries. The cavity between the end of the intestine and excurrent orifice is called atrium.

Chemical note on the animal cellulose or tunicine, the sugar substance of which is identical with ordinary glycose; Franchimont, C. R. lxxxix. pp. 755 & 756.

W. Macleay has observed that several large Ascidians, thrown on shore after a severe storm, changed their positions, leaving on the wet sand a distinct track in accordance with the weight and size of their mass. P. Linn. N. S. W. iii. [1878] p. 54; abstract in J. R. Micr. Soc. ii. p. 302.

Salensky's paper on the development of *Salpa* [Zool. Rec. xv. *Moll.* p. 92] abstracted in J. R. Micr. Soc. ii. pp. 551 & 552.

Kerguelen Island. 6 species of *Tunicata* indicated by T. Studer, Arch. f. Nat., xlv. p. 130.

Lacaze-Duthiers has given a short account of the history and general structure of the Ascidians, pointing out the different opinions of Savigny, Milne-Edwards, and Hancock as to what may be called the front and back in these organisms; he considers the side of the cloaca and the excretory orifice to be the back, the opposite to these to be the front, the point of fixation the upper side, and the aperture of the respiratory sac the lower side. Arch. Z. expér. vi. [1877] pp. 457–473.

Halocynthia, new name for *Cynthia* (Sav., *nec* Fab.); six species from the East coast of North America enumerated by Verrill, P. U. S. Nat. Mus. 1879, p. 188.

Ascidia inornata, sp. n., *id. ibid.*, Johnson's Bay, N. America, 12 fath.

Lacaze-Duthiers has established a distinct family, *Molgulidæ*, characterized by the six-lobed branchial and four-lobed anal orifices, the flexure of the intestine lodged between the two layers of the mantle on the right side and visible from without, the existence of a distinct renal organ on the left side above and in front of the heart, the situation of the genital glands, which form two distinct masses, one right and one left, each containing testicle and ovary, &c. He subdivides this family into two groups:—

1. *Molgulidæ anuræ*. Larva without tail, *Anurella*.

2. *Molgulidæ urodelæ*. Larva tailed, *Ctenicella*, *Molgula*, *Eugyra*. Arch. Z. expér. vii. pp. 473–491.

Anurella, g. n. Larva amœboid; branchial meridian complex, infundibula complicated, tremas short. *A. roscovita*, new name for the species described by the author in Arch. Z. expér. iii., *oculata* (Forbes, as *Molgula*), *solenota*, sp. n., *simplex* (Hanc., as *Molgula*), Bréhat, on stones, *bleizi*, sp. n., figured, all found near Roscoff in the British Channel, the second and third only procured by dredging, the three others also found during strong ebb tides on rocks and stones. Lacaze-Duthiers, *l. c.* pp. 495–567, fully described, the four latter figured, pls. xiv.–xviii.

Molgula. Larva tailed; edges of the orifices simple; branchial meridians complex, borne by the multiple ribs with complicated infundibula, and comparatively short and variable tremas. *M. echinosiphonica*, sp. n., found on and between *Cynthia rustica*; *socialis* (Alder), in holes of gneiss and mica-schist; and *ampulloides* (Van Beneden, Kupffer). The two former observed at Roscoff, all three described and figured. Lacaze-Duthiers, *l. c.* pp. 568–603, pls. xix.–xxii.

Ctenicella, g. n. Edge of both orifices laciniate; in other respects like *Molgula*. *C. lanceplaini*, sp. n., Roscoff, on stones and floating weed; *margatæ*, sp. n., Margate, in holes at low ebb; *appendiculata* (Heller, *Molg.*), Cette and Adriatic. Lacaze-Duthiers, *l. c.* pp. 604–646, pls. xxiii.–xxvi. [Name too near *Ctenocella*, Milne-Edwards, 1855, *Gorgoniidæ*.]

Eugyra (Ald. & Hanc.). Larva tailed; branchial meridians simple, scarcely borne by a single rib; infundibulum simple; tremas long and circular. *E. arenosa* (Hanc.) = *tubulosa* (Forb. & Hanl., as *Molgula*), Roscoff. Lacaze-Duthiers, *l. c.* pp. 647–659, pl. xxvii.

POLYZOA.

A sort of segmental organ, described as a short tube, ciliated internally, opening on one side into the matrix not far from its external aperture, and on the other obliquely into the cavity of the body, has been observed in two species of *Pedicellina* and in *Loxosoma*. It appears very early in the bud. [Hatschek indicated it in 1877.] L. Joliet, C. R. lxxxviii. p. 392; abstract in Ann. N. H. (5) iii. pp. 390 & 391, and J. R. Micr. Soc. ii. pp. 301 & 302.

Abstract of Barrois's paper on the development of the Chilostomatous *Bryozoa* [1877] in Ann. N. H. (5) iii. pp. 171–174.

Abstract of Repiachoff's paper on the development of *Tendra* and *Lepralia* [Zool. Rec. xv. *Moll.* p. 93] in J. R. Micr. Soc. ii. pp. 300 & 301.

W. Repiachoff gives some further observations on the first stages of development in *Tendra zostericola* and *Bowerbankia*, especially the formation of the endo- and ectoderm, and the zone of cilia in the embryo; Zool. Anz. ii. pp. 67–69 & 660–664. He also gives some notes on the larval forms known as *Cyphonautes* and the analogy of the organs called suctory disc and hood (Kappe) in the larvæ of *Bugula*, *Tendra*, and *Lepralia*; tom. cit. pp. 517 & 518. Abstract in J. R. Micr. Soc. ii. pp. 707 & 863.

Arctic Sea. 74 species on the shores of the Kola Peninsula collected by F. Trybom in 1877, enumerated by F. A. Smitt, Œfv. Ak. Förh. xxxv. pp. 19–32.

Mediterranean. W. Waters makes some remarks on the literature of Mediterranean *Polyzoa*, and describes 77 species of *Chilostomata*, 33 of *Cyclostomata*, and 1 of *Ctenostomata*, observed at Naples; Ann. N. H. (5) iii. pp. 28–43, pls. viii.–xi. pp. 114–126, pls. xii.–xv. pp. 192–202, 267–281, pls. xxiii. & xxiv. Many genera found near Naples, not deeper than 40 fath., occur in other seas at greater depths (p. 280). Only the species that are figured will be mentioned *infrà*.

List of 16 *Polyzoa* dredged off Marseilles; A. F. Marion, Ann. Sci. Nat. (6) viii. art. 7, pp. 5 & 6: several of them described, pp. 33–36.

New England. 9 species of *Bugula*, including 2 new, 2 of *Scruparia*, 1 *Bugulopsis*, and 1 new *Porellina*, enumerated by Verrill, Am. J. Sci. (3) xviii. pp. 52 & 53 (7 of these are European).

Port Jackson. 14 species of Cyclostomatous *Polyzoa*, including several new, enumerated by W. A. Haswell, P. Linn. Soc. N. S. W. iv. pp. 350–356.

Victoria. F. McCoy, "Prodromus of the Zoology of Victoria," decade iii. pp. 15–35, pls. xxiv.–xxvi., describes and figures various known species of *Catenicella* and *Membranipora*.

Tasmania. F. W. Hutton, P. R. Soc. Tasm. 1877 [1878], pp. 23–25, records 23 South Australian *Polyzoa*, including 6 new species (1 described by Tate).

New Zealand. F. W. Hutton adds 22 species to his former list of New Zealand *Polyzoa* [Zool. Rec. x. p. 179], Tr. N. Z. Inst. ix. [for 1876, published in 1877] pp. 358–361.

Kerguelen Island. 26 species of *Polyzoa* enumerated by G. Busk, Phil. Tr. clxviii. pp. 193–199, pl. x. The new species have been already described in Ann. N. H. (4) xvii. [1876]. 6 species have not been found in any other locality; the others belong to a fauna which ranges from the southern extremity of S. America to New Zealand, Australia, and S. Africa. 3 are European: *Caberea borii* (Sav.), *Lepralia ciliata* (Pall., Johnst.), and *hyalina* (L.).

T. Hincks proposes the following classification of the *Polyzoa* generally, and the *Chilostomata* in particular, with special regard to the form of *Zoœcia* and their orifices.—

Sub-class HOLOBRANCHIA, Ray Lankester.
Group *ECTOPROCTA*, Nitsche.
Order Gymnolæmata, Allman.
Sub-order 1—*Chilostomata*, Busk.
Fam. 1, *Aetiidæ*; 2, *Eucrateidæ*; 3, *Cellulariidæ*, 4, *Bicellariidæ*; 5, *Notamiidæ*; 6, *Cellariidæ*; 7, *Flustridæ*; 8, *Membraniporidæ*; 9, *Microporidæ*; 10, *Cribrilinidæ*; 11, *Microporellidæ*; 12, *Porinidæ*; 13, *Myriozoidæ*; 14, *Escharidæ*; 15, *Reteporidæ*.

CHILOSTOMATA.

Catenicellidæ.

Catenicella. F. McCoy, Prodr. Zool. Vict. iii. describes (pp. 15–26) and figures from the Victorian Coasts: pl. xxiv., *C. margaritacea*, Busk, fig. 1, *plagiostoma*, Busk, fig. 2, *ventricosa*, Busk, fig. 3, *hastata*, Busk, fig. 4, *rufa*, McGill., fig. 5, *cribraria*, Busk, fig. 6, *alata*, Wyv. Thoms., fig. 7, *lorica*, Busk, fig. 8, *formosa*, Busk, fig. 9, *elegans*, Busk, fig. 10, *perforata*, Busk, fig. 11, *buski*, W. T., fig. 12, *hannafordi*, McG., fig. 13, *crystallina*, W. T., fig. 14, *carinata*, Busk, fig. 15, *aurita*, Busk, fig. 16, and *geminata*, W. T., fig. 17. *C. cornuta*, Busk, and *intermedia*, McG., described, p. 27.

Aetiidæ.

Aetia anguina (L.), forma *recta*, from Naples; Waters, Ann. N. H. (5) iii. pp. 114 & 115, pl. xv. fig. 7.

Eucrateidæ.

This family is equal to *Gemellariidæ*, Busk, omitting *Notamia* and *Didymia*; Hincks, *l. c.* p. 154.

Eucratea cordieri (Audouin); Waters, Ann. N. H. (5) iii. p. 116, pl. xv. figs. 9–11, Naples.

Scruparia (Oken) restricted to *S. clavata* (Hincks), with new generic definition; Hincks, *l. c.* p. 154.

Scruparia (Oken, restr.) = *Scrupocellaria* (Gray, pt.) = *Canda* (Busk, *nec* Lamx.), lateral avicularia and vibracula absent; a lateral spine developed into a protective shield. *S. reptans* (L.). Verrill, Am. J. Sci. (3) xviii. p. 53.

Brettia tubaformis [*tubif-*], sp. n., Hincks, *l. c.* p. 154, S.E. coast of England and Hebrides.

Cellulariidæ.

Cellularia (Pallas, restr.) divided into 2 subgenera, *Cellularia* = *Scrupocellaria* (Gray, Busk, pt.), lateral spines all simple, and *Cellarina* (Van Beneden) = *Tricellaria* (Flem.), one of the lateral spines more or less dilated; *C. scabra* (Van Beneden) and *ternata* (Solander). Verrill, Am. J. Sci. (3) xviii. p. 53.

Bicellariidæ.

Bugula decorata and *cucullata*, spp. nn., Verrill, *l. c.* p. 52, Maine.

Bugula prismatica (Gray); Hutton, Tr. N. Z. Inst. ix. p. 359, New Zealand.

Bugulella, g. n.; stems dichotomously branched, consisting of single series of zoœcia connected by short tubular joints; zoœcia elongated, expanded distally, with a large sunken elliptical frontal area, which is surrounded by spines. Oœcia subglobular, attached to the distal end of the zoœcia. Avicularia shaped as in *Bugula*. *B. fragilis*, sp. n., East of George's Bank, Maine, 220 fath.; Verrill, Am. J. Sci. (3) xvii. p. 472.

Bugulopsis, g. n., = *Cellularia* (Busk, pt., *nec* Pallas); zoœcia simple, unarmed, in alternating rows; no avicularia, vibracula, or shields. *B. peachi* (Busk), N. Europe and New England. Verrill, *op. cit.* xviii. p. 53.

Cellariidæ.

Tubucellaria cereoides (Ellis & Solander) = *Onchopora tubulosa* (Busk), from Naples, described by Waters, Ann. N. H. (5) iii. p. 118.

Onchopora sinclairi, sp. n., Busk, Phil. Tr. clxviii. p. 193, pl. x. figs. 1 & 2, Kerguelen Island and New Zealand.

Flustridæ.

Carbasea papyrea (Pallas), var. n. *mazeli*, Marseilles, 105–108 mètres, Marion, Ann. Sci. Nat. (6) viii. art. 7, pp. 33–35, pl. xviii. fig. 10.

Diachoris patellaria (Moll.) = *simplex* (Heller), with var. n. *multijuncta*, and *D. magellanica* (Busk) = *buski* (Heller), all from Naples, the last 30-50 fath., described by Waters, *l. c.* pp. 120 & 121, pl. x. figs. 6–9, pl. xii. fig. 1, pl. xiii. fig. 4.

Diachoris costata (Busk, 1876), Busk, Phil. Tr. clxviii. p. 195, pl. x. figs. 4 & 5, Kerguelen and Falklands.

Membraniporidæ.

Membranipora. McCoy, *l. c.* pp. 29–35, describes and figures from the Victorian coasts: pl. xxv., *M. membranacea*, Linn., fig. 1, *perforata*, McGill., fig. 2, *ciliata*, McG., fig. 3, *mamillaris*, McG., fig. 4, *umbonata*, Busk, figs. 5 & 6, *pilosa*, Linn., fig. 7, *cervicornis*, Busk, fig. 8; pl. xxvi., *M. vulgispar*, McG., fig. 1, *woodsi*, McG., fig. 2, *lineata*, Linn., fig. 3, *rosseli*, Aud., fig. 4, *lacroixi*, Sav., figs. 5 & 6.

Membranipora (? g. n.) *cincta*, sp. n., Hutton, P. R. Soc. Tasm. 1877 [1878], p. 23, St. Vincent's Gulf, Tasmania.

Membranipora flemingi (Busk), with var. *gregaria* (Heller) = *aperta* (Manzoni), and *M. angulosa* (Reuss), from Naples; Norman, Ann. N. H. (5) iii. pp. 122 & 123, pl. xiii. figs. 2, 3, & 5.

Membranipora spinosa (Qu. & Gaim.); Busk, *l. c.* p. 195, pl. x. fig. 3, Kerguelen.

Microporidæ.

Micropora impressa (Moll, as *Eschara*) = *Membranipora gracilis* (Reuss) = *Membr. andegavensis* and *calpensis* (Busk) = *bifoliata* (Heller), distinguished by the separable distinct operculum and the calcareous margin of the aperture, from Naples; Waters, Ann. N. H. (5) iii. p. 123.

Steganoporella smitti, new name for *Membranipora andegavensis* (Busk, Crag Polyzoa, *nec* Michelin), new to Britain; Hincks, Ann. N. H. (5) iii. p. 156.

Microporellidæ.

Diporula, g. n. Zoœcia calcareous, without a membranous area or raised margins; orifice arched and expanded above, contracted below, and slightly constricted by two lateral projections, lower margin straight and entire; a semilunate pore on the front wall. Avicularia present. Zoarium erect, with cylindrical branches. *D. verrucosa* (Peach). Hincks, *l. c.* p. 156.

Chorizopora, g. n. Zoœcia without a membranous area or raised margins, more or less distant, connected by a tubular network; orifice semicircular, with the inferior margin entire; no special pore. Type, *C. brongniarti* (Audouin). *Id. ibid.*

Myriozoidæ.

Myriozoon truncatum (Pall.) : literature and description ; Waters, Ann. N. H. (5) iii. p. 201, Naples.

Myriozoon subgracile (Orb.) from Japan ; *id.* J. R. Micr. Soc. ii. p. 390, pl. xv. fig. 5, operculum.

Schizoporella (Hincks, 1877). Note on this genus. *S. cristata*, sp. n., Hastings, on *Pecten maximus* (L.). *Hemeschara sanguinea* (Norm.) and *Lepralia venusta* (Norm.) are also to be placed in this genus. Hincks, *l. c.* p. 157.

Schizotheca (Hincks). On its generic character ; *id. l. c.* p. 158.

Hippothoa (Lamx.) restricted to the forms with distinct caudate cells and without any membranous area ; *H. catenularia* belongs to *Membranipora* : id. *ibid.*

Vincularia neo-zelandica, sp. n., Busk, J. R. Micr. Soc. (2) i. p. 155, & Hutton, Tr. N. Z. Inst. ix. p. 360, New Zealand.

Escharidæ.

Eschara foliacea (Ellis) = *fascialis* (Pallas, Moll.) = *bidentata* (M. Edw.) and its *Hemeschara*-stage, and *E. verrucosa* (Peach) = *lunaris* (Waters, 1878), both from Naples, 30–40 fath. ; Waters, Ann. N. H. (5) iii. p. 43, pl. xi. figs. 4 & 5, pp. 124–126, pl. xii. figs. 2–4, pl. xv. fig. 8.

Eschara (?) *huttoni*, sp. n., Tate, P. R. Soc. Tasm., 1877 [1878], p. 24, St. Vincent's Gulf, Tasmania.

Porellina stellata, sp. n., Verrill, Am. J. Sci. (3) xviii. p. 53, Casco Bay, Maine.

Lepralia (Johnst.), restricted as by Smith, and *Porina* (Gray). Generic characters discussed and British species enumerated ; Hincks, Ann. N. H. (5) iii. pp. 158–160.

Lepralia ciliata (Pallas) on the cirri of *Antedon phalangium*, Marseilles ; Marion, Ann. Sci. Nat. (6) viii. art. vii. p. 35. Also found at Kerguelen ; Busk, Phil. Tr. clxviii. p. 196.

Lepralia tatii and *spicea*, p. 23, *baccata* and *pocula*, p. 24, spp. nn., F. W. Hutton, P. R. Soc. Tasm. 1877 [1878], St. Vincent's Gulf, Tasmania.

Lepralia cecilii (Aud.) = *duboisi* (Aud.) = *perugiana* (Hell.), *L. vulgaris* (Moll.), *otophora* and *intermedia* (Reuss), *pertusa* (Esp.) varr. nn. *rotundata* and *sinuata*, *ansata* (Johnst.) var. *porosa* (Reuss), *auriculata* (Hass.), *bimucronata* (Moll.) var. *granifera* (Johnst.), *brongniarti* (Aud.) = *capitata* (Reuss), *gattyæ* (Landsb.) = *steindachneri* (Hell.), *cribrosa* (Hell.), *linearis* (Hass.) var. *biaperta* (Smitt) and var. *secundaria* (Smitt), *errata*, sp. n., forma Hemeschara, *arrogata*, sp. n., *cucullata* (Busk) = *torquata* (Edw.), *reticulata* (MacG.) var. *ophidiana* and var. n. *inæqualis*, *ventricosa* (Hass.) var., *pallasiana* (Moll.) var. n. *projecta*, *lata* (Busk) and *fissa* (Busk), all from Naples, described and figured by Waters, Ann. N. H. (5) iii. pp. 30–43, pls. viii.–xii. & xv. figs. 12 & 13.

Lepralia eatoni (Busk, 1876) and *hyalina* (L.), several varieties ; Busk, Phil. Tr. clxviii. pp. 196 & 197, pl. x. figs. 7–11, Kerguelen.

Lepralia margaritifera (Lamx.) has a small avicularium with semicircular mandible, and is also found at Kerguelen; *id. l. c.* p. 195.

Smittia, g. n., = *Escharella* (Smitt, *nec* Orb.). Primary orifice suborbicular, the lower margin entire and dentate; peristome elevated and forming a secondary orifice, channelled in front; generally an avicularium below the sinus. Type, *S. landborovii* (Johnst.): 9 British species enumerated. Hincks, Ann. N. H. (5) iii. p. 161.

Phylactella, g. n. Primary orifice more or less semicircular, lower margin sometimes dentate, surrounded by an elevated peristome which is not produced or channelled in front. No avicularia. 3 British species, *labrosa* (Busk), *collaris* (Norman), and *eximia* (Hincks). *Id. ibid.*

Escharoides (Smitt). Generic characters, *E. rosacea* (Busk) and *quincuncialis* (Busk), British; *id. l. c.* p. 162.

Mucronella (Hincks, 1877) = *Discopora* (Smitt): 8 British species enumerated; *id. ibid.*

Palmicellaria (Alder). Generic characters, 4 British species; *id. l. c.* pp. 162 & 163.

Cellporidæ.

Characters of the family: zoœcium urceolate with a perfectly terminal orifice, peristome much elevated and carried up into one or more prominent rostra, supporting avicularia. Genera, *Cellepora* (Fab., pt.) and *Celleporaria* (Smitt, *nec* Lam., *nec* Orb.), the latter including the British *C. hassalli*. Hincks, *l. c.* p. 163.

Cellepora avicularis (Hincks) = *redouti* (Aud.), *verruculata* (Smitt), *retusa* (Manz.) var. n. *caminata*, *C. sardonica*, *cutleriana*, and *digitata*, spp. nn., *margaritacea* (Pourt.) = *Buskea nitida* (Hell.), all from Naples; Waters, Ann. N. H. (5) iii. pp. 192–199, pl. xiii. fig. 1, pl. xiv. figs. 1–13, pl. xxiv. figs. 8–10.

Cellepora repleta, sp. n. ?, Adelaide, *id.* J. R. Micr. Soc. ii. p. 392, pl. xv. figs. 6 & 8.

Reteporidæ.

Retepora cellulosa (L.) and *couchi* (Hincks) = *beaniana* (Hincks), both from Naples, described by Waters, Ann. N. H. (5) iii. pp. 199–201, pl. xv. figs. 1–6.

CYCLOSTOMATA.

Tubuliporidæ.

Tubulipora transversa (Lamx.) = *serpens* (Johnst.) = *Idmonea dilatata* (Orb.), Marseilles, on the cirri of *Antedon phalangium*, 100 mètres, and on muddy ground, 40–80 mètres; Marion, Ann. Sci. Nat. (6) viii. art. 7, p. 36.

Tubulipora organizans (Orb.) and *stellata* (Busk, 1876); Busk, Phil. Tr. clxviii. p. 198, pl. x. figs. 20–26, Kerguelen.

Idmonea pedleyi, sp. n., *radians* (Lam.) and *milneana* (Orb.), observed at Port Jackson; Haswell, P. Linn. Soc. N. S. W. iv. p. 351.

Idmonea marionensis (Busk), Busk, *l. c.* p. 198, pl. x. figs. 15 & 16. young state, Kerguelen, Auckland, New Zealand.

Diastopora lato-marginata (Orb.) = *complanata* (Meneghini) = *sparsa* (Manzoni), Naples; Waters, Ann. N. H. (5) iii. p. 272, pl. xxiv. fig. 12.

Alecto repens var. n. *vitriensis*, Naples, on *Terebratula vitrea*, id. *l. c.* p. 273.

Discoporella radiata (Aud., as *Melobesia*) = *flosculus* (Hincks) = *patina* (Heller), Naples; *id. l. c.* p. 276, pl. xxiv. fig. 11.

Discoporella porosa, *complicata*, and *tridentata*, spp. nn., Haswell, *l. c.* pp. 354 & 355, Port Jackson.

Discoporella ciliata and *novæ-zelandiæ*, spp. nn., Busk, J. R. Micr. Soc. (2) i. p. 32, & Hutton, Tr. N. Z. Inst. ix. p. 361, New Zealand.

Discoporella infundibuliformis and *canaliculata* (Busk, 1876), Busk, Phil. Tr. clxviii. p. 199, pl. x. figs. 19, 12–14, Kerguelen.

Tennysonia stellata (Hutton, 1873) distinct from *stellata* (Busk); Hutton, Tr. N. Z. Inst. ix. p. 361.

Pustulipora purpurascens, sp. n., = *porcellanica* (Hutton, 1873, *nec* M.-Edw.), Hutton, *l. c.* p. 361, New Zealand.

Pustulipora parasitica, sp. n., Busk, J. R. Micr. Soc. (2) i. p. 21, & Hutton, *l. c.* p. 361, New Zealand.

Radiopora pustulosa (Orb.), Naples; Waters, Ann. N. H. (5) iii. p. 277, pl. xxiv. fig. 15.

Radiopora intermedia, sp. n., Jullien, Guide du Naturaliste, Jan. 1879, p. 10.

Reticulipora dorsalis, sp. n., = *nummulitarum* (Smitt, *nec* Orb.), Waters, Ann. N. H. (5) iii. p. 278, pl. xxiii. figs. 5–11, Naples and Algiers.

Frondipora verrucosa (Lamx., as *Krusensternia*), Naples; *id. l. c.* p. 279, pl. xxiv. figs. 1–7.

Cerioporidæ.

Heteropora (Blainv., hitherto only known in the fossil state). Two recent species, *pelliculata*, sp., Gulf of Tartary, 14–37 fath., and *cervicornis* (Orb.), recent from Adelaide, both externally quite similar to other Chilostomatous *Polyzoa* of the same seas, *Myriozoum subgracile* and *Cellepora repleta*. Waters, J. R. Micr. Soc. ii. pp. 390–393, pl. xv. figs. 1–4 & 7.

Heteropora neo-zelandica, sp. n., Busk, J. L. S. xiv. pp. 724–726, New Zealand.

Crisiidæ.

Crisia fistulosa (Hell., *nec* Busk) = *haueri* (Reuss), *elongata* (M. Edw.) = *attenuata* (Hell.), with var. *angustata* = *fistulosa* (Busk), and *C. denticulata* (Lamx.), from Naples; Waters, Ann. N. H. (5) iii. pp. 268 & 269, pl. xxiii. figs. 1–4.

Crisia punctifera and *incurva*, spp. nn., Haswell, *l. c.* pp. 355 & 356, Port Jackson.

Crisia kerguelensis (Busk, 1876), Busk, Phil. Tr. clxviii. p. 197, pl. x. figs. 17 & 18, Kerguelen.

CTENOSTOMATA.

Pherusa tubulosa (Ellis & Soland.), Naples; Waters, *l. c.* p. 279, pl. xxiv. figs. 13 & 14.

LOPHOPODA.

Cristatella idæ (Leidy) observed at Philadelphia, forming vermicular groups, several individuals being connected by the basal membrane; Leidy, P. Ac. Philad. 1879, p. 203.

ENDOPROCTA.

Loxosoma. O. Schmidt's paper [Zool. Rec. xv. *Moll.* p. 95] is translated in Ann. N. H. (5) iii. pp. 392–404.

Loxosoma. 9 known species enumerated; *L. phascolosomatum* (Vogt) was seen as early as 1861 by Norman, and described as "tentacular appendages of a Sipunculid, *Strephenterus*": Norman, Ann. N. H. (5) iii. pp. 133–138.

Loxosoma on *Phascolion strombi* at Marseilles, without peduncular glands; Marion, Ann. Sci. Nat. (6) viii. art. 7, p. 33.

Triticella flava (Dalyell) = *koreni* (G. O. Sars), found by Dalyell and Norman on *Sacculina carcini* in Scotland; Norman, *l. c.* pp. 138 & 139.

G. J. Allman proposes a new order of *Polyzoa*, to be called *Aspidophora*, for the genus *Rhabdopleura*; J. L. S. xiv. pp. 581–586.

CRUSTACEA.

BY

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1. *Nervous and Muscular Systems.*

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Abstract of Krieger's paper on the same subject (Zool. Anz. i. [1878] p. 340); J. R. Micr. Soc. ii. pp. 422 & 423.

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The nervous and digestive systems in *Idotea irrorata* and *Serolis gaudichaudi* (Aud. & Edw.) described and figured; A. S. Packard, Jr., "Zoology for Students, &c." (New York: 1879) pp. 306 & 307, figs. 255, 256, & 257. Mouth parts and gill of *Serolis*; p. 308, figs. 258 & 259.

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Experiments on the physiology of the muscles and nerves in the lobster by L. Frédericq & Vandevelde; they come to the conclusion that it agrees very much with that of the frog, only in the lobster the motor excitation travels much more slowly along the nerves (6 mètres a second in the lobster, 27 mètres in the frog). Bull. Ac. Belg. xlvii. pp. 477 & 771–797.

Experiments concerning the physiology of the nervous system of the Crayfish by J. Ward, P. R. Soc. xxviii. pp. 379–383; abstract in J. R. Micr. Soc. ii. p. 713.

Observations on muscular contraction in the Crayfish by Richet, C. R. lxxxviii. pp. 868–870. On the effect of the electric current upon the muscles of the pincers of the Crayfish; *id. l. c.* p. 1272. Abstracts of both papers in J. R. Micr. Soc. ii. pp. 562 & 873.

Vibrating muscle in the lobster; Pouchet, Assoc. Fr. vii. [1878] p. 756.

Phosphorence of the abdominal ganglia of *Thysanopoda norvegica* (Sars); Smith, Tr. Conn. Ac. v. p. 90.

2. *Organs of Sense.*

H. Grenacher, in a general treatise on the eyes of Arthropods (title, *suprà*), describes first the simple eyes of some Copepods, as *Calanella mediterranea*, *Copilia denticulata*, and *Sapphirina fulgens*, pp. 62–66, pl. vi. figs. 37–43, then the compound eyes of *Crustacea* of various orders, pp. 106–122, figuring the structure of those of *Porcellio scaber*, pl. ix. figs. 95–98, *Gammarus locusta*, pl. ix. figs. 99–101, *Talitrus saltator*, pl. ix. figs. 102 & 103, *Hyperia galba*, pl. x. figs. 104–106, *Branchipus stagnalis*, pl. x. figs. 107 & 108, *Apus cancriformis*, pl. x. fig. 109, *Mysis vulgaris* and *flexuosa*, pl. x. figs. 110–116, *Palæmon squilla*, pl. xi. figs. 117–119, *Portunus* [*Carcinus*] *mænas*, pl. xi. figs. 120 & 121, and *Squilla mantis*, pl. xi. fig. 122. The eyes of *Limulus polyphemus* are also described and figured, pp. 123–133, pl. xi. figs. 123–126; they are really compound, but, according to the author, quite different from those of the other *Crustacea*, not reducible to the same type, and having only some resemblance to those of some Myriapods. [*Cf.* also Zool. Rec. xiv. *Crust.* p. 5.]

Cases of rudimentary eyes in the stalk-eyed *Crustacea* recapitulated by Norman, Ann. N. H. (5) iv. p. 181.

The eye of *Cambarus pellucidus* (Tellkampf), the blind crayfish of the Mammoth Cave, Kentucky, is larger in the young than in the adult; it differs from the eye of normal species in its smaller size, conical form, want of a cornea, and white pigment cells, the brain also being fuller on the sides and wanting a front conical projection. A. S. Packard, Jr., "Zoology for Students, &c.," p. 315, fig. 369.

The eye of the *Daphniidæ*, *Estheriidæ*, and *Apodidæ* is originally external, but is afterwards covered by a fold of the ectoderm; Grobben, Arb. z. Inst. Wien, ii. No. 5, pp. 51–56, pls. vi. & vii.

Apparently sensitive organs in the first pair of antennæ in the caudal fork, and sensitive bristles spread throughout the whole surface of the body in *Lernanthropus*, described by C. Helder, Arb. Z. Inst. Wien, ii. No. 6, pp. 53–59.

Auditory bristles in the *Amphipoda* by Wrzesniowski, *suprà*.

3. *Circulation and Respiration.*

The blood of the lobster contains two colouring matters, one of a rosy hue, not changed by oxygen, nor invariably present, and one blue, appearing identical with the hæmocyanine of *Octopus*. The blood, when exposed to oxygen, is blue by reflected, brown by transmitted light; on reduction it becomes rosy; it coagulates rapidly after removal from the body. L. Frédericq, Bull. Ac. Belg. xlvii. p. 409; abstract in J. R. Micr. Soc. ii. p. 715.

Abstract of Deszsö's paper on the heart of the crayfish and lobster (Zool. Anz. i. [1878] p. 274) in J. R. Micr. Soc. ii. p. 423.

Experiments and graphic exhibition of the action of the heart in the crayfish by F. Plateau, Nature, xix. p. 470, J. R. Micr. Soc. ii. p. 292.

A peculiar closed system of vessels carrying red blood without globules has been found by C. Helder in the genus *Lernanthropus*; they spread themselves into the lateral appendages and dorsal apron-like expansion,

which may have the functions of gills; there is no heart. Arb. z. Inst. Wien, ii. No. 5, pp. 37–40, pl. i. figs. 13, 15 & 16.

Respiration entirely anal in *Cyclops*; Hartog, Rep. Br. Assoc. (Sheffield) 1879, p. 376.

4. *Digestion.*

C. F. W. Krukenberg states that the liver of the common crayfish and other *Crustacea* contains two sorts of ferments by which albuminous substances are digested; he names them tryptic and peptic enzym, the latter digesting also fibrine. Both are present also in *Maia squinado* and *verrucosa*, *Carcinus mœnas*, and *Palinurus communis*; only the former in *Eriphia spinifrons* and *Squilla mantis*, almost only the latter in the lobster. Untersuch. physiol. Inst. Univ. Heidelberg, v. pt. 3, pp. 261–272.

5. *Organs of Generation.*

The cases of dimorphous males in the *Crustacea* recapitulated by Norman; Ann. N. H. (5) iv. pp. 178–180.

Abstract of Grobben's paper on the male organs of the Decapods (Arb. z. Inst. Wien, i. [1878]) in J. R. Micr. Soc. ii. pp. 420–422.

Abstract of Mayer's paper on the Hermaphroditism of some *Cymotheidæ* [Zool. Rec. xv. *Crust.* p. 9]; *l. c.* pp. 720 & 721.

For Schöbl's observations on the copulation and changes in the sexual organs of the terrestrial Isopods, Weismann's on the spermatozoids, the copulation and parthenogenetic generations in the *Daphniidæ*, and Gruber's on the spermatozoids and copulation of the Copepods, see *infrà*, in the special part.

6. *Embryology and Metamorphosis.*

The nuchal organ, really a gland, is present during the whole life in *Branchipus* and *Apus*, *Estheria*, *Limnetis*, and *Limnadia*, also in *Moina paradoxa* (Weism.); only during the embryonal or larval stage in *Moina rectirostris* (Baird), *Sida*, *Gammarus*, *Euphausia*, *Cuma* and *Pandalus*, *Cyclops* and *Ergasilus*. Grobben, Arb. z. Inst. Wien, ii. No. 5, pp. 56–61, pls. vi. & vii.

Pinnixa (*cylindrica*, White?). The last *Zoea*-stage and first Brachyuran stage, occurring without interruption, the *Megalopa*-stage being completely suppressed, described by Faxon, Bull. Mus. C. Z. v. No. 11, pp. 263–265, pls. iv. & v. Another species of *Pinnixa* seems to have a *Megalopa*-stage, according to the observations of Smith, *l. c.* p. 265.

Pinnoteres maculatus (Say). Note on its larva; Smith, *l. c.* p. 265, footnote.

Porcellana (*Polyonyx*) *macrocheles* (Gibbes). Last *Zoea*-stage and first *Porcellana*-stage described by Faxon, *l. c.* pp. 256–262, with list of works relating to the development in this genus, pls. ii. & iii.

Hippa talpoides (Say). The first stage of the larva, devoid of lateral spines, with short and broad rostrum, described; *id. l. c.* pp. 254–256, pl. i.

The development of *Palæmonetes vulgaris* (Say) described by W. Faxon ; it undergoes a full metamorphosis, issuing from the egg in the *Zoea*-form, *i. e.*, provided with a pair of compound eyes, two pairs of antennæ, two pairs of maxillæ, and three pairs of swimming feet, the future maxillipeds, without gills, abdomen wholly devoid of appendages, and telson not clearly marked off from the sixth abdominal segment. The thoracic legs are subsequently unfolded in succession, beginning with the front, only the last pair are earlier than the penultimate ; all except the last furnished with external natatory branches, which are reduced by subsequent moults, and finally disappear altogether. During the evolution of the thoracic limbs, the abdominal appendages make their appearance ; first the posterior pair, which develop within the telson, then the anterior pairs. Each successive stage has been actually reared in confinement from its predecessor, with one exception. The eggs of the freshwater species, *P. exilipes* (Stimps.), are much larger in size and fewer in number. Bull. Mus. C. Z. v. No. 15, pp. 303–330, with 4 pls.

Larva of *Thysanopoda norvegica* (Sars) described by Smith, Tr. Conn. Ac. v. p. 91.

The larval stages of *Squilla empusa* (Say) are described by W. E. New Chesapeake Zool. Laborat. 1878, pp. 143–170, pls. xviii.–xxi.

ground in development of the embryo of *Cymothoa œstroides* and *parallela* N. Sp.), from the first cleaving of the egg, is described and compared with that of other *Crustacea* by J. F. Bullar, Phil. Tr. clxix. pp. 505–521, pls. xlv.–xlvii.

C. Grobben describes the development of *Moina rectirostris* (Baird), which progresses from the embryo to the full-grown animal in two days and a half, and adds several theoretical considerations concerning the egg and germinal layers in various *Arthropoda*, the embryonal forms called *Nauplius* and *Trochophora*, the very early appearance of the genital organs in *Moina* as well as in *Aphis* and *Miastor*, parthenogenesis, sporogony, and heterogony, &c. Arb. z. Inst. Wien, ii. No. 5, pp. 1–51, pls. i.–v.

7. *General Biology.*

Note on sounds emitted by some *Crustacea*; G. Brown Goode, P. U. S. Nat. Mus. 1878, pp. 7 & 8.

P. Mayer has observed that several species of *Idothea* change colour according to surrounding objects within half an hour, but never if both eyes have been extirpated. MT. z. Stat. Neap. i. pp. 520 & 521. [Similar observations on *Nica*; Zool. Rec. xv. *Crust.* p. 10.]

Cave Fauna. See *Gammarus puteanus*, *Asellus cavaticus*, and *Cantho-camptus cavernarum* (sp. n., Packard).

Richet records his experiments on the influence of heat upon the life-actions of the crayfish. At 23–24° the pincers are only feebly moved when touched, at 24–26° there is complete loss of voluntary nervous action, at 27–29° reflex action disappears, at 28–30° the respiratory movements are affected, and temperatures higher than 32° are mortal. C. R. lxxxviii. p. 977 ; abstract in J. R. Micr. Soc. ii. pp. 714 & 715.

Half-dead and dead *Caprellidæ* and other small *Crustacea* drive on the surface of the water, whereas the living animals sink; Haller, Z. wiss. Zool. xxxiii. p. 393.

Geographical Distribution.

1. Terrestrial and Freshwater Crustacea.

Iceland. Undetermined species of *Gammarus* and *Daphniidæ*; Rougemont, Bull. Soc. Neuch. xi. p. 189.

New British *Entomostraca*: *Leptodora hyalina* (Lillj.) and *Daphnia bairdi* (Graham) = *Hyalodaphnia kahlbergiensis* (Schödl.); Forrest, Midland Naturalist, ii. pp. 225 & 217, J. R. Micr. Soc. ii. p. 877, & Rep. Brit. Ass. (Sheffield) 1879, p. 369.

Switzerland. 42 species of *Cladocera* observed at Bern, *Alona lineata* and *Chydorus sphæricus* (Müll.) on the pass of S. Giacomo at a height of 2400 mètres. A. Lutz, MT. Ges. Bern, 1879, pp. 38–54.

Lake of Geneva. 1 Amphipod, 1 Isopod, 6 *Cladocera*, 5 *Ostracoda*, and 4 *Cyclopidæ* enumerated by F. Forel, Bull. Soc. Vaud. xvi. pp. 318–320. 8 species of *Cladocera*, 4 of *Ostracoda*, 4 of *Copepoda*, found in the Decapods of this lake, enumerated by H. Vernet, *op. cit.* xv. [1878] p. 292.

Some observations concerning the pelagic *Cladocera* and *Copepoda* of the lakes in Upper Italy by P. Pavesi, Bull. Ent. Ital. ix. [1877] have been omitted from former Records. The author has continued his researches on this subject, and observed 14 pelagic species of *Cladocera* and 8 of Copepods in various lakes of Northern and Middle Italy, all identical with German and Norwegian species; they extend from the surface to 10–12 mètres in depth; he thinks that they are of marine origin. Rend. Ist. Lomb. (2) xii. pts. 11, 12 & 16.

A new genus of freshwater Amphipods from Warsaw, nearly allied to *Crangonyx*, by Wrzesniowski, Zool. Anz. ii. p. 299.

Lake Gokcha, in Armenia. Many *Gammaridæ*, some *Cladocera*, *Ostracoda*, and *Cyclopidæ*, not yet determined; no Decapods or Isopods. Specimens of *Gammaridæ* from depths of 45 fath. seem to have rudimentary eyes. A. Brandt, Zool. Anz. ii. p. 525.

Palæmonetes vulgaris (Say) is common in shallow water along the Eastern coast of the United States, ascending far up into the brackish water of estuaries and rivers, even where the water is perfectly fresh to the taste. It is represented in fresh water by a smaller and more slender species, *P. exilipes* (Stimps.), which has a wide distribution in the rivers and lakes of the Western and Southern States. Faxon, Bull. Mus. C. Z. v. No. 15, p. 304.

Mysis, sp. n., in Lake Erie, Am. J. Micr. iii. [1878] p. 284; abstract in J. R. Micr. Soc. ii. p. 152.

Minnesota. C. L. Herrick, Rep. Geol. Surv. Minnesota, vii. pp. 81–123, pls. i.–xxi., describes and in many cases figures from original drawings, the *Entomostraca* known as yet to occur in the lakes within a radius of ten miles of Minneapolis, arranged after Dana's system. 24 species are described: *Calanidæ*, 2 (both new); *Cyclopidæ*, 2; *Sididæ*, 2 (1 new);

Daphniidæ, 11 (2 new); *Polyphemidæ*, 2 (1 new); *Bosminidæ*, 1; *Cypridæ*, 4 (3 new). Various other species are referred to, and their habits and structure described; and in some addenda, p. 121, the author refers to *Eubranchipus serratus*, *Canthocamptus illinoisensis*, *Diaptomus sanguineus*, and *Eubranchipus bundii*, as recently described [? spp. nn.] from Illinois by Forbes, in Bull. Illin. Mus. i.

Three freshwater Amphipods from both slopes of the Cordilleras, in Peru, described by A. Wrzeniowski, Zool. Anz. ii. pp. 175–178 & 199.

Rodriguez Island. An undetermined species of *Oniscus*, and a peculiar species of *Talitrus*, *T. gulliveri* (Miers, 1876), living in damp places, but not actually in the water, are enumerated by E. J. Miers, Zoology of Rodriguez, *Crustacea*, pp. 11 & 12. [Perhaps also *Caridina typus* (M.-E.), p. 8, must be also mentioned, as the other known species of this genus live in fresh water; also *Palæmon ornatus* (Oliv.), *dispar* (Martens), and *hirtimanus* (Oliv), probably from fresh water.]

One fresh-water Copepod, *Centropages brevicaudatus* (Brady), is peculiar to this island; Brady, Phil. Tr. clxviii. p. 215. 4 species of fresh-water *Cladocera*, 1 Ostracode, and 2 Copepods enumerated by Studer, Arch. f. Nat. xlv. p. 114.

New terrestrial species of *Talitrus* 30 miles from the coast, on moist ground in woods and scrubs, New South Wales; Haswell, P. Linn. Soc. N. S. W. iv. p. 248.

Marine Crustacea.

Atlantic. 16 species of *Diastylis* and 14 other *Cumacea* procured during the 'Lightning,' 'Porcupine,' and 'Valorous' Expeditions, in various parts of the Atlantic, described by A. M. Norman, Ann. N. H. (5) iii. pp. 54–73.

North Sea. Notes and lists of *Crustacea* from the Dutch Coast, chiefly *Peltogastridæ*, *Amphipoda*, *Isopoda*, and *Podophthalma*, by P. P. C. Hoek, Tijdschr. Nederl. Dierk. Ver. iii. [1878].

23 species of *Mysidæ* from the coast of Norway, described by G. O. Sars, Mysid. iii. 131 pp. pls. ix.–xli..

Mediterranean. List of 27 *Crustacea*, dredged off Marseilles, by A. F. Marion, Ann. Sci. Nat. (6) viii. art. 7, p. 4; notes on several of them, p. 37. Notes on the occurrence of some marine *Decapoda*, *Stomopoda*, and *Amphipoda* on the shores of Italy, by G. Haller. Zool. Anz. ii. pp. 205–207. The Mediterranean genera and species of *Caprellidæ* characterized; *id. l. c.* pp. 230–233.

Atlantic Coast of N. America. The stalk-eyed Crustaceans north of Cape Cod are reviewed by S. I. Smith. He enumerates 15 species of *Brachyura*, 7 *Anomura*, 23 *Macrura*, 11 *Schizopoda*, and 17 *Cumacea*, in all 73 species; 6 of them occur only in Cape Cod Bay, the fauna of which is rather Virginian than Northern, 7 others occur only occasionally, or in exceptionally protected localities north of Cape Cod; 6 other species, including the American lobster, *Crangon vulgaris*, *Cancer irroratus*, and *C. borealis*, have about equally extensive ranges and are about equally common both north and south of Cape Cod, and must be regarded as

belonging properly to both faunæ. 14 species have not been recorded from less than 50 fath. The fauna from Cape Cod Bay to Labrador is essentially continuous, or, at least, there are no changes in it comparable with the differences between the faunæ north and south of Cape Cod. 37 species are also European, their number is nearly the same in New England, the Gulf of St. Lawrence, and Greenland, but diminishes suddenly south of Cape Cod. About 87 per cent. of all stalk-eyed *Crustacea* known from Greenland occur also on the coast of North America from the Gulf of St. Lawrence southward, 80 per cent. also in Europe. Tr. Conn. Ac. v. pp. 27–136, pls. viii.–xii.; zoogeographical considerations, *l. c.* pp. 122–136.

O. Harger gives a list of the New England marine *Isopoda*, chiefly from the collections of the "Fish Commission;" there are 40 species, 18 of which have as yet been only found north of Cape Cod, 8 only south of Cape Cod, 14 both north and south; 11 occur also on the coast of Europe, 6 of which have only been found north of Cape Cod, 1 (*Tanais vittatus*) only south of it. P. U. S. Nat. Mus. 1879, pp. 157–165.

Virginia. 6 *Brachyura*, 2 *Anomura*, 2 *Macrura*, 2 *Amphipoda*, 1 Isopod, and 1 Cirriped observed at Fort Wool, by Uhler, Chesapeake Zool. Laborat. 1878, pp. 25–27.

Florida. Descriptions of some new *Brachyura*; J. S. Kingsley, P. Bost. Soc. xx. pp. 145–160.

West Indies. Many *Maiidæ*, *Cancridæ*, and *Portunidæ* from Vera Cruz, Cuba, Barbadoes, Guadelupe, and Florida, described by A. Milne-Edwards, Crust. Mexic. v. pp. 185–224, vi. pp. 225–264. Those figured will be mentioned *infrà*.

Japanese and Corean Seas. 40 species of *Brachyura*, 12 of *Anomura*, 10 of *Macrura*, and 1 Cumacean, dredged by Capt. H. C. St. John, enumerated by E. Miers, including many new species and genera. Some of the species are widely distributed in the Indian Seas, e.g., *Actæa granulata* (Aud.); others are American, as *Paracrangon echinatus* (Dana); one European, *Portunus corrugatus*. P. Z. S. 1879, pp. 18–61, with 3 pls.

West Coast of America. Many *Maiidæ*, *Portunidæ*, and *Cancridæ* from the West Coast of Mexico and Central America and from California described by A. Milne-Edwards, Crust. Mexic. v. pp. 185–224, vi. pp. 225–264. Those figured will be mentioned below. Descriptions of some little known *Brachyura* by J. S. Kingsley, P. Bost. Soc. xx. pp. 145–160.

Australia. 38 species of *Leucosiidæ* and 9 of *Penæus*, including several new, enumerated by W. A. Haswell, P. Linn. Soc. N.S.W. iv. pp. 38–60, pls. v. & vi.

Numerous Australian *Amphipoda*, mostly new, described by Haswell, *l. c.* pp. 245–279 & 319–349, pls. vii.–xii. & xviii.–xxiv.

New Zealand. Additions to its Amphipodous *Crustacea*, 3 new, and 1, *Aora typica* (Kröyer), originally described from Valparaiso, by G. M. Thomson, Ann. N. H. (5) iv. pp. 329–331, pl. xvi. New species of *Nebalia*, *Arcturus*, and *Tanais*; id. *l. c.* pp. 415–419, pl. xix.

Kerguelen Island. List of the known *Crustacea*, with remarks on their topographical distribution, containing 1 Copepod, 7 *Amphipoda*, 8

Isopoda, 1 Nebalid, and 1 Decapod (*Halicarcinus*). STUDER, Arch. f. Nat. xlv. pp. 126 & 127.

Two marine Copepods, *Calanus finmarchicus* (Gunner) and *Sapphirina darwinæ* (Lubbock), collected in the Southern Indian Ocean, 35° S., 45° 30' E., one, *Harpacticus fulvus* (Fischer), a European species, abundant in pools above highwater-mark in Kerguelen Island; Brady, Phil. Tr. clxviii. pp. 215 & 216.

Twenty species of *Brachyura*, 5 *Paguridæ*, 6 *Caridea*, 2 *Squillidea* enumerated by E. J. MIERS, in the Zoology of Rodriguez, *Crustacea*, 12 pp. They are all known also from other parts of the Indian Ocean, Eastern Africa, or Malayan Archipelago (mostly from both). Of *Caridina typus* (M. E.) alone, no other locality can be stated, although the species was known before.

CLASSIFICATION.

A. S. PACKARD, JR., in "Zoology for Students, &c.," pp. 292–324, divides the Crustaceans into two series of Orders (or two sub-classes), NEOCARIDA, normal, mostly now living, though containing numerous Palæozoic forms, and PALÆOCARIDA, more generalized, represented by fossil Trilobites and *Eurypterida*, and by the living *Limulus*. The NEOCARIDA are thus subdivided: *Cirripedia*, *Entomostraca*, *Branchiopoda* (with sub-orders *Cladocera* and *Phyllopoda*), *Tetradecapoda* (Isopods and Amphipods), *Phyllocarida* (n.), *Stomapoda*, and *Decapoda*. The *Phyllocarida* are proposed as an Order for the reception of the *Nebaliidæ*—the forerunner of the Decapods, connecting them with the Phyllopods and lower Orders, and represented by *Hymenocaris* and other fossil forms, and the living *Nebalia*. The PALÆOCARIDA, which are again divided into *Merostomata* (with sub-orders *Xiphosura* and *Eurypterida*) and *Trilobita*, may possibly be found to form a distinct class of Arthropods, equivalent to and intermediate between the *Crustacea* and *Insecta*; but they are at present retained among the *Crustacea* from their breathing by external gills. The higher Amphipods are connected with the shrimps by a fossil group, or sub-order, which may be called *Anthracarida* (p. 306). See also Am. Nat. xiii. pp. 785–787; Ann. N. H. (5) iii. p. 459; J. R. Micr. Soc. ii. p. 713.

Here may be mentioned GERSTÄCKER's elaborate account of the *Trilobitæ* in his general treatise of the *Crustacea*, "Klassen und Ordnungen des Thierreichs," v. *Arthropoda*, pp. 1143–1306, pls. xliii.–xlix. Availing himself of the numerous special researches of Barrande, and his own exact and extended knowledge of all divisions of the *Arthropoda*, the author comes to the conclusion that the *Trilobitæ* are real Crustaceans, and form a distinct order among them, which has only superficial resemblance to some Isopods, but some very remarkable relations on one side to the Phyllopods, viz.: the variable number of the segments, the general shape of the cephalothorax, and the structure of the hypostoma, which agree perfectly with the labrum of *Apus*; and on the other to *Limulus*, by the situation and form of the eyes, the general shape of the cephalothorax, and the tripartite disposition of the whole body. Arguing from the general character of the *Arthropoda*, and the external analogy with

Armadillidium or *Glomeris*, it seems very probable that the *Trilobitæ* were provided with feet for locomotion ; but whether these were foliaceous or styliform, soft or solid, homonomous or heteronomous, cannot be decided from the materials at present known, and therefore the real affinity of the Trilobites to other orders of the *Crustacea* must be left undecided. The known *Tritobitæ* form rather a retrograde than a progressive series, as regards time ; in the individual development the number of segments is increasing, but this number is larger in the geologically oldest than in the more recent forms (pp. 1208–1224 & 1306).

An abstract of this author's views on the systematic position of *Limulus* and the Trilobites [Zool. Rec. xv. *Crust.* p. 46], in Naturforscher, xii. pp. 337 & 338, by the RECORDER.

DECAPODA.

J. BOAS, Zool. Anz. ii. p. 257, proposes to classify the *Decapoda* as follows :—

1. REPTANTIA, containing the *Brachyura*, *Anomura*, *Palinuridæ*, *Scyllaridæ*, *Astacidæ*, and *Thalassinidæ*.
2. NATANTIA—(A) *Eukyphota*. All *Caridea* except the *Penæidæ*.
   (B) *Penæidæ*.

OXYRRHYNCHA.

E. F. MIERS, J. L. S. xiv. pp. 634–671, after recapitulating the systematic arrangements of former authors, proposes the following, giving short differential diagnoses for all genera :—

Family 1.—INACHIDÆ. Eyes non-retractile, or retractile against the sides of the carapace ; no defined orbits. Basal joint of antennæ usually slender.

Sub-family 1.—*Leptopodiinæ*. Eyes slender, laterally projecting, not retractile ; præocular and postocular spines minute or wanting. Basal antennal joint very slender throughout its length. *Leptopodia* (Leach), *Metoporaphis* (Stimps.), *Stenorrhynchus** (Lam.), *Achæus* (Leach), *Podochela* (Stimps.), *Podonema* (Stimps.).

Sub-family 2.—*Inachinæ*. Eyes slender and retractile ; præocular spine usually wanting, postocular usually distinct. Basal antennal joint very slender throughout its length : *Eucinetops* (Stimps.), *Collodes* (Stimps.), *Arachnopsis* (Stimps.), *Batrachonotus* (Stimps.), *Euprognatha* (Stimps.), *Achæopsis* (Stimps.), *Inachus* (Fab.), *Oncinopus* (Haan), *Inachoides* (M.-Edw.), *Eurypodius* (Guér.), *Oregonia** (Dana), *Plistacantha* (Miers), *Halimus* (Latr.), *Amathia* (Roux), *Chorinus* (Leach), *Macrochira* (Haan), *Trichoplatus* (A. Milne-Edw.).

Sub-family 3.—*Acanthonychinæ*. Eyes small, concealed beneath the prominent præocular spine. Basal antennal joint usually enlarged at base. *Xenocarcinus** (White), *Anomalothir* (n.), *Mocosoa* (Stimps.), *Trigonothir* (n.), *Huenia* (Haan), *Simo-*

carcinus (n.), *Cyclonyx* (n.), *Menæthius* (M.-E.), *Leucippe* (M.-E.), *Mimulus* (Stimps.), *Epialtus* (M.-E.), including *Antilibinia* (M'Leay), *Eupleurodon* (Stimps.), *Pugettia* (Dana), *Acanthonyx** (Latr.).

Sub-family 4.—*Micronychinæ*. Eyes short and completely retractile, the postocular spine or lobe largely developed. Basal antennal joint enlarged throughout its length. *Microrrhynchus* (Bell) = ? *Salacia* (Lucas), *Apiomaia* (Martens), *Esopus* (M.-Edw.), *Loxorrhynchus* (Stimps.), *Libidoclea* (M.-E.), *Doclea* (Leach).

Sub-family 5.—*Stenocinopinæ*. Eyes elongated and retractile, partly concealed by the præocular spine, which is very greatly elongated. Basal antennal joint considerably enlarged throughout its length. *Stenocinops* (Latr.), *Stilbognathus* (Mart.), *Tyche* (Bell).

Family 2.—MAIIDÆ. Eyes retractile within the orbits, which are distinctly defined, but often marked with open fissures in their margins. Basal antennal joint more or less enlarged.

Sub-family 1.—*Maiinæ*. Rostrum well developed. Anterior legs in male enlarged; fingers not excavate at tips. *Egeria* (Latr.), *Chorilibinia* (Lock.), *Hemus* (A. M.-Edw.), *Hyas* (Leach), *Chionœcetes* (Kröy.), *Herbstia* (M.-E.), including *Rhodia* (Bell) and *Micropisa* (Stimps.), *Cœlocerus* (A. M.-Edw.), *Maia** (Lam.), *Paramithrax* (M.-E.), including *Leptomithrax* (Miers) and perhaps *Phycodes* (A. M.-Edw.); [*H*] *Oplopisa* (A. M.-Edw.), *Acanthophrys* (A. M.-Edw.), *Pisa** (Leach), *Pisoides* (Lucas), *Notolopas* (Stimps.), *Hyastenus* (White), including *Lahaina* and *Chorilia* (Dana), *Naxia* (M.-E.), *Micippoides* (A. M.-Edw.), *Eurynome* (Leach), *Pelia* (Bell).

Sub-family 2.—*Schizophryinæ*. Rostrum very short or obsolete, tips of the fingers usually excavate. Carapace broadly triangular or nearly circular. *Temnonotus* (A. M.-Edw.), *Schizophrys* (White), *Cyclax* (Dana), including *Cyclomaia* (Stimps.). *Pleurophricus* (A. M.-Edw.) also perhaps belongs to this division.

Sub-family 3.—*Micippinæ*. Rostrum vertically deflexed, usually broad, lamellated. Eye-peduncles very long, geniculated, laterally projecting. *Criocarcinus** (M.-E.), *Picrocerus* (A. M.-Edw.), *Pseudomicippe* (Hell.), *Micippa** (Leach), *Paramicippe* (M.-E.).

Family 3.—PERICERIDÆ. Eyes retractile, orbits never incomplete. Basal antennal joint constituting the greater portion of the inferior wall of the orbit.

Sub-family 1.—*Pericerinæ*. Rostrum well developed. Second joint of antennæ not dilated. Fingers acute at the tips. *Libinia* (Leach), *Prionorrhynchus* (Lucas), *Scyra* (Dana), *Pyria* (Dana), *Lissa* (Leach), *Rachinia* (A. M.-Edw.), *Leptopisa* (Stimps.), *Sphenocarcinus* (A. M.-Edw.), *Cyphocarcinus* (A. M.-Edw.), *Tiarinia* (Dana), *Tylocarcinus* (n.), *Pericera** (Latr.), *Microphrys* (M.-E.) = *Milnia* (Stimps.) = *Perinea* (Dana) = *Fisheria* (Lock.); *Macrocœloma* (n.), *Anaptychus* (Stimps.).

Sub-family 2.—*Othoniinæ*. Interorbital space very broad, rostrum

almost obsolete. Second joint of antennæ enlarged. Fingers slightly excavated at the tips. *Othonia** (Bell).

Sub-family 3.—*Mithracinæ*. Carapace broadly triangular, rostrum short or obsolete. Second joint of antennæ not dilated. Fingers excavate at the tips. *Nemausa* (A. M.-Edw.), *Parathoe* (n.), *Thoe* (Bell) = *Platypus* (Lock.), *Mithrax** (Leach), including *Mithraculus* (White).

Family 4.—PARTHENOPIDÆ. Orbits small and well defined. Antennæ very slender, their basal joint very small, not reaching the front, the next joint occupying the narrow hiatus between the front and the inner orbital angle.

Sub-family 1.—*Parthenopinæ*. Rostrum simple, anterior legs greatly developed; a marked depression between the branchial, cardial, and gastric regions. *Lambrus** (Leach), *Parthenope* (Fab.), *Solenolambrus* (Stimps.), *Mesorrhœa* (Stimps.), *Cryptopodia* (M.-E.), *Heterocrypta* (Stimps.), *Œthra* (Leach). But *Eurynolambrus* belongs to the *Cancridæ*.

Sub-family 2.—*Eumedoninæ*. Carapace rhomboidal or subpentagonal, rostrum bifid, anterior legs of moderate length. *Zebrida* (White), *Eumedonus* (M.-E), *Gonatonotus* (Wh.), *Ceratocarcinus* (Wh.), *Harrovia** (Wh.).

The frontal region of the genera marked with * is figured on pls. xii & xiii.

INACHIDÆ.

Stenorrhynchus brevirostris, Port Jackson, and *fissifrons*, New Zealand, spp. nn., Haswell, P. Linn. Soc. N. S. W. iii. pp. 404 & 408.

Achæus spinosus and *tuberculatus*, spp. nn., Miers, P. Z. S. 1879, p. 25, Japan.

Podochela spatulifrons, sp. n., *macrodera* (Say), *grossipes*, *gracilipes*, and *ruesii* (Stimps.), West Indies and Florida, A. Milne-Edwards, Crust. Mexic. v. pp. 190–193, pl. xxxiv. figs. 1–4, and pl. xxxv. fig. 1.

Anisonotus, g. n., distinct from *Podochela* by the long curved rostrum, the very prominent post-orbital angles, and the simple ambulatory legs. *A. curvirostris*, sp. n., Barbadoes, 100–123 fath. *Id. l. c.* pp. 195–197, pl. xxxvi. fig. 3.

Apocremnus [Fieber *Hemiptera*, 1858], g. n. Orbits as in *Achæus*, tarsi falciform as in *Collodes*; *A. septem-spinosus*, sp. n., *id. l. c.* p. 185, pl. xxxv. fig. 5, Florida Straits, 37 fath.

Eucinetops ? stimpsoni, sp. n., Miers, Ann. N. H. (5) iv. p. 3, N.E. Australia.

Achæopsis guentheri, sp. n., *id. l. c.* p. 2, pl. iv. fig. 1, Cape of Good Hope.

Inachoides forceps and *obtusus*, spp. nn., Guiana and Guadelupe, A. Milne-Edwards, *l. c.* p. 199, pl. xxxiii. figs. 3 & 4.

Pleistacantha [*Plist-*], g. n. Rostrum, orbital and antennal region as in *Oregonia*; but carapace convex and spinose, and legs greatly elon-

gated as in *Egeria*. *P. sancti-johannis*, sp. n., Miers, P. Z. S. 1879, pp. 24 & 25, pl. i. fig. 1, Japan.

Halimus truncatipes, sp. n., Miers, Ann. N. H. (5) iv. p. 3, Australia.

Amathia crassa, sp. n., West Indies, 229 fath., and *hystrix* (Stimps.), A. Milne-Edwards, *l. c.* pp. 200–203, pl. xxviii. figs. 1 & 2.

Anomalothir, new name for *Anomalopus* (Stimps.), which is pre-occupied, Miers, *l. c.* p. 618. *Anomalopus furcillatus* (Stimps.), Cuba, and *frontalis*, sp. n., Barbadoes, 100 fath., A. Milne-Edwards, *l. c.* p. 188.

Trigonothir, g. n. Carapace subtriangular, rostrum entire, obtuse, flattened below and produced into lateral carinæ; præocular spine wanting; outer maxillipeds with merus joint not produced at its antero-external angle; anterior legs small, palm compressed. *T. obtusirostris*, sp. n., Miers, *l. c.* p. 648; and Ann. N. H. (5) iv. p. 4, pl. iv. fig. 2, locality unknown.

Huenia pacifica, sp. n., Miers, Ann. N. H. (5) iv. p. 5, pl. iv. fig. 5, Fiji Islands.

Simocarcinus, g. n. Rostrum as in *Huenia*, but shorter; præocular spine wanting; sexes dissimilar; hands in adult male turgid, not cristate above; ambulatory legs not compressed. Type, *Huenia simplex* (Dana), Sandwich Islands, *brevirostrata* (Dana) is the female. Miers, *l. c.* p. 649, and Ann. N. H. (5) iv. p. 6.

Cyclonyx, g. n. Rostrum laminate, flattened, very broad, and transversely ovate; eye situate in the narrow angle between the base of the rostrum and front of the carapace, the sides of which are produced into dilated wing-like expansions as in *Huenia*. Id. *l. c.* p. 649. *C. frontalis* (White, as *Huenia*) figured in the Zoology of the 'Samarang'; *id.* Ann. N. H. (5) iv. p. 6.

Pugettia quadridens and *incisa* (Haan); *id.* P. Z. S. 1879, p. 23, Japan.

Neo [*r*] *rhynchus*, new name for *Microrrhynchus* (Bell), preoccupied; A. Milne-Edwards, Crust. Mexic. v. p. 186.

[*Apiomaia*] *Pyromaia cuspidata* (Stimps.), *id. l. c.* p. 197, pl. xxxvi. fig. 2, Florida, 82–125 fath.

Libinia and *Doclea* are closely connected by *Libidoclea* (Dana); Miers, P. Z. S. 1879, pp. 27 & 28.

Doclea orientalis, sp. n., *id. l. c.* p. 28, pl. ii. fig. 1, N. Japan.

Maiidæ.

Chorilibinia gracilipes, sp. n., Miers, Ann. N. H. (5) iv. p. 7, pl. iv. fig. 4, New Guinea.

Paramithrax (*Leptomithrax*) *compressipes*, Canton, *brevirostris*, locality unknown, *spinosus*, Norfolk Island, 23 fath., and *halimoides*, Eastern Seas, spp. nn., *id.* Ann. N. H. (5) iv. pp. 8–10, the third, pl. iv. fig. 5.

[*H*] *Oplopisa spinipes* (A. Milne-Edw., 1878) and *erinacea*, sp. n., West Indies, A. Milne-Edwards, Crust. Mexic. v. p. 201, pl. xv.*a*, figs. 4 & 5.

Acanthophrys paucispina, sp. n., Miers, Ann. N. H. (5) iv. p. 10, Fiji Islands.

Pisa carinimana, sp. n., *id. l. c.* p. 11, pl. iv. fig. 5, Canaries.

Hyastenus (*Chorilia*) *gracilirostris*, sp. n., *id. l. c.* p. 12, pl. iv. fig. 7, Fiji Islands.

Hyastenus (*Chorilia*) *japonicus*, sp. n., and *H. diacanthus* (Haan, as *Naxia*), id. P. Z. S. 1879, pp. 27 & 26, the former pl. i. fig. 2, Japan.

Pseudomicippe ? *varians*, sp. n. ?, *id.* Ann. N. H. (5) iv. p. 12, pl. iv. fig. 8, Shark's Bay, W. Australia.

Paramicippe affinis, sp. n., *id. l. c.* p. 13, Bass's Straits.

Micippe parvirostris, sp. n., *id. ibid.*, pl. iv. fig. 9, Port Lincoln, South Australia.

Pericerida.

Tylocarcinus, g. n. Carapace tuberculated, without lateral spines; spines of rostrum slender, divergent; interorbital space narrow; basal antennal joint not much enlarged; anterior legs in male with the fingers nearly meeting when closed; ambulatory legs spinose or nodose. Type, *Cancer styx* (Herbst), Fiji Islands; Miers, J. L. S. xiv. p. 664, and Ann. N. H. (5) iv. p. 14. *T. gracilis*, sp. n., *id. l. c.* p. 15, Eastern Seas.

Pericera cælata, sp. n., Havanna, 175 fath., *eutheca* and *septem-spinosa* (Stimps.), A. Milne-Edwards, Crust. Mexic. v. p. 200, pl. xv.*a*, figs. 1–3.

Microphrys error, sp. n., = *depressa* (Streets & Kingsley, 1877, nec *Fisheria depressa*, Lockington), Kingsley, P. Bost. Soc. xx. p. 145, Lower California.

Macrocæloma, g. n. Carapace very convex, branchial spine very large; spine of rostrum parallel or nearly so; orbits tubular and laterally projecting; interorbital space very broad; anterior legs in male with the palm elongated and fingers meeting, or nearly meeting, when closed. Type, *Pericera trispinosa* (Latr.), Miers, J. L. S. xiv. p. 665.

Anaptychus cornutus (Stimps.); additional note by Kingsley, *l. c.* p. 146.

Othonia quadridentata, sp. n., Miers, Ann. N. H. (5) iv. p. 15, pl. v. fig. 1, West Indies.

Othonia hirta (Dana), ? from Japan, *id.* P. Z. S. 1879, p. 24.

Parathoe, g. n., near *Thoe* (Bell). Distinct by a much narrower basal antennal joint and by the non-dilation of the merus-joints of the ambulatory legs. *P. rotundata*, sp. n., Fiji Islands and Port Curtis; Miers, Ann. N. H. (5) iv. p. 16, pl. v. fig. 2.

Mithrax trispinosus, sp. n., Florida, and *triangulatus* (Lockington), Gulf of California; Kingsley, P. Bost. Soc. xx. pp. 148 & 149.

Mithraculus hirsutipes, sp. n., no locality given, and *areolatus* (Lock.), California; *id. l. c.* pp. 147 & 146.

Parthenopidæ.

Lambrus. On its subgenera; Miers, Ann. N. H. (5) iv. p. 17.

Lambrus granulatus, sp. n., Kingsley, *l. c.* p. 150, Tortugas, Florida.

Lambrus intermedius, sp. n., Miers, P. Z. S. 1879, p. 29, Corean Seas.

Lambrus longispinus, sp. n., Shanghai, *holdsworthi*, sp. n., Ceylon, *laevicarpus*, sp. n., Eastern Seas, *longimanus* (L. ?, M.-Edw.), Eastern Seas, *deflexifrons*, Ceylon, *hoplonotus* var. n. *granulosus*, Philippine Islands,

var. n. *longi-oculis*, Queensland, var. n. *planifrons*, Ceylon, and *curvispinus*, sp. n., Java Sea, Miers, Ann. N. H. (5) iv. pp. 18–24, pl. v. figs. 3–7.

Parthenopoides, subg. n. of *Lambrus*. Carapace subtriangular with the posterior margin nearly straight, and produced at the postero-lateral angles over the bases of the ambulatory legs; anterior legs rarely spinose and of moderate length. Type, *Lambrus massena* (Roux), Miers, J. L. S. xiv. p. 672; *P. erosus*, Eastern Seas, and *expansus*, Madeira, spp. nn., *id.* Ann. N. H. (5) iv. pp. 25 & 26, pl. v. figs. 8 & 9.

Cryptopodia spatulifrons, sp. n., with var. *lævissima*, id. Ann. N. H. (5) iv. pp. 36 & 37, pl. v. fig. 10, Shark's Bay, W. Australia.

Ceratocarcinus spinosus, sp. n., *id. l. c.* p. 37, Eastern Seas.

CYCLOMETOPA.

Cancridæ.

Cancer borealis (Stimps.) = *irroratus*, female (Say), Casco Bay, on exposed and very rocky shores, at low water never concealed among the rocks like *C. irroratus*; S. I. Smith, Tr. Conn. Ac. v. p. 39, pl. viii.

Atergatis frontalis (De Haan). Complete specimen from Amoy described by De Man, Notes Leyd. Mus. 1879, p. 54.

Lophactæa rotundata (Stimps.); A. Milne-Edwards, Crust. Mexic. vi. p. 243, pl. xliv. fig. 2, Cape S. Lucas, California.

Atergatopsis amoyensis, sp. n., De Man, Notes Leyd. Mus. 1879, p. 53, Amoy.

Actæa dovii (Stimps.), West coast of Central America; A. Milne-Edwards, *l. c.* p. 244, pl. xlv. fig. 1.

Actæodes tomentosus (M.-Edw.) var. from Japan; Miers, P. Z. S. 1879, p. 30.

Medæus spinimanus (M.-Edw.), Guadelupe; A. Milne-Edwards, *l. c.* p. 250, pl. xliv. fig. 3.

Chlorodius fisheri (Lockington); Kingsley, P. Bost. Soc. xx. p. 154, Gulf of California.

Leptodius exaratus (M.-Edw.) var. = *Xantho affinis* (Haan), Japan; Miers, P. Z. S. 1879, p. 31.

Carpoporus porulosus (Stimps.); A. Milne-Edwards, *l. c.* p. 246, pl. xliv. fig. 1, Tortugas.

Xantho denticulatus [*-a*] (White), Cuba and Vera Cruz, and *X. stimpsoni*, sp. n., = *denticulata* (Stimps., *nec* White), California; *id. l. c.* p. 251, pl. xlv. fig. 2.

Xantho novem-dentatus [*-a*] (Lockington); Kingsley, P. Bost. Soc. xx. p. 153, Lower California.

Xanthodes taylori (Stimps.); A. Milne-Edwards, *l. c.* p. 261, pl. xlv. fig. 3, Lower California.

Glyptoxanthus, g. n. Cephalothorax sculptured with flexuous furrows. *G. vermiculatus* (Lamarck, as *Cancer*), locality unknown, *labyrinthicus* (Stimps., as *Actæa*), W. coast of Mexico, and *erosus* (Stimps., as *Actæa*), Florida; *id. l. c.* pp. 252–256, pl. xliii. figs. 2–4, & pl. xliv. fig. 4. *Actæa*

corrosa and *cavernosa* (M.-E.) and *angolensis* (Brito Capello) also belong to this genus.

Cycloxanthus vittatus (Stimps., as *Xantho*), Cape S. Lucas and Panama; A. Milne-Edwards, Crust. Mexic. vi. p. 259, pl. xlvi. fig. 5.

Lophoxanthus, g. n. A cutting crest along the anterior edge of the legs. *L. lamellipes* and *bellus* (Stimps., as *Xantho*), California and W. coast of Mexico; *id. l. c.* pp. 256–258, pl. xlvi. figs. 3 & 4.

Menippe mercenaria (Say), Cuba and Florida, *rumphi* (Fab.) = *nodifrons* (Stimps.), Brazil, *obtusa* (Stimps.), *frontalis*, sp. n., Ecuador and Panama, and *rudis*, sp. n., Cape Verde Islands; *id. l. c.* pp. 262–264, pls. xlvii. & xlviii. figs. 1–4.

Panopeus packardi, sp. n., Key West, Florida, *affinis* (Streets & Kingsley, 1877) and *purpureus* (Lockington), Lower California; Kingsley, P. Bost. Soc. xx. pp. 152 & 151.

Eriphiidæ.

Geryon quinquedens, sp. n., S. I. Smith, Tr. Conn. Ac. v. [p. 33, pl. ix. figs. 1 & 2, Gulf of Maine and Massachusetts Bay, deep water.

Epixanthus dilatatus, sp. n., De Man, Notes Leyd. Mus. 1879, p. 58, Java.

Ozius granulosus, sp. n., *id. l. c.* p. 56, Bay of Gorontalo, Celebes.

Eurycarcinus integrifrons, sp. n., *id. l. c.* p. 55, Indian Seas.

Pilumnus dasypodus [*-pus*] and *melanacanthus*, spp. nn., Kingsley, *l. c.* pp. 155 & 156, Key West, Florida. *P. spino-hirsutus* (Lockington, 1876), *id. l. c.* p. 154, Gulf of California.

Pilumnus dehaani, sp. n., and *hirsutus* (Stimps.), Japan; Miers, P. Z. S. 1879, pp. 32 & 31.

Portunidæ.

Cœnophthalmus, g. n. Allied to *Carcinus*, but antennæ excluded from the orbit. *C. tridentatus*, sp. n., A. Milne-Edwards, *l. c.* p. 236, pl. xlii. fig. 2.

Portunus corrugatus (Pennant), from Japan, = *strigilis* (Stimps.); Miers, P. Z. S. 1879, p. 33.

Goniosoma, Milne-Edw. (= *Charybdis*, De Haan, preoccupied in *Cœlenterata*), nec Perty, 1832, *Arachn.*, requires renaming; E. Simon, Ann. Ent. Belg. xxxii. p. 227, note.

Goniosoma acutifrons, sp. n., locality not indicated, *sex-dentatum* (Herbst) and *dubium* (Hoffmann); De Man, Notes Leyd. Mus. 1879, pp. 60 & 59.

Achelous depressifrons (Stimps.); A. Milne-Edwards, *l. c.* p. 230, pl. xl. fig. 4, Florida.

Callinectes diacanthus (Latr.) is very variable, including as varieties of the Atlantic coast of America, *C. hastatus*, *ornatus*, *larvatus*, and *tumidus* (Ordway), *bocourti* (n.), and *cayennensis* (n.) = *D. danæ* (Smith); from the Cape Verde Islands, *africanus* (n.); from the Pacific, *C. toxotes* (Ordw.), *robustus* (n.), *bellicosus* (Stimps.), *arcuatus* and *pleuriticus* (Ordw.) and *nitidus* (n.). A. Milne-Edwards, *l. c.* pp. 222–229, pl. xli.

Callinectes dubia, sp. n., Kingsley, P. Bost. Soc. xx. p. 156, Gulf of Fonseca, W. coast of Nicaragua.

Bathynectes longispina (Stimps.); A. Milne-Edwards, *l. c.* p. 234, pl. xlii. fig. 1, Sand Key, 100–120 fath.

Neptunus xantusi (Stimps.) = *asper* (M.-E.), Mazatlan and S. Diego, *ventralis* and *sulcatus*, spp. nn., Guadelupe; *id. l. c.* pp. 213–215, pl. xxxviii. fig. 1, pl. xxxix. figs. 3 & 4, pl. xl. fig. 3.

Hellenus, subg. n. of *Neptunus*. The posterior angles (corners) of the cephalothorax acute, often bearing a short spine. *N. hastatoides* (Fab.), *tuberculosus* and *rugosus* (Alph. M.-E.), *spinicarpus* and *tuberculatus* (Stimps.), belong to this subgenus. *Id. l. c.* pp. 210 & 221, the two latter figured, pl. xxxix. fig. 1, pl. xl. fig. 1.

Euphylax dovii (Stimps.) and *robustus* (A. M.-Edw., 1874), W. coast of Mexico; *id. l. c.* pp. 204 & 205, pls. xxxvii. & xxxviii. fig. 2.

CATOMETOPA.

Telphusidæ.

Paratelphusa convexa (De Haan, MS.), Java, Timor, and New Guinea, and *maculata*, Sumatra, spp. nn., and *tridentata* (Milne-Edw.), Java, Timor, Bavian, and Solor; De Man, Notes Leyd. Mus. 1879, pp. 61–64.

Gecarcinidæ.

Limnocarcinus, g. n. Front not united to the internal suborbital lobes quite as in *Hylæocarcinus*, external maxillipeds as in *Pelocarcinus*, their third joint having an obtuse-angled emargination in the anterior border, and the three terminal joints being fully visible when the maxillipeds are closed. *L. intermedius*, sp. n., Bay of Gorontalo, Celebes. De Man, *l. c.* p. 66.

Ocypodidæ.

Gelasimus coarctatus (M.-E.) found at Lissa; Stossich, Boll. Soc. Adr. iii. [1878] p. 190.

Gelasimus perlatus (Herkl.) = *tangeri* (M.-E.); De Man, *l. c.* p. 66.

Gelasimus lacteus (Haan); Miers, P. Z. S. 1879, p. 36, Japan.

Gonoplacidæ.

Macrophthalmus polleni (Hoffmann) = *latreillii* (M.-E.); De Man, *l. c.* p. 66.

Carcinoplacidæ.

Heteroplax ? nitidus, sp. n., Miers, P. Z. S. 1879, p. 39, pl. ii. fig. 2, Corean Straits, 40 fath.

Pinnoteridæ.

Pinnoteres maculatus (Say) and *Pinnixa cylindrica* (White). On their larval stages, see above, in General Subject.

Malacosoma, g. n. Second joint of the external maxillipeds rectangular and but a little longer than broad, third joint quadrangular, shorter than the second, and bearing the following joint on its internal angle; internal margins of both these joints straight, lying close to those of the opposite side; their exopodites stout, almost half as broad as the third joint. Otherwise like *Pinnotheres*. *M. reticulatum*, sp. n., De Man, *l. c.* p. 67, Amboina.

Rhizopidæ.

Typhlocarcinus villosus (Stimps.); Miers, P. Z. S. 1879, p. 40, Japan.

Grapsidæ.

Grapsus pelii (Herkl.) = *Goniopsis cruentatus* (Latr.); De Man, *l. c.* p. 68.

Pachygrapsus transversus (Gibbes), Florida, and *gracilis* (Stimps.); Kingsley, P. Bost. Soc. xx. pp. 158 & 159.

Nautilograpsus pusillus (De Haan) distinct from *minutus* (L., Milne-Edw.); De Man, *l. c.* p. 69.

Platygrapsus depressus (Haan); Miers, *l. c.* p. 37, Japan.

Heterograpsus longitarsis, sp. n., *id. ibid.* pl. ii. fig. 2, Japan. Note on *H. sanguineus* and *penicillatus* (Haan), Japan, by De Man, *l. c.* pp. 70 & 71.

Gnathograpsus intermedius, sp. n., De Man, *l. c.* p. 69, Moluccas.

Hypselograpsus, g. n. External maxillipeds as in *Gnathograpsus*, but carapace very convex and front very deflexed. *H. deldeni*, sp. n., *id. l. c.* p. 72, Menado, Celebes.

OXYSTOMA.

Corystidæ.

Trichocarcinus, new name for *Trichocera* (Haan), preoccupied in *Diptera*. *T. dentatus* and *affinis*, spp. nn. Miers, P. Z. S. 1879, pp. 34 & 35, Japan.

Telmessus acutidens (Stimps.); *id. l. c.* p. 36, Japan.

Calappidæ.

Calappa convexa (Saussure); Kingsley, P. Bost. Soc. xx. p. 159, Panama.

Leucosiidæ.

Leucosia hæmatosticta (Adams & White), ? juv.; Miers, P. Z. S. 1879, p. 40, Japan.

Leucosia splendida, Port Jackson, *cheverti*, Cape Grenville and Darnley Island, Torres Straits, *leslii*, Darnley Island, *moresbiensis*, Port Moresby, New Guinea, spp. nn., Haswell, P. Linn. Soc. N. S. W. iv. pp. 47-49, pl. v. figs. 1 & 2, and pl. vi. fig. 1.

Myra dubia, sp. n., Miers, P. Z. S. 1879, p. 42, Japan.

Myra australis and *darnleyensis*, spp. nn., Haswell, *l. c.* pp. 50 & 51, pl. v. figs. 3 & 4, Darnley Island, Torres Straits.

Myrodes gigas, sp. n., *id. l. c.* p. 52, pl. v. fig. 5, Darnley Island.

Pseudophilyra, g. n. Distinct from *Leucosia* by the absence of the pit in the sub-hepatic region (thoracic sinus of Bell), and from *Philyra* by the prominent tridentate front and more slender and straight exognath of the outer maxillipeds. *P. tridentata*, sp. n., Japan, Miers, P. Z. S. 1879, pp. 40 & 41, pl. ii. fig. 4.

Philyra. Un-identified species from Japan; *id. l. c.* p. 41.

Ebalia rhomboidalis, *minor*, and *bituberculata*, spp. nn., *id. l. c.* pp. 42 & 43, Japan.

Cryptocnemus pentagonus (Stimps.); *id. l. c.* p. 43, pl. ii. fig. 5, Japan.

Phlyxia orbicularis, *granulosa*, and *ramsayi*, spp. nn., Haswell, *l. c.* pp. 54 & 55, the two first pl. vi. figs. 2 & 3, New South Wales.

Lithadia ? sculpta, sp. n., *id. l. c.* p. 57, pl. vi. fig. 5, Fitzroy Island.

Arcania orientalis, sp. n., Miers, *l. c.* p. 44, Japan.

Arcania pulcherrima, sp. n., Haswell, *l. c.* p. 58, Torres Straits.

ANOMURA.

Dromiidæ.

Dynomene (Latr.) monographed by Milne-Edwards, *D. hispida* (Desm.) = *latreillii* (Eyd. & Soul.), Red Sea, Mauritius, New Caledonia, and Sandwich Islands, *prædator*, sp. n., Samoa Islands and New Caledonia, *ursula* (Stimps., 1860), Lower California, all three figured; Ann. Sci. Nat. (6) viii. Art. 3, 11 pp. 3 pls.

Cryptodromia. Un-identified young specimens from Japan; Miers, P. Z. S. 1879, p. 44.

Homolidæ.

Paratymolus, g. n. Carapace shaped nearly as in *Homola*; antennæ long; outer maxillipeds more of the Maioid type; no defined orbits; legs all alike in form, fifth pair not raised upon the back. *P. pubescens*, sp. n., Miers, *l. c.* p. 45, pl. ii. fig. 6, Japan.

Lithodidæ.

Cryptolithodes expansus, sp. n., *id. l. c.* p. 47, North Japan.

Raninidæ.

Lyreidus elongatus, sp. n., or perhaps = *tridentatus* (Haan); *id. l. c.* p. 46, Japan.

Hippidæ.

Hippa talpoidea (Say). First stages of development; Faxon, Bull. Mus. C. Z. v. No. 11, pp. 254–256, pl. i.

Paguridæ.

Eupagurus prideauxi (Leach) = *solitarius* (Risso, Roux), single small specimens to a depth of 105 mètres at Marseilles; Marion, Ann. Sci. Nat. (6) viii. Art. vii. p. 37.

Eupagurus cavimanus, sp. n., Miers, *l. c.* p. 48, pl. iii. fig. 1, Japan.

Parapagurus, g. n. Gills composed of numerous cylindrical papillæ, as in the majority of *Macrura*, instead of lamellæ, as in most *Paguridæ*; male appendages well developed and symmetrically paired on the first and second abdominal segments; external maxillipeds widely separated at their base; chelipeds very unequal; eyes small, antennulæ and antennæ very long; sternum narrow. *P. pilosimanus*, sp. n., S. I. Smith, Tr. Conn. Ac. v. pp. 50–54, off Nova Scotia, 250 fath.

Pomatocheles, g. n. Carapace, eyes, antennæ, and cephalothoracic limbs like those of *Cancellus*; post-abdomen narrow, straight, with parallel sides, distinctly segmented as in the *Macrura*; hands equal, bent obliquely downwards from the wrist and flattened above, fingers opening horizontally and acute at tips. *P. jeffreysi*, sp. n., Japan, 48 fath., ensconced within the shell of *Dentalium*. Miers, P. Z. S. 1879, p. 49, pl. iii. fig. 2.

Porcellanidæ.

Porcellana spinulifrons, sp. n., Miers, *l. c.* p. 46, Japan.

Porcellana macrocheles (Gibbes); its metamorphosis described by Faxon, Bull. Mus. C. Z. v. No. 11, pp. 256–262.

MACRURA.

Several observations on the habits of the lobster and of *Palinurus*, *Scyllarus*, *Galatea*, *Palæmon*, *Peneus*, and *Squilla* made at the zoological station of Naples by H. Schmidtlein, MT. zool. Stat. Neap. i. pp. 501–514.

Galateidæ.

Galatea orientalis (Stimps.); Miers, *l. c.* p. 51, Japan.

Scyllaridæ.

Scyllarus arctus (L.): note on it by Cornish, Zool. 1879, pp. 473–477.

Ibacus peroni (Lam.). Its *Phyllosoma* described by W. Haswell, P. Linn. Soc. N. S. W. iv. pp. 280–282; *P. dupereyi* (Lesson) may be an earlier stage of the same.

ERYONIDÆ.

Polycheles typhlops (Heller) ?. Last periopods simple in male, chelate in female, from the 'Porcupine' Expedition, described by Norman, who thinks that possibly dimorphous males are to be found in the genus; *Willemoesia* and *Pentacheles* are the female form, and the few male specimens of both, mentioned by Spence Bate, are the second form of males with preponderance of female characters. The rudimentary eye, as described by Heller in *Polycheles*, is different from that described by Bate, who is probably right. Ann. N. H. (5) iv. pp. 173-182.

Amphion (M.-E.) is probably the larva of *Polycheles* (*Willemoesia*); Boas, Zool. Anz. ii. pp. 256–258.

ASTACIDÆ.

Astacus fluviatilis. Monograph by Huxley (title, *suprà*), abstract in Nature, xxi. pp. 353–355.

Astacus fluviatilis (F.) moults at Neuchatel three times in the year, but only once in the first year; it becomes mature for generation in the fourth year; copulation takes place in November. Rougemont, Bull. Soc. Neuch. xi. p. 401.

For physiological observations on it, see above, in General Subject.

The species, habits, and geographical distribution of the crayfishes living in Southern Russia, chiefly in and near the Ural, are discussed by Malachow, Hor. Ent. Ross. xi. pp. 27–44.

Astacoides serratus (Shaw), "The Murray Lobster" described and well figured by F. McCoy, Prodr. Zool. Vict., Dec. ii. [1878], p. 17, pl. xv.: *A. armatus* (Martens), and ? *A. spinifer* (Heller), are referred to it. *A. bicarinatus* (Gray); *id. op. cit.* iii. p. 45, pl. xxix.

Cambarus pellucidus (Tellkampf). On its eye, see ANATOMY, &c., *suprà*, p. 6.

CRANGONIDÆ.

Paracrangon echinatus (Dana), from Japan; Miers, P. Z. S. 1879, p. 52.

Sabinea septemcarinata (Ross), and *sarsi*, sp. n., S. I. Smith, Tr. Conn. Ac. v. pp. 57–60, pl. xi. figs. 5–13, both in New England, 26–60 fath., and also Lofoden Islands, Norway, the former more common, and also found in Greenland, Iceland, and Spitzbergen.

ATYIDÆ.

Caridina typus (M.-E.), from Rodriguez Island; Miers, in Zoology of Rodriguez, *Crustacea*, p. 8.

Alpheidæ.

Alpheus japonicus and *kingsleyi*, spp. nn., Miers, P. Z. S. 1879, pp. 53 & 54, Japan.

Rhynchocyclus planirostris (Haan) = *mucronatus* (Stimps.); *id. l. c.* p. 55, Japan.

Palæmonidæ.

Pandalus montagui (Leach, 1813 or 1814) = *annulicornis* (Leach, 1815) = *lævigatus* (Stimpson); S. I. Smith, Tr. Conn. Ac. v. p. 87, New England, common.

Palæmon ornatus (Oliv.), from Rodriguez Island; *P. reunionensis* and *longimanus* (Hoffmann) are probably the same species. Miers, *Crustacea* in Zoology of Rodriguez, p. 9.

Palæmon rosenbergi, sp. n., Andai, New Guinea, *pilimanus*, sp. n., Sumatra, *lamarei* (De Haan, *nec* Miln.-Edw.) = *amazonicus* (Heller), from Surinam, and very probably not from Japan, *ornatus* (Ol.) = *vagus* (Hell.) = *longimanus* (Hoff.), Xulabessi Island, Malayan Archipelago, *reunionensis* (Hoff.) = *equidens* (Hell.), *nipponensis* (De H.) = *sinensis* (Hell.), and notes on some other species from Africa, Japan, and the Malayan Archipelago. J. G. de Man, Notes Leyden Mus. 1879, pp. 165–184.

Palæmonetes varians (Leach) and *vulgaris* (Say). On its occurrence and development, see above, in the General Subject.

Hippolyte, as first proposed by Leach (1813 or 1814) = *Virbius* (Stimpson), but as nothing but additional synonymy and confusion can result, the author accepts the generic names as they now stand. The number and position of the teeth upon the rostrum and dorsal carina vary considerably: in *H. fabricii* (Kröyer), above from 3–5, beneath from 2–6; in *H. macilenta* (Kröyer), above from 9–15, beneath from 1–4; in *H. phippsi* (Kröyer), above from 6–10, beneath from 1–4; in *H. polaris* (Ross), above from 0–8, beneath from 2–5; in *H. phippsi*, 1 or 2 supra-orbital spines on each side; in *H. polaris* the pterygostomal spine well developed, or rudimentary, or wholly absent. Eleven species from North America north of Cape Cod enumerated, *H. gaimardi* (M.-Edw.), *securifrons* (Norm.), *pusiola* (Kröy.), *polaris* (Ross) figured. S. I. Smith, Tr. Conn. Ac. v. pp. 62–86, pl. ix. figs. 4–9, pl. ii. figs. 2 & 3, pl. xi. figs. 1–4.

Hippolyte leptognatha (Stimps.), var. from Japan; Miers, P. Z. S. 1879, p. 56.

Peneidæ.

Peneus. Australian species enumerated, including *esculentus*, Port Jackson and Port Darwin, *macleayi*, Port Jackson, *granulosus*, Torres Straits and Cape York, *mastersi*, Port Darwin, *novæ-guineæ*, New Guinea, and *palmensis*, Palm Island, spp. nn., Haswell, P. Linn. Soc. N. S. W. iv. pp. 38–43.

SERGESTIDÆ.

Lucifer typus (M.-Edw.) described from specimens taken at night with the hand-net near Fort Wool, Virginia, by W. Faxon, Chesapeake Zool. Laborat. 1878, pp. 113–119, pl. vii.

SCHIZOPODA.

NEBALIIDÆ.

A. S. PACKARD (*suprà*, in Classification) considers this family as a distinct order, to be called *Phyllocarida*, which is the forerunner of *Decapoda*, being represented by some gigantic forms as *Dithrocaris*, over a foot long, in the Silurian period, and remarkable by a combination of Copepod, Phyllopod, and Decapod characteristics.

Nebalia longicornis, sp. n., Thomson, Ann. N. H. (5) iv. pp. 418 & 419, pl. xix. figs. 7–9, Dunedin, New Zealand.

MYSIDÆ.

The ultimate and penultimate segments of the more or less numerously segmented thoracic feet are homologous with the dactylus and propodus of the *Carides*, and the additional segments all result from segmentation of the carpus. S. I. Smith, Tr. Conn. Ac. v. p. 96, footnote.

Boreomysis, 4 spp., *Siriella*, 1 sp., *Leptomysis*, 2 spp., *Hemimysis*, 1 sp., *Mysis*, 10 spp., *Mysidella*, 2 spp., *Parerythrops*, 2 spp., *Pseudomma*, 1 sp., and *Mysideis*, 1 sp., all from Norway, accurately described and figured by G. O. Sars, Mysid. iii. 131 pp. 31 pls.

Mysis stenolepis (S. I. Smith), New England. The young appear in early summer, come to maturity early in the winter, produce young from midwinter to spring, and all the mature individuals disappear before the second summer, the males disappearing long before the females. Smith, *l. c.* p. 105.

Heteromysis (S. I. Smith, 1874) = *Chiromysis* (G. O. Sars, 1877); *H. formosa* (S. I. Smith) closely allied to, but distinct from the Mediterranean species, Vineyard Sound, hidden inside dead bivalve shells, 5–10 fath. *Id. l. c.* pp. 101 & 102.

Meterythrops, g. n. Body very short, posterior cephalothoracic segments almost completely covered above by the carapace; eyes well developed; antennulæ, antennæ, oral and cephalothoracic appendages nearly as in *Parerythrops*; pleopods in the female rudimentary, in the male well developed; inner branch in the first pair, however, rudimentary, its terminal part membranaceous and nearly naked; ovigerous pouch as in *Mysis*. *M. robusta*, sp. n., *id. l. c.* pp. 93–98, pl. xii. figs. 1 & 2, Massachusetts Bay and Gulf of St. Lawrence, 33 & 70 fath.

Pseudomma truncatum, sp. n., *id. l. c.* p. 99, pl. xii. figs. 3 & 4, Gulf of St. Lawrence.

STOMAPODA.

Squilla empusa (Say). Brooks describes the metamorphosis from the *Alima* stage of the larva, probably that in which it escapes from the egg, to the adult form; Chesapeake Zool. Laborat. 1878, pp. 143–170, pls. ix.–xiii.

Squilla lævis, sp. n., Hutton, Tr. N. Z. Inst. xi. p. 340, Auckland Islands.

CUMACEA.

Diastylis politus, sp. n., S. I. Smith, *l. c.* p. 106, Vineyard Sound, &c., on the surface, Nova Scotia, 190 fath.

Diastilis bradyi and *strigata*, Lough Swilly, co. Donegal, 15 fath., *calveri*, 53° N. 15° W., 1630 fath., and *armata*, 59° N. 50° W., 1750 fath., spp. nn., and 12 known species, described by Norman, Ann. N. H. (5) iii. p. 59, resp. 54–65.

Heterocuma, g. n. General form, obsolescence of the terminal post-abdominal segment, form of the uropods as in *Eudorella* (Norman), but the eye well developed; two unequal setæ at the tip of the flagella of the first maxillæ; third joint of the third pair of maxillipeds with its extero-distal angle greatly produced and acuminated, fourth joint of the same dilated and truncated at its distal extremity. *H. sarsi*, sp. n., with var. *granulata*, Japan, 40–50 faths. Miers, P. Z. S. 1879, pp. 57–59, pl. iii. fig. 3.

? *Diastylopsis*, g. & sp. nn., Vancouver Straits, S. I. Smith, in Rep. Geol. Surv. of Canada, 1878–79, p. 206 B.

Leucon serratus, sp. n., entrance of Davis Strait, 1750 fath., *brevirostris*, sp. n., South of Rockall, 109 fath., and *longirostris* (G. O. Sars), described by Norman, Ann. N. H. (5) iii. pp. 70, 71, & 69.

Eudorella hirsuta (G. O. Sars), midway between Ireland and Rockall, 1380 fath., described; *id. l. c.* p. 72.

Eudorella integra, sp. n., S. I. Smith, Tr. Conn. Ac. v. p. 116, aberrant form, like *E. deformis*, perhaps generically distinct, Nova Scotia and Gulf of St. Lawrence, 53–110 fath.

Lamprops quadriplicata, sp. n., *id. l. c.* p. 118, Massachusetts, 10 fath.

Leptostylis producta, sp. n., Norman, Ann. N. H. (5) iii. p. 65, Butt of Lewis, 59° N., 458 fath.

Chalarostylis, g. n. Male with three pairs of the feet on the pleon, each consisting of a long peduncle and two branches furnished with plumose setæ. Telson short, terminating in three spines. Uropods remarkably long and slender. Otherwise similar to *Diastylis*. Female unknown. *C. elegans*, sp. n., off Rockall, 109 fath. *Id. l. c.* pp. 65–67.

Spencebatea, g. n. Male with five segments of cephalothorax exposed behind the carapace; all feet, except the last, palpigerous; no feet on pleon; telson rudimentary; both branches of uropods two-jointed.

Female unknown. *S. abyssicola*, sp. n., West of Donegal Bay, 1360 fath. *Id. l. c.* p. 67.

Iphinoe (Bate). Generic characters and difference from *Leucon*; id. l. c. p. 68.

AMPHIPODA.

Orchestiidæ.

Orchestia cavimana (Heller, terrestrial, from Cyprus) found in a garden near Zalt-Bommel, Gelderland, 80 kilomètres from the sea; Hoek, Tijdschr. Nederl. Dierk. Ver. iv. pp. 130–133, pl. ix. figs. 8–10.

Orchestia macleayana, sp. n., Haswell, P. Linn. Soc. N.S.W. iv. p. 250, pl. vii. fig. 2, New South Wales.

Talorchestia diemenensis, sp. n., *id. l. c.* p. 248, pl. vii. fig. 6, Tasmania. *T. quadrimana* (Dana), from New South Wales; *id. l. c.* p. 250, pl. vii. fig. 3.

Talitrus sylvaticus, sp. n., *id. l. c.* p. 246, pl. vii. fig. 1, New South Wales, 30 miles from the coast, on moist ground.

Hyale lubbockiana (S. Bate, as *Nicea*) = *Allorchestes imbricatus* (S. Bate); Stebbing, Ann. N. H. (5) iv. p. 396.

Hyale, subg. *Allorchestes* (Dana), *jelskii*, sp. n., freshwater springs on the Eastern slope of the Cordilleras at Pumamarca, 8000 feet above the sea, and *lubomirskii*, sp. n., freshwater spring at the western slope of the same at Pacasmayo, 9000 feet. Wrzesniowski, Zool. Anz. ii. pp. 175–178. *H. dybowskii*, sp. n., *id. l. c.* p. 199, Montana de Nancho, 7000 feet.

Hyale, subg. *Nicea* (Nicolet), *stelzmanni*, sp. n., *id. l. c.* p. 201, Chimbote, Peru, in tide-pools.

Allorchestes rupicola, *longicornis*, and *crassicornis*, spp. nn., Haswell, *l. c.* pp. 250–252, pl. viii. fig. 1, pl. vii. figs. 4 & 5, New South Wales. *A. niger*, sp. n., *id. l. c.* p. 319, Port Jackson, common among seaweed.

Gammaridæ.

Lysianassa nitens and *affinis*, spp. nn., Haswell, *l. c.* pp. 255 & 256, Port Jackson, the first pl. viii. fig. 5. *L. australiensis*, sp. n., *id. l. c.* p. 323, pl. xviii. fig. 3, Port Jackson.

Callisoma branickii, sp. n., Wrzesniowski, Zool. Anz. ii. pp. 349–351, Nice.

Glycera, g. n. [name preoccupied in *Annelides*], subfamily *Lysianassinæ*. Superior antennæ slender, rather long, provided with an appendage. Mandibles with a palpus, the incisive edge not toothed; no accessory plate; anterior margin with a prominent tubercle. Maxillipeds with large squamiform processes on the basal joint. Four anterior pairs of coxæ deeper than their respective segments, the fourth pair slightly produced inferiorly and posteriorly. Gnathopods filiform, slender; anterior pair smaller than the posterior, imperfectly subchelate; posterior pair subchelate. Posterior pleopods biramous, the rami broad-lanceolate.

Telson double. *G. tenuicornis*, sp. n. Haswell, *l. c.* pp. 256 & 322, pl. viii. fig. 6, Howick Islands, N.E. Australia.

Stegocephalus latus, sp. n., *id. l. c.* p. 252, pl. viii. fig. 2, Tasmania.

Amaryllis, g. n., subfam. *Stegocephalinæ*. Superior antennæ with a well-developed appendage. Mandibles with a palpus. Maxillipeds with well-developed squamiform plates. Anterior gnathopods subpediform. Posterior gnathopods imperfectly subchelate. Rami of the fourth and fifth pleopods styliform; those of sixth pair broad, lanceolate. Telson squamiform, cleft. *A. macrophthalmus*, Tasmania, and *brevicornis*, Port Jackson. Haswell, *l. c.* pp. 254 & 255, the former pl. viii. fig. 3.

Neobule, g. n., subfamily *Stegocephalinæ*. Superior antennæ simple. Mandibles without an appendage. Maxillipeds with a squamiform process on the bases only. Gnathopods subchelate; second pair the larger; coxæ of anterior pair well-developed. Fourth pair of coxæ wide, excavated behind to receive the anterior part of the fifth pair. Posterior pleopods biramous. Telson squamiform. *N. algicola*, sp. n., Haswell, *l. c.* p. 255, pl. viii. fig. 4, Kiama, New South Wales.

Cyproidea, g. n., subfamily *Stegocephalinæ*. Body broad, perion and pleon of equal length. Coxæ of the first and second pair of periopods enormously developed, and cemented together to form broad and deep lateral shields, almost entirely concealing the gnathopods and periopods, extending forwards to the sides of the cephalon and backwards as far as the posterior border of the sixth thoracic segment, excavated posteriorly for the amalgamated shallow coxæ of the third and fourth periopods. Mandibles with a palpus. Gnathopods subcheliform. Telson single. *C. ornata* and *lineata*, spp. nn., Clark Island, Port Jackson, amongst seaweed at low-water mark. Haswell, *l. c.* pp. 320–322, pl. xviii. figs. 1 & 2.

Phoxus villosus and *batii*, spp. nn., *id. l. c.* pp. 258 & 259, pl. ix. figs. 2 & 3, Port Jackson.

Urothoe pinguis, sp. n., *id. l. c.* p. 325, pl. xix. fig. 2, Bondi, New South Wales.

Montagua miersi and *longicornis*, spp. nn., *id. l. c.* p. 323, pl. xxiv. figs. 4 & 5, Port Jackson.

Eusirus dubius, sp. n., *id. l. c.* p. 331, pl. xx. fig. 3, Tasmania.

Leucothoe commensalis, sp. n., Port Jackson (common, in the pharynx of Ascidians), *diemenensis* and *gracilis*, spp. nn., Tasmania, *id. l. c.* pp. 261–263, pl. x. figs. 3 & 2, pl. ix. fig. 5. *L. novæ-hollandiæ*, sp. n., *id. l. c.* p. 329, pl. xx. fig. 2, New South Wales.

Amphithonotus lævis, sp. n., Thomson, Ann. N. H. (5) iv. p. 330, pl. xvi. figs. 1–4, Dunedin, New Zealand.

Œdicerus latrans and *arenicola*, spp. nn., Haswell, *l. c.* pp. 324 & 325, pl. xix. fig. 1, pl. xxiv. fig. 3, New South Wales, burrowing in sand near high-water mark, the last closely resembling *Œ. fossor* (Stimps.).

Pherusa lævis, sp. n., *id. l. c.* p. 260, pl. ix. fig. 4, New South Wales.

Iphimedia ? *ambigua*, sp. n., *id. l. c.* p. 327, pl. xxiv. fig. 2, New South Wales.

Atylus swammerdammi (M.-Edw.). Dutch specimens described by P. P. C. Hoek, Tijdschr. Nederl. Dierk. Ver. iv. pp. 134–137, pl. vi. fig. 5, pl. x. figs. 1–6.

Atylus monoculoides and *lippus*, spp. nn., Haswell, *l. c.* pp. 327 & 328, pl. xviii. fig. 4, pl. xx. fig. 1, Port Jackson.

Calliopius laviusculus (Kröyer). Dutch specimens described by Hoek, *l. c.* pp. 138–140, pl. vi. figs. 4, 6 & 7, pl. x. fig. 7.

Gammarus puteanus (Koch). Measurements by P. Godet, Bull. Soc. Neuch. xi. pp. 284 & 285. He rectifies the measurement given by him, *op. cit.* ix., and states that the *Gammarus* has also been found near Neuchatel in a small pond, darkened by an overhanging rock; *op. cit.* xi. p. 285. De Rougemont maintains his view that *G. puteanus* is a very variable species [Zool. Rec. xiii. *Crust.* p. 13]; *tom. cit.* pp. 286 & 430. Godet thinks that *G. foreli* may be a distinct species, it being only found in lakes or wells communicating with them; *l. c.* p. 431.

Gammarus (*Niphargus*) *puteanus* (Koch) found in a well in Heligoland, a variety with bluish-grey coloured back in a spring between incrusted moss at the limit of light and darkness, probably widely distributed throughout Central Europe, very variable in absolute size of the body, and in the relative size of several appendages. Fries, Zool. Anz. ii. pp. 35–38.

Fries, *l. c.*, agrees with Rougemont, that *Crangonyx* and *Niphargus* are only different stages of age or local varieties of *Gammarus puteanus*.

Niphargus puteanus (Koch) found also in a well at Venice and Mestre; G. Joseph, JB. schles. Ges. 1879–80, pp. 35 & 36, and Zool. Anz. ii. pp. 350 & 351.

Goplana, g. n. Distinct from *Crangonyx* by the three last segments being united into one piece. *G. polonica*, sp. n., Warsaw, in stagnant ditches; observations on its copulation. *Gammarus ambulans* (Franz Müller) also belongs to this genus. Wrzesniowski, Zool. Anz. ii. pp. 299–302.

Megamæra mastersi, Port Jackson, and *diemenensis*, Tasmania, spp. nn., Haswell, *l. c.* pp. 265-267, pl. xi. figs. 1 & 3. *M. subcarinata* and *bœcki*, Port Jackson, *suensis*, Sue Island, Torres Straits; *id. l. c.* pp. 335 & 336, pl. xxi. figs. 4–6.

Mœra spinosa, sp. n., Tasmania, and *rubro-maculata* (Stimpson, as *Gammarus*), Port Jackson, *id. l. c.* pp. 267 & 268, pl. x. figs. 5 & 4. *M. dentifera*, *hamigera*, *viridis*, and *approximans*, spp. nn., *id. l. c.* pp. 332–334, pl. xx. fig. 4, pl. xxi. figs. 1–3, Port Jackson.

Mœra miersi, sp. n., Wrzesniowski, *l. c.* pp. 348 & 349, Chimbote, Peru, in tide-pools.

Melita obtusata (Mont.). Dutch specimens described by Hoek, *l. c.* pp. 140–142, pl. x. figs. 8 & 9.

Melita australis and ? *ramsayi*, spp. nn., Haswell, *l. c.* pp. 264 & 265, pl. ix. figs. 6 & 7, pl. x. fig. 1, Port Jackson, the first very common. The latter removed to the genus *Mœra*; id. *l. c.* p. 334.

Lada, g. n., near *Melita*. Hand of the first pair of feet with a short thick, hooked immobile process instead of a claw; claw of the hand of the second pair clasped against the inner surface of the hand, not against the palmar edge. *L. chalubinskii*, sp. n., Wrzesniowski, *l. c.* pp. 322–324, Chimbote, Peru, in tide-pools.

Chirocratus brevicornis, sp. n., Hoek, *l. c.* iv. pp. 142–144, pl. x. figs. 10–13, Terschelling Island, Dutch Coast.

Ampelisca æquicornis (Bruz.). Dutch specimens described; *id. l. c.* pp. 144–146.

Ampelisca australis, sp. n., Haswell, *l. c.* p. 257, pl. viii. fig. 6, Port Jackson.

Microdeuteropus australis, p. 271, pl. xi. fig. 5, *mortoni*, *tenuipes*, and *chelifer*, pp. 339 & 340, pl. xxii. figs. 1–3, spp. nn., *id. l. c.*, Port Jackson.

Microdeutopus maculatus, sp. n., Thomson, Ann. N. H. (5) iv. p. 331, Dunedin, New Zealand.

Harmonia, g. n. Allied to *Eurystheus* and *Amathia*, distinct from the former by the single elongate telson and the stout periopods, from the latter by the large size of the posterior gnathopods. *H. crassipes*, sp. n., Haswell, *l. c.* p. 330, pl. xix. fig. 3, Port Jackson.

Wyvillea, g. n. Coxæ scarcely so deep as their respective segments, superior antennæ shorter than the inferior pair, appendiculate; mandibles with an appendage; maxillipeds exunguiculate, squamiform processes rudimentary; gnathopods subchelate, posterior pair very large; posterior pteropods uniramous, the ramus large, telson simple, undivided. *W. longimanus*, sp. n., *id. l. c.* p. 337, pl. xxii. fig. 7, Port Jackson.

Polycheria [*-chiria*], g. n., "incertæ sedis." Perion broad; pleon compressed, more or less carinate; antennæ subequal, superior pair without an appendage; mandibles exappendiculate; maxillipeds with well-developed squamiform process; gnathopods small, subchelate; periopods all prehensile, with narrow basa; posterior pleopods biramous, with equal rami; telson double. *P. tenuipes* and *brevicornis*, spp. nn., Port Jackson, 2 fath., *id. l. c.* pp. 345 & 346, the first, pl. xxii. fig. 8.

Corophiidæ.

Peculiar glands in the basal joints of the third and fourth pairs of thoracic feet described by Hoek, *l. c.* pp. 126–129, pl. v. figs. 14–16.

Amphithoe cinerea and *grandimana*, Port Jackson, *setosa*, Botany Bay, spp. nn., Haswell, *l. c.* pp. 269 & 270, the first, pl. xi. fig. 1. *A.? quadrimanus*, sp. n., *id. l. c.* p. 337, pl. xxi. fig. 7, Port Jackson.

Podocerus falcatus (Mont.). Dutch specimens described, sexual differences pointed out, *P. pulchellus* and *pelagicus* (Sp. Bate & Westwood) are not distinct species; Hoek, *l. c.* pp. 120 & 121, pl. vii. figs. 13–15, pl. ix. figs. 1–3.

Podocerus australis, sp. n., Haswell, *l. c.* p. 338, pl. xxi. fig. 8, Port Jackson.

Cerapus difformis (M.-Edw.): Dutch specimens; Hoek, *l. c.* p. 115, pl. vi. fig. 3, pl. viii. figs. 11 & 12.

Xenocheira [*-chira*], g. n. Body slender; coxæ small; superior antennæ very long, longer than the inferior pair, with a secondary appendage; mandibles with an appendage; both pairs of gnathopods non-subchelate, armed with very long hairs; carpus of posterior pair broad, blade-like, applied to the anterior (dorsal) border of the merus; posterior

pleopods biramous; telson simple. *X. fuscata*, sp. n., Haswell, *l. c.* p. 272, pl. xi. fig. 6, Port Jackson.

Haplocheira [*-chira*], g. n. Body not much compressed laterally; upper and inner antennæ subequal, superior pair without an appendage; inferior subpediform; both pairs of gnathopods simple, fringed with long hairs; posterior pleopods biramous, with unequal rami; telson single? *H. typica*, sp. n., *id. l. c.* p. 273, pl. xi. fig. 2, Port Jackson.

Corophium longicorne at Drontheim; Rougemont, Bull. Soc. Neuch. xi. p. 234.

Corophium crassicorne (Bruzelius) and *longicorne* (Fab.). Dutch specimens comparatively described by Hoek, *l. c.* pp. 115–118, pl. viii. figs. 4–10.

Cyrtophium parasiticum, sp. n., Haswell, *l. c.* p. 274, pl. xii. fig. 1, Port Jackson, clinging to the surface of *Cucumaria pentagona* (Qu. & G). *C. dentatum* and *minutum*, spp. nn., *id. l. c.* pp, 342 & 343, pl. xxii. figs. 5 & 6, Port Jackson.

Cyrtophium cristatum, sp. n., Thomson, Ann. N. H. (5) iv. p. 331, pl. xvi. figs. 9–15, New Zealand.

Icilius australis, p. 274, pl. xii. fig. 2, *punctatus*, p. 343, pl. xxiii. fig. 1, spp. n., Haswell, *l. c.*, Port Jackson.

Orthopalame, g. n. "Epimera anteriora quinque magna, quinto in margine posteriore non inciso; antennæ superiores flagello elongato, flagello accessorio parvo 2-articulato, inferiores non subpediformes, superioribus parum breviores, flagello multi-articulato; mandibulæ robustæ, palpo elongato, 3-articulato, articulo tertio palpi non perdilatato; pedes secundi paris iisdem primi multo validiores; pedes saltatorii ultimi paris uniramosi; appendix caudalis recurvata, hamulo parvo armata." *O. terschellingi*, sp. n., Hoek, *l. c.* pp. 123–125, pl. ix. figs. 4–7, Terschelling Island, Dutch Coast.

Colomastix brazieri, sp. n., Haswell, *l. c.* p. 341, pl. xxii. fig. 4, Port Jackson 2–10 fath.

Phronimidæ.

C. Claus reviews this family from systematic and anatomical points of view, adding some new genera and describing the internal parts, chiefly the heart and the ganglions; the large size of the head and eyes is, according to him, more a characteristic of this family than the shape of the hands; both pairs of antennæ are much more developed in the male than in the female; the first pair has in each sex several basal joints, but only in the male a many-jointed flagellum; the second pair in the male is similar to those of *Hyperia*, in the female reduced to the first joint which is soldered to the head and contains the attennal gland; the long hepatic vessels, which extend from the stomach backwards in other Amphipods, are wanting in this family; the eye grows continually by formation of new peripherical elements; the cuticular cornea is renewed at each moult by a special hypodermic stratum, not by the crystalline cones. Arb. z. Inst. Wien, ii. 88 pp. 8 pls.; an abstract in J. R. Micr. Soc. ii. pp. 717–719.

Mayer's paper on the caudal glands and the "house" of the *Phronimidæ* (MT. z. Stat. Neap. i. 1878), is also abstracted, *l. c.* p. 719.

Phronima sedentaria (Forskal) figured; Claus, *l. c.* pl. ii. figs. 11–14.

Phronimopsis, g. n. Body Zoea-like, head short and high, pleon stout, nearly globular, its first two segments soldered together, perion narrow, elongated; anterior antennæ of the female four-jointed, comparatively long; mandibular palpus of the male three-jointed; second pair of gnathopods with perfect hand, the five following pairs of thoracic limbs thin, long, all with small elongated hands; five pairs of long styliform uropods, their branches nearly as long as the stalk. Only one species from the Mediterranean [not named], Claus, *l. c.* pp. 5 & 6, pl. i. figs. 1–3.

Paraphronima, g. n. Body compressed, head square, with vaulted vortex, last segment of the thorax only a little narrower and a little elongated; anterior antennæ of the female four-jointed, posterior rudimentary, styliform; mandibular palpi wanting also in the male; two anterior pairs of gnathopods short, the first with a little developed hand; three pairs of styliform uropods; four pairs of gill-bags on the third, fourth, fifth, and sixth segments of the thorax. *P. gracilis*, Atlantic, and *crassipes*, Mediterranean, sp. nn., *id. l. c.* pp. 6 & 7, pl. i. figs. 4–9, pl. ii. fig. 10.

Typhidæ.

Claus (*l. c.*, 52 pp.) subdivides this family, which he now calls a tribe, Platyscelidæ, into the following 5 families:—

1. *Typhidæ*. Body broad, abdomen shortened, perfectly bent beneath the thorax; buccal organs broad and short; femoral plates of 5th and 6th segments of the thorax very broad.
2. *Scelidæ*. Body broad, abdomen less shortened, imperfectly bent beneath the thorax; buccal organs lengthened, rostriform; femoral plates as in the preceding.
3. *Pronoidæ*. Body more or less compressed, abdomen large, lengthened, half-bent; femoral plates of the 5th segment moderately, those of the 6th very much, dilated.
4. *Lycæidæ*. Body compressed, somewhat like *Hyperia*, abdomen large, lengthened, half-bent; femoral plates of the 5th and 6th segments similar, triangular.
5. *Oxycephalidæ*. Body lengthened, abdomen large, not bent, uropods styliform; femoral plates of segments 5–7, triangular, thin.

He distinguishes (*l. c.* No. 3, p. 4) the following genera in the restricted family *Typhidæ*:—

1. *Eutyphis*, new name for *Typhis* (Risso, *nec* Montagu [Montfort]), the male = *Thyropus* (Dana), the female = *Dithyrus* (Dana) = *Platyscelus* (Sp. Bate).
2. *Hemityphis*, g. n. Distinct from the preceding by the two last joints of the hinder antennæ being long in the male, and by the deeply-notched inner edge of the under lip (paragnaths).
3. *Paratyphis*, g. n. First pair of gnathopods without, second with a rudimentary hand.

4. *Tetrathyrus*, g. n. Both pairs of gnathopods terminated by simple pincers (Zange); femoral plate of 6th pair of legs without pouch.
5. *Amphithyrus*, g. n. Both pairs of gnathopods terminated by double compound pincers; femoral plate of 6th pair of legs with a large pouch.

The following new species are described:—

Eutyphis armatus, Atlantic and Indian Sea, Zanzibar and Chili, *serratus*, Messina and Zanzibar, *globosus*, Messina, pp. 10–12.

Hemityphis tenuimanus, Atlantic and Cape of Good Hope, and *crustulum*, Zanzibar, pp. 12 & 13.

Paratyphis maculatus, Cape of Good Hope and Atlantic, p. 14.

Tetrathyrus forcipatus, Cape of Good Hope and Atlantic, p. 14.

Amphithyrus bispinosus and *sculpturatus*, Atlantic, *similis*, Messina, pp. 15 & 16.

Scelidæ.

Claus (*l. c.* pp. 17–22) distinguishes the following new genera and species:—

Euscelus. Both pairs of gnathopods terminated by a compound hand (Scheere); femoral plate of the 6th pair of legs without fissure. *E. robustus*, Zanzibar.

Schizoscelus. First pair of gnathopods terminated by a simple claw, second with a compound hand; sixth femoral plate with a long sickle-shaped cleft. *S. ornatus*, Atlantic.

Tanyscelus. Both pairs of gnathopods terminated by a simple claw; 6th femoral plate with a pouch on the external face; uropods broad, fin-like. *T. sphæricus*, Zanzibar and Street Ombaai, ? = *Thyropus diaphanus* (Dana).

Parascelus. Gnathopods as in the preceding; 6th femoral plate without pouch; uropods lanceolate. *P. edwardsi* and *pareus*, Atlantic, *typhoides*, Messina and Naples.

Pronoidæ.

Claus (*l. c.* pp. 23–31) distinguishes the following genera:—

1. *Pronoe* (Guérin). Both pairs of gnathopods terminated by a simple claw; flagellar appendage of the anterior antenna two-jointed in the male. *P. capito* (Guér., M.-Edw.) widely distributed, Zanzibar, Moluccas, Chili. Female unknown.

2. *Eupronoe*, g. n. Second pair of gnathopods terminated by a compound hand, flagellar appendage of the anterior antennæ three-jointed in the male; double segment of the abdomen (fifth and sixth coalescent) relatively short; branches of the last uropods very long, fin-like. *E. armata*, sp. n., Atlantic, Zanzibar, Moluccas ?, = *Pronoe brunnea* (Dana), and *E. minuta*, sp. n., South Sea.

3. *Parapronoe*, g. n., ? = *Amphipronoe* (Sp. Bate). Gnathopods and flagellar appendage as in the preceding; double segment of the abdomen very long: branches of the last uropods short. *P. crustulum*, Atlantic, Lagos, Zanzibar, and *parva*, Zanzibar, spp. nn.

Lycæidæ.

Claus (*l. c.* pp. 32–43) distinguishes and characterizes the following genera:—

1. *Thamyris* (Sp. Bate, 1861) = *Sohnehagonia* (Claus, 1872). *T. globiceps*, sp. n., Zanzibar. *T. rapax* (Claus, 1872), Cape of Good Hope.

2. *Lycæa* (Dana). *L. nasuta*, Zanzibar, *similis*, Lagos, *serrata*, Bengal, and *robusta*, Naples and Messina, spp. nn. *L. pulex* (Marion) is a young male of the last.

3. *Simorrhynchus* (Claus, 1871), *S. antennarius* (Claus), Zanzibar and South Sea.

4. *Pseudolycæa*, g. n. Both pairs of gnathopods terminated by a simple claw; fifth and sixth pairs of legs nearly equal, seventh pair well developed, with broad femoral plate. *P. pachypoda*, sp. n., Messina and Zanzibar.

5. *Paralycæa*, g. n. Gnathopods as in the preceding; fifth pair of legs very long, seventh rudimentary with thin curved femoral plate. *P. gracilis*, sp. n., locality unknown.

6. *Lycæopsis*, g. n. Gnathopods as in the preceding; sixth pair of legs very long, seventh well developed but thin and slender. *L. themistoides*, sp. n., Messina, frequent.

Oxycephalidæ.

Oxycephalus similis, Messina, *latirostris*, Lagos, *porcellus*, *longiceps*, and *typhoides*, Zanzibar, the last also from Messina, spp. nn., Claus, *l. c.* pp. 47–49. *O. piscator* (M.-E.) = *oceanicus* (Guér.) = *tuberculatus* (Sp. Bate), widely distributed, and *tenuirostris* (Claus, 1871), Gilolo, described; *id. l. c.* pp. 44 & 48.

Rhabdosoma armatum (White), South Sea and Southern Atlantic, fully described. *R. whitii* (Sp. Bate) is its male; *id. l. c.* pp. 49–52.

Caprellidæ.

G. Haller publishes his observations, made at Messina and Villafranca, on the nervous system, sensitive hairs, and other problematical sensitive organs in the mandibular palpi and foot-claws, especially in the first and second pair, the natatory hairs in the lower antennæ and prehensile spines in the claws and tarsi of the feet; also upon the heart, generative organs, stomach, and intestine with their glands, the peculiar gland within the hand of the second pair of feet described by P. Mayer, and the numerous large cells of the type of conjunctive tissue spread throughout the body of the animal. He also makes some observations on sexual differences, variations of colours (see below), manner of living and parasites of these animals, describing several species, and finishing by an attempt to derive the Læmodipods from the *Gammaridæ* phylogenetically, by adaptation to a sedentary semiparasitical life. *Cyamus* is, according to

him, a lateral offshoot of *Protella*. Z. wiss. Zool. xxxiii. pp. 350–422, pls. xxi.–xxiii.

Anatomical notes on the microscopical structure of the skin, on the ganglions, olfactory cones, dorsal bristles, skeleton of the stomach and genital organs of the *Caprellidæ* by P. P. C. Hoek, Tijdschr. Nederl. dierk. Ver. iv. pp. 97–105, pl. v. figs. 1–13, pl. vii. figs. 1–4.

Abstract of Gamroth's paper on the structure of the *Caprellidæ* [Zool. Rec. xv. *Crust.* p. 34] in J. R. Micr. Soc. ii. pp. 715 & 716.

Caprella (Lam.), generic description; *C. liparotensis*, Lipari, 15–16 mètres, *helleri*, Messina, 60 mètres, *dohrni*, Villafranca, near the surface, and *elongata*, Messina, spp. nn., Heller, *l. c.* pp. 403–410, pl. xxiii. figs. 41–45 (abstract in Zool. Anz. ii. pp. 232 & 233). *C. æquilibra* (Sp. Bate) common at Villafranca and Naples, but the males remarkably scarce, distinct by the striking elongation of the two anterior segments of the neck; *C. monacantha* (Heller) is the young state of this species; *id. l. c.* pp. 404 & 390.

Caprella linearis (L.). Dutch specimens described, *C. lobata* (Spence Bate) is its full-grown male, *hystrix* (Sp. & Westw. *nec* Kröy.) a variety of it; Hoek, *l. c.* pp. 109–113, pl. vi. fig. 2, pl. vii. figs. 1–3 & 11–14.

Caprella tenuis, p. 276, pl. xii. fig. 5, *echinata*, *cornigera*, *inermis*, and *obesa*, pp. 346–348, pl. xxiii. figs. 2, 3 & 5, pl. xxiv. fig. 1, spp. nn., Haswell, *l. c.*, Port Jackson.

Leptomera pedata (Abildg.). Dutch specimens; Hoek, *l. c.* pp. 113 & 114, pl. vii. figs. 15 & 16, pl. viii. figs. 1–3.

Proto brunneo-vittata, sp. n., Messina, 150 mètres, and *goodsiri* (Sp. B.), Roscoff, distinct from *pedata*, Haller, *l. c.* pp. 399 & 398, pl. xxii. figs. 19–22 & 23–25. *P. pedata* (Müll.) common in the Mediterranean, distinctive characters, differently coloured at different localities; *id. l. c.* pp. 398 & 391.

Proto (Leach). Characters of the genus and three Mediterranean species, including *brunneo-vittata*, sp. n., Messina, 145 mètres, Haller, Zool. Anz. ii. pp. 230 & 231.

Proto novæ-hollandiæ, sp. n., Haswell, *l. c.* p. 275, pl. xii. fig. 3, Port Jackson.

Protella (Dana). Generic description; *P. phasma* (Latr.), male common on buoys in the Mediterranean and at Roscoff, remarkably larger and stouter than the female, with some other sexual differences; the pigment cells of the skin contract in the darkness. Graber, Z. wiss. Zool. xxxiii. pp. 402 & 391, pl. xxii. figs. 26–35.

Protella (Dana). Characters of the genus. *P. major*, sp. n., Haller, Zool. Anz. ii. p. 231, Messina and Villafranca.

Protella australis, sp. n., Haswell, *l. c.* p. 276, pl. xii. fig. 4, Port Jackson.

Podalirius (Kröy.). Generic description. *P. kræyeri*, sp. n., Messina, Lipari, Villafranca, remarkable sexual differences; Haller, Z. wiss. Zool. xxxiii. pp. 410–414, pl. xxiii. figs. 46–49; abstract, Zool. Anz. ii. p. 233.

Podalirius typicus (Kröy.). Dutch specimens described by Hoek, *l. c.* pp. 106–109, pl. vi. fig. 1, pl. vii. figs. 4–10.

ISOPODA.

Tanaidæ.

Tanais novæ-zeelandiæ, sp. n., Thomson, Ann. N. H. (5) iv. p. 417, pl. xix. figs. 5 & 6, Dunedin.

Leptochelia (Dana) = *Paratanais* (Dana) ; *L. rapax*, sp. n., Harger. P. U. S. Nat. Mus. 1879, p. 163, New England.

Arcturidæ.

Arcturus tuberculatus, sp. n., Thomson, Ann. N. H. (5) iv. p. 416, pl. xix. figs. 1–4, male and female, Dunedin.

Astacilla granulata (Sars, as *Leachia*, 1877) = *americana* (Harger, 1878) ; Harger, *l. c.* p. 161.

Idoteidæ.

Idotea. Change of colour observed by P. Mayer ; see above, in General Subject.

Idotea irrorata (Say, as *Stenosoma*, 1818) = *tricuspidata* (Desm., 1823), common to Europe and North America ; Harger, *l. c.* p. 160.

Idotea euplectellæ, sp. n., found inside the silicean sponge *Euplectella aspergillum* ; Landois, JB. zool. Sect. westf. Ver. 1879, p. 41, Philippine Islands.

Asellidæ.

Janira spinosa, sp. n., Harger, *l. c.* p. 158, Banquereau, New England. *Asellodes alba* (Stimps.) belongs also to this genus ; *id. ibid.*

Asellus cavaticus (Schiödte, Leydig, 1871) = *sieboldi* (Rougem., 1876), found in several spots in Germany, and its differences from *A. aquaticus* (L.) pointed out, especially in the first abdominal feet of both sexes, by Fries, Zool. Anz. ii. pp. 129–134. Other differences between both species, for instance, in the number of sensitive bristles of the first maxilla, 4 in *A. aquaticus*, 5 in *cavaticus*, and in the comparative size of the hepatic organs, are pointed out by M. Weber, *tom. cit.* pp. 150 & 151 (abstract in J. R. Micr. Soc. ii. pp. 721 & 722).

Asellus foreli, sp. n., Lake of Geneva, in depths of 200–300, rarely only 40–60 mètres ; distinct from *cavaticus*, by lesser size, constantly three olfactory cones (Riechzapfen), and a smaller number of lids in the flagella of both antennæ. Blanc, Bull. Soc. Vaud. xvi. pp. 377–394, pl. xiv. Abstract in Zool. Anz. ii. pp. 428–431.

Limnoria has unmistakable affinity to the *Sphæromidæ* ; Harger, *l. c.* p. 161 ; he proposes a new family, *Limnoriidæ*, for its reception.

Oniscidæ.

G. Budde Lunde (Prospectus, &c. : *suprà*, in Titles) gives a list of the known terrestrial *Isopoda*, containing 26 genera, to which 11 subgenera

are to be added, and 302 species, some new, but not described (they will, therefore, not be mentioned here). The author notes the species existing in the Museum of Copenhagen (95), and a part of those in the Berlin Museum.

J. Schöbl has continued his observations on the breeding of *Oniscidæ*, having kept a large number of living specimens (chiefly *Porcellio scaber*) in confinement. He describes the female orifices on the ventral part of the fifth segment, the oviducts, ovary, and receptaculum seminis, and the act of copulation; those parts of the male which have been called by former authors accessorial, are the true intromitting organs; after fecundation the female becomes very inactive, losing the female orifices and receptacula seminis at the next moult. The fecundated eggs penetrate from the oviducts into the abdominal cavity, and from this by a median cleft in front of the sixth segment into the cavity formed by chitinous processes at the under surface of the body (incubatory cavity). During incubation, another set of ovula is ripened in the ovaries, and fecundated by the spermatozoids which have remained in the oviducts or at the entry of the ovary, and a second brood is produced by the same female without fresh copulation. A new moult follows afterwards, by which the female orifices are again opened, and a new fecundation becomes possible. The spermatozoids are moveable in a certain degree. SB. böhm. Ges. 1879, pp. 339–351; also in Arch. mikr. Anat. xvii. pp. 125–140.

Hemilepistus, subg. n. of *Porcellio*; type, *P. klugi* (Brandt), Budde Lund, *l. c.* p. 4.

Metoponorthus, subg. n. of *Porcellio*; type, *P. glaber* (L. Koch), *id. ibid.*

Leptotrichus, subg. n. of *Porcellio*; types, *P. truncatus* and *ciliatus* (Brandt), *id. l. c.* p. 5.

Stymphalus, g. n., near *Styloniscus* (Dana); type, *dilatatus* (Perty), *id. l. c.* p. 9.

Syspastus, new name for *Helleria* (Ebner, 1868) [*cf.* Zool. Rec. v. pp. 522 & 520]; *id. ibid.*

Serolidæ.

Serolis cornuta, sp. n., *ovalis*, sp. n., = *septem-carinata* (Miers, 1875), and *latifrons* (White), all from Kerguelen Island, fully described. They live on sandy ground, half creeping, half swimming; in the third species the last pair of abdominal feet are transformed into a knife-shaped sting, which can be spread outwards and fixed in position by an acetabulum-like notch in the caudal shield, like a clasp-knife, or the pectoral sting of many Siluroid fishes. Studer, Arch. f. Nat. xlv. pp. 19–34, pl. iii. figs. 1–19; knife-apparatus, figs. 20–23; medullar string, fig. 24.

Cirolanidæ.

Barybrotes (g. n.) *indus* and *agilis*, spp. nn., Schiödte & Meinert, Nat. Tids. xii. p. 279, Indian Seas.

Icochæa (g. n.) *crassipes*, sp. n., *iid. ibid.*, Indian Seas.

Corallana (Dana) *collaris*, *brevipes*, *nodosa*, and *hirsuta*, spp. nn., *iid. ibid.*, Indian Seas. These three genera are externally very near *Ægæ* but the mouth is manducatory, not suctorial.

Cymothoidæ.

On hermaphroditism and development, see above in General Subject.

Ægæ. Monograph of the genus, 20 species described in different stages, including *Æ. hirsuta*, Nice, *antillensis*, Cuba, *nodosa*, Bass's Straits, *tenuipes* and *dentata*, Cuba, *incisa*, Mediterranean, spp. nn.: Schiödte & Meinert, Nat. Tids. (3) xii. pp. 321–414, pls. viii.–xiii.

Rocinela. Monograph of the genus, 9 species in different stages of age described, including *insularis*, West Indies, *maculata*, Vladivostok, *americana*, Ireston, N. America, *orientalis*, Philippines and Calcutta, *australis*, Magelhaen's Strait, *signata*, West Indies, and *aries*, Mazatlan, spp. nn.: *iid. l. c.*

Alitropus typus (M.-Edw.) = *Ægæ interrupta* (Martens), Bengal and Borneo, and *foveolatus*, sp. n., locality unknown: *iid. l. c.*

Bathynomus, g. n., distinct by true tree-like gills, covered by the operculiform abdominal feet; parts of the mouth near those of *Cirolana*, legs like those of *Ægæ*; eyes greatly developed. *B. giganteus*, sp. n., 0·23 mètre in length, 0·10 in breadth, West Indies, near Yucatan, 955 fath. A. Milne-Edwards, C. R. lxxxix. pp. 21–23, and Ann. N. H. (5) iii. pp. 241–243.

Bopyridæ.

Bopyrus pandalicola, sp. n., A. S. Packard, jun., "Zoology for Students, &c." (New York: 1879), p. 308 [no description], fig. 262 *a–d*; the female many times larger than the male, with ventral side partly aborted, absorbed by pressure against carapace of its shrimp-host; male lodged under ventral plates of female.

Bopyrus sp. observed on *Palæmonetes varians*; Leidy, P. Ac. Philad. 1879, p. 198.

Abstract of Fraisse's paper on *Entoniscus* [Zool. Rec. xv. *Crust.* p. 38] in J. R. Micr. Soc. ii. p. 563.

Entoniscus cavolinii (Fraisse). Bibliographical, anatomical, biological, and embryological observations by A. Giard, who has found it on *Grapsus varius* at Pouliguen, Dép. Loire-Inférieure; J. de l'Anat. Phys. 1878, pp. 675–700, with a plate, translated Ann. N. H. (5) iv. pp. 137–157, pl. x.

Entoniscus. Note by Giard, Assoc. Fr. vii. [1878] p. 747.

A popular report on the freshwater *Entomostraca* by C. L. Herrick, Am. Nat. xiii. pp. 620–628.

PHYLLOPODA.

Branchipodidæ.

Chirocephalus and *Streptocephalus* successively appearing in the same pond; J. A. Ryder, Am. Nat. xiii. p. 703.

Chirocephalus holmani, sp. n., Ryder, P. Ac. Philad. 1879, p. 148, woodcut, Woodbury, New Jersey. *Cf.* also Ann. N. H. (5) iv. pp. 251 & 252, and J. R. Micr. Soc. ii. p. 875.

Streptocephalus scalii, sp. n., from Woodbury, New Jersey, and the 5 other known species of the genus enumerated by Ryder, P. Ac. Philad. 1879, pp. 200 & 201, with woodcut.

Artemia salina. A note by C. Briguel, separately published at Nancy, has not been seen by the Recorder.

CLADOCERA.

A. Weismann describes the spermatozoids and their transmission in various genera of *Cladocera*; they are immobile in all, and never thread-like-elongate, often ovate, or nearly spherical. The size varies between 0·1 and 0·0005 mm.; the largest are found in the *Polyphemidæ* and *Sididæ*. Fecundation is always effected while the eggs are still without any envelope; the spermatozoids are transferred by ejaculation either into the oviducts directly (*Daphnella*, *Sida*, *Latona*), the breeding cavity of the shell (*Bythotrephes*), or the ephippium (*Daphniinæ* and *Lynceidæ*); in the third case many spermatozoids are lost, and therefore their number is much larger in these families. The spermatozoids are either direct transformations of the cells in the testicle, as in *Daphnella* and *Sida*, probably also in the *Polyphemidæ*; or they are formed within other large cells (spermatoblasts), as in *Moina*, probably also in all *Daphniinæ* and *Lynceidæ*. In *Scapholeberis*, the spermatozoids are very minute, and many of them are formed within one epithelial cell of the testicle; these differences are in close relation to the number of the spermatozoids in each animal. Z. wiss. Zool. xxxiii. pp. 55–110, pls. viii.–xiii.

The author has made numerous experiments upon the times and circumstances in which parthenogenetic and sexual generation take place in various genera of the *Cladocera*; he distinguishes *polycyclic*, *monocyclic*, and *acyclic* species. In the polycyclic, several sexual generations occur in one year, the second from the winter-eggs becoming possibly sexual, as in *Moina* and in other genera which dwell in puddles, pools, and marshes easily subject to temporary desiccation. *Sida*, *Daphnia hyalina*, *Bythotrephes*, and *Leptodora* are monocyclic, with only one sexual generation a year; the number of parthenogenetic generations which precede the sexual one, is in them respectively about 20, 12, 10, and 6–7; they live in lakes, the temperature of which is slowly rising and decreasing according to the season; in most of them, the sexual generation is the last of the year, but in *Daphnia hyalina* several parthenogenetic generations follow in the autumn. *Bosmina*, and in several localities also *Chydorus*, are acyclic, only parthenogenetic, without a known sexual generation; they live and propagate during the winter, winter-eggs not being necessary for them. In all *Cladocera*, the first generation of the year is parthenogenetic; generally the same female can produce parthenogenetic and sexual females; in *Moina*, the parthenogenetic female cannot from

its structure be fecundated; in *Polyphemus*, the sexual female only produces winter-eggs, and never other eggs without fecundation (pp. 110–214). The author discusses in a hypothetical manner the phylogenetic origin of those changes of generations, and their relations to other alternations of generation, pp. 214–264.

An abstract of Kurz's paper on limicolous *Cladocera* [Zool. Rec. xv. *Crust.* p. 39] in J. R. Micr. Soc. ii. pp. 153 & 154.

Sididæ.

Daphnella winchelli, sp. n., C. L. Herrick, Rep. Geol. Surv. Minnesota, vii. p. 122, near Minneapolis.

Daphniidæ.

Daphnia bairdi, sp. n., Graham, Naturalist, ii. p. 217, Birmingham; = *Hyalodaphnia kahlbergiensis* (Schödler): E. Ray Lankester, J. R. Micr. Soc. ii. p. 877. *D. spinosa*, sp. n., Herrick, *l. c.* p. 105, pl. xiii. fig. 1, Lake Calhoun, Minneapolis.

Macrothrix agilis, sp. n., Herrick, *l. c.* p. 106, pl. xiv., Rocky Lake, near Minneapolis.

Moina rectirostris (Baird). For history of development by Grobben, see above, in General Subject.

Moina bathycola, sp. n., Vernet, Bull. Soc. Vaud. xv. [1878] pp. 528–530, pl. ix. fig. 23, Lake of Geneva, in deep water.

Lynceidæ.

Alona verrucosa, sp. n., Lutz, MT. Ges. Bern, 1879, p. 38, Bern.

Copechate (Hesse) [Zool. Rec. xv. *Crust.* p. 41]; abstract in J. R. Micr. Soc. ii. p. 424.

Polyphemidæ.

Polyphemus occidentalis, sp. n., Herrick, *l. c.* p. 122, Mud Lake, Minneapolis.

Bythotrephes asovicus, sp. n., N. Pengo, Monograph [see Titles], with general remarks on the genus, and plate, Sea of Azof.

Corniger, g. n. [name preoccupied in *Pisces*]. "Caput a corpore parva impressione disjunctum atque valde deorsum spectans; testa testam corporis non attingente præditum et in tubum, dua magna cornua gerentem, productum. Ramorum secundi paris antennarum unus tri-articulatus, alter quadri-articulatus, uterque setis septem, quarum quinque articulo ultimo et singulæ unicuique posteriori adfixæ, præditus. Pedes omnes appendice externa tereti, setifera et interna dentata, ciliata. Aculei caudales magni, deflexi sursum versus. Setæ caudales brevissimæ. *C. mæoticus*, sp. n., Pengo, *l. c.* 10 pp., plate, Sea of Azof.

Leptodora hyalina (Lillj.). Anatomy described by H. R. Forrest, J. R. Micr. Soc. ii. pp. 825–834, pls. xxiv. & xxv. Found in a deep pool near Birmingham; Lubbock, Rep. Br. Ass. (Sheffield), 1879, p. 369.

OSTRACODA.

Cypridæ.

Cypris neglecta, sp. n., Herrick, *l. c.* p. 112, pl. xvii. fig. 2, Lakes near Minneapolis.

Candona ornata, pl. xx. fig. 1, and *C.* (?) *elongata*, spp. nn., *id. l. c.* p. 113, Lakes near Minneapolis.

Six species from a lake of brackish water near Bayonne, enumerated by Folin, Faune lacustre de l'ancien lac d'Ossegor, p. 5.

Cytheridæ.

Acanthopus [Zool. Rec. xv. *Crust.* p. 42] *resistens* and *elongatus*, spp. nn., Vernet, Bull. Soc. Vaud. xv. [1878] pp. 506–526, pl. viii. figs. 1–13, pl. ix. figs. 14–19, Lake of Geneva, 40 mètres deep.

COPEPODA.

A. Gruber describes the formation of the spermatozoids and spermatophores in the Copepods, and their transmission to the females. In some genera of the *Calanidæ*, as *Heterocope*, *Diaptomus*, *Temora*, *Candace*, and *Ichthyophorba*, there is no special receptaculum seminis, the spermatozoids, cemented together by glutinous matter, are transferred directly to the vulva. In all *Cyclopidæ* and *Harpactidæ* examined by the author, there is, on the contrary, a single distinct receptaculum seminis, in the median line of the belly; the same also is found in some genera of *Calanidæ*, as *Pleuromma*, *Leuckartia*, and *Pachysoma*. Other *Calanidæ*, as *Cetochilus*, *Calanus*, *Calanella*, and *Dias*, have two symmetrical receptacula, one on each side; generally each receptaculum is provided with a special external orifice (porus); the spermatophores are attached near to this orifice, and their contents enter by this orifice into the receptaculum and come from thence to the eggs. The matter for forming the ovisacs is never furnished by those receptacula, but only by the oviducts themselves. Z. wiss. Zool. xxxii. pp. 407–442, pls. xxiv.–xxvii.

A new organ of secretion, furcal gland, in the last segment of *Sapphirina*, described, by G. Ficker, Zool. Anz. ii. pp. 515 & 516.

Branchiura.

Argulus lepidostei, sp. n.?, Kellikotts, Am. J. Micr. iv. pp. 153–155, N. America, on *Lepidosteus*.

Cyclopidæ.

Cyclops. Note on its nervous system and anal respiration by Hartog, Rep. Br. Ass. (Sheffield) 1879, p. 376.

Cyclops magniceps (Lilljeb.) from the Lake of Geneva; Vernet, Bull. Soc. Vaud. xv. [1878] p. 532, pl. ix. figs. 20–22.

Harpacticidæ.

Balænophilus, g. n. Body almost cylindrical; anterior antennæ 8-jointed, posterior 2-jointed, with a secondary 1-jointed branch, mandibular palpus reduced to a setiferous tubercle, maxillary palpus unbranched; first pair of feet strongly clawed; feet of fifth pair rudimentary; two ovisacs. Nauplius transversely oval, with three pairs of short appendages, destitute of joints. *B. unisetis*, sp. n., epizoic on the whalebone-plates of *Balænoptera sibbaldi* (Gray), Vadsö, Arctic Norway, all stages of development from the new hatched Nauplius to the adult *Cyclops* together, firmly adhering to the plates by means of strongly-armed limbs. Aurivillius, Œfv. Ak. Förh. v. No. 18, Bihang, 16 pp. 4 pls.

Canthocamptus cavernarum, A. S. Packard, Jun., "Zoology for Students, &c." (New York: 1879), p. 297, fig. 238, eyed, Mammoth Cave, Kentucky.

Canthocamptus minutus (Mull.), var. n. *occidentalis*, C. L. Herrick, Rep. Geol. Surv. Minnesota, vii. p. 95, pl. v., Lakes near Minneapolis.

Calanidæ.

Centropages brevicaudatus (Brady, 1875), Brady, Phil. Trans. clxviii. p. 215, pl. xii. figs. 11–19, Kerguelen, in fresh-water lakes; no males found.

Diaptomus longicornis, p. 90, pl. i., *pallidus*, p. 91, pl. ii. spp. nn., Herrick, *l. c.*, Lakes near Minneapolis.

Peltidiidæ.

Zausoscidia, g. n. "Corpus depressum, porrectum, profunde incisum, feminæ 9–, maris 10-articulatum, abdomine magnopere attenuato. Maxillipedes inferiores magni, manu prehensili, pars basalis elongata, non articulata. Pedum primi paris ramus internus biarticulatus natatorius et prehensilis, externus longior, 3-articulatus, uncis compluribus armatus, prehensilis. Pedes postici tenues, non foliacei." *Z. folii* [*foli*], sp. n., G. Haller, Zool. Anz. ii. p. 179, Messina and Lipari.

Porcellidium parvulum and *ovatum*, spp. nn., *id. l. c.* pp. 179 & 180, Messina.

Oniscidium triarticulatum, *sculptum*, and *incertum*, spp. nn., *id. l. c.* p. 180, Messina and Lipari.

Corycæidæ.

Sapphirina danæ (Lubbock); Brady, Phil. Tr. clxviii. p. 216, pl. xii. figs. 1–10, Southern Indian Ocean, 30° S., 45′ E., fully described.

Notodelphyidæ.

Ovary and testis unpaired; a female orifice present, not found before;

the breeding cavity is an invagination from the outer surface; nervous system described. Kerschner, Denk. Ak. Wien, xli. 44 pp. 6 pls.; abstract Ann. N. H. (5) iv. pp. 321 & 322, and J. R. Micr. Soc. ii. p. 877.

Paryphes, g. n. [name pre-occupied in *Insecta*]. Allied to *Gynentophorus*; first thoracic segment with collar-like duplicature; external branches of the foot very long. *P. longipes*, sp. n., Bay of Muggia, near Trieste, in a species of *Cynthia*; id. *l. c.*

Doroixys, g. n. Allied to *Doropygus*; a hook on the fifth thoracic segment, abdomen very short. *D. uncinata*, sp. n., Trieste, in *Amaræcium*; id. *l. c.*

Ergasilidæ.

Doridicola antheæ, sp. n., Ridley, Ann. N. H. (5) iv. p. 458, on *Anthea cereus*, Ilfracombe.

Dichelesthiidæ.

Margesia crenilabri (on the gills of *Crenilabrus melops*), *labri-mixti*, *labri-viridis* (on *Z. viridis*), *acantholabri-exoleti*, *labri-trimaculati*, *pagelli-bogueravii*, and *Bathari-grisei* (on the gills of the respective fishes named), spp. nn., Hesse, Ann. Sci. Nat. (6) viii. art. 11, pp. 2–15; the first, second, fourth, and fifth figured, pl. xix. figs. 1–20.

Krœyeria scylli-caniculæ, *carchariæ-glauci*, and *acanthiæ-vulgaris*, spp. nn., on the gills of the respective fishes named, and with physiological and biological observations; *id. l. c.* pp. 15–30, pls. xx. & xxi.

Lernanthropus externally, anatomically, and histologically described, by C. Helder, Arb. z.-b. Wien, ii. No. 6, pp. 1–68. The author enumerates 19 species, giving a table of distinctive characters for the known females, 18 spp., p. 74, and for the known males, 10 spp., p. 72. The following are figured and described: *L. larvatus* (Hell.), *lativentris* (Hell.), *giganteus* (Koll.), *pupa* (Burm.), *atrox* (Hell.), *pagodus* (Koll.), *gisleri* (Bened.), *trigonocephalus* (Hell.), *belones* (Koll.), *krœyeri* (Bened.), and *nobilis* (Hell.), pp. 72–92, pls. i.–v. On a special system of vessels in this genus, see above in General-Subject.

Lernæidæ.

Ive, g. n. Male and female similar in shape; no eyes; antennæ and oral parts as in *Peniculus*, but without sucking trunk; only two pairs of rudimentary thoracic feet; no vent; eggs arranged in strings. *I. balanoglossi*, sp. n., in the visceral cavity of *Balanoglossus minutus*, Naples. P. Mayer, MT. z. Stat. Neap. i. pp. 515–520, pl. xvii.

Lernæopodidæ.

Stylophorus (g. n.) *hippocephalus*, sp. n., 5 centimètres long, in the nasal cavity of *Raia rostrata*, the long arms deeply buried in the cartilage of the skull, grasping a small cartilaginous ossicle, but retractile at the will of the animal; eggs and embryo described. Hesse, *l. c.* art. 15, 16 pp., pl. xxviii.

CIRRIPEDIA.

Some remarks concerning the fixation of young Cirripeds by Wendt, Verh. Ver. Hamb. 1876, may be mentioned here.

Platylepas decorata (Darwin) found on *Lepidosteus*; Am. Nat. xiii. p. 473.

XIPHOSURA.

Moult of *Limulus polyphemus* (Lat.) described; H. Bolau, Verh. Ver. Hamb. 1879, pp. 22 & 23.

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ARACHNIDA (FOR 1878).

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S.

List of the more Comprehensive Publications.

BECKER, L. Catalogue des Arachnides de Belgique. 1ère partie. Ann. Ent. Belg. xxi. pp. 45–61.

Contains a list of 19 known species of *Attidæ*, 22 of *Lycosidæ*, 2 of *Sparassidæ*, 21 of *Thomisidæ*, 26 of *Epeiridæ*, 11 of *Agelenidæ*, and 12 of *Dictynidæ*. The author (*l. c.* pp. 187 & 188) adds 9 known species of *Salticidæ*, *Lycosidæ*, *Thomisidæ*, and *Agelenidæ* ; and, *op. cit.* CR. pp. clxxiv.–clxxvii., enumerates various species taken in Belgium by MM. Pierret and Donckier, of which 7 are new to the fauna.

——. Aranéides recueillies en Hongrie par M. de Horvath, et en Moldavie par M. A. Montandon. C. R. Ent. Belg. xxi. pp. cclii.–cclvi.

Contains a list of species of various families : *Attidæ* 5 species, *Lycosidæ* 8, *Thomisidæ* 8, *Epeiridæ* 7, *Theridiidæ* 10, *Agelenidæ* 6, *Drassidæ* 9, *Dysderidæ* 1 ; and notes an example of *Micaria fulgens*, Walck., wanting the lateral pair of eyes on the right side.

——. Diagnoses de quelques Aranéides du Méxique. *Tom. cit.* Ann. pp. 77–80, pl. ii.

Describes 3 new species (*Theraphosidæ* and *Drassidæ*).

——. Aranéides recueillies en Suisse et dans le nord de l'Italie. *L. c.* pp. 62–65.

Records 47 known species of Swiss Spiders belonging to 8 families and 25 genera, and 21 species of Italian Spiders belonging to 6 families and 13 genera.

BERTKAU, PHILIP. Versuch einer naturlichen Anordnung der Spinnen, nebst Bemerkungen zu einzelnen Gattungen. Arch. f. Nat. xliv. 1, pp. 351–410, pl. xii.

The author divides the *Araneidea* of Germany into two suborders, based on the number and character of the respiratory organs : I. TETRASTICTA, with two pairs of stigmata on the under side of the abdomen. II. TRISTICTA, having one pair of stigmata in the ordinary position, lead-

ing to "fan tracheæ," and a single one at a greater or less distance behind the others, consisting of a simple transverse slit in the skin, and leading to tracheæ. In the first suborder, are included the families *Atypidæ* and *Dysderidæ*; in the second, the *Drassidæ*, *Sparassidæ*, *Thomisidæ*, *Aphantochilidæ*, *Attidæ*, *Lycosidæ*, *Argyronetidæ*, *Micryphantidæ*, *Dictynidæ*, *Uloboridæ*, *Eresidæ*, *Amaurobiidæ*, *Agelenidæ*, *Hahniidæ*, *Scytodidæ*, *Pholcidæ*, *Theridiidæ*, *Pachygnathidæ*, and *Epeiridæ*.

CAMBRIDGE, O. P. Notes on British Spiders, with descriptions of new species. Ann. N. H. (5) i. pp. 105–128, pl. xi.

Forty-five species (5 new) of various families and genera are recorded.

——. *Arachnida*, in Zoology of Kerguelen Island. Transit of Venus Expedition. Phil. Tr. clxviii. pp. 219–227, pl. xiii. figs. 2–6.

The greater part of this is a reprint from P. Z. S. 1876, pp. 259–265, pl. xix., the additional portion (with woodcuts) being of a new species of *Acarus*. [Cf. Zool. Rec. xiii. *Arachn.* p. 2.]

EMERTON, J. H. The Structure and Habits of Spiders. Salem, Ress.: 1878, 8vo, pp. 1–118, woodcuts. (Forms vol. ii. of the "American Natural History" series.)

A useful popular book, treating on "Anatomy and Classification," chap. i., pp. 11–31, "Eating and Biting," chap. ii., "Spinning Habits," chap. iii., "Growth of Spiders," including the palpi and palpal organs of the male spider, and the genital aperture, and processes connected with it of the female, chap. iv. Of all these particulars, excellent illustrations are given. In the preface it is stated that the portion of the work treating of the spinning and flying habits is copied chiefly from the works of Blackwall and Menge; some other portions being taken from papers by Wilder.

HERMANN, OTTO. Magyarország Pók-faunája, &c. (Ungarns Spinnenfauna, im Auftrage der Kön. Ungarischen naturwissenschaftlichen Gesellschaft). ii. Das System, pp. 1–100, pls. iv.–vi.

In continuation of the work referred to in Zool. Rec. xii. p. 239, following the arrangement of Thorell in "European Spiders." Analytical tables of suborders, families, subfamilies, and genera are given. The figures in the plates are clear and mostly good, detailing the eyes and one or two other leading characters of each genus.

HOLMBERG, E. L. Arácnidos Argentinos. Anales de Agricultura de la Republica Argentina [Buenos Aires], iv. [1876]; also separately, 4to, pp. 28.

Contains rough descriptions of 97 species, mostly new. The author admits the inexactness of this sketch; and proposes to recast it in detail, with corrections and additions. He now knows of 400 species from the Argentine Republic. [Quoted from Naturalista Argentino, i. p. 69.]

KARSCH, F. Uebersicht der von ihm in Mossambique gesammelten Arachniden. MB. Ak. Berl. 1878, pp. 314–338, pls. i. & ii.

Records 23 species of various families and genera of *Araneidea*, 1 species of *Phalangiidea*, and 7 of *Acaridea*; of the *Araneidea*, 11 are

described as new. Descriptions and figures are also given of various other known species; 1 species of *Phalangiidea* and 2 of *Acaridea* are also given as new.

——. Ueber einige von Herrn Hildebrandt in Zanzibargebiete erbeutete Arachniden. *Z. ges. Naturw.* (3) iii. pp. 311–322, pl. viii.

Describes and figures 8 new species of *Araneidea* and *Phalangiidea*, belonging to the *Theridiidæ*, *Hersiliidæ*, *Gasteracanthidæ*, *Thomisidæ*, *Oxyopidæ*, *Eresidæ*, and *Phalangiidæ*.

——. Exotisch-araneologisches. *L. c.* pp. 323–333, 771–826, pl. ix.

The first paper describes 5 new species belonging to as many families of *Araneidea*, and characterizes 2 new genera, one in each, of the *Thomisidæ* (?) and *Podophthalmidæ*. The second is divided into four parts :—i. Describes 5 new species of *Araneidea* from Natal, belonging to the *Epeiridæ* and *Thomisidæ*, and a new genus of the latter; ii. Notices a new "Harlequin-crab-spider" of the genus *Platythomisus*, Dol., and suggests that this genus and *Stiphropus*, Gerst., are synonymous; iii. Is upon *Texistichops*, Tacz. (*Agelenidæ*), with descriptions of 2 new species; iv. Contains remarks upon Australian *Arachnida*. In the last paper, 79 known species are recorded, with remarks on the synonyms, &c., of some of them, and 25 are described as new; 6 new genera are characterized, *Gasteracanthidæ*, *Epeiridæ*, *Drassidæ*, *Theraphosidæ*, and *Lycosidæ*. In a note, p. 817, a new genus of *Drassidæ* (*Trochanteria*) from America is characterized.

——. Diagnoses Attoidarum aliquot novarum Novæ Hollandiæ Collectionis Musei Zoologici Berolinensis. *MT. Münch. ent. Ver.* ii. pp. 22–32.

Characterizes 21 new species and 6 new genera of *Salticidæ*.

Keyserling, Eugen von. Spinnen aus Uruguay und einigen anderen Gegenden Amerikas. *Verh. z.-b. Wien*, xxvii. pp. 571–624, pl. xiv.

Records 25 species distributed amongst seven families of *Araneidea*. A new genus (*Tetromma*) of *Drassidæ* is characterized; 22 species of *Epeiridæ*, *Theridiidæ*, *Agelenidæ* [including *Dictynidæ* of other authors], *Drassidæ*, *Theraphosidæ*, *Lycosidæ*, and *Salticidæ*, are described as new.

Koch, Ludwig. Verzeichniss der bei Nürnberg bis jetzt beobachteten Arachniden (mit Ausschluss der Ixodiden und Acariden) und Beschreibungen von neuen, hier vorkommenden Arten. Nürnberg: 1878, 8vo, pp. 1–86, pl.

Contains a record of 500 species of *Araneidea*, 23 of *Phalangiidea*, 1 of *Acaridea*, and 12 of *Pseudo-scorpiones*. The *Araneidea* are distributed among 84 genera of 14 families; *Epeiridæ*, 7 genera, 43 species; *Uloboridæ*, 2 genera, 2 species; *Theridiidæ*, 15 genera, 144 species; *Pholcidæ*, 1 genus, 1 species; *Enyoidæ*, 1 genus, 1 species; *Dictynidæ*, 4 genera, 10 species; *Agelenidæ*, 9 genera, 18 species; *Drassidæ*, 12 genera, 73 species; *Dysderidæ*, 3 genera, 6 species; *Theraphosidæ*, 1 genus, 2 species; *Thomisidæ*, 11 genera, 39 species; *Lycosidæ*, 6 genera, 31 species; *Salticidæ*, 11 genera, 33 species. Ten species are described, eight of them

new (*Theridion*, *Gnaphosa*, *Micaria*, *Chiracanthium*, and *Lycosa*). The *Phalangiidea* are distributed among eight genera of two families. *Trogulidæ*, 2 genera, 4 species. *Phalangiidæ*, 6 genera, 18 species (one new). The *Pseudo-Scorpiones* are thus distributed; *Chernes* 3, *Chelifer* 3, *Chthonius* 2, and *Obisium* 4 species. The only Acarid is a new species of the genus *Rhipidocephalus*.

[Koch, L.]. Japanesische Arachniden und Myriapoden. Verh. z.-b. Wien, xxvii. pp. 735–798, pls. xv. & xvi.

Records 33 species of *Araneidea* of various families and genera; 30 species being described as new. Two new genera of *Theraphosidæ* and *Thomisidæ* are also characterized. Of *Phalangiidea*, two species (both new) are described, one being the type of a new genus (*Psathyropus*, allied to *Liobunum*). The distribution of the *Araneidea* is as follows:—*Epeiridæ*, 5 genera, 7 species; *Theridiidæ*, 2 genera, 2 species: *Filistatidæ*, 1 genus, 1 species; *Agelenidæ*, 3 genera, 5 species; *Drassidæ*, 1 genus, 1 species; *Theraphosidæ*, 1 genus, 1 species; *Thomisidæ*, 5 genera, 7 species; *Lycosidæ*, 3 genera, 4 species; *Oxyopidæ*, 1 genus, 1 species; *Salticidæ*, 1 genus, 2 species.

——. Kaukasische Arachnoideen, in Oscar Schneider's "Naturwissenschaftliche Beiträge zur Kenntniss der Kaukasusländer" (Dresden: 1878, 8vo), pt. iii. pp. 36–71, pls. i. & ii.

A list is given of 37 species of *Araneidea*, 3 of *Solpugidea*, 2 of *Pseudo-Scorpiones* (*Chernetidæ*), 2 of *Scorpiones*, and 2 of *Phalangiidea*, collected by Dr. Schneider in Transcaucasia. The *Araneidea* belong to 6 families, and 13 species are described as new: *Drassidæ*, 4; *Theridiidæ*, 1; *Dysderidæ*, 1; *Thomisidæ*, 3; *Lycosidæ*, 4. The *Phalangiidea* are two species of *Opilio*, both new. Of the *Scorpiones* two are new, both of the genus *Buthus*. The *Pseudo-Scorpiones* and *Solpugidea* are all of known species, excepting one of the latter (*Gluvia*).

——. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg: 1878, pts. 22 & 23, pp. 969–1044, pls. lxxxv.–xcii.

In continuation of the work [*cf.* Zool. Rec. xiv. *Arachn.* p. 4], 7 new genera of *Lycosidæ* are characterized, and of the 35 species of *Lycosidæ*, *Ctenidæ*, *Oxyopidæ*, *Eresidæ*, and *Dinopidæ* described, 32 are new.

Pavesi, Pietro. Saggio di una fauna aracnologica del Varesotto. Atti Soc. Ital. 1878, pp. 789–817.

Enumerates 150 species of *Arachnida* (none new) with localities and general observations from this district (Lago Maggiore). The species are distributed as follows: *Scorpionidea*, 4 (*Scorpiones* 3, *Pseudo-Scorpiones* 1); *Araneidea*, 132; *Phalangiidea*, 9; *Acaridea*, 5.

——. Aracnidi: aggiunto un Catalogo sistematico delle specie di Grecia, in Risultati zoologici, Crociera del Violante, ii. Ann. Mus. Genov. xi. pp. 337–396.

Chap. i. (pp. 337–353) contains a list of the species found during the cruise of the 'Violante' in 1876, in various Mediterranean Islands. 47

... of *Arachnida*, belonging to 3 orders, 15 families, and 31 genera are included. Two species of the *Araneidea* (the list of which contains 45 spp.) are described as new, viz., a *Textrix* and a *Micrommata*. Remarks are also made on various other species of the Spiders catalogued.

Chap. ii. (pp. 354–396) contains a list of the Greek *Araneidea*, compiled from the published works of the Author, C. L. & L. Koch, the Recorder, Simon, and Erber. A comparison is made of the 191 species found in Greece with those recorded in common with Italy, Palestine, and Syria, and other countries of S.E. Europe and the Mediterranean Basin. From this comparison, it appears that of the 191 species, 95 are common to Italy, 55 to Palestine and Syria, 38 to Lower Egypt, 37 to Turkey and Crete, 35 to South Russia, 28 to Tunis, 19 to Dalmatia and the Islands, 16 to Asia Minor and the Islands. Among the 191 species of Greek Arachnids are: *Scorpiones*, 5; *Pseudo-Scorpiones*, 9; *Araneidea*, 151; *Solpugidea*, 3; *Phalangiidea*, 18; *Acaridea*, 5. The *Araneidea* are distributed among 16 families, containing 62 genera.

—— & Pirotta, R. Brevi notizie intorno ad Arachnidi [e Miriapodi] dell' agro Romano. *Op. cit.* xii. pp. 552–567.

Records 52 known species belonging to 11 families and 37 genera of *Araneidea*, 1 known species of *Scorpionidea*, and 4 of *Phalangiidea* (1 new).

Simon, E. Études Arachnologiques. 7me. mémoire. Ann. Soc. Ent. Fr. (5) viii. Section xi., pp. 145–153, Liste des Espèces de la famille des *Cheliferidæ* qui habitant l'Algérie et le Maroc (22 species, 5 new); Sect. xii., pp. 154–158, Descriptions de quelques *Cheliferidæ* de Californie (5 species, 4 new, with remarks on the scanty number, 7 only, known in the Atlantic regions); Sect. xiii., pp. 158–160, Descriptions de deux espéces de Scorpions (both new).

——. 8me. mémoire. *L. c.* pp. 201–212. Sect. xiv., Liste des espèces Européennes et Algériennes de la Famille des *Attidæ* composant la collection de M. le Comte E. Keyserling.

Contains 73 species (3 new), mostly European, and belonging to various genera.

——. Les Arachnides de France. Vol. iv. pp. 1–334, pls. xii.–xvi. (pls. xii. & xiii. belong to vol. iii.). Paris: 1878.

In continuation of the work [*cf.* Zool. Rec. xiii. *Arachn.* p. 4]. Contains the *Drassidæ*, divided into—i. *Drassinæ*, with 12 genera; ii. *Clubioninæ*, with 11. 6 genera of the first of these groups, and 1 of the second, are characterized as new. The species described are 218, of which 95 are new. The genera and species are distributed as follows:—i. *Drassinæ*: *Micaria* 18, *Chrysothrix*, g. n., 1, *Aphantaulax*, g. n., 3, *Prosthesima* 46, *Echemus*, g. n., 1, *Drassus* 38, *Pœcilochroa* 3, *Gnaphosa* 22, *Pythonissa* 8, *Cybeodes*, g. n., 1, *Leptodrassus*, g. n., 1, *Tephlea*, g. n., 1. ii. *Clubioninæ*: *Clubiona* 23, *Chiracanthium* 15, *Anyphæna* 4, *Micariosoma*, g. n., 6, *Trachelas* 2, *Ceto* 1, *Liocranum* 6, *Agræca* 9, *Apostenus* 1, *Zora* 6, *Zoropsis*, g. n., 2. It should be noted that the spiders described in the body of the work are not all found in France, while the footnotes

contain not only descriptions of 7 species and a new genus found [illegible] (*Lycosa*). countries, but several other species, included in the fauna of France [illegible]s. the authority of Thorell. All are reckoned in the above summary. [illegible]e

Taczanowski, L. Les Aranéides du Pérou, Fam. Attides. Bull. Mosc. liii. pp. 278–374, pl. iv.

Describes and records 68 species (57 new) of *Salticidæ*, from Northern and Central Peru, belonging to 13 genera (one new).

——. Les Aranéides du Pérou Central. Hor. Ent. Ross. xiv. pp. 140–175, pls. i. & ii.

Describes 27 species (21 new) of *Epeiridæ*.

Thorell, T. Notice of the Spiders of the 'Polaris' Expedition. Am. Nat. xii. pp. 393–396.

Collates the results of former works by O. Fabricius, L. Koch, T. Thorell, and O. P. Cambridge on Greenland Spiders, which now number 25 species; only 19 however being tolerably well known. Those found during the 'Polaris' Expedition were four only.

——. Studi sui Ragni Malesi e Papuani. Part ii. Ragni di Amboina raccolti dal Prof. O. Beccari. Ann. Mus. Genov. xiii. pp. 1–317 [cf. Zool. Rec. xiv. *Arachn.* p. 6].

Characterizes 7 new genera of several families, and describes 100 species, of which 40, of various families and genera, are given as new.

J. Barrois (J. Anat. Phys. xiv. pp. 529–547, pl. xxxiv.) has contributed an interesting and valuable paper on the development of spiders. Those upon which his researches have been made are (among others not named) *Tegenaria domestica*, some species of *Lycosa*, and *Epeira diadema*ta. The result is to modify some of the views hitherto admitted in respect to external development. (The completely segmented form of the caput, thorax, and abdomen is well shown, figs. 1 & 2.)

L. Becker, CR. Ent. Belg. xxi. pp. cxxvii.–cxxxii., details experiments very similar to those long ago recorded by Blackwall (Tr. L. S. xv. pp. 449–459), and shows how Spiders can emit a line which is carried by the current of air and fixes itself to any object on which it impinges, and thus enables it to cross intervening spaces. The author comes however to the conclusion that a current of air, though of great assistance, is not absolutely needed; the Spider being able to emit a line which will rise of itself and sail away to an opposite point.

H. C. McCook (P. Ac. Philad. 1878, pp. 337–339, records observations on the aeronautic flight of spiders (*Lycosidæ* and *Salticidæ*). The general results are given with great clearness, and are similar to those arrived at by other observers on this subject.

The same author (*l. c.* pp. 124–135) has a paper on "The Basilica Spider and her snare," with woodcut figures of snares and spiders. The species described are of the genera *Epeira* (*Meta*) and *Linyphia*. [The fact of the two distinct types of snare (geometric and irregular) being here recorded as spun by the same spider is very interesting, and tends

.w the untenability of the suborders of *Araneidea* (*Orbitelariæ* ;etitelariæ, &c.) established by Thorell.]

Becker, *l. c.* pp. clxxvii.–clxxxv., details the enemies of Spiders and the dangers to be encountered by them, with their methods of defence; also the provision made for the perpetuation of the species by fecundity, as well as the means used to check their too rapid increase. He also, *l. c.* pp. cliii.–clix., cites instances of maternal care in Spiders, from the *Dictynidæ*, *Theridiidæ*, *Epeiridæ*, *Lycosidæ*, and *Thomisidæ*, and gives, in a popular way, many interesting details of habits.

E. Simon, Bull. Soc. Ent. Fr. (5) viii. pp. lviii. & lix., gives a list of 102 species of Spiders found by M. A. Engel in the island of Ischia, being 17 more than those found previously in the island of Capri by P. Pavesi; at p. lxxi. he corrects errors in lists of Spiders published (Ann. Soc. Ent. Fr. 1878, pp. 48 & 191) by H. Lucas; and (p. lxxii.) adds 13 species of Spiders to the Turkish list in Bull. Soc. Ent. Fr. 1875, p. cxcvi.

F. Karsch, MT. Münch. ent. Ver. ii. p. 95, remarks critically on T. Thorell's "European Spiders."

R. McLachlan, in his Report (J. L. S. xiv.) on the *Insecta*, &c., collected during Nares's Arctic Expedition [Zool. Rec. xv. *Ins.* p. 7] gives an account of the *Arachnida* (pp. 120–122), taken from a paper by the Recorder [Zool. Rec. xiv. *Arachn.* p. 3].

C. H. Robson (Tr. N. Z. Inst. x. pp. 299 & 300, with woodcut) records the discovery of a marine Spider, with its nest in a *Lithodomus*-hole below high-water mark, at Cape Campbell. Its food is unknown, but in confinement (in a bottle of water) it attacked and killed at once a small fish placed with it. Hector adds a note (*l. c.* p. 300), and concludes that the Spider is an *Argyroneta*, which he names *marina*. [Probably it belongs to an undescribed genus of the *Agelenidæ*.]

ARANEIDEA.

Liénard, Valère. Recherches sur la structure de l'appareil digestif des Mygales et des Néphiles. Bull. Ac. Belg. (2) xlvi. pp. 698–708, pl.

Refers to works of F. Plateau, E. Blanchard, and A. Weissmann, and differs from some of the conclusions of the two former. The spiders examined are *Mygale javanensis* and *Nephila chrysogaster*, Walck.

Theraphosidæ.

R. Gillies (Tr. N. Z. Inst. x. pp. 301–306, pl. xiii.) describes several Trap-Door Spiders' nests from California and Western Australia, in the Christchurch Museum. Those from California are furnished with a "cork-lid" on a level with the surface of the ground, while those from Australia project above the surface, and their lids are of the "wafer" type. [This is evident from the general description and figures, but the author thinks not, because the lids are thicker than those of the typical (European) "wafer-lids." They preserve, however, the essential feature

of a wafer-lid, *i.e.*, its covering over the orifice of the nest, inste[illegible] fitting into it like a cork.]

The Recorder, *tom. cit.* pp. 281–287, remarks on the various Trap-door nests described and figured by Gillies, *op. cit.* viii. pp. 222–262, pls. vi.–viii. The conclusion is come to that there are several species of Trap-door Spider in New Zealand, though the examples as yet met with appear to belong to one only. A curious fact (related by Gillies, *l. c.*, and not previously recorded), viz., the occurrence of nests hermetically sealed upon the outside, but with the Spider alive inside, is referred to (p. 284) as confirmed by subsequent observations of Gillies.

Cteniza sauvagii, Rossi. The nest, with its lid, described from Corsica. The habit of this Spider, to cover the outside of the lid with mosses and lichens for purpose of the concealment, is noticed, but this purpose is said to be thwarted by the Spider not always selecting such mosses and lichens as grow immediately near the nest, to which attention is consequently drawn. L. Becker, CR. Ent. Belg. xxi. p. ccxxiv.

Atypus piceus, Sulz. Branched tubes of this Spider are described, but their purpose is unknown. O. P. Cambridge, Ann. N. H. (5) i. pp. 106 & 107.

Eurypelma mollicomum, Auss.; E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 612, pl. xiv. fig. 28, Uruguay.

Sericopelma breyeri, sp. n., L. Becker, Ann. Soc. Ent. Belg. xxi. p. 77, pl. ii. fig. 1, Mexico [*cf.* also *tom. cit.* p. 81, on the subgenus *Sericopelma*, Auss.].

Metriopelma, g. n., *id. tom. cit.* C. R. p. cclvi. Allied to *Sericopelma*, *Lasiodora*, and *Eurypelma*, Auss.; differing from the first by the want of a femoral tuft on the fourth pair of legs, and the much wider separation of the anterior median eyes. For *S. breyeri*, above recorded.

Harpactira elevata, sp. n., Karsch, MB. Ak. Berl. 1878, p. 316, Mozambique.

Ischnocolus alticeps, p. 609, and *I. parvus*, p. 611, E. von Keyserling, *l. c.*, spp. nn., Uruguay.

Idiommata schomburgki, sp. n., Karsch, Z. ges. Naturw. (3) iii. p. 820, Adelaide.

Leptopelma dubia, sp. n., Karsch, MB. Ak. Berl. 1878, p. 314, pl. i. fig. 1, Mozambique.

Arbanitis gilliesi, sp. n., O. P. Cambridge (as *Nemesia*), Tr. N. Z. Inst. x. p. 284, pl. x., Oamaru, New Zealand.

Misgolas, g. n., Karsch, Z. ges. Naturw. (3) iii. p. 821. Near *Arbanitis*, L. Koch; for *M. rapax*, sp. n., N. S. Wales.

Hermeas, g. n., *id. l. c.* p. 823. Also near *Arbanitis*; for *H. crispus*, sp. n., Van Diemen's Land.

Accatyma, g. n., L. Koch, Verh. z.-b. Wien, xxvii. p. 760. For *A. roretzi*, sp. n., *id. l. c.* p. 761, pl. xvi. figs. 23–25, Japan.

Œcobiidæ.

Uroctea compactilis, sp. n., L. Koch, Verh. z.-b. Wien, xxvii. p. 749, pl. xv. fig. 11, Japan.

Dysderidæ.

Dysdera concinna, sp. n., L. Koch, Kaukas. Arachn. p. 43, Lenkoran.

Drassidæ.

Micaria albo-striata, p. 74, figs. 15 & 16, and *socialis*, p. 76, figs. 13 & 14, L. Koch, Verzeichniss, &c., Nürnberg; *M. spinulosa*, p. 13, Monetier de Briançon, *smaragdula*, p. 14, Mont Léberon and Corsica, *scenica*, p. 17, various localities in France, *funerea*, p. 18, and *movens*, p. 22, Corsica, *guttigera*, p. 19, various French localities and Spain, *breviuscula*, p. 25, Hautes Alpes, *corvina*, p. 23, Oran, *scabra*, p. 26, Algiers, Tangier, and *todilla*, p. 28, Cyprus, E. Simon, Arachn. de Fr. iv.: spp. nn.

Chrysothrix, g. n., Simon, *l. c.* p. 29. Very closely allied to *Micaria*; differs notably in the forward curve of the anterior row of eyes. Type, *C. splendidissima*, L. Koch, = *Micaria armata*, Cambr., p. 30, pl. xiv. fig. 3, France, Corsica, and Spain.

Aphantaulax, g. n., *id. l. c.* p. 32. Types, *A. seminiger*, E. Sim. (= *Micaria albini*, L. Koch, *nec* Savigny), p. 34, Corsica and Algeria, *A.* (*M.*) *cinctus*, L. Koch, p. 35, Hyères, Hungary, and Algeria, *A. trimaculatus*, sp. n., p. 36, France.

Gnaphosa nigerrima, Koch, Verzeichniss, &c., p. 73, fig. 11, Nürnberg; *G. nigella*, id. Kaukas. Arachn. p. 39, pl. i. fig. 1, Sardarabad; *G. atramentaria*, p. 169, fig. 15, and *tetrica*, p. 170, fig. 18, France, *prosperi*, p. 175, Spain, *iberica*, p. 176, fig. 13, E. Pyrenees, *occidentalis*, p. 177, fig. 11, France, *oceanica*, p. 179, fig. 23, Morbihan, *tigrina*, p. 180, Valais, Riffelberg, at 2000–3000 mètres elevation, *alpica*, p. 183, Valais, Zermatt, &c., *hospitalis*, p. 186, Valois, Gt. St. Bernard, &c., at elevation of 2600 mètres, *inconspecta*, p. 187, fig. 23, Pyrenees, *secreta*, p. 190, E. Pyrenees, *alacris*, p. 191, fig. 24, E. Pyrenees and Corsica, E. Simon, Arachn. de Fr. iv. pl. xv.: spp. nn.

Pythonissa, C. L. Koch, retained as separate, and distinguished from *Gnaphosa*, Latr.; Simon, *l. c.* p. 192 (note).

Pythonissa nubivaga, p. 197, and *silacea*, p. 198, Hautes Alpes, *spinosissima*, p. 202, Provence, Spain, and Algeria, *cinereo-plumosa*, p. 203, Algeria, spp. nn., *id. l. c.*

Leptodrassus, g. n., *id. l. c.* p. 208. Scarcely distinguishable from *Drassus*, but has no transverse impression of the maxillæ. For *L. femineus*, sp. n., *id. l. c.* p. 209, pl. xv. fig. 3, Corsica.

Prosthesima semibadia, Kock, Kaukas. Arachn. p. 42, pl. i. fig. 3, Baku; *P. pallida*, Keyserling, Verh. z.-b. Wien, xxvii. p. 602, pl. xiv. fig. 22, Uruguay; *P. mutabilis*, p. 46, fig. 7, Corsica, *holosericea*, p. 47, fig. 10, Spain and Eastern Pyrenees, *segrex*, p. 49, fig. 9, Digne, *mania*, p. 59, fig. 12, France and Spain, *fulvo-pilosa*, p. 61, fig. 14, France, *antiope*, p. 64, Lot-et-Garonne, *fusco-micans*, p. 72, Paris, *atro-cærulea*, p. 73, fig. 16, Morbihan, *suavis*, p. 76, fig. 6, Digne and Algeria, *ænea*, p. 79, fig. 18, France and Spain, *civica*, p. 80, fig. 20, Paris, *fortuita*, p. 81, and *rubicundula*, p. 89, France, *sicula*, p. 86, Sicily, *tantula*, p. 88, fig. 21, *larifuga*, p. 90,

fig. 22, and *callida*, p. 91, fig. 23, Corsica, *tarsalis*, p. 92, fig. 25, Digne, *circumspecta*, p. 94, fig. 26, France and Corsica, *fusco-rufa*, p. 95, fig. 27, and *fulvastra*, p. 96, Corsica, *fusco-testacea*, p. 97, fig. 31, Morbihan, Plouharnel, E. Simon, *l. c.* pl. xiv.: spp. nn.

Echemus, g. n., *id. l. c.* p. 100. Intermediate between *Prosthesima* and *Drassus*, differing notably in the position of the eyes. For *E. ambiguus*, sp. n., *ibid.*, pl. xv. fig. 1, Digne.

J. H. Emerton, Psyche, ii. pp. 123 & 124, fig. 5, describes and figures the method of oviposition in *Drassus*, agreeing with Menge's account of it in *Lycosa piratica*.

Drassus flavo-maculatus, p. 40, Krasnowodsk, and *D. thimei* [*thiemii*], p. 66, pl. ii. figs. 5 & 5 *a*, Caspian Sea, Koch, Kaukas. Arachn.; *D. navaricus*, Simon, Bull. Soc. Ent. Fr. (5) viii. p. clix., La Rhûne, Basses-Pyrénées; *C. difficilis*, p. 110, France, *luteo-micans*, p. 112, Corsica, *albicans*, p. 112, Gers, Lectoure, and Corsica, *fugax*, p. 114, Eastern Pyrenees and Spain, *rubidus*, p. 115, E. Pyrenees and mountains in N. Spain, *portator*, p. 116, E. Pyrenees, *hypocrita*, p. 120, pl. xv. fig. 8, France and Spain, *variosus*, p. 123, France, *typhon*, p. 128, and *concertor*, p. 129, pl. xvi. fig. 24, E. Pyrenees, Vernet-les-bains, *vicarius*, p. 132, pl. xvi. fig. 22, Corsica, *politus*, p. 142, France, *retusus*, p. 150, Villers-sur-mer, *musculus*, p. 152, Lot-et-Garonne and Sos, *dimidiatus*, p. 153, and *patricius*, p. 156, Corsica, and *auspex*, p. 154, E. Pyrenees, and Spain, E. Simon, Arachn. de Fr. iv.: spp. nn.

Drassus bulbifer, Cambr., = *braccatus*, L. Koch; Simon, Arachn. de Fr. iv. p. 136.

Pœcilochroa picta, sp. n., *id. l. c.* p. 160, pl. xiv. fig. 2, France and Corsica.

Tetromma, g. n., E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 607; for *T. lutea*, sp. n., *id. l. c.* p. 608, pl. xiv. figs. 25–27, Colombia.

Clubiona japonica, Koch, Verh. z.-b. Wien, xxvii. p. 759, Japan; *C. hilaris*, p. 220, *juvenis*, p. 227, and *stigmatica*, p. 236, France, and *diniensis*, p. 238, Basses Alpes, Vallée de la Bléone, Simon, Arachn. de Fr. iv.: spp. nn.

Matidia, g. n., T. Thorell, Ann. Mus. Genov. xiii. p. 182. Allied to *Clubiona*, and forms a transition to the *Thomisidæ* (*Heteropodidæ*). For *M. virens*, p. 182, and *M. calcarata*, p. 184, spp. nn., *id. l. c.*, Amboina.

Eutittha, g. n., *id. l. c.* p. 179. Closely allied to *Chiracanthium*, C. L. Koch, but differing in the structure of the spinners, and in the small, or absent, interval between the eyes of each lateral pair. Type, *E. insulana*, sp. n., *id. l. c.* p. 179, Amboina.

Chiracanthium montanum, Koch, Verzeichniss, &c., p. 77, fig. 18, Nürnberg; *C. keyserlingi*, Becker, Ann. Soc. Ent. Belg. xxi. p. 79, pl. ii. fig. 11, Mexico; *C. angulitarse*, p. 252, fig. 11, and *pennatum*, p. 257, fig. 10, pl. xvi., Corsica, *candidum*, p. 258, France, *fulvo-testaceum*, p. 259, Digne, *abbreviatum*, p. 262, Gironde, and *striolatum*, p. 263, pl. xv. fig. 5, France, Simon, *l. c.*: spp. nn.

Anyphæna maculatipes, p. 603, pl. xiv. fig. 23, Uruguay, and *oblonga*, p. 605, fig. 24, Mexico, Vera Cruz, Keyserling, Verh. z.-b. Wien, xxvii.; *A. simoni*, Becker, *l. c.* p. 78, pl. ii. fig. 7, Mexico; *A. albo-irrorata*,

. 269, Mouths of the Rhone, Hyères, *conspersa*, p. 270, pl. xv. fig. 6, rance, Simon, *l. c.*: spp. nn.

Agræca annulipes, p. 304, and *lineata*, p. 308, Corsica; *id.* l. c.; *A. ounieri*, p. lx., Oran, and *badia*, p. lxi., Spain, *id.* Bull. Soc. Ent. Fr. (5) viii.: spp. nn.

Micariosoma, g. n., Simon, Arachn. de Fr. iv. p. 271. Substituted for *Phrurolithus*, C. L. Koch, for *P. flavitarsis*, Luc., p. 273, *P. festivus*, C. L. Koch, p. 275, pl. xvi. fig. 6, and *P. minimus*, C. L. Koch, p. 277, pl. xvi. fig. 7; also *M. nigrinum*, p. 276, fig. 4, France, *corsicum*, p. 278, fig. 8, Corsica, and *tibiale*, p. 280, N. Spain: spp. nn.

Zora manicata, p. 318, Digne, &c., *armillata*, p. 320, S. France ?, *pardalis*, p. 322, France and Algeria, *parallela*, p. 323, pl. xvi. fig. 9, France, spp. nn., *id. l. c.*

Zoropsis, g. n., *id. l. c.* p. 327. Allied to *Zora*, but much larger. Type, *Dolomedes ocreata*, C. L. Koch, also *Z. media*, sp. n., p. 328, pl. xvi. fig. 12, France, Spain, and Italy.

Creugas, g. n., Thorell, Ann. Mus. Genov. xiii. p. 175. Nearly allied to *Megæra*, Sim., but differs in having the fore-central pair of eyes no larger than usual, and the "patella" devoid of spines. Type, *C. gulosus*, sp. n., *id. ibid.*, Amboina.

Liocranum pallidulum, North Spain, and *majus*, Spain, p. li., *libanicum*, p. lii., Lebanon, Simon, Bull. Soc. Ent. Fr. (5) viii.; *L. concolor*, p. 292, Corsica, and *segmentatum*, p. 293, pl. xvi. fig. 3, Digne, *id.* Arachn. de Fr. iv.: spp. nn.

Trachelas rayi, id. *l. c.* p. 284, pl. xvi. fig. 1, France; *T. amabilis*, id., Bull. Soc. Ent. Fr. (5) viii. p. l., fig. 1, Oran and Daya: spp. nn.

Tephlea, g. n., *id.* Arachn. de Fr. iv. p. 207. Near *Trachelas*, for *T. agelenoides*, sp. n., *id. ibid.*, Syria.

Cybeodes, g. n., *id. l. c.* p. 205. Bears considerable resemblance (particularly as to the spinners) to the *Agelenidæ*; for *C. testaceus*, sp. n., *id. l. c.* p. 206, pl. xv. fig. 2, Corsica.

Miltia, Sim., referred to the *Drassidæ*; id. *l. c.* p. 280 (note).

Battalus, g. n., Karsch, Z. ges. Naturw. (3) iii. p. 816. Bears a resemblance in pattern and colouring to *Habronestes* (*Agelenidæ*). For *B. spinipes*, sp. n., *id. l. c.* p. 817, Northern Australia.

Trochanteria, g. n., *id. l. c.* p. 817, note. Specially characterized by the great length of the coxa and trochanter of the fourth pair of legs, which are devoid of spines. Type, *T. ranuncula*, sp. n., *id. ibid.*, America.

Eresidæ.

Eresus hildebrandti, sp. n., Karsch, Z. ges. Naturw. (3) iii. p. 319, pl. viii. fig. 7, Zanzibar. *E. bubo*, L. Koch; L. Koch, Arachn. Austr. p. 1028, pl. xc. figs. 4 & 4 *a*, Algoa Bay.

Dictynidæ.

Dictyna similis, sp. n., E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 589, pl. xiv. fig. 14, Uruguay.

Lethia patula (Sim., described by mistake as new), O. P. Cambridge, Ann. N. H. (5) i. p. 108 [previously described by E. Simon as *Dictyna*], Arachn. de France, i. p. 197], and *L. albispiraculis*, id. *l. c.* p. 109, pl. xvi. fig. 1, England; *L. sex-pustulata*, Simon, Bull. Soc. Ent. Fr. (5) viii. p. lxv., Lebanon: spp. nn.

Psechrus, g. n., Thorell, Ann. Mus. Genov. xiii. p. 170. Allied to *Amaurobius*, but differs in the elevated caput, very long legs, and long, narrow abdomen. For *P. argentatus*, sp. n., *id. l. c.* p. 171, Amboina.

Amaurobius simoni, p. 585, figs. 11 & 12, Uruguay, and *granadensis*, p. 587, fig. 13, St. Fé de Bogota, E. von Keyserling, Verh. z.-b. Wien, xxvii. pl. xiv.; *A. laminatus*, Thorell, *l. c.* p. 169, Amboina: spp. nn.

Titanœca obscura, sp. n., Keyserling, *l. c.* p. 591, fig. 15, St. Fé de Bogota.

Dinopidæ.

Dinopis schomburgki, Karsch, Z. ges. Naturw. (3) iii. p. 332, Adelaide; *D. subrufus*, p. 1039, fig. 2, Bowen and Brisbane, *ravidus*, p. 1041, fig. 3, Gayndah, and *unicolor*, p. 1043, fig. 4, pl. xci., King George's Sound, L. Koch, Arachn. Austr.: spp. nn.

Avella despiciens, Cambr., p. 1033, figs. 5 & 4 *b*, Sydney, with *A. unifasciata*, p. 1035, figs. 6 & 6 *a*, pl. xc., Sydney, and *angulata*, p. 1037, fig. 1, pl. xci., Rockhampton, spp. nn., Koch, *l. c.*

Agelenidæ.

Argyroneta marina, sp. n. [name only; but figured by Robson, *ibid.*], J. Hector, Tr. N. Z. Inst. x. p. 300, Cape Campbell, New Zealand. [Certainly not an *Argyroneta*, but of an undescribed genus of this family.]

Cybæus maculatus, sp. n., Keyserling, Verh. z.-b. Wien, xxvii. p. 592, pl. xiv. fig. 16, St. Fé de Bogota.

Cœlotes insidiosus, p. 751, *luctuosus*, p. 752, and *exitialis*, p. 755, L. Koch, Verh. z.-b. Wien, xxvii., spp. nn., Japan.

Tristichops aculeatus, p. 779, and *approximatus*, p. 780, Karsch, Z. ges. Naturw. (3) iii., spp. nn., Natal. [If, as stated by the author, these Spiders possess calamistra and cribellum, they are not of the genus *Tristichops* (*Cydippe*, Cambr.), and should probably be removed to the *Dictynidæ*, with a new generic name.]

Agelena opulenta, Koch, *l. c.* p. 757, pl. xv. fig. 20, Japan; *A. americana*, Keyserling, Verh. z.-b. Wien, xxvii. p. 599, pl. xiv. figs. 20–24, N. America: spp. nn.

Tegenaria derhami, Scop.; Koch, *l. c.* p. 757, Japan. *T. modesta*, p. 594, figs. 17 & 18, Uruguay, and *bidentata*, p. 597, fig. 19, Colombia, Keyserling, *l. c.* pl. xiv.; *T. vicina*, Karsch, *l. c.* p. 816, New Zealand: spp. nn.

Textrix violantis, sp. n., P. Pavesi, Ann. Mus. Genov. xi. p. 344, Caprera.

Hersiliidæ.

Hersilia hildebrandti, sp. n., Karsch, *l. c.* p. 312, pl. viii. fig. 2, Zanzibar.

Pholcidæ.

Pholcus margarita, T. Workman, Ann. N. H. (5) ii. p. 451, pl. xviii. fig. 1, Rangoon; *P. v-notatus*, T. Thorell, Ann. Mus. Genov. xiii. p. 163, Amboina: spp. nn.

H. Lucas, Bull. Soc. Ent. Fr. (5) viii. pp. cv. & cxxxix., records and remarks upon the habits of *P. borbonicus*, Vins., found in Paris among objects received from Honolulu.

Theridiidæ.

Argyrodes amboinensis, p. 141, *inguinalis*, p. 149, and *delicatulus*, p. 151, spp. nn., Thorell, *l. c.*, Amboina.

Theridium zickzack, sp. n., Karsch, Z. ges. Naturw. (3) iii. p. 311, pl. viii. fig. 1, Zanzibar; *T. albipes*, sp. n., L. Koch, Kaukas. Arachn. p. 69, Caspian Sea; *T. gemmosum*, p. 71, figs. 2, 6, & 8, and *persubtile*, p. 71, spp. nn., L. Koch, Verzeichniss, &c., Nürnberg; *T. blackwalli*, Cambr., *id. l. c.* p. 71, fig. 34; *T. inquinatum*, sp. n., Thorell, *l. c.* p. 155, Amboina; *T. thalia*, sp. n., pl. viii. fig. 2, and *luteipes*, Cambr., Workman, *l. c.* p. 451, Rangoon. *T. tepidariorum*, C. L. Koch; E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 579, Uruguay.

Latrodectus 13-*guttatus*, Rossi, = *L. lugubris*, Motsch., var.; E. Simon, Bull. Soc. Ent. Fr. (5) viii. p. xxiii.

Steatoda pustulosa, sp. n., Keyserling, *l. c.* p. 579, pl. xiv. figs. 7 & 8, Uruguay.

Centropelma bidens, New South Wales, and *nodata*, Van Diemen's Land, spp. nn., Karsch, *l. c.* p. 815.

Erigone psychrophila, Thor.; T. Thorell, Am. Nat. xii. p. 393, Arctic Regions, Polaris Exped.

Neriene atro-tibialis, sp. n., O. P. Cambridge, Ann. N. H. (5) i. p. 116, pl. xi. fig. 3, England. *N. penessa*, sp. n., Thorell (as *Erigone*), l. c. p. 394, Polaris Bay.

Linyphia incerta, sp. n., Cambridge, *l. c.* p. 117, fig. 2, England; *L. exornata*, sp. n., L. Koch, Verh. z.-b. Wien, xxvii. p. 746, pl. xv. fig. 10, Japan.

Ero foliata, sp. n., L. Koch, *l. c.* p. 748, Japan.

Gelanor (*Galena*) *zonatus*, L. Koch, = *G. picta*, Tacz.; Simon, *l. c.* p. clxviii.

Epeiridæ.

Meta longula, p. 94, *pusilla*, p. 97, *pilatrix*, p. 99, and *cavernicola*, p. 102, T. Thorell, Ann. Mus. Genov. xiii., Amboina; *M. rabli*, Karsch, *l. c.* p. 771, Natal; *M. blanda*, L. Koch, Verh. z.-b. Wien, xxvii. p. 743, pl. xv. fig. 5, Japan: spp. nn.

Tetragnatha prædonia, Koch, *l. c.* p. 744, Japan; *T. trichodes*, Thorell,

l. c. p. 115, Amboina; *T. linyphioides*, Karsch, MB. Ak. Berl. 1878, p. 317, pl. i. fig. 2, Mozambique; *T. peruviana*, p. 142, pl. i. fig. 1, and *andina*, p. 144, fig. 2, L. Taczanowski, Hor. Ent. Ross. xiv., Central Peru: spp. nn.

Nephila fasciculata, Koch; Taczanowski, *l. c.* p. 145, Central Peru. *N. clavata*, sp. n., Koch, *l. c.* p. 741, pl. xv. fig. 4, Japan.

Nephilengys genualis, Gerst., hitherto only found at Mombas and on the Congo, now recorded and described from Rio Janeiro; H. Lucas, Bull. Soc. Ent. Fr. (5) viii. p. clvii.

Cyrtophora petersi, sp. n., Karsch, MB. Ak. Berl. 1878, p. 321, pl. ii. fig. 4, Mozambique.

Argiope amœna, Koch, *l. c.* p. 735, pl. xv. fig. 1, Japan; *A. verecunda*, Thorell, *l. c.* p. 35, Amboina: spp. nn.

Singa longicauda, sp. n., Taczanowski, *l. c.* p. 145, Central Peru.

Zilla bosenbergi, p. 575, figs. 4 & 5, Uruguay, and *rogenhoferi*, p. 578, fig. 6, Brazil, spp. nn., E. von Keyserling, Verh. z.-b. Wien, xxvii. pl. xiv.

Epeira montevidensis, p. 571, figs. 1 & 2, *latro*, p. 574, fig. 3, Von Keyserling, *l. c.* pl. xiv., Uruguay; *E. salebrosa*, p. 49, *goniæa*, p. 51, *flavisternis*, p. 61, *triangulifera*, p. 65, *beccarii*, p. 65, *postilena*, p. 70, *camelodes*, p. 78, and *thelura*, p. 84, Thorell, Ann. Mus. Genov. xiii. Amboina; *E. seminigra*, p. 737, *ventricosa*, p. 739, fig. 2, and *opima*, p. 740, fig. 3, L. Koch, Verh. z.-b. Wien, xxvii pl. xv., Japan; *E. turcica*, E. Simon, Bull. Soc. Ent. Fr. (5) viii. p. lxxii., Constantinople: *E. stigmatisata*, p. 326, pl. ix. figs. 3, 3 *a*, 3 *b*, Siam, *gazellæ*, p. 803, New Hanover, *parva*, p. 804, Adelaide, *walesiana*, p. 805, and *pia*, p. 806, N. S. Wales, F. Karsch, Z. ges. Naturw. (3) iii.; *E. petersi*, id. MB. Ak. Berl. 1878, p. 320, pl. ii. fig. 2, Mozambique; *E. rhodomelas*, p. 147, pl. i. fig. 3, *adiantoides*, p. 148, fig. 4, *peruviana*, p. 150, fig. 5, *nigriventris*, p. 151, fig. 6, *abunda*, p. 152, fig. 7, *viridipes*, p. 155, fig. 8, *coronigera*, p. 157, fig. 9, *velutina*, p. 159, fig. 10, pl. i., *smaragdinea*, p. 161, fig. 12, *trilineata*, p. 162, fig. 13, *carminea*, p. 163, fig. 14, *hirtipes*, p. 164, fig. 15, *punctipes*, p. 166, fig. 15, *nigropunctata*, p. 167, fig. 17, *bicornuta*, p. 168, fig. 18, *elegantissima*, p. 170, fig. 19, *cylindrica*, p. 171, figs. 20 & 21, *fusiformis*, p. 173, fig. 22, pl. ii., Taczanowski, Hor. Ent. Ross. xiv., Central Peru; *E. basilica*, H. C. McCook, P. Ac. Philad. 1878, p. 133, Texas: spp. nn.

Epeira guianensis, Tacz., p. 160, pl. ii. fig. 11, *cayana*, Tacz., p. 174, *jelskii* and *caudacuta*, Tacz., p. 175; Taczanowski, *l. c.*, Central Peru.

Epeira diadela, Walck., = *azzara*, Walck., and *E. borbonica*, Vins. & F. Karsch, = *Nephilengys genualis*, Gerst.; Simon, Bull. Soc. Ent. Fr. (5) viii. p. lxx.

Gasteracanthidæ.

Isacantha hildebrandti, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 313, pl. viii. fig. 3, Zanzibar.

Gasteracantha petersi, id. MB. Ak. Berl. 1878, p. 320, pl. ii. fig. 2, Mozambique; *G.* (as *Stanneoclavis*) *studeri*, p. 799, New Hanover, and *G.* (as *Actinacantha*) *maculata*, p. 800, North Australia, N. S. Wales, and Fiji Islands, *id.* Z. ges. Naturw. (3) iii.: spp. nn.

Paraplectana peltoides, sp. n., Thorell, Ann. Mus. Genov. xiii. p. 21, Amboina.

Acroaspis, g. n., p. 806. Appears to be intermediate between *Cyrtarachne* and *Epeira*; type, *A. olorina*, sp. n., p. 807, Swan River. Karsch, Z. ges. Naturw. (3) iii.

Dema, g. n., nearly allied to *Paraplectana*; type, *D. simplex*, sp. n., N. S. Wales. *Id. l. c.* p. 801.

Cœrostris avernalis, A. G. Butler, P. Z. S. 1878, p. 799, Madagascar; *C. rugosa*, Karsch, MB. Ak. Berl. 1878, p. 323, pl. i. fig. 8, Mozambique: spp. nn.

Bunocrania, g. n., Thorell, Ann. Mus. Genov. xiii. p. 24; appears to be allied intermediately to *Gasteracantha*, *Paraplectana*, and *Epeira*; type, *B. biloba*, sp. n., p. 25, Amboina.

Peltosoma (as *Aranæthra*, Butl.) *ungari*, sp. n., Karsch, Z. ges. Naturw. (3) iii. p. 322, Accra.

Uloboridæ.

Uloborus undulatus, sp. n., Thorell, Ann. Mus. Genov. xiii. p. 133, Amboina.

Stephanopidæ.

Stephanopis erinacea, sp. n., Karsch, *l. c.* p. 810, Fiji Islands.

Thomisidæ.

Misumena bitæniata, sp. n., Thorell, *l. c.* p. 199, Amboina.

Diæa nitida, L. Koch, Verh. z.-b. Wien, xxvii. p. 769, pl. xvi. fig. 33, Japan; *D. decens*, Karsch, *l. c.* p. 773, Natal: spp. nn.

Pistius insignitus, sp. n., Koch, Kaukas. Arachn. p. 47, pl. i. fig. 4, Sardarabad.

Stiphropus, Gerst., ? = *Platythomisus*, Dol. [!]; Karsch, *l. c.* p. 775.

Portia, g. n., for *P. schultzii*, sp. n., Natal; *id. l. c.* p. 774.

Xysticus dentiger, E. Simon, Bull. Soc. Ent. Fr. (5) viii. p. clviii., France; *X. caucasius*, Koch, Kaukas. Arachn. p. 48, pl. i. fig. 5, Borshom; *X. walesianus*, Karsch, *l. c.* p. 811, N. S. Wales: spp. nn.

Tharpyna decorata, sp. n., Karsch, *l. c.* p. 819, N. S. Wales.

Imarus stellio, E. Sim., ♂ new to science, France; Simon, *l. c.* p. lxi.

Hexomma, g. n., p. 323, for *H. hahni*, sp. n., p. 325, pl. ix. figs. 1 & 2. Herrero Land, Karsch, *l. c.* [? whether this Spider belongs to the *Thomisidæ*, or not rather to the *Scytodidæ* next *Loxoscelis*].

Platythomisus heraldicus, p. 315, pl. viii. fig. 4, Zanzibar, *cimex*, p. 775, S. Africa, spp. nn., *id.* l. c.; *Platythomisus*, Dol., = *Stiphropus*, Gerst., *id. ibid.*

Prychia maculata, sp. n., *id. l. c.* p. 808, Salawatti.

Heteropoda natalia, p. 772, Natal, and *patellata*, p. 809, Van Diemen's Land, *id.* l. c.; *H. bimaculata*, Thorell, Ann. Mus. Genov. xiii. p. 194, Amboina: spp. nn.

Sarotes aulicus, p. 766, fig. 31, and *invictus*, p. 767, fig. 32, spp. nn., Japan, and *S. regius*, Fabr., p. 769, L. Koch, Verh. z.-b. Wien, xxvii. pl. xvi. *S. venatorius*, Linn: the wide geographical distribution of this Spider is supposed to be effected by the Trade winds; H. C. McCook, P. Ac. Philad. 1878, p. 136. *S. truncus*, sp. n., *id. l. c.* p. 147, Japan.

Isopeda villosa, sp. n., Koch, *l. c.* p. 769, Japan.

Micrommata formosa, sp. n., P. Pavesi, Ann. Mus. Genov. xi. p. 348, Lampedusa.

Sparassus africanus, Karsch, MB. Ak. Berl. 1878, p. 325, pl. ii. fig. 6, Mozambique; *S. serenus*, id., Z. ges. Naturw. (3) iii. p. 773, Natal: spp. nn.

Oxytate, g. n., Koch, *l. c.* p. 764. Allied to *Philodromus*; for *O. striatipes*, sp. n., *id. ibid.* pl. xvi. figs. 26–30, Japan.

Philodromus auricomus, id. *l. c.* p. 763, Japan; *P. lineatipes*, O. P. Cambridge, Ann. N. H. (5) i. p. 122, pl. xi. fig. 5, Scotland: spp. nn.

Thanatus africanus, Karsch, Z. ges. Naturw. (3) iii. p. 316, pl. viii. fig. 5, Zanzibar; *T. imbecillus*, Koch, Kaukas. Arachn. p. 45, Krasnóvodsk: spp. nn.

Podophthalmidæ.

Tetragonophthalma, g. n. Between *Ocyale* and *Podophthalma* (pl. ix. fig. 5). Type, *T. phylla*, sp. n., Accra; Karsch, Z. ges. Naturw. (3) iii. p. 329, pl. ix. fig. 4.

Dendrolycosa albo-limbata, sp. n., T. Thorell, Ann. Mus. Genov. xiii. p. 201, Amboina.

Perenethis, g. n., L. Koch, Arachn. Austr. p. 980. Placed by the author in the *Lycosidæ*. Allied to *Ocyale*, but distinguished by the anterior row of eyes being "procurva" [*i.e.*, the convexity of the curve directed backwards], the clypeus being low, the eyes of the middle and third row more widely separated *inter se*, and by the form of the labium and proportion of the legs. For *P. venusta*, sp. n., *id. ibid.* pl. lxxxv. fig. 7, Rockhampton and Peak Downs.

Thasyræa, g. n., *id. l. c.* p. 982. Maxillæ very divergent [but otherwise nearly allied to *Perenethis*]. For *T. ornata*, p. 983, fig. 1, Gayndah, and *T. lepida*, p. 984, fig. 2, Sydney, spp. nn., *id. l. c.* pl. lxxxvi.

Ocyale novicia, sp. n., Koch, Kaukas. Arachn. p. 54, Borshom and Tuapse.

Lycosidæ.

Cycloctenus, g. n., Koch, Arachn. Austr. p. 987, for *C. flaviceps*, sp. n., p. 988, pl. lxxxvi. fig. 3, Australia.

Argoctenus, g. n., *id. l. c.* p. 990, for *A. igneus*, ibid. fig. 4, King George's Sound, and *pictus*, p. 992, fig. 5, Sydney, spp. nn., *id. l. c.* pl. lxxxvi.

Leptoctenus, g. n., for *L. agelenoides*, sp. n., *id. l. c.* p. 994, pl. lxxxvii. fig. 1, Gayndah.

Pycnoctenus, g. n., for *P. robustus*, sp. n., *id. l. c.* p. 996, pl. lxxxvii. fig. 2, Sydney.

Ænigma [‖ Newman, *Ins.*], g. n., allied to *Dolomedes*, for *Æ. australiana*, sp. n., N. S. Wales, Karsch, Z. ges. Naturw. (3) iii. p. 825.

Dolomedes sulfureus, Koch, Verh. z.-b. Wien, xxvii. p. 778, Japan; *D. bilatus*, Karsch, Z. ges. Naturw. (3) iii. p. 814, Western Australia: spp. nn.

Trabea lineata, sp. n., Koch, Arachn. Austr. p. 970, pl. lxxxiv. fig. 7, Sydney.

Trochosa moluccensis, sp. n., Thorell, Ann. Mus. Genov. xiii. p. 206, Amboina; *T.*, sp. inc., *id.* Am. Nat. xii. p. 395, Greenland.

Anoteropsis, g. n., remarkable for the height of the clypeus; for *A. flavescens*, p. 971, fig. 1, New Zealand, and *A. longipes*, p. 973, fig. 2, Australia, spp. nn., Koch, Arachn. Austr. pl. lxxxv.

Tarentula beckeri, sp. n., E. von Keyserling (per L. Becker), CR. Ent. Belg, xxi. p. ccli., Antigua.

Lycosa lutetiana and *figurata*, Sim., described from France by E. Simon, Bull. Soc. Ent. Fr. (5) viii. p. lvii. *L. lucaris*, L. Koch; Koch, Arachn. Austr. p. 979, pl. lxxxv. fig. 6, New Zealand.

Lycosa sabulonum, p. 79, fig. 19, and *lucorum*, p. 81, figs. 20 & 21, Koch, Verzeichniss, &c., Nürnberg; *L. martensi*, p. 812, Australia, and *subrufa*, p. 813, Van Diemen's Land, Karsch, Z. ges. Naturw. (3) iii.; *L. felina*, p. 50, pl. i. fig. 6, Azkhur, *ocellata*, p. 52, pl. ii. figs. 1 & 2, Baku, and *cereipes*, p. 68, pl. ii. fig. 6, Caspian Sea, Koch, Kaukas. Arachn.; *L. nesiotis*, Thorell, Ann. Mus. Genov. xiii. p. 209, Amboina; *L. atropos*, p. 770, fig. 34, and *cœlestis*, p. 772, figs. 25 & 36, Koch, Verh. z.-b. Wien, xxvii. pl. xvi., Japan; *L. guttata*, p. 329, fig. 1, and *petersi*, p. 330, fig. 3, Karsch, MB. Ak. Berl. 1878, pl. ii., Mozambique; *L. albo-guttulata*, p. 975, fig. 3, Bowen, *brisbanæ*, p. 976, fig. 4, Australia, *nævia*, p. 978, fig. 5, Sydney, Koch, Arachn. Austr. pl. lxxxv.: spp. nn.

Diapontia kochi, sp. n., E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 614, pl. xiv. figs. 29 & 30, Uruguay.

Sphasidæ.

Oxyopes sertatus, L. Koch, Verh. z.-b. Wien, xxvii. p. 779, Japan; *O. macilentus*, p. 1000, fig. 4, Cape York, *attenuatus*, p. 1002, fig. 6, pl. lxxxvii., Peak Downs, *molarius*, p. 1004, figs. 1 & 2, Gayndah and Peak Downs, *gratus*, p. 1006, figs. 3 & 4, Peak Downs and Rockhampton, *elegans*, p. 1008, figs. 5 & 6, Sydney, Rockhampton, Port Mackay, Gayndah, and Peak Downs, *punctatus*, p. 1011, figs. 7 & 8, pl. lxxxviii., Rockhampton, Peak Downs, and Gayndah, *rubicundus*, p. 1013, figs. 1 & 2, Sydney, *lautus*, p. 1015, fig. 3, Port Mackay, *amœnus*, p. 1017, figs. 4 & 5, Rockhampton, Gayndah, and Peak Downs, *quadrifasciatus*, p. 1020, fig. 6, pl. lxxxix., Peak Downs, *variabilis*, p. 1021, figs. 1 & 2, Rockhampton, Port Mackay, and Gayndah, and *mundulus*, p. 1025, fig. 3, pl. xc., Sydney, *id.* Arachn. Austr.: spp. nn.

Peucetia (*Pasithea*, Bl.) *striata*, Karsch, Z. ges. Naturw. (3) iii. p. 317, pl. viii. fig. 6; *P. albescens*, Koch, Arachn. Austr., p 998, pl. lxxxvii., fig. 3, Bowen and Peak Downs: spp. nn.

Salticidæ.*

Salticus formicarius, Deg., found in Belgium, in a very dry and stony locality; L. Becker, CR. Ent. Belg. xxi. p. lxi.

Salticus melanops, Tacz., *S. ruficeps*, p. 369, and *discicollis*, p. 371, spp. nn., L. Taczanowski, Bull. Mosc. liii., Peru.

Jelskia unicolor, Tacz., p. 373, and *J. robusta*, sp. n., p. 374, *id. l. c.*, Peru.

Janus mutillæformis [*mutilli-*], sp. n., *id. l. c.* p. 372, Peru.

Chirothecia, g. n., *id. l. c.* p. 362. Chiefly remarkable for the inordinately developed tibiæ of the anterior pair of legs. For *C. cheliferoides*, p. 363, figs. 1 & 2, *crassipes*, p. 364, figs. 3 & 4, *wrzesniowskii*, p. 366, figs. 5 & 6, and (*C.*?) *formicina*, p. 367, spp. nn., *id. l. c.* pl. iv.

Amycus spectabilis, C. L. Koch, p. 345, *guianensis*, Tacz., p. 349, *fuscomanus* [*fusci-*], p. 347, *steindachneri*, p. 349,, *lechugalensis*, p. 351, *thoracicus*, p. 353, *crocutus*, p. 355, *mystacalis*, p. 358, *lycosiformis*, p. 360, spp. nn., and *A. spinipes*, Tacz., p. 361, Taczanowski, *l. c.*, Peru.

Lycidas, g. n., Karsch, MT. Münch. ent. Ver. ii. p. 25, for *L. anomalus*, sp. n., p. 26, N. S. Wales.

Ligonipes, g. n., *id. l. c.* p. 26, for *L. illustris*, sp. n., *ibid.*, N. S. Wales.

Hyllus fuscomanus [*fusci-*], p. 336, *cambridgii*, p. 337, *calliethérinus*, p. 339, *quadrilunatus*, p. 341, *heliophaninus*, p. 342, and *tumbezanus*, p. 343, spp. nn., Taczanowski, *l. c.*, Peru.

Ligurinus, g. n., Karsch, *l. c.* p. 27. Closely allied to *Hyllus*, C. L. Koch; for *L. scopifer*, sp. n., *ibid.*, N. S. Wales.

Philæus luteo-striatus, sp. n., E. von Keyserling, Verh. z.-b. Wien, xxvii. p. 617, pl. xiv. figs. 31 & 32, Uruguay.

Phidippus aneidens, sp. n., Taczanowski, *l. c.* p. 333, Peru.

Alcmena superba, sp. n., Karsch, *l. c.* p. 29, Northern Australia.

Icius inhonestus, sp. n., Keyserling, *l. c.* p. 621, pl. xiv. fig. 33, Uruguay.

Mævia fenestrata, p. 327, *stolzmanni*, p. 329, *fusiformis*, p. 330, *trilineata*, p. 331, and *gracilipes*, p. 332, spp. nn., Taczanowski, *l. c.*, Peru.

Marpissa raimondii, p. 317, *lubomirskii*, p. 319, *modesta*, p. 320, *hieroglyphica*, p. 321, *mystacina*, p. 322, and *isabellina*, p. 325, *M. plana*, Tacz., p. 324, and *branickii*, Tacz., p. 327, *id. l. c.*, Peru. *M. fusca*, sp. n., Karsch, *l. c.* p. 28, N. S. Wales.

Marptusa doleschalli, sp. n., T. Thorell, Ann. Mus. Genov. xiii. p. 229, Amboina.

Phyale gratiosa, sp. n., p. 315, and *P. ministerialis*, C. L. Koch, p. 316; Taczanowski, *l. c.*, Peru.

Maratus, g. n., Karsch, *l. c.* p. 27, for *M. amabilis*, sp. n., *ibid.*, Northern Australia.

Ascyltus, g. n., *id. l. c.* p. 29. *A. divinus* and *penicillatus*, p. 30, *simplex*, p. 31, spp. nn., Fiji Islands.

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* The relative positions of the various genera recorded in this family are not necessarily to be taken as systematic.—O. P. C.

10 *Mopsus*, g. n., *id. l. c.* p. 31. Allied to *Ascyltus*, Karsch; for *M. pormon*, sp. n., *ibid.*, Segaar Bay, New Guinea.

Cocalus limbatus, p. 283, and *macellus*, p. 287, spp. nn., Thorell, *l. c.*, Amboina.

Dendryphantes bis-quinque-punctatus, p. 309, *centro-maculatus*, p. 311, *seriatus*, p. 312, and *cuprinus*, p. 313, spp. nn., Taczanowski, *l. c.*, Peru.

Sinis, g. n. Allied to *Cocalus*, C. L. Koch, in the great height of the cephalothorax, but differs in its being not much longer than broad. Metatarsi and tarsi long and slender. Abdomen shorter than that of *Cocalus*, and the structure of the spinners is different. Type, *Cocalus ...nbriatus*, Dol., Amboina. Thorell, *l. c.* p. 270.

...is bella, sp. n., Karsch, *l. c.* p. 22, N. S. Wales.

...phrys peruvianus, p. 280, *quinque-radialis*, p. 282, *crux*, p. 284, *key-*SIMON, p. 285, *maurus*, p. 287, *nigriceps*, p. 288, *albipalpis*, p. 291, *pelze-fan*92, *vestitus*, p. 293, *leucodon*, p. 294, *andinus*, p. 297, *quadricolor*, cc*sancti-matei*, p. 300, *leucopalpis* [vox hybr.], p. 301, *sinapicolor*, Descri*rum-equinum*, p. 304, *unachonensis*, p. 306, and *acrifrons*, p. 308, different and *E. obscurus*, Tacz., p. 289; Taczanowski, *l. c.*, Peru. *E.* ...on, ♂ new to science, Dalmatia; E. Simon, Ann. Soc. Ent. Fr. ... p. 211. *E. petersi*, sp. n., F. Karsch, MB. Ak. Berl. 1878, p. 33... fig. 7, Mozambique.

Plexippus laticeps, p. 247, and *veles*, p. 251, Thorell, Ann. Mus. Genov. xiii., Amboina; *P. punctatus*, Fiji Is., *incanus* and *phyllus*, N. S. Wales, Karsch, *l. c.* p. 25: spp. nn.

Rhanis jelskii, Tacz., L. Taczanowski, *l. c.* p. 279, Peru. *R.* (*Rhene*) *tricolor*, sp. n., Karsch, *l. c.* p. 22, Fiji Is.

Hasarius albarius, p. 280, fig. 39, and *fulvus*, p. 282, figs. 40 & 41, L. Koch, Verh. z.-b. Wien, xxvii. pl. xvi., Japan.

Epiblemum pilosum, sp. n., Karsch, *l. c.* p. 23, N. S. Wales.

Heliophanus lacteus, L. Koch, ♂ described as new, from Naxos, p. 210. *H. keyserlingi*, p. 208, *stylifer*, p. 209, Algeria, *miles*, p. 209, Sarepta, E. Simon, l. c.; *H. maculatus*, Karsch, *l. c.* p. 23, N. S. Wales: spp. nn.

Boethus, g. n. Between *Attus* and *Evophrys* in form of the cephalothorax; more like *Marptusa*, Thor., in form of the abdomen; and resembles *Synemosyna* and *Diolenius* in the form and armature of the first pair of legs. Type, *B. spinimanus*, sp. n., T. Thorell, Ann. Mus. Genov. xiii. p. 221, Amboina.

Attus kraali, sp. n., *id. l. c.* p. 290, Amboina; *A. niger*, p. 23, *asper-limbatus*, and *gazellæ*, p. 24, Karsch, *l. c.* Segaar Bay, New Guinea: spp. nn.

SCORPIONIDEA.

SCORPIONIDÆ.

Euscorpius italicus, C. L. Koch; L. Koch, Kaukas. Arachn. p. 38, Borshom. *E. picipes*, sp. n., E. Simon, Ann. Soc. Ent. Fr. (5) viii. p. 158, Transcaucasia.

Buthus eupeus, C. L. K., Mastara, Baku, Sardarabad, and Krasnowodsk,

with *B. cognatus*, p. 58, pl. i. fig. 7, Azkhur, and *schneideri*, p. 61, pl. i fig. 4, Krasnowodsk, spp. nn., L. Koch, l. c. *B. mardoche*, sp. n., E. Simon, *l. c.* p. 159, S. Morocco.

Nebo, g. n., Simon, Ann. Soc. Ent. Fr. (5) viii. p. 399. Differs from *Hemiscorpio*, Sim., by the absence of lateral tubercles on the vesicle, and the presence of a strong denticulation under the terminal claw or sting, which last brings it near *Diplocentrus*, Pet. Type, *N. hierochonticus*, Sim., Syria.

Teuthraustes, g. n., *id. l. c.* p. 400; possesses seven denticulations in each of the combs. For *T. atramentarius*, sp. n., *ibid.*, Ecuador.

PSEUDO-SCORPIONES.

Chelifer neglectus, p. 147, *niger*, p. 148, *politus*, p. 149 (also France), *procer*, p. 150, *anachoreta*, p. 151, spp. nn., E. Simon, Ann. Ent. Fr. (5) viii., Algeria.

Lophochernes, g. n. Closely allied to *Chelifer*; the first five abdominal segments strongly carinated on the side, the following segmen[illegible] For *L. bicarinatus*, sp. n., E. Simon, Bull. Soc. Z. Fr. iii. p. [illegible] alive in Paris, but evidently imported from Japan.

Garypus saxicola, sp. n., C. O. Waterhouse, Tr. E. Soc. 1878, p. 182, fig., Spain.

THELYPHONIDEA.

E. J. Wilkinson, in a letter to the Smithsonian Institute, states that *Thelyphonus giganteus* (Mexico) emits an extremely offensive smell from its caudal appendage "whip"; Am. Nat. xiii. p. 396. (*Cf. op. cit.* xi. p. 367, where, apparently on good authority, the venomous nature of *Thelyphonus* is stated to be undoubted.)

SOLPUGIDEA.

Holmberg, E. L. Notas Aracnológicas sobre los Solpúgidos Argentinos. Naturalista Argentino, i. pp. 69–74.

The author includes *Gonyleptidæ*, *Opilionidæ*, &c., in this Order.

Gluvia patagonica, Holmberg, Aracn. Arg. [*vide suprà*, in General Titles], No. 83; *G. caucasica*, L. Koch, Kaukas. Arachn. p. 57, Baku and Sardarabad: spp. nn.

PHALANGIIDEA.

Gonyleptidæ.

Pachyloides, g. n., Holmberg, Nat. Argent. i. p. 6. Resembles *Pachylus*, but more elongate; tarsi 6-, 8-, 4-, and 7-jointed; ocular eminence with 2 conic granulations, slightly elevated and distant; post-thorax with no appendage. For *P. thorelli*, sp. n., *id. ibid.*, Buenos Aires.

Opisthoplatus, g. n., *id. l. c.* p. 73. Tarsi of first pair 6-, of second pair

10- to 12-, and of third and fourth pairs 7-jointed. Ocular eminence and post-thorax each with 2 púas. For *Gonyleptes prospicuus*, Holmberg, Aracn. Arg. No. 85 [*suprà*].

Discocyrtus, g. n., *id. l. c.* p. 74. Apparently differs from the preceding in its narrow and more convex thorax; post-thorax with 2 sub-conic tubercles. For *G. testudineus*, Holmberg, Aracn. Arg. No. 87.

Gonyleptes robustus, sp. n., *id. l. c.* No. 86, Argentine Republic. Is a true *Pachylus*; id. Nat. Argent. i. p. 71.

Scotolemon doriæ, sp. n., Pavesi & Pirotta, Ann. Mus. Genov. xii. p. 565, Rome.

PHALANGIIDÆ.

SIMON, EUGÈNE. Descriptions d'Opiliones (Faucheurs) nouveaux de la faune circa-Méditerranéenne. CR. Ent. Belg. xxi. pp. ccxv.–ccxxiv.

Describes a new genus and 12 new species of various genera found at different places, from Algeria and Spain to the Ukraine.

New genera and species :—

Psathyropus, allied to *Liobunum*, for *P. tennipes*; L. Koch, Verh. z.-b. Wien, xxvii. p. 785, Japan.

Dasylobus, Simon, *l. c.* p. ccxviii., note. Differs from *Phalangium* in the proportion and structure of the maxillary leg, in which the patella is as long as the tibia, and has its inner angle (which projects like an apophysis) furnished with a brush of hairs. Type, *P. argentatum*, Canestr., also *D. serrifer*, p. ccxviii. and *nigricoxis*, p. ccxix., Algeria, and *eremita*, p. ccxix., Lebanon.

Liobunum coccineum, p. ccxv., Algeria, *cupreum*, p. ccxvi., Morocco, and *seriatum*, p. ccxvii., Latakieh, Simon, *l. c.*

Prosalpia martini, id. *l. c.* p. ccxvii., Portugal.

Phalangium discolor, Karsch, Z. ges. Naturw. (3) iii. p. 320, pl. viii. fig. 8, Zanzibar.

Platybunus placidus, Simon, *l. c.* p. ccxx., locality doubtful, ? Spain.

Acantholophus duriusculus, p. xxi., Gibraltar, *angulifer*, Oran, and *seoanii*, Ferrol, p. ccxxii. *id. l. c.*

Zacheus africanus, Karsch, MB. Ak. Berl. 1878, p. 333, pl. ii. fig. 5, Mozambique.

Egænus gulosus, Simon, *l. c.* p. ccxxiii., Ukraine.

Opilio weyenberghi, Holmberg, Aracn. Arg. No. 88, Argentine Republic; *O. punctipes*, p. 63, Sardarabad, and *lepidus*, p. 65, Krasnowodsk, L. Koch, Kaukas. Arachn.; *O. decoratus*, id. Verh. z.-b. Wien, xxvii. p. 784, Japan.

TROGULIDÆ.

Anelasma soerensis, sp. n., L. Koch, Verzeichniss, &c., p. 65, Nürnberg.

PYCNOGONIDEA.

DOHRN, A. Neuere Untersuchungen über Pycnogoniden. MT. Zool. Stat. Neap. i. pp. 28–29.

Consists of preliminary general notes on the organisation of the *Pycnogonidæ*, defending the author's statements as to the typical number of the pairs of feet (7) against Semper's objections [Zool. Rec. xi. p. 220]; stating that two kinds of blood-corpuscles are to be found in these creatures (one, amœboid); and pointing out the rather considerable differences caused by sex and age.

JARZYNSKY, —. Præmissus Catalogus Pycnogonidarum inventarum in mari glaciali, ad oras Lapponiæ Rossicæ et in Mari Albo, anno 1869 et 1870.

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WILSON, E. B. Synopsis of the *Pycnogonida* of New England. Tr. Conn. Ac. v. pp. 1–26, pls. i.–vii.

The author divides the group into the following families:—

i. PYCNOGONIDÆ, for *Pycnogonum*, Brunnich.
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Fourteen species are described (4 new), and portions of each figured. A table is given showing general geographical and bathymetrical distribution.

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Ascor[*r*]*hynchus*, Sars, *l. c.* p. 367. "Probiscis permagna, trunci fere longitudinem æquans, piriformis. Mandibulæ parvæ. Palpi longissimi, 9-articulati; pedes 8-articulati, accessorii 9-articulati." *A. abyssi*, sp. n., *id. ibid.*, Northern Sea, 63–65° N. lat. 1° W., 1000–1500 fath.

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Colossendeis angusta, Sars, *l. c.* p. 368, Northern Sea, 62°–63° N. lat., 1°–4° E. long., 412–417 fath.; length of body, 18 mm.

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Nymphon macronyx and *megalops*, Sars, *l. c.* pp. 365 & 366, Northern Sea, 62°–64° N. lat., 1° E.–10° W. long., 300–400 fath.

ACARIDEA.

KRAMER, P. Beiträge zur Naturgeschichte der Milben. Z. ges. Naturw. (3) iii. pp. 519–561, woodcut.

Discusses minutely the life-history and external anatomy of mites.

R. McLachlan, J. L. S. xiv. pp. 120–122, in reporting on the *Arachnida* collected during Nares's Arctic Expedition, refers to 10 spp. of *Bdellidæ*, *Hydrachnidæ*, *Oribatidæ*, and *Sarcoptidæ*, of which only 2 are identified.

Acari eating eggs of insects; C. V. Riley, Canad. Ent. x. p. 58.

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Sarcoptidæ.

P. Mégnin, under the heading "Sarcoptides psoriques," R. Z. (3) vi. figures the following species, with no accompanying text: pls. i. (♂), ii., & iii., *Psoroptes longirostris*, M., var. *equi*; vi. & vii., *Chorioptes spathiferus*; viii., *C. setiferus*, var. *hyenæ*; ix., *C. ecaudatus*, M. The latter species = *Sarcoptes cynotes*, Hering, and occurs in ears of dogs, cats, and ferrets; *id.* Bull. Soc. Ent. Fr. (5) viii. p. xxiii.

Acaridæ.

Mégnin, P. Mémoire sur un nouveau groupe d'Acariens, les Cheylétides parasites. Pet. Nouv. ii. pp. 234 & 235 (Report by M. Girard of the Entomological Section of the "Seizième Réunion des Sociétés savantes des Départements en 1878"; also in J. de l'Anat. Phys. xiv. pp. 416–441, 4 pls.).

The author considers that the true parasites should be divided into two principal sub-classes: i., inoffensive; ii., dangerous. After observations on Acarideous parasites in general, he includes in the *Cheyletides* (not the *Cheyletides* of Leach): *Harpirhynchus*, g. n., *Picobia*, G. Haller, and *Myobia*, Heyden. In his remarks on the anatomy and physiology of this group, the author describes the digestive, respiratory, generative, and locomotive apparatus. A constant and remarkable fact is that in these parasites the male organ of generation is situated behind the anus (where this last exists), and in two species the female organ is similarly placed.

Cheyletus venustissimus recorded as British; the ♀ and her habits, and the previously unknown ♂, larva, and nympha, described. A. D. Michael, J. R. Micr. Soc. i. p. 313, pl.

Glyciphagus palmifer recorded from Britain, figured, and described in all stages; *id.* J. Quekett Micr. Club, 1878, p. 29, pl. *G. plumiger* also recorded from Britain, and its female described and (for the first time) figured; *id.* Sci. Goss. xiv. p. 153.

Analyges, sive *Dermalichus*, C. L. Koch. G. Haller thoroughly revises this genus; Z. wiss. Zool. xxx. pp. 50–80, pl. iii. *A. nitzschi*, p. 70, fig. 12, *affinis*, p. 75, fig. 15, and *certhiæ*, p. 76, fig. 16, spp. nn., *id. l. c.*

The same author, *l. c.* pp. 511-562, pls. xxxiii.-xxxv., enters still more fully into this genus, in respect to its synonymy, systematic position, biology, and anatomy.

Dimorphus, g. n., Haller, *l. c.* p. 514, pls. xxxiii. *a b c* and xxxiv. *d e*, formed for 16 known species of *Dermalichus*, C. L. Koch.

Crameria, g. n., *id. l. c.* p. 522, for *C. lunulata*, p. 524, figs. A ♂ B ♀, and *major*, p. 525, fig. C, pl. xxxiv., spp. nn.

Freyana ovalis, sp. n., *id. l. c.* p. 527, pl. xxxiv. fig. G (Nymphal form).

Acarus ? neglectus, sp. n., O. P. Cambridge, Transit Venus Exp. Zool. p. 221, woodcut, figs. 1–4, Kerguelen Island.

Cheyletus flabellifer, Michael, J. R. Micr. Soc. i. p. 133, pl., Tamworth, feeding on *Glyciphagus palmifer* (habits described, and a review of the genus given); *C. parasitivorax*, p. 425, pl. xxviii., on the hairs of rabbits,

living on soft parasites, particularly Listrophores; *heteropalpus*, p. 426, pl. xxix. figs. 1–6, at the base of feathers of several of the *Columbidæ* and *Passeres*, and *macronychus*, p. 427, pl. xxix. figs. 7 & 8, in colonies at the base of the feathers of several exotic *Passeres*, Mégnin, *l. c.*: spp. nn.

Harpi[*r*]*rhynchus*, g. n., Mégnin, *l. c.* p. 429; for *H. nidulans*, sp. n., in large colonies in the follicles of the wing feathers in a Lark, and in tumours on a Grosbeak.

Gamasidæ.

Gamasus scarabæicolus, sp. n., F. Karsch, MB. Ak. Berl. 1878, p. 335, pl. i. fig. 5, Mozambique.

Pterygosoma agamæ, Peters; *id. l. c.* p. 336, pl. i. fig. 9.

Ixodidæ.

Four different species of *Ixodes* observed on one animal, coupling. Mode of copulation noted; the situation of the penis and oviduct being at the base of the rostrum. P. Mégnin, Bull. Soc. Ent. Fr. (5) viii. p. xci.

Ixodes acanthoglossi, p. xxxv., on *Acanthoglossus bruijni*, and *trimaculatus*, p. cxxviii., on a Saurian, *Varanus chlorostigma*, both from New Guinea, spp. nn., H. Lucas, Bull. Soc. Ent. Fr. (5) viii.

Amblyomma variegatum, F., *Rhipidostoma leachi*, Aud., and *Dermacentor rhinocerotis*, De G., from Mozambique; F. Karsch, MB. Ak. Berl. 1878, p. 337.

Amblyomma petersi, Karsch, *l. c.* p. 336, pl. i. fig. 4, Mozambique; *A. arteriosum*, L. Koch, Verh. z.-b. Wein, xxvii. p. 786, Japan: spp. nn.

Rhipi[*do*]*cephalus expositicus*, sp. n., Koch, Verzeichniss, &c., p. 84, Nuremberg.

Hæmophysalis hirudo, sp. n., Koch, Verh. z.-b. Wien, xxvii. p. 786, Japan.

Trombidiidæ.

Geckobia, g. n., P. Mégnin, Bull. Soc. Ent. Fr. (5) viii. p. xlii. and Ann. *l. c.* The first known instance of one of the group living parasitically in the adult state. Respiratory stigmata forming a pair of elongate tubes inserted above the base of the rostrum. Mandibles approaching those of *Ixodes*; eyeless. *G. latasti*[*i*], sp. n., p. 188, pl. vii., in the interdigital spaces and peri-palpebral furrows of a lizard [*Platydactylus*] from Algiers.

Hydrachnidæ.

Cronenberg, A. H. Ueber den Bau der Hydrachniden. Zool. Anz. i. pp. 316–319.

An abstract of the author's paper in Russian (Nachr. Ges. Mosc. xxix. pt. 2, pp. 1–40, pls. i.–iii.), which is based upon an examination of the tracheal, digestive, excretory, glandular, and generative systems of different species of *Eylais*, *Hydrachna*, and *Nesæa*. There appears to be no rectum in these species, the colon ending in a cul-de-sac.

ARACHNIDA (FOR 1879).

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S.
(Assisted by F. M. CAMPBELL, F.L.S., &c.)

LIST OF THE MORE COMPREHENSIVE PUBLICATIONS.

BECKER, LÉON. Catalogue des Arachnides de Belgique. (2me partie) Ann. Ent. Belg. xxii. pp. 24–30; (3me partie) *l. c.* pp. 101–108; (4me partie) *tom. cit.* CR. pp. civ.–cvii.

These parts respectively record 31 species of 13 genera of *Drassidæ*, 57 species chiefly of *Theridiidæ*, and 21 of *Phalangiidea*. The author, *l. c.* CR. pp. lxxxix., cxxvii., clxiii. & clxxiv., adds various known genera and species to the Belgian list; and, pp. xcv.–xcvii. & cxxii.–cxxvii., gives list of fresh localities for species already recorded.

——. Aranéides de Néerlande. *L. c.* pp. xxxix.–xlvii.

A catalogue, with localities, of 159 known species of 14 families and 66 genera, based upon lists by Six and Van Hasselt. The author, *l. c.* pp. cxxix. & clxxvi., adds various known species.

——. Diagnoses de nouvelles Aranéides Américaines. *L. c.* pp. 77–86, pls. i. & ii.

Describes 1 new genus and 12 new species of various families.

——. Caractères généraux des Aranéides (Abrégé de l'histoire naturelle des Aranéides de Belgique). *L. c.* (CR.) pp. xxi.–xxxiv.

Treats of the external characters and classification of the *Araneidea*. The classification adopted is that of Eugène Simon, Arachn. de France.

——. Communications Arachnologiques. *L. c.* (CR.) pp. xcv.–cii. cxxii.–cxxvii., & clxix.–clxxiv.

Contains various notes on and lists of Belgian and Netherlands Spiders; also, pp. xcvii.–cii., some details on Spiders flying by means of their silken lines. The experiments made many years ago by Blackwall are repeated and with a similar result, showing that lines are emitted, carried by a current of air, and self-fixed to any point with which the line happens to come in contact. An instance is also recorded, p. xcviii., of a Thera-

phosid (*Selenocosmia javanensis*, Walck.), having nine eyes instead of the normal eight.

[Becker, Léon.] Aranéides de Russie recueillies à Jaroslaw (Russie Centrale) par M. Kokouyeux. *L. c.* pp. xlvii. & xlviii.

Records 22 known species of 14 genera, comprised in 6 families.

——. Aranéides recueillies en Moldavie par M. A. Montandon. *L. c.* pp. lxxxviii. & lxxxix.

Records 18 known species of 15 genera, and comprised in 8 families.

——. Faune de Hongrie et Moldavie. *L. c.* pp. cxxix.–cxxxi.

Records 15 species of various genera and families of *Araneidea*, and 3 species of *Phalangiidea* also captured by M. A. Montandon. 7 other species are mentioned, p. xlviii., and 3 new to science described, pp. cxlv.–cxlvii.

——. Descriptions d'Aranéides exotiques nouveaux. *L. c.* pp. cxl.–clxv.

Describes 4 spp. nn. of 4 genera of *Theraphosidæ*, one genus (*Scodra*) being characterized as new.

Butler, A. G. On *Arachnida* from the Mascarene Islands and Madagascar. P. Z. S. 1879, pp. 729–734, pl. lviii.

Eight species, one of which is new, are recorded from the Islands of Réunion and Mauritius: 9 from Madagascar, 4 being new, with one new genus, *Pyrestheres* (*Thomisidæ*).

——. On a Small Collection of *Arachnida* from the Island of Johanna, &c. Ann. N. H. (5) iv. pp. 41–44, pl. i.

Records and describes 7 species of *Araneidea* (5 new).

——. Zoology of Rodriguez: *Arachnida*. Phil. Trans. clxviii. pp. 501–509, pl. lii.

Describes or records 30 species of *Araneidea*, and 1 of *Acaridea*. This is, for the most part, a reprint from Ann. N. H. (4) xvii. [1876; *cf.* Zool. Rec. xiii. *Arachn.* p. 1]. The spp. nn. there described are now also figured. [The figures show unmistakably that *Theca vacillans*, fig. 4, is a *Tetragnatha*; *Sphasus* (*Oxyopes*) *extensipes*, fig. 2, is far removed from the family *Oxyopidæ*; and *Pholcus vexillifer*, fig. 6, is not a *Pholcus*, but belongs to the *Thomisidæ*, probably g. n., near *Monaxtes*, Luc.]

Cambridge, O. P. On some new and little known species of *Araneidea*, with remarks on the genus *Gasteracantha*. P. Z. S. 1879, pp. 279–293, pls. xxvi. & xxvii.

Records 23 species (19 new).

——. On some New and Rare British Spiders, with characters of a new genus. Ann. N. H. (5) iv. pp. 190 & 215, pl. xii.

Notes and describes 51 species of numerous genera and various families. One new genus of *Theridiidæ* characterized. Fifteen species of various genera are considered to be new to science, and 12 others new to Britain.

——. The Spiders of Dorset. Proc. Dorset Nat. Hist. & Antiq. Field

Club, i. pp. 1–235, pls. i.–iii.; with Introduction, pp. i.–xli. and preface. Sherborne: 1879.

The Introduction details both the internal and external structure of Spiders, and their differences from Insects and other Arachnids; also their habits, economy, snares, mode of entrapping their prey, nests and egg cocoons, gossamer, use of their silken lines, venom, sexual differences, protective resemblance to insects and other objects, enemies, affection for their young, duration of life, classification, mode of capture and preservation, and where to look for them. 245 species belonging to 46 genera (to *Ero*, C. L. Koch, inclusive) and 9 families are described (*Theraphosidæ*, *Dysderidæ*, *Drassidæ*, *Eresidæ*, *Dictynidæ*, *Agelenidæ*, *Scytodidæ*, *Pholcidæ*, *Theridiidæ*), seven of the species are described as new, and one new genus, *Robertus* (*Theridiidæ*), is characterized. The plates illustrate structural details, and several of the families.

[Cambridge, O. P.] On some New and Rare Spiders from New Zealand, with characters of four new genera. P. Z. S. 1879, pp. 681–703, pls. lii. & liii.

Seventeen species (15 new) of various families and genera are described. The new genera belong to the *Drassidæ*, *Agelenidæ*, and *Theridiidæ*.

——. On some new species of *Araneidea*. Ann. N. H. (5) iv. pp. 343–349, pl. xvii.

Contains a list of a collection of German *Araneidea* received from Von Keyserling, from Silesia. The list comprises 32 species, of which 5 (of the genera *Neriene* and *Walckenaera*) are described as new.

Graber, V. Ueber das unicorneale Tracheaten- und speciell das Arachniden- und Myriopoden- Auge. Arch. mikr. Anat. xvii. p. 58, with 3 pls.

The eyes of the following Arachnids are investigated:—*Scorpionidæ*, *Buthus*, and *Scorpio*; *Araneidea*, *Epeira*, *Tegenaria*, and *Thomisus*. The layer next beneath the cornea-lens, vitreous body, is a special development of the hypoderm, with which it is continuous. The so-called "iris" of *Buthus*, &c., is produced by a development of the pigment in the cells of the same layer, which lie beneath the circumference of the cornea-lens. (*Cf.* J. R. Micr. Soc. iii. p. 61.)

Grenacher, H. Untersuchungen über des Sehorgan der Arthropoden, insbesondere der Spinnen, Insecten, und Crustaceen. Gottingen: 1879, 4to, pp. 188, 11 pls.

The eyes of some spiders are discussed (pp. 39–57), investigations are recorded upon the form and structure of some of the eyes of the *Phalangiidea* and *Araneidea* (*Epeiridæ*, *Lycosidæ*, and *Salticidæ*). Dimorphism is widely spread in the eyes of the *Araneidea*, and it is shown (in respect to the retinal elements) that the muscles discovered by A. Brandt cannot (as hitherto supposed) act as sphincters; it is suggested that their function is similar to that of the outer muscles of the human eye; and that the movements in the eyes of Spiders may be thus accounted for.

—, A. W. M. VAN. Araneæ exoticæ, quas collegit, pro museo Lugdunense, cel. C. B. H. von Rosenberg, ex insulâ Celebes (Gorontalo). Tijdschr. Ent. xxii. pp. 217–226, pl. xii. figs. 1–5.

Contains a list of 47 species: *Epeiridæ* (including *Gasteracanthidæ*) 25; *Theridiidæ*, 1; *Lycosidæ*, 3; *Thomisidæ*, 2; and *Attidæ*, 16, one of the last being new.

HERMAN, OTTO. Magyarország Pók-faunája, &c. (Ungarns Spinnenfauna, im Auftrage der Kön. Ungarischen naturwissenschaftlichen Gesellschaft) iii. pp. 1–394, pls. vii.–x. [*Cf. anteà*, p. 2.]

Concludes the work, and is a descriptive catalogue of the known *Araneidea* of Hungary, with a synoptic list of *Phalangiidea* (pp. 327–331). The present volume is written in Hungarian, with an additional part (Uebersicht der Spinnen Ungarns, pp. 335–387) in German, containing a complete list of *Araneidea*, with descriptions of new species. 229 species (36 new), included in the following families and genera, are recorded or described:—Sect. I.—Theretricæ: *Epeiridæ*, 8 gen., 31 spp.; *Uloboridæ*, 2 gen., 2 spp.; *Theridiidæ*, 13 gen., 53 spp. (3 new); *Scytodidæ* (including *Pholcidæ*, auctt.), 2 gen., 3 spp.; *Enyoidæ*, 1 gen., 1 sp.; *Urocteridæ*, 1 gen., 1 sp.; *Agelenidæ* (including *Dictynidæ*, auctt.), 12 gen., 27 spp. (2 new); *Drassidæ*, 10 gen., 70 spp. (17 new); *Dysderidæ*, 3 gen., 7 spp. (1 new); *Theraphosidæ*, 2 gen., 3 spp. (1 new). Sect. II.—Diotricæ: *Heteropodidæ*, 3 gen., 6 spp. (1 new); *Thomisidæ*, 5 gen., 24 spp. (1 new); *Lycosidæ*, 7 gen., 36 spp. (7 new): *Oxyopidæ*, 1 gen., 3 spp.; *Eresidæ*, 1 gen., 2 spp.; *Attidæ*, 11 gen., 33 spp. (3 new).

KARSCH, F. West-afrikanische [Myriopoden und] Arachniden. Z. ges. Naturw. (3) iv. pp. 825–837, pl. xi. figs. 1–6.

Records and describes 13 species (8 new) of various families and genera of *Araneidea*.

——. Arachnologische Beiträge. *L. c.* pp. 534–562, pl. vii.

This paper is divided as follows:—

I. *Sphærobothria*, eine neue Riesen von Costa Rica, Vogel-Spinnen, pp. 534–536; characterizing (with figures) a new genus and species of *Theraphosidæ*.

II. Die Arachniden Gattung *Trochanteria*, Karsch (family *Trochanteroidæ*), pp. 536 & 537; describing and figuring the type species.

III. Zur Naturgeschichte der Araneiden Gattung *Trechalea* (*Triclaria*, C. L. Koch), pp. 539–442; describes a new species from Brazil, and discusses the systematic position of the genus.

IV. Die Arachniden Gattungen *Trechona* und *Linothele* (*Theraphosinæ*), pp. 542–546. Discusses the characters of *Trechona*. Describes a new species of that genus from Bogota, and characterizes a new genus (*Linothele*), describing also its type as a new species. Two other new genera of *Theraphosidæ* are also characterized in a footnote to pp. 543 & 544, with a type of each as new species, all from Caracas.

V. Zur Arachniden-fauna Ceylan's, pp. 547–560. Discusses and criticizes the materials furnished by various authors (Herbst, C. L. Koch, O. P.

Cambridge, A. G. Butler, &c.) for an Arachnid-fauna [illegible] pp. i.–xli. and pre- describes 9 new species of the families *Epeiridæ*, *Lycosidæ*, *Salticidæ* and *Thomisidæ*, 1 genus of this last family (*Pelmopoda*) being cha[illegible] of racterized as new.

[Karsch, F.] West-afrikanische Arachniden, gesammelt von Herrn Stabsarzt Dr. Falkenstein. *L. c.* pp. 329 & 373.

This paper is divided into three parts. Part i. records and describes 45 species of *Araneidea*, belonging to 10 families and 28 genera: 25 species (including a *Phoneutria* from Mexico) being described as new, and 2 new genera (*Gasteracanthidæ* and *Salticidæ*) characterized. Pt. ii. records 2 species of *Acaridea*, 1 new. Pt. iii. records a new species of *Phalangiidea*, 1 known species of *Phrynidæ*, and 3 of *Scorpionidea* (1 new).

——. Baustoffe zu einer Spinnen-fauna von Japan. Verh. Ver. Rheinl. xxxvi. pp. 57–105, pl. i.

Comprises 60 species (52 new) of various families and genera. 2 new genera, families *Theridiidæ* and *Lycosidæ*, are characterized.

——. Die zwerg Männchen der Araneiden Gattungen *Nephila*, *Celænia*, und *Cœrostris*. Z. ges. Naturw. (3) iv. pp. 838–842, pl. xi. figs. 7–11.

Discusses the subject of the extreme difference of size in the sexes of these genera, which belong to 3 different families, referring to authors who have called attention to it, but omitting notice of remarks and figures given by O. P. Cambridge, P. Z. S. 1871, pp. 620 & 621, pl. xlix. figs. 2 & 3.

——. Sieben neue Spinnen von Sta. Martha. S. E. Z. xl. pp. 106–109.

5 species and 1 new genus (fam. *Drassidæ*) of *Araneidea*, 1 species of *Scorpionidea*, and 1 of *Solpugidea* are described.

Koch, Ludwig. Arachniden aus Sibirien und Novaya Zemlya, eingesammelt von der Schwedischen Expedition im Jahre 1875. Sv. Ak. Handl. xvi. No. 5, pp. 3–136, pls. i.–vii.

157 species of *Araneidea* are described or recorded, 76 (principally *Theridiidæ*) being new to science; also 7 species of *Phalangiidæ* (3 new), and 42 of *Acaridea* (30 new).

——. Uebersicht der von Dr. Finsch in Westsibirien gesammelten Arachniden. Verh. z.-b. Wien, xxviii. pp. 481–490, with woodcut figures.

15 species of *Araneidea* (4 new) and 1 of *Phalangiidea* are recorded.

——. Die Arachniden Australiens. Parts 24 & 25, pp. 1045–1156, pls. xciii.–c.

The continuation of the work [*cf. anteà*, p. 4]. Describes and figures 40 new species of *Araneidea* of various genera, almost all being *Salticidæ*, and characterizes 6 new genera.

Menge, A. Preussische Spinnen. Parts x. & xi. pp. 495–560, pls. lxxxii.–xci.

Completing the work [*cf.* Zool. Rec. xiv. *Arachn.* p. 4]. Describes and

figures 36 species (including 1 of *Theridiidæ* [*Episinus*, Walck.]) of *Salticidæ*, *Oxyopidæ*, and *Lycosidæ* (2 of these last new). In the appendix, among others, a new species of *Epeiridæ* is described.

Pavesi, Pietro. Saggio di una Fauna Aracnologica del Varesotto. Atti Soc. Ital. xxi. pp. 1–31.

Records 150 species of 5 orders, 19 families, and 75 genera, as follows: *Scorpiones*, 1 species; *Araneidea*, 132 species; *Opiliones* [*Phalangiidea*], 11 species; *Pseudo-Scorpiones*, 1 species; *Acaridea*, 5 species.

Simon, E. Les Arachnides de France. vii. Contenant les Ordres des *Chernetes*, *Scorpiones* et *Opiliones*, pp. 1–332, pls. xvii.–xxiv. Paris: 1879.

In continuation of the work [*cf. anteà*, p. 5]. This volume is published out of order, the last recorded being vol. iv. The present is an exceedingly valuable and important memoir, especially in regard to the *Chernetes* and *Opiliones*. The order *Chernetes* (*Pseudo-Scorpiones* of other authors), pp. 1–78, pls. xvii.–xix., contains but one family, and comprises, in its 6 genera, 48 species, all of which are characterized, 18 being described as new to science. The *Scorpiones* (pp. 79–115, pl. xx.) contain 5 species only, belonging to 2 genera; 2 species are described as new, and 1 new genus is characterized. The *Opiliones* (*Phalangiidea* of authors), pp. 116–313, pls. xxi.–xxiv., occupy the larger portion of the volume. 100 species are distributed among 23 genera, of which last 4 are characterized as new; 34 also of the species being described as new.

H. Lebert * shows from the experiments of Clarizio (1693), Cornelio (end of the 17th century), Serrao (1742), D'Azyr (1784), Walckenaer (1836), Panceri (1868), and Gasco, that the old and popular stories of the bite of the *Tarentula* are untrustworthy, or much exaggerated in their account of its effects on man. The like opinion is also recorded by him from experiments with other Spiders reputed deadly, as *Latrodectus* 13-*guttatus*, Rossi, *Argyroneta aquatica*, Clk., *Trochosa ingens*, Bl., and *Chætopelma ægyptiaca*, Dol. The bite of the last Spider—known at Cairo as "Abu-Schebet"—was, however, fatal to pigeons in ten minutes or half-an-hour, and to a hare in four hours.

The same author treats fully of collecting and preserving Spiders.

A. G. Butler, in "Science for All," i. (pp. 176–181, woodcuts), details the formation of the snare of *Epeira diadema*, Clk., from original observation; the mode in which the foundation-line of the snare was laid being actually witnessed. The line was emitted by the Spider, carried out by a current of air and adhered to the nearest object of contact. The snares of other Spiders are also noticed. (See also Becker, *suprà*, pp. 6 & 26.)

H. C. McCook, P. Ac. Philad. 1879, pp. 150–152, gives a minute account of the copulation of a species of *Linyphia*.

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* The Recorder quotes this from a separate copy, with no indication.—Ed.

pp. i.–vli. and pre-

Anton Stecker, MT. Afrikanischen Ges. in Deutschland, i. p. [illegible] gives a short description of the Arachnids of Tripoli (two new genera of *Pseudo-Scorpiones* referred to, with instances of mimicry in *Epeira*).

G. Carlet, Sur la locomotion des Insectes et des Arachnides, C. R. lxxxix. p. 1124, observes that *Epeira diademata*, Clk., moves forward legs 1 & 3 on the left side, and then 2 & 4 on the right, the polygon of support being a quadrangle formed by the alternate legs on each side—odd numbers on one side, even numbers on the other.

ARANEIDEA.

Eugène Simon, Bull. Soc. Ent. Fr. (5) iv. pp. xix. & xx., corrects observations of H. Lucas, published in *op. cit.* iii. Ann. pp. 48 & 191, on the localities of some species of *Araneidea*.

Theraphosidæ.

Eurypelma duponti, sp. n., L. Becker, CR. Ent. Belg. xxii. p. cxliii. Mexico.

Metriopelma breyeri, Becker. Note on the habits of this Spider in Mexico, the powers ascribed to it by the natives, and a case of injury from its venom observed at Guanajuato by Dr. Dugès; *id. l. c.* p. clxix.

Avicularia deborrii, sp. n., *id. l. c.* p. cxliii., Surinam.

Sphærobothria, g. n. Allied to *Eurypelma*, but distinguishable at once by a large spherical knob or process, which fills up the normal depression at the junction of the caput and thorax. Type, *S. hoffmani*, sp. n., F. Karsch, Z. ges. Naturw. (3) iv. p. 535, Costa Rica.

Crypsidromus gypsator, sp. n., L. Becker, Ann. Ent. Belg. xxii. p. 85, Antilles.

Scodra, g. n., *id. tom. cit.* CR. p. cxli. Very closely allied to *Scurria*, C. L. Koch, differing especially in the depth of the thoracic indentation, and in the slight elevation of the central eyes. Type, *S. aussereri*, sp. n., *id. l. c.* p. cxlii., Liberia.

Trechona sericata, sp. n., Karsch, *l. c.* p. 545, Bogota. Characters of *Trechona* discussed; *id. ibid.*

Diplura longipalpis, sp. n., *id. l. c.* p. 364, West Africa.

Linothele, g. n. Allied to *Ischnothele* and *Macrothele*, Auss.; for *L. curvitarsis*, sp. n., *id. l. c.* p. 546, Caracas.

Holothele, g. n.; for *H. recta*, sp. n., *id. l. c.* p. 544, Caracas.

Schismatothele, g. n.; for *S. lineata*, sp. n., *id. l. c.* Caracas.

Heterothele, g. n.; for *H. honesta*, sp. n., *id.* SB. nat. Fr. 1879, pp. 64 & 65, Loango Coast.

Acontius, g. n.; for *A. hartmanni*, sp. n., *id. l. c.* p. 64, Loango.

Arbanitis huttoni, sp. n., O. P. Cambridge, P. Z. S. 1879, p. 682, pl. liii. fig. 1, New Zealand.

Moggridgea meyeri, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 384, Hantam, S.E. Africa.

Nemesia congener, Cambr., and *N. simoni*, Moggr.; the methods of forming the tubes, &c., described from observation of living specimens;

d. Becker, CR. Ent. Belg. xxii. pp. clxx.–clxxii. *N. pannonica*, sp. n., *c*Herman, Ungarns Spinnen-fauna, iii. p. 369, pl. viii. fig. 179, Semlin.

Migas distinctus, sp. n., Cambridge, *l. c.* p. 683, pl. lii. fig. 2, New Zealand.

Boiostromus ? brevipes, sp. n., Karsch, *l. c.* p. 830, Chinchoxo, W. Africa.

Atypus piceus, Sulz. Branch-tubes noticed in the nest of this species, similar to those mentioned by O. P. Cambridge (Ann. N. H. Feb., 1878); but no clue obtained to their use or significance; Becker, CR. Ent. Belg. xvii. pp. cxiii-cxxiii.

Pachylomerus pustulosus, sp. n, *id. l. c.* p. cxl., Mexico.

Typhlochlana magdalena, sp. n., F. Karsch, S. E. Z. xl. p. 106, Sta. Martha.

Calommata signata, sp. n., *id.* Verh. Ver. Rheinl. xxxvi. p. 60, Japan.

Dysderidæ.

Harpactes le honii [*lehoni*], L. Becker, *l. c.* p. cxlvi., Moldavia; *H. savus*, Herman, *l. c.* p. 367, pl. viii. fig. 174, Semlin: spp. nn.

Segestria bavarica, C. L. Koch: O. P. Cambridge, Spiders of Dorset, part i. pl. ii. fig. 1, new to Britain.

Drassidæ.

Micaria soyauxi, F. Karsch, Z. ges. Naturw. (3) iv. p. 343, W. Africa; *M. rogenhoferi*, Herman, Ungarns Spinnen-fauna, iii. p. 358, pl. vii. fig. 162, Orsova: spp. nn.

Micariaulax, g. n.; Becker, Ann. Ent. Belg. xxii. p. 82. Differs from *Micaria* principally by the presence of a short, longitudinal median stria on the cephalothorax. For *M. dugesi*, sp. n., *id. l. c.* p. 83, pl. ii. figs. 9 & 10, Mexico.

Chrysothrix, E. Sim., being preoccupied, is renamed *Micariolepis*; E. Simon, Bull. Soc. Ent. Fr. (5) ix. p. clxi.

Prosthesima calceolata, p. 359, fig. 163, Blocksberge, *allionica*, p. 360, fig. 164, Allion, Orsova, *tragica*, p. 361, fig. 165, Gratzka-Thale, Orsova, and *accepta*, p. 361, figs. 166, Allion, spp. nn.; Herman, *l. c.* pl. vii.

Gnaphosa suspecta, O. P. Cambridge, Ann. N. H. (5) iv. p. 191, England; *G. bilineata*, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 86, pl. iii. fig. 5, Potapowskoj, Siberia; *G. soror*, p. 362, fig. 169, Budapest, *dolosa*, p. 362, fig. 167, Orsova, *suspecta*, p. 363, fig. 168, Orsova, &c., *molesta*, p. 363, fig. 170, Orsova, *opaca*, p. 364, fig. 171, S A-Ujhely-Berge, Kopasz, pl. vii. *fallax*, p. 364, fig. 173, Orsova and S-A-Ujhely, and *schuszteri*, p. 365, fig. 172, Orsova, pl. viii., Herman, *l. c.*: spp. nn.

Dyomonomma, g. n.; for *D. drassoides*, sp. n., F. Karsch, S. E. Z. xl. p. 108, Sta. Martha.

Drassus malagassicus, A. G. Butler, P. Z. S. 1879, p. 730, pl. lviii. fig. 3, Madagascar: *D. stuxbergi*, L. Koch, *l. c.* p. 87, pl. iii. fig. 6, Salivanniskoj, Siberia; *D. montandoni*, Becker, CR. Ent. Belg. xxii. p. cxlv., Roumania; *D. minor*, O. P. Cambridge, Ann. N. H. (5) iv. p. 192, pl. xii.

fig. 1, England : spp. nn. *D. bulbifer*, Cambr., figured, Spiders of Dors[illegible]e-pl. iii. fig. 1.

Clubiona interjecta, p. 89, pl. iii. fig. 7, *propinqua*, p. 90, fig. 8, Kocl[illegible] pf *l. c.*, Krasnojarsk, Siberia; *C. vigil*, Karsch, Verh. Ver. Rheinl. xxx[illegible] p. 93, pl. i. fig. 13, Japan : spp. nn. *C. neglecta*, Cambr., figured, O. P. Cambridge, Spiders of Dorset, part i. pl. iii. fig. 3 [as *C. reclusa*, in error].

Chiracanthium strebloni, Koch, *l. c.* p. 93, fig. 9, Siberia ; *C. furculatum*, Karsch, Z. ges. Naturw. (3) iv. p. 342, West Africa; *C. lascivum*, id. Verh. Ver. Rheinl. xxxvi. p 91, Japan; *C. rupestre*, p. 356, fig. 158, Majláth, *efossum*, p. 356, fig. 159, and *cuniculum*, p. 357, fig. 160, Schemnitz, Herman, *l. c.* pl. vii. : spp. nn. *C. nutrix*: E. Grube describes its bite from personal experience ; JB. schles. Ges. 1879, pp. 117 & 118.

Agræca maculata, sp. n., Koch, *l. c.* p. 92, pl. iii. fig. 9, Siberia.

Anyphæna velox, p. 83, figs. 5–7, and *striata*, p. 84, fig. 8, pl. ii., Pascagoula, Mississippi, *argentata*, p. 84, pl. i. figs. 12–14, New Orleans, Becker, Ann. Ent. Belg. xxii.; *A. pugil*, F. Karsch, Verh. Ver. Rheinl. xxxvi. p. 94, pl. i. fig. 14, Japan : spp. nn.

Cycais gracilis, sp. n., Karsch, *l. c.* p. 95, pl. i. fig. 15, Japan.

Liocranum celer, O. P. Cambridge, Spiders of Dorset, 1879, p. 40, Dorsetshire ; *L. jucundum*, Karsch, *l. c.* p. 92, Japan ; *L. kochi*, Herman, Ungarns Spinn.-f. iii. p. 355, pl. vii. fig. 157, Schamnitz: spp. nn.

Phrurolithus szilii, sp. n., Herman, *l. c.* pl. vii. fig. 161, Orsova.

Trochanteriidæ (Becker).

Trochanteria, g. n., remarkable (among other points) for the great and unusual length of the trochanter joints of the fourth pair of legs. Type, *T. ranuncula*, sp. n., F. Karsch, Z. ges. Naturw. (3) iii. [for 1878, published in 1879] p. 817, Vera Cruz. *Cf.* also *op. cit.* iv. pp. 536 & 537, pl. vii. fig. 3, where the affinities of the genus are discussed, and its place considered to be nearest to the *Drassidæ*.

Dictynidæ.

Dictyna masculosa, sp. n., Karsch, Verh. Ver. Rheinl. xxxvi. p. 96, Japan.

Titanœca sibirica, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 84, pl. iii. fig. 4, Krasnojarsk ; *T. veteranica*, Herman, *l. c.* p. 351, pl. vii. fig. 155, Jeselnicza, &c., Hungary : spp. nn.

Dinopidæ.

Dinopis fasciatus, p. 1045, pl. xcii. fig. 1, Bowen and Gayndah, *D. tabidus*, p. 1047, fig. 3, Cape York, and *D. bicornis*, p. 1049, fig. 4, Sidney, N. S. W., spp. nn., L. Koch, Arachn. Austr.

Agelenidæ.

Desis robsoni, sp. n., Llewellyn Powell, Tr. N. Z. Inst. xi. p. 263, pl. xii., Cape Campbell, New Zealand. This is the *Argyroneta marina* figured and named though not described by Hector [*vide suprà*, p. 12].

Robsonia, g. n. Closely allied to *Desis*, Walck.; for *Argyroneta quarina*, Hector (MS.). Cambridge, P. Z. S. 1879, p. 687, fig. 4, Cape Campbell, New Zealand.

Huttonia, g. n. For *H. palpimanoides*, sp. n., which bears a general resemblance to Spiders of the family *Palpimanoidæ*, its true position being probably near *Enyo*. Id. *l. c.* p. 685, pl. lii. fig. 3, New Zealand.

Collotes japonicus, sp. n., F. Karsch, Verh. Ver. Rheinl. xxxvi. p. 97, pl. i. fig. 17, Japan.

Agelena japonica, id. *l. c.* p. 98, fig. 18, Japan; *A. hentzi*, Becker, Ann. Ent. Belg. xxii. p. 81, pl. ii. figs. 1–4, New Orleans: spp. nn.

Cryphœca carpathica, sp. n., Herman, *l. c.* p. 353, pl. 7, fig. 156, Central Carpathia.

Tegenaria berthæ, sp. n., Becker, CR. Ent. Belg. xxii. p. xx., near Brussels.

Pholcidæ.

Pholcus rotundatus, sp. n., Karsch, S. E. Z. xl. p. 107, Sta. Martha.

Spermophora comoroensis, sp. n., A. G. Butler, Ann. N. H. (5) iv. p. 43, pl. 1. fig. 5, Johanna Island.

Theridiidæ.

Argyrodes trituberculatus, Becker, Ann. Ent. Belg. xxii. p. 79, pl. i. figs. 1–3, Pascagoula; *A. lepida*, Cambridge, *l. c.* p. 688, pl. lii. fig. 5, New Zealand: spp. nn. *A. fissifrons*, Cambr., = *A. (Linyphia) argyrodes*, Walck.; Van Hasselt, Tijdschr. Ent. xxii. p. 219. [These are certainly not identical.]

Theridium serrato-signatum, p. 79, Krasnojarsk, &c., *bellissimum*, p. 80, pl. iii. fig. 2, Nischnij Jubatsk, Siberia, and *oleatum*, p. 81, pl. iii. fig. 3, Miller Bay, Novaya Zemlya, L. Koch, Sv. Ak. Handl. xvi. No. 5; *T. flavo-notatum*, p. 79, figs. 7–9, *pascagoulensis*, p. 80, fig. 10, and *glaucescens*, p. 81, fig. 11, Pascagoula, Becker, *l. c.* pl. i.; *T. hilgendorfi*, F. Karsch, Verh. Ver. Rheinl. xxxvi. p. 63, pl. i. fig. 2, Japan; *T. frivaldszky* [*-kii*], Herman, *l. c.* p. 347, pl. vii. fig. 154, Tokay, &c.: spp. nn.

Sudabe, g. n. Allied to *Theridium* and *Ero*, p. 103, for *S. pilula*, sp. n., p. 63, F. Karsch, *l. c.*, Japan.

Theridiosoma, g. n. Allied to *Theridium*, but appears to be a connecting link with the *Epeiridæ*; for *T. argenteolum*, sp. n., O. P. Cambridge, Ann. N. H. (5) iv. p. 194, pl. xii. fig. 8, England.

Latrodectus katipo, Powell. In notes on its breeding habits, a cocoon is stated to have produced 60 young Spiders; C. H. Robson, Tr. N. Z. Inst. xi. pp. 391 & 392.

Steatoda clarkii, sp. n., O. P. Cambridge, *l. c.* p. 193, England. *S. sticta*, Cambr., figured; *id.* Spiders of Dorset, pl. iii.

Lithyphantes lepidus, sp. n., *id.* P. Z. S. 1879, p. 690, pl. liii. fig. 9, New Zealand.

Atkinsonia, g. n. Allied to *Euryopis*, but differs in the form of the cephalothorax; for *A. nana*, sp. n., *id. l. c.* p. 691, pl. liii. fig. 10, New Zealand.

Phycosoma, g. n. Bears much resemblance to *Phycus*, Cambr., and also to *Œcobius*, Luc., but allied to *Atkinsonia*. Type, *P. œcobioides*, sp. n., Cambridge, *l. c.* p. 692, pl. lii. fig. 6, New Zealand.

Robertus, g. n. Allied to *Neriene*, Bl., but differs in the position of the eyes, the convexity of the curve of the posterior row being directed slightly forwards The legs also are stronger, and the tarsi and metatarsi are of equal length. Type, *R. astutus*, sp. n., *id.* Spiders of Dorset, p. 103, England.

Neriene reproba, p. 196, fig. 2, England, *rudis*, p. 197, Scotland, *exhilarans*,* p. 199, fig. 3, and *nefaria*, p. 200, fig. 4, England, *mystica*, p. 201, fig. 5, Scotland, and *improba*, p. 202, fig. 6, England and Ireland, pl. xii., *rasa*, p. 343, fig. 1, Dux, *keyserlingi*, p. 344, fig. 2, hab. ?, *iracunda*, p. 346, fig. 3, Livland, pl. xvii., *id.* Ann. N. H. (5) iv.; *N. dolosa*, p. 126, and *jugulans*, p. 138, *id.* Spiders of Dorset, England: spp. nn.

Erigone (includes *Neriene* and *Walckenaera*, Bl.) *borea*, p. 40, pl. i. fig. 28, Novaya Zemlya, *aquilonaris*, p. 42, fig. 29, Siberia and Novaya Zemlya, *granulosa*, p. 43, pl. ii. fig. 1, *mirabilis*, p. 49, fig. 4, *incerta*, p. 52, fig. 6, *succinea*, p. 55, fig. 9, *caliginosa*, p. 56, fig. 10, *vulnerata*, p. 57, fig. 11, *semiflava*, p. 58, fig. 12, *pilifrons*, p. 62, fig. 14, *incondita*, p. 66, fig. 17, *formosa*, p. 67, fig. 18, *læsa*, p. 67, fig. 19, *submissa*, p. 69, fig. 20, *æsopea*, p. 70, fig. 21, *proterva*, p. 70, fig. 22, *hyperborea*, p. 71, fig. 23, *faceta*, p. 72, fig. 24, *deserta*, p. 73, fig. 26, *imula*, p. 74, fig. 27, *mollicula*, p. 75, fig. 28, *excelsa*, p. 76, fig. 29, and *diversa*, p. 77, pl. iii. fig. 1, and *repudiata*, p. 78, fig. 20, Siberia, *mendica*, p. 52, fig. 7, *oxycephala*, p. 54, fig. 8, *barbata*, p. 60, fig. 13, *leviceps*, p. 63, fig. 15, Novaya Zemlya and Siberia, *barbigera*, p. 65, fig. 16, *brachyopis*, p. 73, fig. 25, Novaya Zemlya, L. Koch, Sv. Ak. Handl. xvi. No. 5; *E. mascula*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 62, pl. i. fig. 1, Japan: spp. nn.

Walckenaera minutissima, p. 203, pl. xii. fig. 7, Scotland, *nasuta*, p. 347, pl. xvii. fig. 4, Lisbon, *congenera*, p. 348, fig. 5, Munich, O. P. Cambridge, Ann. N. H. (5) iv., spp. nn.; *W. cristata*, Bl., *id.* P. Z. S. 1879, p. 693, New Zealand; *W. diceros*, Cambr., figured, *id.* Spiders of Dorset, pl. iii. fig.

Linyphia setosa, Cambr., figured; O. P. Cambridge, Spiders of Dorset, pt. i. pl. iii. fig.

Linyphia encausta, Becker, CR. Ent. Belg, xxii. p. cxlvi., Moldavia; *L. frederici*, p. 186, *decipiens*, p. 208, and *pholcommoides*, p. 212, O. P. Cambridge, *l. c.*, England; *L. subnigripes*, p. 204, Ireland, *relativa*, p. 205, and *turbatrix*, p. 206, England, *id.* Ann. N. H. (5) iv.; *L. subdola*, p. 693, fig. 11, *peramana*, p. 694, fig. 12, and *melanopygia*, p. 696, fig. 13, *id.* P. Z. S. 1879, pl. liii., New Zealand; *L. latebricola*, p. 19, fig. 7, Siberia and Novaya Zemlya, *conspersa*, p. 9, fig. 1, *cultrigera*, p. 11, fig. 2, *mordax*, p. 13, fig. 3, *albula*, p. 15, fig. 4, *incesta*, p. 17, fig. 5, *trucidans*, p. 18, fig. 6, *luteipes*, p. 21, fig. 8, *picturata*, p. 22, fig. 9, *proletaria*, p. 23, fig. 10, *vidua*, p. 24, fig. 11, *humilis*, p. 25, fig. 12, *polita*, p. 26, fig. 13, *semi-atra*, p. 27, fig. 14, *cumeris*, p. 27, fig. 15, *similior*, p. 28, fig. 16, *simillima*, p. 29, fig. 17, *cerina*, p. 30, fig. 18, *terrena*, p. 31, fig. 19, *ingloria*, p. 32, fig. 20,

* Since ascertained to be identical with *N. herbigrada*, Bl.—O. P. C.

decipiens, p. 33, fig. 21, *nigriventris*, p. 34, fig. 22, *hebescens*, p. 35, fig. 23, *clara*, p. 36, fig. 24, *pigra*, p. 36, fig. 25, *concinna*, p. 37, fig. 26, and *desolata*, p. 38, fig. 27, Siberia, L. Koch, Sv. Ak. Handl. xvi. No. 5, pl. i.; *abrupta*, p. 61, *albo-limbata*, p. 62, Karsch, Verh. Ver. Rheinl. xxxvi., Japan; *L. alpina*, fig. 152, Central Carpathia, and *thorelli*, fig. 153, Schemnitz, Herman, *l. c.* p. 345, pl. vii.: spp. nn.

Mimetus mendicus, sp. n., O. P. Cambridge, P. Z. S. 1879, p. 697, pl. liii. fig. 14, New Zealand.

Pachygnatha tenera, sp. n., Karsch, Verh. Ver. Rheinl. xxxvi. p. 64, Japan.

Stegosoma quadratum, sp. n., O. P. Cambridge, *l. c.* p. 698, pl. liii. fig. 15, New Zealand.

Epeiridæ.

Meta ungulata, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 834, Loango.

Miranda pentagrammica, sp. n., *id.* Verh. Ver. Rheinl. xxxvi. p. 72, pl. i. fig. 6, Japan.

Atea semilunea, sp. n., *id. l. c.* p. 73, fig. 7, Japan.

Tetragnatha borealis, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 5, Siberia; *T. squamata*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 65, pl. i. fig. 3, Japan: spp. nn.

Eugnatha caudicula, sp. n., Karsch, *l. c.* p. 66, fig. 4, Japan.

Lancaria, g. n., Karsch, Z. ges. Naturw. (3) iv. pp. 547–560, for *Tegenaria torva*, Cambr., Ceylon.

Nephila constricta, sp. n., *id. l. c.* p. 834, pl. xi. fig. 4, Loango. *N. madagascariensis*, Vins., ♂ & ♀ in copula, figured; *id. l. c.* pl. xi. figs. 7–9.

Cyclosa formosa, id. *l. c.* p. 835, Loango; *C. octo-tuberculata*, fig. 8, and *sedeculata*, fig. 9, *id.* Verh. Ver. Rheinl. xxxvi. p. 74, pl. i., Japan: spp. nn.

Argiope pechueli, id. Z. ges. Naturw. (3) iv. p. 340, West Africa; and *A. minuta*, id. Verh. Ver. Rheinl. xxxvi. p. 67, Japan: spp. nn.

Singa Van Bruyssellii [*vanbruysseli*], sp. n., Becker, Ann. Ent. Belg. xxii. p. 78, pl. i. figs. 4–6, Pascagoula, Mississippi.

Epeira chinchoxensis, p. 333, *semi-annulata*, p. 334, *Güssfeldii* [*guessfeldti*], p. 335, *lateriguttata*, p. 336, and *penicillipes*, p. 836, West Africa, *enucleata*, p. 550, Ceylon, Karsch, l. c.; *E. gracilis*, Menge, Preuss. Spinn., p. 558, pl. xci. fig. 320 n, Prussia; *E. slateri*, p. 730, fig. 1, Réunion, *locuples*, p. 732, fig. 2, Madagascar, A. G. Butler, P. Z. S. 1879, pl. lviii.; *E. trapezoides*, Karsch, S. E. Z. xl. p. 107, Sta. Martha; *E. pinguis*, p. 68, *abscissa*, p. 69, *stella*, p. 69, *senta*, p. 70, pl. i. fig. 5, and *scylla*, p. 71, *id.* Verh. Ver. Rheinl. xxxvi., Japan: spp. nn.

Gasteracanthidæ.

A. W. M. Van Hasselt, Tijdschr. Ent. xxii. p. 217, remarks on the rarity of males of *Gasteracantha*.

Gasteracantha hexacantha, C. L. Koch, described from Gorontalo, Celebes; *id. ibid.*

Gasteracantha quadrispinosa, p. 281, pl. xxvi. fig. 1, Australia, *canestrinii*, p. 282, fig. 2, Antigua, *rimata*, p. 282, fig. 3, Ceylon, *pavesii*, p. 280,

fig. 4, Laos, *peccaris*, p. 283, fig. 6, Mauritius, *callida*, p. 284, fig. 7, Trinidad, *flabilis*, p. 284, fig. 8, and *harpax*, p. 284, fig. 9, Sarawak, *importuna*, p. 286, pl. xxvii. fig. 12, and *molesta*, p. 286, fig. 13, West Central Africa, *crepidophora*, p. 287, fig. 14, Dorey, New Guinea, *propinqua*, p. 288, fig. 16, Cambodia, *claveata*, p. 289, fig. 17, Celebes, *simoni*, p. 289, fig. 18, Cape York, *acrosomoides*, p. 289, fig. 19, Madagascar, *wealii*, p. 290, fig. 20, Caffraria, *observatrix*, p. 291, fig. 21, Pratos Reef, China Sea, *proba*, p. 291, fig. 22, Caffraria, and *rogersi*, p. 292, fig. 23, River Coanza, spp. nn., O. P. Cambridge, P. Z. S. 1879; *G. frontata*, Bl., p. 282, pl. xxvi. fig. 5, East Indies, *G. madagascariensis*, Vins., p. 285, fig. 10, Madagascar, *formosa*, Vins., p. 285, fig. 11, Madagascar and S. & E. Africa, *G. helva*, Bl., p. 287, pl. xxvii. fig. 15, East Indies, figured; *id. l. c.*

Atelacantha (*Gasteracantha*) *heterodoxa*, sp. n., Karsch, Z. ges. Naturw. (3) iv. 330, West Africa.

Actrocantha, g. n., closely allied to *Stanneoclavis*, Butl.; type, *A. falkensteini*, sp. n., Karsch, *l. c.* p. 331, West Africa.

Cyrtarachne bicurvata, sp. n., Becker, Ann. Ent. Belg. xxii. p. 77, pl. ii. figs. 16–19, Donaldsonville, Louisiana.

Carostris stygiana, sp. n., A. G. Butler, P. Z. S. 1879, p. 731, Madagascar. *C.* ? sp., ♂ figured; Karsch, *l. c.* pl. xi. figs. 10 & 11.

Paraplectana thorntoni, Bl., figured from the Zambesi; O. P. Cambridge, P. Z. S. 1879, pl. xxvii. fig. 24.

Thlaosomatidæ.

Celænia [*Thlaosoma*, Cambr.] *excavata*, L. Koch, ♂; Karsch, *l. c.* pp. 837–842, Australia. [The latter generic name has priority; O. P. C.]

Thlaosoma atkinsoni, p. 699, fig. 7, and *hectori*, p. 700, fig. 8, spp. nn., Cambridge, P. Z. S. 1879, pl. lii. New Zealand.

Arcy[i]dæ.

Simon, E. Note sur les *Epeiridæ* de la sous famille *Arcyinæ*. CR. Ent. Belg. xxii. pp. lv.–lx.

The author describes the chief characters of this group, and the points in which it agrees with and differs from the *Epeiridæ*, of which he retains it as a subfamily. *Heterognatha*, Nic., = *Epeira*. *Arcys* proper is restricted to Australia, and Nicolet's Chilian species, of which the types are now in the Paris Museum, prove to be generically distinct, having the cephalic region neither elevated nor angulose, and the area of the median eyes wider than its length. The following new genera and species are characterized:—

Gnolus, p. lviii. Differs from *Arcys* as above, and from the next genus in its dorsally flat cephalothorax, which abruptly slopes behind, and in the lateral eyes being approximated, but widely remote from the central. For *Arcys parvulus* and *nigriventris*, Nic., = *spiculator*, Nic.; *A. variabilis*, Nic., = *cordiformis*, Nic.; and *A. limbatus*, Nic.

Oarces, p. lix. Differs from *Gnolus* in its cephalothorax being convex in the middle, and evidently sloping before and behind, also in the

lateral eyes being separated and not far from the median. For *A. piriformis, gayi, flavescens, liliputanus*, and *inflatus*, Nic., = *reticulatus*, Nic.

Arcys walckenaeri, p. lvii., Victoria.

Episinidæ.

Episinus, Walck., considered to form a separate family near the *Thomisidæ*, and probably next to the *Stephanopidæ*; O. P. Cambridge, P. Z. S. 1879, p. 688.

Episinus antipodianus, sp. n., *id. l. c.* p. 701, pl. lii. fig. 16, New Zealand.

Thomisidæ.

Thomisus foka, Vins. J. E. Para, Rev. Sci. Nat. viii. p. 55, confirms the report of the extremely venomous nature of this Spider by experiments upon insects; and speaks of the great dread in which it is held by the natives, though no evidence is given to justify it. The ♀ is described from Mauritius.

Pyresthesis, g. n., near *Loxobates*, Thor, and *Synema*, Sim.; type, *P. cambridgii*, sp. n., Butler, P. Z. S. 1879, p. 733, pl. lviii. fig. 6, Madagascar.

Synema japonica, sp. n., Karsch, Verh. Ver. Rheinl. xxxvi. p. 75, pl. i. fig. 10, Japan.

Diæa devoniensis, sp. n., Cambridge, Ann. N. H. iv. (5) p. 208, England.

Xysticus austerus, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 99, pl. iii. fig. 12, Siberia; *X. frater*, Herman, Ungarns Spinnen-fauna, iii. p. 372, pl. viii. fig. 177, Palánka: spp. nn.

Oxyptila septentrionalium, Koch, *l. c.* p. 96, fig. 11, Siberia; *O. decorata*, p. 76, and *O. fulvipes*, p. 77, Karsch, *l. c.*, Japan: spp. nn.

Thomisops, g. n., allied to *Platythomisus*, Dol., for *T. pupa*, p. 375, and *T. pusio*, p. 376, spp. nn., Karsch, Z. ges. Naturw. (3) iv., Zanzibar.

Selenops sector, id. *l. c.* p. 341, West Africa; *S. bursarius*, id. Verh. Ver. Rheinl. xxxvi. p. 81, pl. i. fig. 12, Japan: spp. nn.

Pistius undulatus, sp. n., Karsch, *l. c.* p. 77, Japan.

Oxytate setosa, sp. n., *id. l. c.* p. 78, pl. i. fig. 11, Japan.

Pelmopoda, g. n., allied to *Heteropoda*, Latr.; for *P. hirta*, sp. n., *id.* Z. ges. Naturw. (3) iv. p. 560, Ceylon.

Heteropoda occidentalis, id. *l. c.* p. 341, West Africa; *H. rosea*, id. S. E. Z. xl. p. 107, Sta. Martha: spp. nn.

Themeropis? paripes, sp. n., *id.* Z. ges. Naturw. (3) iv. p. 559, Ceylon.

Sparassus gentilis, sp. n., *id. l. c.* p. 833, West Africa.

Philodromus blandus, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 95, Siberia; *P. molarius*, id. Verh. z.-b. Wien, xxviii. p. 483, fig. 1 (epigyne), Saissan, Turkistan; *P. roseo-femoralis*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 79; *P. pellax*, Herman, *l. c.* p. 371, pl. viii. fig. 176, Orsova: spp. nn.

Artanes fuliginosus, sp. n., Karsch, *l. c.* p. 80, Japan.

Triclariidæ.

Trechalea (*Triclaria*, C. Koch) *protenta*, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 540, Brazil.

Podophthalmidæ.

Ocyale conspersa, sp. n., Karsch, *l. c.* p. 831, West Africa.

Lycosidæ.

Anahita, g. n. (? *Lycosidæ* or *Drassidæ*). Tarsal claws, 2; eyes, according to the figure, like those of *Ctenus*. For *A. fauna*, sp. n., Karsch, Verh. Ver. Rheinl. xxxvi. p. 99, fig. 18, Japan.

Ctenus spinosissimus, sp. n., *id.* Z. ges. Naturw. (3) iv. p. 345, West Africa.

Phoneutria. The differences between this genus and *Ctenus* detailed; Karsch, *l. c.* pp. 344 & 345.

Phoneutria avicularia, p. 347, and *capulina*, p. 343, West Africa, *oculifera*, note to p. 350, Mexico, spp. nn., *id. l. c.*

Pirata pilipes, sp. n., *id. l. c.* p. 351, West Africa.

Lycosa lindneri, p. 351, *atramentata*, p. 353, *ingenua*, p. 354, *fabella*, p. 354, *levis*, p. 355, *tenera*, p. 356, *lupina* and *lanca*, p. 551, Karsch, *l. c.*, West Africa; *L. badia*, p. 550, fig. 314, and *nana*, p. 552, fig. 316, A. Menge, Preuss. Spinnen, pl. lxxxviii.; *L. immanis*, L. Koch, Sv. Ak. Handl. xvi. p. 100, pl. iii. fig. 13, Omsk, Siberia; *L. leucocephala*, p. 484, fig. 2 (epigyne), Maitereck, in the Altai, and *insolita*, ♀, p. 486, fig. 3 (epigyne), the Poderata Tundra, ♂, p. 488, Schtschutschja, *id.* Verh. z.-b. Wien, xxviii.; *L. profuga*, p. 374, fig. 181, Tokay and Rakamaz (Hungary), *pœcila*, p. 375, fig. 178, various localities in Hungary, *farinosa*, ibid., fig. 179, and *festinans*, fig. 180, Doroszló (Hungary), and *exornata*, p. 376, fig. 182, Rakos, Budapest, Herman, l. c.; *L. lucernata*, p. 100, fig. 19, and *ipsa*, p. 101, fig. 20, Japan, Karsch, Verh. Ver. Rheinl. xxxvi. pl. i.: spp. nn.

Tarentula tigrina, McCook. The form and position of its tubular nest detailed, and the habits and mode of copulation of the sexes; the male eventually devoured by the female. Mrs. M. Treat, Am. Nat. xiii. pp. 484 & 489.

Tarentula solitaria, sp. n., Herman, *l. c.* p. 377, pl. viii. fig. 183, Lykanka, Rosenberg.

Trochosa hungarica, sp. n., *id. l. c.* p. 380, pl. viii. fig. 184, Platten Lake, Hungary.

Pardosa chionophila, p. 102, fig. 15, *lasciva*, p. 103, fig. 16, *indecora*, p. 104, fig. 17, and *atalanta*, p. 105, fig. 18, Koch, Sv. Ak. Handl. xvi. No. 5, pl. iii., Siberia; *P. laura*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 102, pl. i. fig. 21, Japan: spp. nn.

Oxyopidæ.

Pasithea foliifera, sp. n., A. G. Butler, Ann. N. H. (5) iv. pl. i. fig. 1, Johanna Island.

Salticidæ.*

Attus bewsheri, p. 42, fig. 2, *johannæ*, p. 42, fig. 3, and *anjuanus*, p. 43, fig. 4, Butler, *l. c.* pl. i., Johanna Island; *A. volupe*, Karsch, Z. ges. Naturw. (3) iv. p. 552, Ceylon; *A. finschi*, L. Koch, Verh. z.-b. Wien, xxviii. p. 489, fig. 4 (♂ copulatory organ), Obdorsk, West Siberia; *A. brassayi*, Herman, *l. c.* p. 386, pl. x. fig. 216, Orsova (Allion-berg); *A. basalis*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 90, Japan: spp. nn.

Ælurops simplex, Herman, *l. c.* p. 386, pl. viii. fig. 189, Doroszló (Hungary); *Æ.* (*Ictidops*, Ficker) *pupus*, Karsch, *l. c.* p. 85, Japan: spp. nn.

Ballus angulosus, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 553, Ceylon.

Evophrys declivis, id. *ibid.*, Ceylon; *E. linea*, id. Verh. Ver. Rheinl. xxxvi. p. 90, Japan: spp. nn.

Rhene (*Rhanis*) *tamula*, sp. n., *id.* Z. ges. Naturw. (3) iv. p. 554, Ceylon.

Hasarius inhebes, p. 359, and *punctiventris*, p. 832, West Africa, *id. l. c.*; *H. dœnitzi* and *crinitus*, id. Verh. Ver. Rheinl. xxxvi. p. 86, Japan: spp. nn.

Plexippus setipes, sp. n., *id.* Verh. Ver. Rheinl. xxxvi. p. 89, Japan. *P.* (as *Attus*) *cornutus*, Dol., described and figured from Gorontalo (Celebes); A. W. M. Van Hasselt, Tijdschr. Ent. xxii. p. 221, pl. xii. figs. 1–3.

Phidippus procus, sp. n., Karsch, *l. c.* p. 88, Japan.

Marptusa marita, Karsch, Z. ges. Naturw. (3) iv. p. 358, West Africa; *M. complana*, p. 1093, pl. xcv. fig. 78, Queensland Coast and Sydney, *leucocornis* [vox hybr.], p. 1096, pl. xcvi. figs. 1 & 2, Sydney, Queensland Coast, Cape York, and New Zealand, *invenusta*, p. 1099, fig. 3, Sydney, *planissima*, p. 1100, figs. 4 & 5, Cape York, Queensland, and Sydney, *liturata*, p. 1103, pl. xcvi. fig. 6, Gayndah, *bracteata*, p. 1105, figs. 7 & 8, Queensland, *jovialis*, p. 1109, pl. xcvii. figs. 1 & 2, Peak Downs, Caigan, Sydney, and Melbourne, *cinerea*, p. 1112, fig. 3, New Zealand, *melancholica*, p. 1113, fig. 4, Belle Vue Hill, *tenerrima*, p. 115, fig. 5, Peak Downs, *ærata*, p. 1117, fig. 6, Port Mackay, *elegans*, p. 1119, fig. 7, and *parallelestriata* [*paralleli-*], p. 1121, fig. 8, Peak Downs, L. Koch, Arachn. Austr.; *M. vittata* and *pulla*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 87, Japan: spp. nn.

Natta, g. n., allied to *Thiania*, C. L. Koch, for *N. horizontalis*, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 362, West Africa.

Fritziâ, g. n., allied to *Menemerus*, Sim., *Marpessa*, C. L. Koch, *Hyctia* and *Icius*, Sim. Type, *F. muelleri*, sp. n., O. P. Cambridge, P. Z. S. 1879. p. 120, figs. 1, 2 & 3, Blumenau, Sta. Catherina, Brazil. (Forms a curious 3-doored nest on the leaves of various herbaceous plants.)

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* The position of the genera in this family is not intended to be systematic.—O. P. C.

Menemerus foliatus, L. Koch, redescribed and figured by the author, Arachn. Austr. p. 1123, pl. xcviii. figs. 1 & 2, Upolu, Huahine, Tahiti, and Raiatea.

Mævia cylindrata, sp. n., Karsch, Verh. Ver. Rheinl. xxxvi. p. 84, Japan.

Icius severus, p. 1128, pl. xcviii. fig. 3, Ferinan, May, Caigan, *viduus*, p. 1129, figs. 4 & 5, Sydney, Peak Downs, Rockhampton, Gayndah, and Cape York, *semi-ater*, p. 1133, fig. 6, Rockhampton and Peak Downs, *semiferrugineus*, p. 1135, pl. xcix. fig. 1, Gayndah, *semiferrugineus*, p. 1135, pl. xcix. fig. 1, Gayndah, *albo-barbatus*, p. 1138, figs. 2 & 3, Sydney, L. Koch, l. c.; *I. elongatus* and *magister*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 83, Japan : spp. nn.

Scæa, g. n., for *S. vestita*, sp. n., L. Koch, *l. c.* p. 1142, pl. xcix. figs. 4 & 5, Sydney and Peak Downs.

Accompse, g. n., p. 1145, for *A. suavis*, p. 1146, pl. xcix. figs. 6 & 7, Huahine, Raiatea, and Tahiti, and *dulcinervis*, p. 1149, pl. c. figs. 1 & 2, Pelew Island, spp. nn., *id. l. c.*

Astia, g. n., p. 1152, for *A. hariola*, p. 1153, figs. 3 & 4, and *nodosa*, p. 1156, fig. 9, Gayndah and other Australian localities, spp. nn., *id. l. c.* pl. c.

Homalattus, White, characterized; *id. l. c.* p. 1083. *H. opulentus*, p. 1083, fig. 1, Gayndah and Peak Downs, *auro-nitens*, p. 1085, figs. 2 & 3, Sydney and Peak Downs, *auratus*, p. 1087, figs. 4 & 5, Queensland, and *violaceus*, p. 1090, fig. 6, Peak Downs, spp. nn., *id. l. c.*

Philæus metallescens, sp. n., *id. l. c.* p. 1080, pl. xciv. figs. 7 & 8, Queensland.

Hyllus rosenbergi, sp. n., Van Hasselt, Tijdschr. Ent. xxii. p. 225, Gorontalo.

Viciria hasselti, Thor., described from Gorontalo; *id. l. c.* p. 220.

Dineresus walckenaeri, White, described and figured from Gorontalo; *id. l. c.* p. 223, pl. xii. figs. 4 & 5.

Athamas whitmeei, Cambr.; L. Koch, *l. c.* p. 1076, pl. xciv. figs. 4 *c*, 5 & 6, Tahiti and Upolu.

Lagnus, g. n.; for *L. longimanus*, sp. n., *id. l. c.* p. 1074, pl. xciv. fig. 4, Ovalau.

Scirtetes, g. n.; for *S. nitidus*, sp. n., *id. l. c.* p. 1070, pl. xciv. figs. 2 & 3, Sydney and Peak Downs.

Rhombonotus, g. n.; for *R. gracilis*, sp. n., *id. l. c.* p. 1067, pl. xciii. figs. 2 & 3, Sydney and Peak Downs.

Leptorchestes erythrocephalus, p. 1057, fig. 3, Peak Downs, *striatipes*, p. 1059, fig. 4, Sydney and Rockhampton, *simoni*, p. 1061, fig. 5, Sydney and Rockhampton, *cognatus*, p. 1063, fig. 6, Sydney, and *luctuosus*, p. 1065, fig. 7, Shelley's Flats and Rockhampton, spp. nn., *id. l. c.* pl. xciii.

Salticus bicolor, id. *l. c.* p. 1055, pl. xciii. fig. 2, Peak Downs; *S. simonis*, Herman, *l. c.* p. 383, pl. viii. fig. 185, Feketetó, Siebenbürgen; *S. japonicus*, Karsch, Verh. Ver. Rheinl. xxxvi. p. 82: spp. nn.

Synemosina lupata, sp. n., L. Koch, *l. c.* p. 1052, pl. xciii. fig. 1, Port Mackay.

THELYPHONIDEA.

Phryneidæ.

F. Karsch, Arch. f. Nat. xlv., pp. 189–197, proposes four divisions of the *Phryneidæ*:—

i. The six true legs formed alike, excepting the fourth pair, which want the posterior tibial joint. Gen. *Phrynicus*, Karsch; type, *P. raniformis*, Linn. (*Phalangium limatum*, Pall.).

ii. Legs of fourth pair with one such joint. Gen. *Damon*, C. L. Koch; type, *D. medius*, Herbst (*Phrynus variegatus*, Perty).

iii. Legs of fourth pair with two such joints, of which the anterior is the shorter. Gen. *Tarantula*, Fabr. Type, *T. pumilio*, C. L. Koch (*Phal. reniforme*, Pall.).

iv. Legs of fourth pair with three such joints. Gen. *Charon*, Karsch. Type, *C. grayi*, Gen. (*Phrynus medius*, Van der Hoeven).

The larger number of known species belong to *Phrynicus*.

A. G. Butler, Ann. N. H. (5) iv. pp. 313–316, considers that the number of the tibial joints of the fourth pair of legs, although of great interest in itself, and not before brought prominently forward, is unreliable even for specific distinction, and still more so for characterizing genera in this family.

SCORPIONIDEA.

H. F. Hutchinson, Nature, xx. p. 553, denies the possibility of a Scorpion's committing suicide, owing to the position and nature of its sting, and the unalterable line of its stroke.

Allen Thomson, *tom. cit.* p. 577, reasserts the fact above denied, and details experiments in which Scorpions committed suicide when only the light of a candle was suddenly brought upon them in the dark. This is confirmed by G. Gillman, *l. c.* p. 620 (*cf. op. cit.* xi. pp. 29 & 47).

Karsch, F. Scorpionologische Beiträge. MT. Münch. ent. Ver. 1879, pt. i. pp. 6–22; pt. ii. pp. 97–136.

An important and comprehensive paper on the true Scorpions, with a conspectus of the families, subfamilies, and genera. At p. 98 is an analytical table of the species of *Diplocentrus*, Peters. A monograph of the *Iurini*, pp. 101–109, with an analytical conspectus of the genera, p. 101, and a conspectus of species, pp. 102 et seq. *Uroctonus privas*, Karsch, is described from California, p. 103. *Vejovis schuberti*, C. L. K.; genus and species discussed, pp. 110 & 111. The following new genera and species are described:—

Androcottus, for *A. discrepans*, p. 11, Caracas.

Charmus, p. 101, for *C. laneus*, p. 104, Ceylon.

Petrovicus, formed for type, *Heterometrus carinatus*, Peters, p. 109, Herero-land.

Diplocentrus sulcatus, p. 99, Africa.

Scorpiops montanus, pp. 105 & 107, *solidus*, pp. 105 & 106, Himalaya.

Chærilus truncatus, pp. 107 & 108, Himalaya.

Isometrus basilicus, p. 113, Ceylon, *cylindricus*, p. 114, Bahia, *costatus*, p. 115, Rio Janeiro, *sonticus*, Chili, *chinensis*, China, *pallidimanus*, Colombia, p. 116, *obtusus*, p. 117, Porto Rico.

Centrurus limpidus, p. 123, *heterurus*, p. 122, Mexico, *republicanus*, ibid., and *princeps*, p. 121, Port-au-Prince (Haiti), *gambiensis*, p. 123, Cape de Verde Islands.

Lepreus fischeri, p. 124, Barawa Somali, *otjimbinquensis*, Otjimbinque, and *planimanus*, S.E. Africa, p. 125.

Pandinus meidensis, p. 127, Meid (Somali Land).

Opisthophthalmus austerus, p. 128, Cape of Good Hope.

Hormurus diremptus, p. 129, Caffraria.

Broteas æquinoctialis, p. 130, Colombia, and *lævipes*, p. 131, Caracas and Colombia.

Chactas gollmeri, p. 133, Caracas, and *delicatus*, p. 134, British Guiana.

Vejovis punctatus, p. 135, Mexico.

Hadrurus parvulus, East Indies, and *charcasus*, Bolivia, p. 135.

Hormurus brevicaudatus, sp. n., Karsch, S. E. Z. xl. p. 108, Sta. Martha.

Buthus australis, L. Note on its habits, from observation of an example kept alive in confinement; L. Becker, CR. Ent. Belg. xxii. p. clxx. *B. martensi*, sp. n., Karsch, MT. Münch. ent. Ver. 1879, p. 112, Singapore.

Odonturus, g. n.; of the group *Androctonides*. Type, *O. dentatus*, sp. n., Karsch, SB. nat. Fr. 1879, p. 119, Mombas.

Tityus chinchoxensis, sp. n., *id.* Z. ges. Naturw. (3) iv. p. 370, West Africa.

Nebo, g. n., allied to *Hemiscorpio* and *Diplocentrus*, Peters; type, *N. hierichonticus*, Sim. Eugène Simon, Ann. Soc. Ent. Fr. (5) viii. [1878], p. 399, Syria.

Teuthraustes, g. n., allied to *Broteas*, C. L. Koch, *Ioctonus*, and *Euscorpius*, Thor. Type, *T. atramentarius*, sp. n., *id. l. c.* p. 400, Ecuador.

Euscorpius fanzagoi, sp. n., *id.* Arachn. de France, vii. p. 111, pl. xx. fig. 5, Vernet-les-Bains.

Belisarius, g. n., for *B. xambeui*, sp. n., *id. l. c.* p. 114, pl. xix. fig. 6, Eastern Pyrenees.

PSEUDO-SCORPIONES.

H. Hagen, Zool. Anz. ii. pp. 399 & 400, notices two forms of *Blothrus packardi*, sp. n., one from Wyandotte Cave, Indiana, without eyes, the other with two eyes, from the Mammoth Cave, Kentucky. Some species of *Cheliferidæ* found on particular insects, &c., are also mentioned.

Chelifer, Sim., includes *Chernes*, Menge, and L. Koch; p. 1; *C. subruber*, p. 30, fig. 7, Hyères, *phaleratus*, p. 38, fig. 12, Fontainebleau, Aube, Troyes, *montigenus*, p. 40, fig. 15, Valais, and *rufeolus*, p. 41, Savoy,

Conflans, Lot-et-Garonne, Sos, and Hyères, spp. nn., Simon, Arachn. de France, pl. xviii.

Chiridium ferum, sp. n., *id. l. c.* p. 44, pl. xviii. fig. 21, Gironde, Arcachon.

Garypus nigrimanus, sp. n., *id. l. c.* p. 47, Hérault, Montpellier, Hyères, and Corsica.

Corosoma, g. n., allied to *Garypus*, L. Koch, for *C. seloi*, sp. n., Karsch, MT. Münch. ent. Ver. 1879, p. 95, St. Paulo, Brazil.

Obisium (includes *Roncus*, L. Koch, and *Blothrus*, Schiödte) *præcipuum*, p. 59, Basses Alpes, *sub-lævе*, p. 60, Corsica, *euchirum*, p. 65, pl. xviii. fig. 23, Bouches du Rhone, Martigues, *lucifugum*, p. 66, fig. 25, Cave of Esparron, near Hyères, and *cerberus*, p. 67, Cave of Vallon, spp. nn., Simon, *l. c.*

Chthonius globifer, p. 72, pl. xix. fig. 16, Isère, Bourg d'Oisans, and *microphthalmus*, p. 75, fig. 17, Tarn-et-Garonne, spp. nn., *id. l. c.* *C. pennsylvanicus*, Hag., = *maculatus*, Menge, and *Chthonius* = *Blothrus*; Hagen, *l. c.*

SOLPUGIDEA.

A. Croneberg (Zool. Anz. ii. p. 450) considers that the poison glands of *Solpuga* consist of two thoracic glands at the sides of the stomach. (*Cf.* J. R. Micr. Soc. iii. p. 248.)

Simon, E. Essai d'une Classification des Galéodes; remarques synonymiques, et descriptions des espèces nouvelles ou mal connues. Ann. Soc. Ent. Fr. (5) ix. pp. 93–154, pl. iii.

The Arachnids of this Order are divided by Simon into 10 genera, the main characters of which are given in an analytical table. 33 species are described, and 25 others given as unseen. The 58 species are divided among the various genera as follows: *Galeodes*, Oliv., 13 species (6 described, 7 unseen), *Gætulia*, Sim., 14 species (7 described, 7 unseen), *Zeria*, Sim., 1 species (described), *Rhax*, C. L. Koch, 8 species (3 described, 5 unseen), *Gylippus*, Sim., 1 species (described), *Dinorrhax*, Sim., 1 species (described), *Gluvia*, C. L. Koch, 4 species (described), *Datames*, Sim., 5 species (described), *Cleobis*, Sim., 5 species (3 described, 2 unseen), *Mummucia*, Sim., 1 species (described). *Callopus*, C. L. Koch, 1 species (both genus and species unknown), 4 other species (under *Solpuga* and *Galeodes* by several authors) considered doubtful.

The following new genera and species are described:—

Zeria, closely allied to *Gætulia*; differs in having the ocular eminence without the two bulbous hairs, and in the absence of spines on the metatarsi of the fourth pair of legs. Type, *Z. persephone*, p. 118, Oran.

Gylippus; close to *Rhax*, but differs in having the first pair of legs slender, and no spines on the palpi. The "flagellum" is also inserted quite at the base of the falx, thus differing in its position from that of all the other genera. Type, *G. syriacus*, Sim., *id. l. c.* p. 125, Syria.

Dino[r]rhax, very like *Rhax*, but the legs still shorter, the falces enormously developed, and no terminal claws on the tarsi of the first pair of legs. Type, *D. rostrum-psittaci*, Sim., p. 126, pl. iii. fig. 16, Moluccas, Annam, and Cochin China.

Datames, closely allied to *Gluvia*, differing chiefly in the dentition of the falces, the armature of the metatarsi of the fourth pair of legs. The fang of the falx is also fixed, unarmed, and straight, the "flagellum" being represented by a fascia of hairs. *D. sulfureus*, p. 142, Colorado, and *californicus*, p. 143, pl. iii. fig. 37, California. *Id. l. c.*

Cleobis differs from other genera in the elongated, lozenge-shaped caput, the legs slender, but the femora of the fourth pair enlarged and compressed, as though for the purpose of leaping. *C. saltatrix*, p. 146, pl. iii. figs. 32–36, Mexico.

Mummucia. Very closely allied to *Cleobis*, differing chiefly in the dentition of the falces. Type, *M. variegata*, P. Gerv., p. 151, pl. iii. figs. 29 & 30, Chili.

Galeodes venator, p. 104, Morocco.

Gætulia merope, p. 112, fig. 13 & 14, Zanzibar, *aciculata*, p. 114, fig. 8, Algeria, and *dentatidens*, p. 115, fig. 9, White River, pl. iii.

Rhax melanocephala, p. 124, Syria.

Gluvia kabiliana, p. 131, pl. iii. figs. 23 & 24, Algeria, Bou-Saada, and *atlantica*, p. 132, Cape de Verde Islands.

Definitions of various other species are given on pl. iii.

Gætulia (E. Sim.), being preoccupied, is renamed *Cærellia*; id. *tom. cit.* Bull. p. clx.

Aellopus, C. L. Koch (1843), *nec* Hübner (1816, *Ins.*), is renamed *Hexisopus*; Karsch, S. E. Z. xl. p. 109.

Gluvia martha, sp. n., Karsch, *id. l. c.* p.108, Sta. Martha.

PHALANGIIDEA.

The species of this Order (OPILIONES, Sim.) are divided by E. SIMON, Arachn. de France, vii. pp. 116–142, into three Sub-orders: i. CYPHOPHTHALMI; ii. MECOSTETHI; iii. PLAGIOSTETHI. The MECOSTETHI chiefly found in exotic regions; the PLAGIOSTETHI in temperate countries. The CYPHOPHTHALMI, including a few types only (both exotic and European) separated from the MECOSTETHI by several important characters. [*Cf.* A. Strecker, Arch. f. Nat. 1876, p. 293, pls. xvii.–xx.]

CYPHOPHTHALMI, represented in France by one family only, *Sironidæ*, containing two species. *Siro rubens*, Latr., *S. corsicus*, E. Sim., pp. 144–146, pl. xxii. figs. 9–14.

MECOSTETHI represented in France by one family, *Phalang[i]odidæ*, containing 6 species of the genus *Phalang[i]odes*, Tellkampf, pp. 147–156, pl. xxi. figs. 1 & 2, pl. xxii. figs. 1–8.

PLAGIOSTETHI, divided into four families: i. *Phalangiidæ*, containing (in France) 11 genera and 61 species, pp. 157–265; ii. *Ischyropsalidæ*, containing 2 genera and 7 species, pp. 265–277; iii. *Nemastomatidæ*, containing 1 genus (*Nemastoma*) and 8 species, pp. 277–289; iv. *Trogulidæ*, containing 6 genera and 16 species, pp. 289–311, pls. xxi. (pt.), xxii. xxiii. & xxiv.

The same author, Ann. Ent. Belg. xxii. pp. 183–241, publishes the first part of an "Essai d'une Classification des *Opiliones Mecostethi*, Remar-

ques Synonymiques et descriptions d'espèces nouvelles," in continuation of the treatise above recorded. The sub-order is divided into 3 families: *Phalang[i]odidæ*, *Cosmetidæ*, and *Gonyleptidæ*, 7 genera (3 new) and 22 species (4 new) being recorded and described in the first; 8 genera (6 new) and 29 species (21 new) in the second; and 14 genera (8 new) and 40 species (8 new) in the third of those groups (without reckoning various doubtful species), of which last the part now published only contains 2 of the proposed 4 sub-families.

Phalang[i]odidæ.

Acanthochir and *Scotolemon*, Luc., and *Erebomaster*, Cope, are sunk under *Phalang[i]odes*, with which *Ptychosoma*, Sorensen, is queried as probably synonymic; E. Simon, Ann. Ent. Belg. xxii. p. 185.

Maracandus, g. n., *id. l. c.* p. 186. Differs from *Phalang[i]odes* in the maxillipeds being shorter than the body; and from *Mermerus* in having an erect spine on the anterior cephalothoracic margin, before the ocular tuberosity, which is depressed in the middle. For *M. macei* [*macæi*], Bengal, and *mouhoti*, Cambodia, spp. nn., *id. ibid.*

Sitalces, g. n., *id. l. c.* p. 187. Allied to *Epedanus*, Thor., but with the ocular tuberosity abruptly elevated in the anterior margin. For *S. novem-tuberculatus*, ibid., and *breoni* [*bræoni*], p. 188, spp. nn., *id. l. c.*, Réunion.

Feretrius, g. n., *id. l. c.* p. 189. With the exceptional character of four eyes. For *Phalang[i]odes quadri-oculatus*, L. Koch.

Phalang[i]odes navarica, sp. n., *id.* Arachn. de Fr. vii. p. 152, Basses Pyrénées, Palombière Cave, near Sare.

Scotolemon salebrosa, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 366, West Africa.

Cosmetidæ.

This family is exclusively American, and the Bornean *Oncopus* has probably nothing to do with it. It is especially well represented in Central America, but does not extend so far south as the *Gonyleptidæ*, none of its species being known even in the Argentine States. Various species of *Flirtea*, *Gnidea*, *Cosmetus*, *Ortonia*, and *Gonyleptes* are provisionally referred to *Cynorta*, C. Koch; and *Gonyleptes ornatus*, Wood, *nec* Say, is renamed *C. sayi* (p. 200). E. Simon, Ann. Ent. Belg. xxii. p. 190 *et seq.*

The following new genera and species are characterized, *l. c.*:—

Protus, p. 193. Differs from *Pœcilæma* [*-lima*] in its scutum having no tubercles, and in its posterior claws being strongly pectinated. For *P. insolens*, ibid., Pará, Brazil.

Gryne, p. 194. Differs from both the last named genera in the femora of its maxillipeds being denticulate above, and from *Pœcilima* in the posterior claws (of its ♀?) being regularly pectinate. For *G. paraensis*, ibid., Pará.

Erginus, p. 200. Differs from *Cynorta* in its posterior legs being more robust than the anterior, its dorsal scutum being very convex behind, and depressed in the middle, and the first joint of its first pair of tarsi oval, longer than the second. For *E. devillii*, p. 201, Ecuador, *militaris*, p. 203, *papilionaceus*, p. 205, *ventricosus*, p. 209, and *granulosus*, p. 211, Bogota, *serripes*, p. 204, and *marginellus*, p. 208, Colombia, *late-sulfureus*, p. 207, Brazil.

Vonones, p. 212. Differs from the next named genus in its first pair of tarsi being 5-jointed, the patella of the maxillipeds being depressed and lamellose, and the ocular tuberosity not tuberculate. For *V. octo-tuberculatus*, ibid., "South America."

Rhaucus, p. 213. First pair of tarsi 6-jointed; body very wide and thick; anterior tarsi of ♀ with 3 joints long and slender. For *R. vulneratus*, ibid, and *quinque-lineatus*, p. 215, Brazil.

Libitia, p. 216. Differs from *Pœcilima* in its non-tuberculate scutum; legs very short and robust, tarsi 1, 3 & 4 five jointed, with the first two joints very inflated. For *Cosmetus cordatus*, Gerv., and *L. fusca*, p. 217, locality unknown.

Gonyleptidæ.

Simon, *l. c.* p. 218, divides this family into subfamilies *Stygninæ*, *Mitobatinæ*, *Cælopygina*, and *Gonyleptinæ*, of which he discusses the first two, as follows:—

Stygninæ.

With *Stygnus*, Perty, as its type, and having the eyes not carried on a single median elevation, but on two widely transversely separated tubercles or else entirely sessile, with a sharp intermediate vertical point, representing the tubercle of the other *Gonyleptidæ*. The transverse striæ of the body are almost straight (even the first of them), the maxillipeds excessively long, &c. Besides *Stygnus*, and possibly *Octophthalmus*, Wood, it comprises the following new genera and species:—

Phareus, p. 219. Eyes on widely remote conic tuberosities; coxæ 4, scarcely wider than the rest; legs almost all alike in thickness. For *Goniosoma raptator*, Gerv., and *Ortonia ferox*, Wood (possibly the same as the preceding species; *Ortonia* at all events cannot stand, from erroneous description).

Styphelus, p. 221. Allied to *Stygnus*, Perty, with tarsi 1, 3, 4 three-jointed, the first joint being very long and the rest short, coxæ 4 much depressed internally and carinated. For *Styph. flavitarsis*, ibid., Guadelupe.

Stygnoplus, p. 222. Patella shorter than tibia; femur of maxillipeds denticulate beneath. For *Stygnus triacanthus*, Kollar, and *S. forcipatus*, C. Koch.

Stygnidius, p. 223. Cephalothorax simple; scutum bituberculate behind; legs short, the posterior thickest. For *Stygnus inflatus*, Guérin.

Stenostygnus, p. 224. Differs from the preceding in its non-tuberculate scutum, and very long and slender legs, which are almost all of the same thickness. *S. pusio*, ibid., Brazil.

Timesius, p. 225. Eyes sessile, scutum with a single tubercle behind, &c. For *Stygnus vesicularis*, Gerv.

MITOBATINÆ (p. 226).

Types, *Mitobates*, Sund., and *Goniosoma*, Perty; maxillipeds longer than the body, very robust, with the femur thin and highly compressed, slightly curved and spiny, &c. Besides these genera, *Asarcus*, C. Koch, and *Phalangodus*, Gervais (*P. anacosmatus*, Gerv., is from Colombia, not Australia ; p. 241), it includes the following new genera and species:—

Cranaus, p. 236. Allied to *Phalangodus*, but with rather long and not robust legs, the ocular tuberosity and posterior part of scutum tuberculato-spinose, claw of maxilliped slender, and posterior coxæ simple beneath. For *Gonyleptes prædo*, Wood, *C. diabolicus*, p. 238, and *margaritipalpis*, p. 239, Ecuador, and 5 unseen species of *Goniosoma* (Gerv.) and *Gonyleptes* (Wood).

Ampycus, p. 241. Differs from *Cranaus* in the posterior coxæ, having a long perpendicular apophysis under the articulation of the trochanter. For *Gonyleptes telifer*, A. G. Butler (unseen).

Goniosoma thalassinum, p. 229, *acutangulum*, p. 230, and *calcariferum*, p. 232, localities unknown.

Asarcus grallipes, p. 235, Brazil.

PHALANGIIDÆ.

Sclerosoma coriaceum, sp. n., Simon, Arachn. de Fr. vii. p. 162, South of France and Spain.

Mastobunus, g. n. Closely allied to *Sclerosoma*, Luc. ; for *M. tuberculifer*, Luc., Corsica and Provence. *Id. l. c.* pp. 164 & 165, pl. xxii. fig. 17.

Astrobunus bernardinus, p. 171, pl. xxii. fig. 18, Valais, and *grallator*, p. 312, Aude, &c., spp. nn., *id. l. c.*

Liobunum religiosum, p. 180, pl. xxiv. fig. 1, *nigripalpe*, p. 183, *fusci-frons*, p. 185, *sylvaticum*, p. 187, spp. nn., various localities in France, *id. l. c.*

Prosalpia insignipalpis, sp. n., *id. l. c.* p. 191, pl. xxii. figs. 21 & 22, Corsica.

Opilio funestus, L. Koch, in Bremen Catalogue of West Siberian collections [Zool. Rec. xiv. *Arachn.* p. 7] is named *Phalangium nordenskiældi*, from Krasnojarsk, the river Ob, &c. ; L. Koch, Verh. z.-b. Wien, xxviii. pp. 481 & 483.

Phalangium segmentatum, Simon, *l. c.* p. 206, Corsica; *P. nordenskiældi* [cf. *supra*], p. 107, and *personatum*, p. 109, L. Koch, Sv. Ak. Handl. xvi. No. 5, Siberia: spp. nn.

Dasylobus, g. n., = *Phalangium*, auctt., pt. Type, *D. argentatus*, Canestr. Simon, *l. c.* pp. 209 & 212, Corsica and Sardinia; also *D. echinifrons*, p. 214, Aude, &c., and *nivicola*, p. 216, Hautes Alpes, spp. nn., *id. l. c.*

Platybunus nigro-vittatus, sp. n., *id. l. c.* p. 222, Maritime Alps.

Gyas, g. n. Somewhat similar to *Liobunum*, but more nearly allied to *Oligolophus*, C. L. Koch (*Opilio*, auctt.). Type, *Gyas annulatus*, Oliv.

(as *Phalangium*). *Id. l. c.* pp. 223–226, Hautes Alpes, Briançon; also *G. titanus*, sp. n., *id. l. c.* p. 236, Ariége, &c. &c.

Oligolophus ephippiger, p. 249, generally distributed in France, and *vittiger*, p. 250, pl. xxiii. fig. 3, Seine-et-Oise, &c., spp. nn., *id. l. c.*

Opilio agrestis, Meade, = *Oligolophus ephipphiger*, E. S. The former name has priority; *id.* Bull. Soc. Ent. Fr. (5) ix. p. cxlvii.

Opilio ephippiatus, Meade, = *Oligolophus tridens*, C. L. Koch; *id. l. c.* p. cxlvii.

Acantholophus brevispina, p. 259, Gironde, Arcachon, *simplicipes*, p. 260, Basses Pyrénées, St. Jean de Luz, *gallicus*, p. 262, pl. xxiii. fig. 11, France, generally distributed, *id.* Arachn. de France, vii.

Rhampsinitus, g. n. Allied to *Acantholophus*; for *R. lalandii*, sp. n., *id.* CR. Ent. Belg. xxii. p lxxiii., Caffraria.

Sabacon, g. n. Type, *S. paradoxus*, sp. n., *id.* Arachn. de France, vii. p. 266, Hérault, &c.

Pantopsalis, g. n. Allied to *Gagrella*, Stoll. Type, *Phalangium listeri*, White. *Id.* CR. Ent. Belg. xxii. p. lxxiii., New Zealand.

Ischyropsalis nodifera, p. 270, fig. 4, Basses Pyrénées, *lucantii*, p. 273, fig. 3, Hautes Pyrénées, *id.* Arachn. de France, pl. xxiv.; *I. sharpi*, id. Bull. Soc. Ent. Fr. (5) ix. p. cxxix., Caves of Saint Adien, between Zumarraga and Alsasua, Spain: spp. nn.

Taracus, g. n. Closely allied to *Ischyropsalis*; for *T. packardi*, sp. n., *id.* CR. Ent. Belg. xxii. p. lxxiv., Colorado.

Zacheus, C. Koch, = *Egænus*, C. K., and an analytical table of the six species known to the author given; *id. l. c.* p. lxxi.

Egænus pachylomerus, sp. n., *id. l. c.* p. lxx., Abyssinia.

Nemastomatidæ.

Nemastoma argenteo-lunulatum, p. 283, Corsica, *scabriculum*, p. 284, fig. 16, Hautes Pyrénées, *pyrenæum*, p. 287, fig. 10, Ariége, *bacciliferum*, p. 287, fig. 9, Gers, &c., Spain, Simon, Arachn. de Fr. vii. pl. xxiv.; *N. crassipalpis*, L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 111, pl. iii. fig. 19, Siberia: spp. nn.

Dicranolasma latifrons, sp. n., Simon, *l. c.* p. 295, pls. xxi. fig. 20, xxiv. fig. 18, Corsica.

Anelasmocephalus, g. n. Closely allied to *Trogulus*. Id. *l. c.*, p. 297, for *A. rufitarsis*, p. 298, pl. xxiv. fig. 10, Basses Alpes, *bicarinatus*, p. 298, pl. xxi. fig. 25, Provence, Corsica, Algeria, and *pusillus*, p. 300, Corsica, spp. nn., *id. l. c.*

Calathocratus, g. n. Very nearly allied to *Trogulus*. Type, *Trogulus africanus*, Luc. *Id. l. c.* p. 301, Algeria and Corsica.

Trogulus aquaticus, p. 306, pl. xxi. figs. 21 & 22, pl. xxiv. figs. 22 & 23, Corsica, *cristatus*, p. 308, Alpes Maritimes, *id. l. c.*; *T. gypseus*, id. CR. Ent. Belg. xxii. p. lxxv., Jerusalem: spp. nn.

Metopoctea, g. n. Closely allied to *Trogulus*. Type, *Phalangium melanotarsus*, Herm., p. 309, France, also *M. separata*, sp. n., *id. l. c.* p. 311, pl. xxi. figs. 23 & 24, Haute Garonne and Corsica.

PYCNOGONIDEA.

BÖHM, R. Über die Pycnogoniden des Kgl. zoologischen Museums in Berlin, insbesondere über die von S. M. S. 'Gazelle' mitgebrachten Arten. MB. Ak. Berl. 1879, pp. 170–195, 2 pls.

The first pair of cephalic appendages, well developed in the larva, is sometimes reduced later on in some genera, according to the same author, SB. nat. Fr. 1879, pp. 55 & 140.

Nymphon gracilipes (Miers, 1875), p. 170, pl. i. fig. 1, Kerguelen Island, distinct from the arctic *gracilipes* (Heller, 1878), *phasmatodes*, sp. n., p. 173, fig. 2, S.W. of Cape of Good Hope, 50 fath., *horridum*, sp. n., p. 175, fig. 3, Kerguelen Island, 15–65 fath., Böhm, *l. c.*

Tanystylum, g. n. Mandibles reduced to a single joint; abdomen with slender styliform termination. For *Nymphon styligerum*, Miers (1875), Miers, Phil. Tr. clxviii. p. 213, pl. xi. fig. 9, Kerguelen, on roots of *Macrocystis*.

Gnamptor[r] *hynchus*, g. n. Rostrum thick, bent downwards; ocular segment and abdomen very long; first pair of cephalic appendages ("Kieferfühler"), in the young state 3-jointed with two pincers, in the adult 2-jointed with rudimentary hand; palpi 10-jointed; oophores 11-jointed, present in both sexes; first pair of feet 8-jointed, the rest 9-jointed. *G. ramipes*, sp. n., Japan, Böhm, SB. nat. Fr. 1879, pp. 54–59, with woodcut. Distinct from *Ascorrhynchus* (Sars); *id. l. c.* p. 140, footnote.

Achelia lævis (Hodge, 1864), specimens from Kerguelen Island; Böhm, MB. Ak. Berl. 1879, p. 186, pl. i. fig. 5.

Corniger, g. n. Rostrum long, first pair of appendages rudimentary, single-jointed, second (palpi) long and strong, 9-jointed, feet of moderate length, their eighth joint prehensile, ovisacs long, 10-jointed. *C. hilgendorfi*, sp. n., Enosima, Japan; *id. l. c.* pp. 186–188, pl. ii. fig. 3. The name *Corniger* being preoccupied [Agassiz, 1829, *Pisces*], is changed into *Lecytho*[r]*rhynchus*, with *L. armatus*, sp. n. (with distinct 2-jointed first pair of cephalic appendages), found in the mouth of *Halientæa stellata*, Japan; *id.* SB. nat. Fr. [Nov.] 1879, pp. 140 & 141.

Parazetes, g. n. Body slender, rostrum pedunculated, broad in the centre; first pair of appendages 2-jointed, not chelate; second pair (palpi) 9-jointed; ovigerous legs 10-jointed; first (cephalic) segment sending forward a long, slender neck-like process towards the rostrum, on the middle of which the oculiferous tubercle is seated; legs smooth and slender. *P. auchenicus*, sp. n., Cape Sima, Japan, Slater, Ann. N. H. (5) iii. p. 282 [April, 1879; probably the same as *Corniger* = *Lecythorrhynchus*, Böhm].

Pallene. On its distinctive characters from *Phoxichilidium*, the ovisacs being present only in the male; *Oomerus* (Hesse) is not distinct from it. *P. fluminensis* (Kröyer), Straits of Magellan and Coast of Patagonia, 30–42 fath., *P.* [*Pseudopallene*, Wils.] *lappa*, sp. n., Ibo, Mozambique, on

Ophiocoma erinaceus. Böhm, MB. Ak. Berl. 1879, pp. 177–183, pl. i. fig. 4, and pl. ii. fig. 1. *P. breviceps*, sp. n. (with small palpi in the male), *id.* SB. nat. Fr. 1879, pp. 54, 59 & 60, Japan.

Phoxichilidium (*Anoplodactylus*) *digitatum*, sp. n., *id.* MB. Ak. Berl. 1879, p. 184, pl. ii. fig. 2, Singapore.

Phoxichilus meridionalis, sp. n., *id. l. c.* p. 189, pl. ii. fig. 4, Singapore.

Pycnogonum litorale (Ström.), specimen from Kerguelen Island with scarcely pointed rostrum and two small knobs behind the eyes, and *P.* (?) *chelatum*, sp. n., perhaps the young state of a species nearly allied to *P. litorale*, locality unknown ; *id. l. c.* pp. 191–194, the latter pl. ii. fig. 5.

Pycnogonum litorale var. n. *tenue*, South-west Japan ; Slater, Ann. N. H. (5) iii. p. 283.

ACARIDEA.

Michael, A. D. On some peculiarities in the reproductive system of certain of the *Acarina*. J. Quek. Club, 1879, pp. 223–230, pl. xiii.

Deals with the mode and period of fertilization in the *Dermalichi*, and describes and figures what the author considers to be the female external sexual organ in *Glyciphagus*, in which he differs from previous writers ; describes the dorsal position of the male organ in *Myobia*, &c., and details the structure of the oviduct in the *Oribatidæ*, and the means by which its great expansiveness is obtained.

Oribatidæ.

Michael, A. D., & George, C. F. A Contribution to the Knowledge of British *Oribatidæ*. J. R. Micr. Soc. ii. pp. 225–251, pls. ix.–xi.

This paper, apparently the first systematic attempt to deal with the subject in this country, gives the distinctive characters of the family and refers to the principal bibliography. In addition to the new genus and 3 new species recorded *infrà*, 41 species of this family are noticed (nearly all for the first time) as belonging to the British fauna, viz. :—*Pelops* 1, *Oribata* 9, *Lyosoma* 4, *Cepheus* 2, *Notaspis* 4, *Eremæus* 2, *Nothrus* 6, *Damæus* 6, *Tegeocranus* 2, *Hermannia* 2, and *Hoplophora* 3.

The various contrivances are detailed by which the legs are protected when these mites, which are without defensive weapons, simulate death, and other protective provisions for the safety of various species are noticed, also their habitats (chiefly moss, fungi growing on trees, decaying wood, &c.). The transformations of several species are described ; also the mode of escape of the larva from the egg in *Damæus geniculatus* and *D. clavipes* ; the change from nymph to perfect creature in *Tegeocranus latus*, *Oribata punctata*, &c., and the very remarkable nymph of the former, previously unknown, is described and figured, with the mode in which the skin was cast. All transformations described are from actual observation of the various stages. The conclusion is arrived at, from experiment, that these mites, which are without apparent eyes, have some limited vision, and it is contended that what have been known as the protecting hairs of the stigmata are really sense organs.

Nothrus nigro-femoratus, p. 112, pl. iii. fig. 23, and *punctatus*, p. 114, fig. 25, Novaya Zemlya, *scaber*, p. 113, fig. 24, Novaya Zemlya and Siberia, spp. nn., L. Koch, Sv. Ak. Handl. xvi. No. 5.

Oribata reticulata, p. 115, and *nitens*, p. 117, fig. 4, Siberia, *lucens*, p. 115, fig. 2, Novaya Zemlya, *crassipes*, p. 116, fig. 3, Siberia and Novaya Zemlya, spp. nn., *id. l. c.* pl. iv.

Oppia sphærica, p. 117, fig. 5, Novaya Zemlya and Siberia, and *oblonga*, p. 118, fig. 6, Siberia, *id. l. c.* pl. iv.

Scutovertex, g. n. Allied to *Eremæus*. Cephalothorax with a tectum attached only by its base; legs with three strongly heterodactyle claws. For *S. sculptus*, sp. n., A. D. Michael & C. F. George, J. R. Micr. Soc. ii. p. 242, pl. xi. fig. 4, England.

Tegeocranus labyrinthicus, p. 249, pl. xi. fig. 2, *elongatus*, p. 250, pl. x. fig. 7, *iid. l. c.*, England.

Gamasidæ.

P. Kramer, in a paper on some differences between full grown and young *Gamasidæ*, Arch. f. Nat. xlv. (2) pp. 238-242, arrives at the following conclusions:—i. the absence of holding-flaps (Haftlappen) on the fifth pair of feet is peculiar to some ♀ ♀ and nymphs; ii. the dorsal shield belongs exclusively to the nymphs; iii. the "Labidostoma-Rand-figur" ("Rand-figur") varies in form in nymphs, and even in Gustavia-sexes.

Gamasus armatus, p. 119, pl. iv. fig. 8, and *tenellus*, p. 120, pl. v. fig. 1, Novaya Zemlya, *borealis*, p. 120, fig. 2, and *ovalis*, p. 121, fig. 3, Siberia, spp. nn., L. Koch, *l. c.*

Gamasus, ? sp., Troupeau, Bull. Soc. Angers, vi. & vii. p. 115, figs. 28 & 30. *G. inaquipes*, sp. n., found on a common *Bombus*; P. A. Conil, Period. Zool. Argent. iii. pp. 65–73, Cordova.

Sejus excisus, p. 122, fig. 4, Siberia, and *semitectus*, p. 123, fig. 5, Novaya Zemlya, spp. nn., L. Koch, *l. c.* pl. v.

Ixodidæ.

Amblyomma arcanum, sp. n., F. Karsch, Z. ges. Naturw. (3) iv. p. 366, West Africa.

Cecidopus, g. n., near *Amblyomma*; for *C. diversipes*, sp. n., *id. l. c.* p. 562, Ceylon.

Margaropus, g. n., for *M. winthemi*, sp. n., *id.* MT. Münch. ent. Ver. 1879, p. 96, Valparaiso.

Ixodes auricularis, sp. n., P. A. Conil, Act. Ac. Buenos Aires, iii. pp. 99–110.

Hoplothyrus ? testudineus, Butl., described and figured; A. G. Butler, Phil. Tr. clxviii. p. 508, pl. 52, fig. 11, Rodriguez.

Trombidiidæ.

Trombidium holosericeum. A. Croneberg, Bull. Mosc. liv. pp. 234–252, pl. v., in an apparently exhaustive description, with illustrations, shows its close resemblance to the Hydrachnids. Pagenstecher is disagreed

with in many respects; and, among others, the account given by Treviranus of the generative organs appears to be more exact than that of the former author.

Leptognathus, Hodge, characterized, type, *L. violaceus*, Kram.; Kramer, *l. c.* p. 150, pl. viii. figs. 1–4.

Caligonus, C. L. Koch, characterized, type, *C. piger*, C. L. Koch; *id. l. c.* p. 153, pl. viii. figs. 5–9.

Cryptognathus, g. n., for *C. lagena*, id. *l. c.* p. 156, pl. viii. figs. 10–15.

Rhyncholophidæ.

Rynchолophus sucidus, p. 124, fig. 1, Novaya Zemlya and Siberia, *signatus*, p. 124, fig. 2, *albicomus*, p. 125, fig. 3, and *tonsus*, p. 126, fig. 4, Siberia, spp. nn., L. Koch, Sv. Ak. Handl. xvi. No. 5, pl. vi.

Actineda setosa, sp. n., *id. l. c.* p. 127, pl. vi. fig. 5, Siberia.

Limnocharidæ.

Calyptostoma hardii, Cambr.: C. F. George, Sci. Goss. 1879, p. 249, gives good figures of the concealed mouth parts, and describes what the author believes to be the nymphal form, with three tarsal cl[illegible] from previous the adult form possesses only two. [illegible]n *Myobia*, &c., and the means

Smaris, Latr., = *Calyptostoma*, Cambr.; L. Koch, *l. c.* p. [illegible] sp. n., *id. ibid.* pl. vi. fig. 6, Siberia.

Tetranychidæ.

Tetranychus borealis, sp. n., L. Koch, *l. c.* p. 129, pl. vi. fig. 7, Novaya Zemlya and Siberia.

Eupodidæ.

Penthaleus borealis, p. 129, pl. vi. fig. 8, and *crassipes*, p. 130, pl. vii. fig. 1, *id. l. c.*, Novaya Zemlya.

Bdellidæ.

Bdella pallipes, p. 131, fig. 4, and *grandis*, p. 133, fig. 7, Novaya Zemlya and Siberia, *brevirostris*, p. 132, fig. 5, and *mollissima*, p. 132, fig. 6, Novaya Zemlya, spp. nn., *id. l. c.* pl. vii.

Hydrachnidæ.

Lebert, Hermann. Description de quelques espèces nouvelles d'Hydrachnides du Lac Leman. (Mémoire posthume.) Bull. Soc. Vaud, xvi. pp. 327–377, pls. x.–xii. (*cf.* J. R. Micr. Soc. iii. pp. 69 & 70).

The preface contains a biographical account of the author. After some general considerations on the form and structure of Hydrachnids, with special reference to those of Lake Leman, the species found therein are described, belonging to 3 groups: i. *La faune littorale*, those found to a depth of 4–8 mètres from the shore (12 species); ii. *La Region profonde*, found at a depth of 20–300 mètres (5 species); iii. the parasitic

group, represented by the genus *Atax*, and common on *Anodonta anatina* (2 species). 19 species are recorded as inhabiting the lake, of which the following are new:—

Campognatha schnetzleri, p. 18, pl. x. fig. 1 (Reg. prof.)

Hygrobates nigro-maculatus, p. 19 (Faune litt.).

Limnesia variegata, p. 21, *tricolor*, p. 24, *tesellata*, p. 26, pl. x. fig. 2, *triangularis*, p. 29, pl. x. fig. 3, *cassidiformis*, p. 32, pl. x. fig. 4 (F. litt.).

Neumannia nigra, p. 34, pl. x. fig. 5, and *alba*, p. 36 (F. litt.).

Arrhenurus tuberculatus, p. 37, fig. 6, and *biscissus*, p. 39, fig. 7, pl. x. (F. litt.).

Nesæa magna, p. 41, fig. 8 (F. litt.), *lutescens*, p. 42, fig. 9 (Reg. prof.), pl. xi.

Pachygaster tau-insignitus, p. 48, pl. xi. fig. 11 (Reg. prof.).

Piona accentuata, p. 50, pl. xi. fig. 12 (F. litt.).

Brachyopoda paradoxa, p. 51, pl. xi. fig. 13 (Reg. prof.).

Krendowsky, Arb. naturf. Ges. Charkow, xii. 66 pp. 2 pls., describes the economy of the larvæ of *Hydrachnidæ* (one sp. n.).

P. Kramer, Arch. f. Nat. xlv. 1, describes the following new genera and species (all of uncertain locality):—

Labidostoma, for *L. luteum*, p. 13, pl. ii. fig. 1.

Gustavia, for *G. sol*, p. 16, pl. ii. fig. 2.

Sperchon squamosus, p. 1, pl. i. fig. 1.

Oxus oblongus, p. 5, fig. 2.

Limnesia nigra, p. 9, fig. 3, *magna*, p. 10, fig. 4.

Nesæa reticulata, p. 11, fig. 8, *binotata*, p. 11, fig. 5, *rotunda*, p. 12, fig. 6, and *pachydermis*, p. 12, fig. 7.

Acaridæ.

G. Canestrini: Nuove Specie di Genere *Dermalichus*, Atti Soc. Pad. v. pp. 1–28; and Intorno ad alcuni parasiti, *op. cit.* vi. pp. 32–42, pls. i.–iv. [The Recorder has not seen these papers; the latter includes *Xoloptes* and *Alloptes*, gg. nn., and one sp. n.]

Tyroglyphus armatus, p. 115, figs. 27–29, and *ovatus*, p. 106, figs. 9–12, spp. nn., Trouessau, Bull. Soc. Angers, vi. & vii.

Cheyletus eruditus, id. *l. c.* p. 107, fig. 20.

Glycyphagus cursor, p. 110, figs. 22–26, and *G. cursor*, var. ?, or sp. n. ?, p. 112, fig. 17; *id. l. c.*

Tortonophora serrata, Cambr.; L. Koch, Sv. Ak. Handl. xvi. No. 5, p. 134, Siberia and Novaya Zemlya.

Claviceps trimaculatus, p. 134, fig. 8, *bimaculatus*, p. 135, fig. 9, and *rugosus*, p. 135, fig. 10, spp. nn., *id. l. c.* pl. vii., Novaya Zemlya.

Phytoptidæ.

Löw, Franz. Beiträge zur Kenntniss der Milbengallen (Phytoptocecidien). Verh. z.-b. Wien, xxviii. pp. 127–150, pl. ii.

Describes, and in some cases figures, *Phytoptus*-galls found in Lower Austria on the following plants (those marked * being new): *Acer cam-*

pestre,* *Achillea millefolium*,* *A. moschata*, *Alnus incana*, *Artemisia vulgaris*,* *Betula alba*, *Centaurea jacea*,* *Daucus carota*,* *Euphorbia cyparissias*,* *Fraxinus ornus*,* *Galium mollugo*, *G. verum*, *Geranium palustre*, *Populus tremula*, *Prunus padus*, *P. spinosa*, *P. paradisiaca*, *Pyrus malus*, *Quercus coccifera*, *Salix alba*, *Sambucus ebulus*,* *Saxifraga aizoides*, *S. oppositifolia*,* *Taxus baccata*, *Tilia argentea*,* *T. grandiflora*, *Veronica chamædrys*, and *Viola sylvestris*. The *Phytopti* themselves are in no case described; but identification with supposed fungoid growths are in some cases made.

F. Thomas, Z. ges. Naturw. (3) iv. pp. 740–745, describes a sixth *Phytoptocecidium* from *Acer campestre*.

J. A. Ryder, Am. Nat. xiii. p. 704, figures and describes (without name) a species of *Phytoptus* found in galls on maple-leaves.

Typhlodromus oiliioorus [sic], sp. n., W. H. Ashmead, Canad. Ent. vi. p. 160, Florida.

Oligotrophus tanaceticolus, sp. n., F. Karsch, JB. zool. Sect. Westf. Ver. 1878–79, pp. 26–31, "Die Gallen (Zoocecidien) des Wurmkrauts und ihre Erzeuger."

Pentastomiidæ.

Rudolph Leuckart, in "Allgemeine Naturgeschichte der Parasiten, mit besonderen Berücksichtigung der bei dem Menschen schmarotzenden Arten," pp. 1–216, and woodcuts (Leipzig & Heidelberg: 1879), figures *Pentastomum denticulatum*, p. 103, and *P. constrictum*, p. 179.

MYRIOPODA.

BY

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

THE GENERAL SUBJECT.

BUTLER, A. G. Zoology of Rodriguez: *Myriopoda*. Phil. Tr. clxviii. pp. 497–500.

12 species enumerated; the descriptions of 10 described as new in Ann. N. H. (4) xvii. [*cf.* Zool. Rec. xiii.] are reproduced here; of these 12, one only occurs at Mozambique; a second was originally described from an unknown locality, and a third is of doubtful occurrence at Bourbon; the rest are all peculiar to Rodriguez, so far as is known at present.

KARSCH, F. Westafricanische Myriopoden und Arachniden. Z. ges. Nat. (3) iv. pp. 825–837.

The *Myriopoda* mentioned comprise *Heterostoma trigonopoda*, Leach, *Mecistocephalus punctifrons*, Newp., *Cryptodesmus gabonicus*, Luc., *Euryurus thomsoni*, Luc., and 4 new species.

PIROTTA, R. Intorni agli Ortotteri ed ai Myriapodi del Varesotto. Atti Soc. Ital. xxi. pp. 629–647.

40 species of *Myriopoda* enumerated, some new to Italy.

PLATEAU, F. Recherches sur les phénomènes de la digestion et sur la structure de l'appareil digestif chez les Myriapodes de Belgique. Mém. Cour. xlii. pp. 94, 3 pls.

[Not seen by the Recorder.]

PORATH,* C. O. v. Om några exotiska Myriopoder. Sv. Ak. Handl. Bihang iv. No. 7, pp. 48 [1876].

Includes full descriptions of several known species of *Chilopoda* and *Diplopoda*, in addition to the new ones. The genus *Scolopendra* is divided into 4 groups, as follows:—

i. *Collares* (vel *Collaria*, subg. n.). Scutum dorsale primum antice prope marginem sulco transverso, marginem sequente. (*S. gigantea*, Linn., = *insignis*, Gerv.; *S. crudelis*, Koch, = *longipes*, Wood; &c.)

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* Spelled Porat in this Memoir, but invariably hitherto given as above.—ED.

ii. *Calcaratæ* (vel *Calcaria*, subg. n.). Pedes anales articulo penultimo infrà calcarato. Scutum dorsale primum antice sulco transverso nullo. (*S. calcarata*, sp. n.)

iii. *Multispinatæ*. Pedum analium articulus primus infrà spinis numerosis, plerumque in tres series digestis. (*S. platypus*, Brandt, = *afzeli*, Por.; &c.)

iv. *Parcispinatæ*. Pedes anales subteretes, parum spinati, articulo primo infrà spinis 3–2 l. nullis. Corpus postice elongatum. (*S. elongata*, Por., &c.)

TÖMÖSVÁRY, E. Adatok a Hazánkban Elöforduló Myriopodákhoz. Term. füzetek, iii. pp. 152–156, 186 & 187, 244–249, & 269, pls. viii. & x.

A list of the *Myriopoda* of Hungary, with the description of a new *Lithobius*. The following known species are redescribed and figured:—*Paradesmus gracilis*, pl. x. figs. 1–5, a species introduced into Hungary from Samoa; and *Schendyla eximia*, pl. x. fig. 6.

CHILOPODA.

KOHLRAUSCH, E. Beiträge zur Kenntniss d— Scolopendriden. J. Mus. Godeffr. xiv. pp. 51–74, pl. vi.

The general characters of the *Scolopendridæ*, and their relative value in the determination of genera and species are discussed, and the following arrangement of genera is proposed:—

A. 23 pairs of legs.

1. *Scolopendropsis*, Brandt. 4 eyes on each side.
2. *Scolopocryptops*, Newp. Eyeless; all the legs 5-jointed.
3. *Newportia*, Gerv. Eyeless; last pair of legs 14-jointed.

B. 21 pairs of legs, and 10 pairs of stigmata.

4. *Heterostoma*, Newp. Stigmata sieve-like; last pair of legs stout.
5. *Branchiostoma*, Newp. Stigmata branchiform; last pair of legs slender.
6. *Trematoptychus*, Peters. Stigmata S-shaped; last pair of legs slender.

C. 21 pairs of legs, and 9 pairs of stigmata.

a. 4 eyes on each side; stigmata branchiform.

7. *Branchiotrema*, g. n. Last pair of legs very slender.
8. *Alipes*, Imhoff. Last pair of legs broad and flat.
9. *Cupipes*, g. n. Last pair of legs very short and thick.

b. 4 pairs of eyes; stigmata slit-like.

10. *Cormocephalus*, Newp. Neck-plate expanded; head rounded; straight behind.
11. (?) *Rhombocephalus*, Newp. Neck-plate expanded; head lozenge-shaped.
12. (?) *Theatops*, Newp. Head-plate but slightly expanded; last back-plate large.

13. *Scolopendra*, Newp. Head-plate heart-shaped, expanded. *c.* 1 pair of eyes, or eyes absent.
14. *Monops*, Gerv. A simple eye on each side.
15. *Cryptops*, Leach. Eyeless; last back-plate of the usual form.
16. *Opisthemega*, Wood. Eyeless; last back-plate considerably larger than the preceding.

The 26 figures are devoted partly to illustrating some of the new species and partly to various generic details.

Sograff, N. Vorläufige Mittheilungen über die Organisation der Myriapoden. Zool. Anz. ii. pp. 16–18.

Discusses the internal anatomy of *Chilopoda*.

A. Selevanoff publishes an important paper on Russian *Myriopoda* (*Chilopoda*: *Lithobius* and *Henicops*), Troudy Ent. Ross. xi. pp. 3–26, pl. i. The following known species are redescribed and figured:—*L. forficatus*, Linn., p. 8, figs. 1 & 2, *venator*, Koch, p. 13, fig. 5, *granulatus*, Koch, p. 15, fig. 7, *crassipes*, Koch, p. 17, fig. 9, *sibiricus*, Gerstf., p. 20, figs. 12 & 13, and *Henicops fulvicornis*, Mein., p. 25.

The centipede does not bite, but, when alarmed, distils venom into the tiny incisions made by its numerous feet; Nature, xxi. p. 12.

Cermatia forceps: on its northern range, Am. Nat. xiii. pp. 527 & 711.

Scolopocryptops mexicana, Humb. & Sauss., = *S. sex-spinosa*, Newp.; Porath, Sv. Ak. Handl. Bihang iv. No. 7.

Geophilus. Luminosity; Feuill. Nat. x. pp. 14 & 26.

New genera and species:—

Branchiotrema, Kohlrausch, *l. c.* pp. 58 & 70, *vide suprà*. To contain *B. multicarinatum*, fig. 5, Japan, *astenon*, fig. 6, Ena, Tonga Islands, *l. c.* p. 70, *luzonicum*, Luzon, *calcitrans* and *tuberculatum*, fig. 4, Rockhampton, Australia, spp. nn., and *Branchiostoma scabricauda*, Humbert & Saussure, fig. 7, *l. c.* p. 71, pl. vi.

Cupipes, id. *l. c.* pp. 58 & 71. To contain *Cormocephalus lineatus*, Newp., *C. brasiliensis*, Humb. & Sauss., ? *Scolopendra flavipes*, Koch, and *C. amphicurys*, figs. 8 & 9, Ponapé, Carolina Islands, *microstoma*, fig. 18, Mexico, and *græcus*, locality unknown, p. 72, pl. vi., spp. nn.

Otostigmus, Porath, *l. c.* p. 18. Allied to *Cormocephalus*; to contain *O. orientalis*, Bombay, p. 19, *scaber*, China, *carinatus*, China (?), p. 20, *rugulosus*, Mauritius, p. 21, *spinosus*, Java, p. 22, *inermis*, Buenos Aires, and *appendiculatus*, Rio Janeiro (? = *Branchiostoma scabricauda*, Sauss.), p. 23, spp. nn.

Bothriogaster, A. Selevanoff, Zool. Anz. ii. p. 620. Allied to *Geophilus*; to contain *G. signatus*, Kessl. (essential characters given), *B. affinis*, Caucasus, and *B. meinerti*, Turkey, spp. nn., p. 621.

Scolopocryptops megacephalus, pl. vi. fig. 1, Rosario, *luzonicus* (Semper, MS.), Luzon, and *S.* (?) *boholensis*, Bohol, Kohlrausch, *l. c.* p. 69.

Heterostoma (?) *pygomega*, id. *l. c.* p. 69, pl. vi. fig. 2, Himalaya.

Branchiostoma gracile, pl. vi. fig. 3, p. 69, and *gymnopus*, Banda, *indicum*, Rangoon, and *affine*, Zanzibar, p. 70, *id.* l. c.; *B. immarginum*, Manilla, and *obsoletum*, Melbourne, Porath, *l. c.* pp. 24 & 25.

Cormocephalus impressus, W. Indies, New York, p. 15, *monilicornis* and *marginatus*, Sydney, p. 16, *lævigatus*, Montevideo, p. 17, and *mirabilis*, Cordofan, p. 18, *id.* l. c.; *C.* (?) *lanatipes*, Gayndah, E. Australia, *C. gracilis*, E. Australia, *acanthophorus*, Zanzibar, and *C.* (?) *pygomelas*, S. America, Kohlrausch, *l. c.* p. 73.

Scolopendra pachypus, California, *pernix*, N. America, *leptodera*, Brazil, p. 73, and *cormocephalina*, Montevideo, p. 74, *id.* l. c.; *S. calcarata*, China, and *impressa*, Ceylon, Porath, *l. c.* pp. 10 & 12; *S. respublicana*, Giebel, Z. ges. Naturw. (3) iv. p. 326, Colombia.

Lithobius viriatus, p. 11, fig. 3, Sebastopol, *palustris*, p. 12, fig. 4, Saratoff, *tauricus*, p. 14, fig. 6, Sebastopol, &c., *armatus*, p. 16, fig. 8, Moscow, &c., *vicinus* (= *curtipes*, Palmb., and *crassipes*, Mein.), p. 18, figs. 10 & 11, Moscow, &c., *affinis*, p. 21, Irkutsk, *microcephalus*, p. 12, fig. 14, Ussuri, *proximus*, Irkutsk, and *orientalis*, Ussuri, fig. 15, p. 23, A. Selevanoff, *l. c.* pl. i.; *L. bicolor*, Tömösváry, Term. füzetek, iii. pp. 154 & 186, pl. viii., Hungary.

Chilognatha.

Fanzago, F. Miriapodi nuovi. Atti Soc. Pad. vi. pp. 20 & 21, pl. xii. figs. 12 & 9.

[Not seen by the Recorder.] Relates to *Polyxenus* and *Atractosoma*.

Fedrizzi, G. I Cordeumidi Italiani. Atti Soc. Pad. v. pp. 375–386.

[Not seen by the Recorder; noticed in Bull. Ent. Ital. xi. pp. 126 & 127.]

The following species are noticed as belonging to the family *Cordeumidæ*:—*Atractosoma meridionalis*, Panz., *Craspedosoma rawlinsi*, Leach, and *Cordeuma sylvestre*, Koch, besides a new genus and 3 new species.

Ryder, J. A. An Account of a new Genus of Minute Pauropod Myriapods. Am. Nat. xiii. pp. 603–612, woodcuts.

Relates to *Eurypauropus*, which the author regards as the type of a new family (*Eurypauropodidæ*) of the order *Pauropoda*, of which he gives a short table. The *Eurypauropodidæ* differ from the *Pauropodidæ* as follows:—Only six segments; no eyes; head concealed by a hood-like projection of the first body-segment; legs hidden beneath the lateral expansions of the body-segments.

Craspedosoma, sp. taken at Vienna; F. v. Feiller, SB. z.-b. Wien, xxix. p. 11.

Atractosoma meridionale, Fanzago: genus and species redescribed by him; Atti Soc. Pad. vi.

Polydesmus complanatus, Fabr. Fragments found in clay from the valley of the Boisse; A. Locard, Description de la Faune malac. des terraines quaternaires des environs de Lyon, pp. 1 & 2.

New genera and species:—

Megalosoma, Fedrizzi, Atti Soc. Pad. v. Allied to *Atractosoma*; types, *M. canestrinii* and *atherinum*, spp. nn., Italy.

Eurypauropus, Ryder, P. Ac. Philad. 1879, pp. 139 & 164, Am. Nat. xiii. pp. 603–612, figs. Type, *E. spinosus*, id. *ll. cc.*, Philadelphia, in nests of *Termes flavipes*.

Polydesmus alternatus, Karsch, Z. Ges. Nat. (3) iv. p. 826, Chinchoxo; *P. siculus*, Fanzago, Atti Soc. Pad. vi., Messina.

Atractosoma nigrum, id. *l. c.*, Messina.

Craspedosoma levicanum, Fedrizzi, Atti Soc. Pad. v., Italy.

Spirostreptus rugifrons, Ecuador, p. 38, *papillaris*, Brazil, p. 39, *flavicornis*, Surinam, *microps*, Pernambuco, Corcovado, p. 40, *ochrurus*, Corcovado, p. 41, *ventralis*, St. Thomas, *alicollis*, p. 42, *collaris*, Java, p. 43, and *aciculatus*, New Holland, p. 44, Porath, Sv. Ak. Handl. Bihang iv. No. 7; *S. multiplicatus* and *pictus*, Karsch, *l. c.* p. 829, Chinchoxo (the latter also from Abyssinia); *S. hercules*, Giebel, Z. ges. Naturw. (3) iv. p. 146, Oroway.

Alloporus crenatus, Porath, *l. c.* p. 45, Montevideo.

Iulus seticaudus, Nubia, and *lepidus*, Egypt, *id. l. c.* p. 29.

Spirobolus costulatus, Bogota, Colombia, *monilicornis*, p. 31, *univittatus*, Brazil, p. 32, *lævigatus*, Azores, *capucinus*, Singapore, p. 33, *albido-limbatus*, p. 34, *impressus*, Pernambuco, &c., *goesi*, St. Barthélemy and Java, p. 36, *suturalis*, Ceylon, and *heteroporus*, Java, p. 37, *id.* l. c.; *S. falkensteini*, Karsch, *l. c.* p. 828, Chinchoxo.

Peripatus.

Balfour, F. M. On Certain Points in the Anatomy of *Peripatus*. P. Cambr. Soc. iii. pp. 266–269; *cf.* also Zool. Anz. ii. pp. 332–335.

Segmental organs corresponding to those of Annelids described; nervous system discovered to be much more highly organized than was supposed; the "fat body" described by Moseley seems to be analogous to the simple salivary glands of *Iulus*.

Moseley, H. N. Notes on the species of *Peripatus*, and especially on those of Cayenne and the West Indies. Ann. N. H. (5) iii. pp. 263-267.

The writer reviews the various published accounts of this genus, and briefly notices the results of his own examination of specimens in the British Museum and elsewhere. The number of legs seems to vary considerably in specimens received from the same localities, but in the Australian and New Zealand species, the number seems fixed.

INSECTA.

THE GENERAL SUBJECT.

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

Ballard, J. P. Insect Lives, or Born in Prison. Cincinnati: 1879, sq. 12mo, pp. 97.

A popular introductory book on Entomology (*cf.* Am. Nat. xiii. p. 774).

Bellesme, J. de. Sur une fonction de direction dans le vol des Insectes. C. R. lxxxix. pp. 980–983.

In the flight of Insects, the direction is determined by the position of the part of the body which cuts the air; and this again depends on the position of the centre of gravity, and the axis of support. In most cases the centre of gravity only is displaced. The mode of flight of the various Orders of Insects is briefly reviewed.

Bertoloni, C. G. Di quattro diverse specie d'insetti nocivi al pini ed agli abeti. Mem. Ac. Bologn. (3) ix. pp. 181–197.

Contains an account of the transformations and ravages of *Pissodes pini*, L., *Retinia buoliana*, W. V., *Cnethocampa pityocampa*, F., and *Phorocera atripalpis*, Rond. MS.

Brandt, E. Recherches anatomiques et morphologiques, sur le systéme nerveux des Insectes. C. R. lxxxix. pp. 475–477; Ent. xii. pp. 291–293.

Contains a brief summary of the results of the examination of the nervous system in 1032 species of various orders.

——. Vergleichend- anatomische Skizze des Nerven- systems der Insekten. Hor. Ent. Ross. xv. pp. 3–19, pls. iii. & iv.

——. Ueber die Metamorphosen der Nerven-systems der Insecten. *Id. l. c.* pp. 20–30, pls. v. & vi.

——. Vergleichend-anatomische Untersuchungen über das Nervensystem der Hymenopteren. *Id. l. c.* pp. 31–50, pls. vii.–x.

——. Vergleichend-anatomische Untersuchungen des Nerven-systems der Käfer (*Coleoptera*). Id. *l. c.* pp. 51–67, pls. xi.–xiii.

[Brandt, E.] Vergleichend-anatomische Untersuchungen über das Nerven-system der Lepidopteren. *Id. l. c.* pp. 68–83, pl. xiv.

——. Vergleichend-anatomische Untersuchungen über das Nervensystem der Zweiflügler (*Diptera*). Id. *l. c.* pp. 84–101, pls. xv.–xviii.

This series of papers contains a compendium of the author's observations on the nervous system of Insects, derived from the investigation of a great number of species of various Orders. A copious bibliography accompanies each section.

Camerano, L. Gli Insetti. Introduzione alle studio dell' Entomologia. Torino & Roma: 1879, 8vo, pp. viii. & 344, woodcuts.

A compendious Introduction to Entomology, profusely illustrated, and treating of the history of the science; Insects in relation to agriculture; their origin, natural and sexual selection, internal and external anatomy, geographical distribution, and classification. There is also a chapter on collecting, and a chapter on each of the leading Orders, including tables of families, and bibliography.

——. Descrizione di alcuni Insetti monstruosi delle Raccolte Entomologiche del Regio Museo Zoologico di Torino. Atti Acc. Tor. xiv. pp. 148–154, figs. 1–7.

Deformities of the following species described:—*Carabus galicianus*, Gory, *Abax contractus*, Heer, *Broscus politus*, Dej., *Chlænius nigricornis*, Fabr., var. *melanocornis*, Dej., *C. holosericeus*, Fabr., *Ocypus similis*, Fabr., *Athous niger*, Linn., *Polistes gallica*, Linn., *Gryllus melas?*, *Dieuches luscus*, Fabr., and *Bombyx trifolii*, Fabr.

Carlet, G. Sur la locomotion des Insectes et des Arachnides. C. R. lxxxix. pp. 1124 & 1125.

When Insects walk, the legs move according to the following formula:

$$\begin{matrix} 1 & 4 \\ 5 & 2 \\ 3 & 6 \end{matrix}$$

legs 1, 2, 3 moving almost simultaneously, and supporting the body while the others are raised. In *Arachnida* the formula is as follows:—

$$\begin{matrix} 1 & 5 \\ 6 & 2 \\ 3 & 7 \\ 8 & 4 \end{matrix}$$

Dallas, W. S. Entomology. Pop. Sci. Rev. (2) iii. pp. 147–154.

A popular article on the study.

Davis, H. Notes on the Pygidia and Cerci of Insects. J. R. Micr. Soc. ii. pp. 252–255.

Pygidia are present in the majority of the *Orthoptera*, *Neuroptera*, and *Pulicidæ*; whether the cerci of the *Blattidæ* correspond to them, is doubtful.

Dewitz, H. Nachtrag zu "Beiträge zur postembryonalen Gliedmassenbildung bei den Insecten." Z. wiss. Zool. xxxi. pp. 25–28.

Relates to the development of the legs of Ants.

EATON, A. E. Observations on Insects collected in Kerguelen Island. Phil. Tr. clxviii. pp. 227 & 228.

FITZWILLIAM, S. Economic Entomology. Ent. xii. pp. 176–179, 197–201, 242–244.

Relates to the work of the late Andrew Murray, and to the steps taken in various foreign countries to enforce the destruction of noxious Insects.

GOSS, H. Introductory Papers on Fossil Entomology. Ent. M. M. xv. pp. 169–173, 226–228, 245 & 246, xvi. pp. 7–10, 25–29, 58–60, 124–128.

The writer discusses the Insects of the Carboniferous, Permian, Triassic, Jurassic, Cretaceous, and Eocene periods, and notices the animals and plants with which they were associated.

GRABER, V. Die Naturkräfte. Eine naturwissenschaftliche Volksbibliothek, xxii. Band, 2 Hälfte. Die Insekten. II. Theil, 2 Hälfte. Vergleichendes Lebens und Entwicklungsgeschichte der Insekten, 8vo, München: 1879 (127 woodcuts).

[Not seen by the Recorder; noticed in Am. Nat. xiii. pp. 774 & 775.]

GRENACHER, H. Untersuchungen über das Sehorgan der Arthropoden insbesondere der Spinnen, Insecten, und Crustaceen. Göttingen: 1879, 4to, pp. viii. 188, pls. xi.

An elaborate monograph, describing the simple and compound eyes of a great number of species. In conclusion, their general structure, functions, and homologies with those of the higher animals are discussed; but the whole work is far too elaborate to admit of any abridgment of the author's observations or results.

HAGEN, H. A. Attacks of native Insects upon imported trees. Psyche, ii. pp. 210 & 211.

KOMPFE, D. Die Insecten. Naturgeschichtliche Aufsätze über Freunde und Feinde der Landwirthschaft unter den freilebenden Thieren. Leipzig & Mainz: 1879, 8vo, pp. 156, pls. 2.

LE ROY, J. J. Het ademhalingsmechanisme der Insecten. Isis, Maandschr. v. Natuurwet. vii. pp. 257–272.

A popular article.

LICHTENSTEIN, J. Quelques observations entomologiques. Ann. Soc. Ent. Fr. (5) iv. pp. 43–46.

Relates to *Hymenoptera*, *Coleoptera*, and *Homoptera*.

LOWNE, B. T. On the Modifications of the Simple and Compound Eyes of Insects. Phil. Tr. clxix. pp. 577–602, pls. lii.–liv., and diagrams.

After treating of the structure of the simple and compound eyes of various Insects belonging to the principal Orders, the writer closes with general remarks on the morphology of the eyes of Insects, and on the theory of mosaic vision.

LUBBOCK, SIR J. Scientific Lectures. London: 1879, 8vo, pp. 187, col. pl. and woodcuts.

As this is a popular work, and does not profess to contain anything new, it is sufficient to observe that the greater portion is devoted to the relations between plants (especially flowers) and Insects, and to the habits of Ants.

MACLEOD, J. La Respiration chez les Insectes. Feuill. Nat. ix. pp. 148–150.

MAURICE, J. Relations entre les faunes entomologiques d'Europe et d'Amérique. Bull. Soc. L. N. Fr. 1879, pp. 108–112.

MEINERT, F. Om Mundens bygning hos Larverne af Myrmeleontiderne, Hemerobierne, og Dytiscerne. Vid. Medd. 1879-80, pp. 69–72.

In the larvæ of the *Myrmeleonidæ* and *Hemerobiidæ*, the mandibles are not hollow, as is usually supposed, but a closed tube runs behind them through the maxillæ, which is not directly connected with the intestine, but opens outwardly, close to the mouth, which is reduced to two small openings. The larvæ of the *Dytiscidæ* are similarly constructed, except that the opening in the mandibles forms a tube independently of the maxillæ. In the larva of *Myrmeleon*, the intestine is blind, and the mouth serves the purpose of an excretory organ.

MIGNAULT, L. D. Les Plantes Insectivores. Nat. Canad. xi. pp. 151–159, 193–198, 233–238, 244–248.

A popular article.

MÜLLER, F. Schützende Färbung und die Farbenempfindung der Thiere. Kosmos, v. pp. 62 & 63.

The perception of colour in Insects, &c., probably varies in different individuals.

MÜLLER, H. Schützende Aehnlichkeit einheimischer Insekten, unter Benutzung von Beobachtungen des A. Speyer. Kosmos, vi. pp. 29–38, 114–124, woodcuts.

NEWTON, E. T. On a New Method of Preparing a Dissected Model of an Insect's Brain from Microscopic Sections. J. Quek. Club, v. pp. 150–158, woodcuts.

Includes general remarks on the brain of Insects.

NICKERL, O. Bericht über die im Jahre 1878 der Land- und Forstwirthschaft schädlichen Insecten. Prag: 1879.

Relates chiefly to *Coleoptera*.

ONTARIO. Annual Report of the Entomological Society of Ontario for the year 1878. Toronto: 1879, 8vo, pp. iv. 61.

ORMEROD, E. A. Considerations as to Effects of Temperature on Insect Development. Ent. xii. pp. 137–142.

Chiefly relates to the great abundance of *Clythra quadripunctata* and *Rhipidophorus paradoxus* in unusually warm and sheltered nests of *Formica rufa* and *Vespa vulgaris* respectively.

[Ormerod, E. A.] Observations of the Effects of Low Temperature on Larvæ. Tr. E. Soc. 1879, pp. 127–130.

During the severe winter of 1878–79, the authoress made observations on Insects of various orders exposed to the full effects of the cold; but she found that they invariably appeared to recover perfectly (whatever their stage) as soon as they were thawed.

——. Sugar-cane Borers of British Guiana. P. E. Soc. 1879, pp. xxxiii.–xxxvi.

——. Notes on the Prevention of Cane-Borers. P. E. Soc. 1879, pp. xxxvi.–xl.; see also p. xxxi.

In these papers, the authoress discusses the damage caused to sugar-canes in Guiana and the West Indies and elsewhere by *Calandra palmarum* and *C. sacchari* and a moth (*Procerus* sp. ?). The habits of the insects, and the modes of extirpating them, are also noticed; burning the fields, however, is not to be recommended, as this destroys the Ants and other natural enemies of the obnoxious insects. (The moth is probably *Phalæna saccharalis*, Fabr.; R. McLachlan, *op. cit.* p. xl.)

Osten-Sacken, C. R. Ueber einige Fälle von Copula inter mares bei Insecten. S. E. Z. xl. pp. 116–118.

Relates to *Melolontha vulgaris*, *Rhagonycha melanura*, *Lampyris lusitanica*, and *Bombyx mori*.

Provancher, —. Additions à la Faune Entomologique de la Province de Quebec. Nat. Canad. xi. pp. 301–[illegible] woodcuts.

Includes *Orthoptera* and *Coleoptera*, non

Riley, C. V. Parasites of the Cotton W[illegible] Canad. Ent. xi. pp. 161 & 162.

7 *Hymenoptera* and *Diptera* mentioned, 3 of which are described as new.

Rendu, V. Mœurs pittoresques des Insectes. Paris: 1879, 8vo, pp. viii. & 324.

Sanborn, F. G., & Lintner, J. A. An account of the collections which illustrate the labours of Dr. Asa Fitch. Psyche, ii. pp. 273–276.

Saussure, H. de. Sur le genre *Hemimerus*, Walk., paraissant former un ordre nouveau dans la classe des Hexapodes. Mém. Soc. Phys. Genèv. xxvi. pp. 399–418, pl. i.

Hemimerus palpoides, Walk., was regarded by that author as an Orthopterous insect. It is remarkable for the unique character of a second labium, and has affinities both to the *Orthoptera* and *Thysanura*, but is nearer to the former. Saussure treats it as the type of a new Order (*Diploglossata*), characterized as follows: Corpus ovatum, depressum, crustaceum, blattiforme, apterum. Caput deplanatum, antrorsum vergens. Instrumenta cibaria:—(A) *Labia* 2-*superposita*, *utrumque palpi* 2. Lingula transversa brevissima, vix ulla. (B) Maxillæ 2 palpigeræ. (C) Mandibulæ 2-articulatæ, manducariæ. (D) Labrum perspicuum, transversum. Pedes gressorii, plantigradi, breves, tarsis articulatis,

biungulatis. Abdomen 9-articulatum, segmentis ventralibus ♂ 7 (♀ 6?) non appendiculatis ; segmentum mediale absque parte ventrali. Cerci 2, e segmento ultimo orientes. Spiracula ?. Antennæ setaceæ.

SCHILDE, J. Gegen pseudodöxische Transmutationslehren, ein etymologisch Nachweis irriger Studien zur Descendenztheorie. Leipzig : 1879, pp. 154.

SCHLECHTENTHAL, H. v., & WÜNSCHE, O. Die Insecten. Band. i. Leipzig : 1879, 8vo, pp. xii. & 707, 15 pls.

SCUDDER, S. H. The Early Types of Insects ; or the Origin and Sequence of Insect Life in Palæozoic Times. Mem. Bost. Soc. iii. pt. i. pp. 13–21.

The author's principal conclusions are that *Hexapoda*, *Arachnida*, and *Myriopoda* appeared simultaneously in Carboniferous strata. *Hexapoda* may be divided into a higher group (*Metabola*), including *Hymenoptera*, *Lepidoptera*, and *Diptera*, and into a lower group (*Heterometabola*), including *Coleoptera*, *Hemiptera*, *Orthoptera*, and *Neuroptera*. All Devonian and Carboniferous insects are *Heterometabola*, and many synthetic types combining the characters of various Orders existed in palæozoic times ; and the lower suborders of *Heterometabola* (*Orthoptera* and *Neuroptera*) were much more abundant than *Coleoptera* and *Hemiptera*. Most of the palæozoic *Orthoptera* were *Blattidæ* ; and the *Neuroptera* were much rarer than the lower *Pseudoneuroptera*. The general type of wing-structure has remained unaltered from the first, but the front and hind wings of palæozoic Insects, with three exceptions, were similar and membranous, and the neuration in widely diverse types was much more similar than now. The *Metabola* do not appear till Jurassic times. It is probable that winged Insects may be discovered in Devonian, and even Silurian, formations, of still more generalized structure than any yet known. The earlier Insects were usually of large size, and there is a great similarity between the carboniferous insect-fauna of Europe and N. America.

SLATER, J. W. On certain minute characters of Insects, with reference to the theory of Evolution. P. E. Soc. 1879, pp. liii.–lv.

Consists chiefly of remarks on the venom of *Hymenoptera*, and on the structure, &c., of the wing-scales of *Lepidoptera*.

SPICER, W. W. Plants as Insect Destroyers. P. R. Soc. Tasm. 1877, pp. 81–91.

Relates to mould, resin, insectivorous plants, &c.

TASCHENBERG, E. L. Praktische Insectenkunde, oder Naturgeschichte aller derjenigen Insecten, mit welchen wir in Deutschland nach den bisherigen Erfahrungen in nähere Berührung kommen können, nebst Angabe der Bekämpfungsmittel gegen die schädlichen unter ihnen. Bremen : 1879, 8vo, woodcuts. I. Einführung in die Insektenkunde ; pp. vi. & 233. II. Die Käfer und Hautflügler ; pp. viii. & 401.

The first volume of this work contains a general sketch of the various orders of Insects, treating of the structure, transformations, &c., of each

order, with instructions for collecting, notices of the principal works on European species, and a sketch of the principal families. The second volume treats of the orders *Coleoptera* and *Hymenoptera* in greater detail, and full accounts are given of all the commonest and most remarkable species. The work contains a large amount of important Entomological information in a very small compass.

TASCHENBERG, O. Färbung der Thiere als natürliches Schutzmittel gegen ihre Feinde. Z. ges. Nat. (3) iv. pp. 408–420.

The latter part of this paper relates to protective mimicry in Insects.

UNDERHILL, H. M. J. The Preparation of Insects for Microscopical Examination. Sci. Goss. xv. pp. 101–103, 121 & 122.

WAGNER, N. Sur la structure des ganglions céphaliques des Insectes. C. R. lxxxix. pp. 378 & 379.

Of the two pairs of ganglions in the heads of Insects, the hinder pair chiefly regulates the mouth and its appendages, and the front pair forms the seat of intelligence. Towards the centres of the front ganglions are three groups of small cellules arranged in layers, and communicating by numerous nervous fibres. The groups situated before the others are intimately connected with the circumvolutions, or horse-shoe shaped organs, in the social *Hymenoptera*, and are developed in proportion to their intelligence. They are most developed in worker ants, next in worker bees; while they are less developed in the females, and are rudimentary in the males. The sides of the ganglions are produced into lobes connected with the large compound eyes.

WALLACE, A. R. The Protective Colours of Animals. Science for All, 1879, pp. 138–157, woodcuts.

——. Protective Mimicry in Animals. *L. c.* pp. 284–296, woodcuts.

Popular essays, much of which relates to Insects, especially *Lepidoptera*.

WATSON, F. On Indian Wheat. (Parliamentary Report; *cf.* E. A. FITCH, Ent. xii. p. 292.)

WESTWOOD, J. O. On some Unusual Monstrous Insects. Tr. E. Soc. 1879, pp. 219–228, pls. vi. & vii.

The author describes and figures 3 butterflies, with supplemental wings or portions of wings, and various *Coleoptera*, *Lepidoptera*, and *Diptera* in which the head of the larva or pupa has been retained in the imago state.

WOOD-MASON, J. Morphological Notes bearing on the Origin of Insects. Tr. E. Soc. 1879, pp. 143–167, woodcuts.

The antennæ of *Machilis* appear to be homologous with the antennæ proper of *Crustacea*. These, as well as those of an Indian *Lepisma*, lead to the biramose antennæ of *Pauropus* in the *Myriopoda*, and to those of *Cyclops*, or the various larval forms of *Crustacea*. Rudiments of a second antennal branch likewise exist in ripe embryos of *Blatta* (*Panœsthia*) *javanica*, thus lending support to the opinion that the *Blattidæ* are

descended from some form allied to *Lepisma*. The mandibles of the *Blattidæ* are discussed, and the writer concludes that they are compound structures, made up of 3 or 4 joints such as exist in *Machilis*, the structure of which is also described. The mandibles of Insects and Myriopods do not appear to represent walking legs, but to have resulted from the direct modification of such a biramose appendage as is seen in the *Nauplius* condition of many *Crustacea*. The abdominal appendages of the *Thysanura* are also discussed, and it is suggested that the limbs of Myriopods may not be strictly homologous with those of Insects, but may correspond with the rudimentary appendages of *Machilis*. The abdominal pouches of *Machilis*, &c., are fully described, and the writer inclines to regard them as analogous to the renal or segmental organs of Worms. The difference in the position of the genital openings exhibited by the different groups, and generally by the opposite sexes of the *Arthropoda*, indicates that all the members of this sub-kingdom have descended from some wormlike creature, provided in every somite of its body with a pair of segmental organs or nephridia, and that different pairs of these organs have, in different descendants of this hypothetical ancestor, been converted into the genital aperture and ducts. The gonapophyses of ♀ *Blattidæ* are homologous with the appendages of the 8th and 9th abdominal somites in the ♀ of *Machilis*. The ex-articulate setose styles movably attached to the hinder extremity of the 9th abdominal sternum in ♂ *Blattidæ*, are possibly homologous with the abdominal appendages of *Thysanura*.

Mimicry, Habits, Senses, &c.

Theory of insect mimicry questioned; Horn, Tr. Am. Ent. Soc. vii. p. ii.

Notes on the inherited and acquired intelligence of *Hymenoptera* and *Lepidoptera*; W. v. Reichenau, Ent. Nachr. v. pp. 93–95.

The degeneration of visual organs in insects, spiders, and *Crustacea*, which live in darkness, is discussed; Kosmos, iv. pp. 148–153.

Colour-sense in insects, and its connection with flowers; G. Allen, P. R. Inst. ix. pp. 201 & 202.

Fertilization of flowers by insects, &c.; Am. Nat. xiii. pp. 648 & 649, 688–692. Brilliancy of flower-haunting insects; C. R. Sclater, Ent. xii. pp. 130 & 131. *Angelica sylvestris* very attractive to insects of all orders; Beckers, Ent. Nachr. v. p. 257. Bees, &c., stupefied by the flowers of *Kalmia latifolia*.

Simulation of death by *Coleoptera* and *Arachnida*; C. R. Slater, Sci. Gos. xv. pp. 160 & 161.

List of insects (*Hymenoptera*, *Lepidoptera*, and *Diptera*, ?) found feeding on the service-tree; J. B. Fletcher, Ent. M. M. xv. p. 190.

Honey without wax, stored by an insect resembling a large mosquito, in Ethiopia; Villiers, Am. Nat. xiii. p. 472.

Notes on garden insects in 1879; J. W. Douglas, Ent. M. M. xvi. pp. 115 & 116.

Effect of wet season on Insects; E. A. Fitch, Ent. xii. pp. 281–291.

Great flight of butterflies and dragonflies at Wilhelmshaven, on 22nd August, 1879 : Emder Zeitung, quoted in Ent. Nachr. v. p. 256.

Notes on various galls ; F. Karsch, JB. zool. Sect. Westf. Ver. vii. pp. 26–31, woodcuts.

Amber containing fossil insects; E. Goldsmith, P. Ac. Philad. 1879, pp. 207 & 208.

Local Faunæ.

Notes on insects of New Forest (chiefly *Lepidoptera*, of which several woodcuts are given) ; E. D. Marquand, Sci. Gos. xv. pp. 125–127.

Captures of *Coleoptera* and *Lepidoptera* in Sutherlandshire ; L. D. Dunbar, Ent. xii. pp. 227 & 228.

Additions to French fauna in various orders ; L. Fairmaire, Bull. Soc. Ent. Fr. (5) ix. pp. clxx. & clxxi.

Captures of insects of various orders in S. France ; L. Samie, Actes Soc. L. Bord. xxxii. pp. xxxvii.–xlii., lxv.–lxxv., xcv.–cx. ; xxxiii. pp. xxxvi.–xlvi., lvi.–lxviii., xcvii.–cx.

Captures of *Coleoptera* and *Hemiptera* at Remilly, near Metz ; R. de Tinseau, Feuill. Nat. ; ix. p. 115.

Captures of various orders in Holland ; Tijdschr. Ent. xxii. pp. xxvi., xciii.–xcv.

Captures of various orders in Sardinia ; P. Magretti, Atti Soc. Ital. xxi. pp. 461 & 462.

Notes on insects at Zanzibar ; J. Thomson, Ent. M. M. xv. p. 280.

List of the Insects of Kerguelen's Land ; T. Studer, Arch. f. Nat. xiv. pp. 111–113.

Economic Entomology.

A. Costa, Atti Ist. Nap. (2) xiv. [1877] pp. 340, pls. xiii., gives a new edition, with additions and corrections, of his work on agricultural Entomology, "Degli Insetti che attaccano d'albero, &c.," published in 1855.

Note on collections illustrative of Economic Entomology ; Ormerod & D'Urban, Ent. M. M. xvi. pp. 44 & 45.

Insect galls are distorted buds ; Wilson & Hollis, Nature, xx. pp. 55 & 95.

General observations on injurious Insects ; Sintenis, SB. Ges. Dorpat. v. pp. 93–105.

Insects, &c., injurious to peas ; E. A. Fitch, Ent. xii. pp. 281–291.

Insects injurious to books ; Westwood, Nature, xx. pp. 471 & 472.

Yeast, mould, &c., as insect destroyers ; H. Hagen, Canad. Ent. xi. pp. 110–114 ; S. E. Z. xl. pp. 369–374 ; E. A. Fitch, Ent. xii. pp. 274 & 275 ; C. G. Siewers, Am. Nat. xiii. pp. 681–683.

Experiments with *Pyrethrum roseum* as an insect-poison ; W. L. Carpenter, Am. Nat. xiii. pp. 176 & 177. See also on insect powders, W. Saunders, *op. cit.* pp. 572–574 ; Canad. Ent. xi. pp. 41–43.

Preserving Collections.

On preserving *Aphides*, *Cynipidæ*, and other small and delicate Insects ; De Borre, CR. Ent. Belg. xxii. pp. iv.–vii.

On preserving Insects for microscopic examination ; Petzold, Nature, xix. p. 301.

Animals injurious to collections of Insects ; G. de Rossi, Ent. Nachr. v. pp. 20–22 & 33–38.

On killing Insects with cyanide of potassium, which does not [illegible] strongly on hybernating specimens ; Grosschupff & Müller, Ent. Nachr. v. pp. 22 & 23.

Improved cyanide bottle ; Kenderesy & Czermak, Ent. Nachr. v. pp. 51, 53, & 119.

On the use of petroleum and naphthalin to destroy Insects injurious to collections ; W. v. Reichenau, Zool. Anz. ii. pp. 573 & 574 ; Jacobs & Weinmann, Ann. Ent. Belg. xxii. pp. lxxxvii. & lxxxviii.

Essence of bitter almonds recommended for the preservation of collections ; O. Kœchlin, Pet. Nouv. ii. p. 294.

Comparative merits of black and white pins ; O. Staudinger, Ent. Nachr. v. pp. 98 & 99 ; A. B. Farn, &c., Ent. xii. pp. 112, 131 & 132.

On the best position for store-boxes ; De Borre, Ann. Ent. Belg. xxii. pp. lxxxiii.–lxxxvi.

On spacing out cabinet drawers ; E. Holton, Ent [illegible] xii. pp. 111 & 112.

Labelling collections ; Pet. Nouv. ii. pp. 301 & 30[illegible]2, 305 306. 310.

Bibliography.

Plan for a compressed Entomological Bibliography ; K. v. Dalla Torre, Ent. Nachr. v. pp. 258 & 259.

Notes on the nomenclature of Insects ; G. D. Hulst and others, Canad. Ent. xi. pp. 22–25, 61–64, 79 & 80.

Obituary notice of E. Perris, with list of publications (83 items) ; Mulsant, Ann. Soc. L. Lyon, xxv. pp. 85–110 (portrait).

COLEOPTERA.

BY

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

The General Subject.

Austin, E. P. Geographical Distribution of North American *Coleoptera*. Psyche, ii. pp. 217–223.

Baly, J. S. Descriptions of Phytophagous *Coleoptera*, belonging to the families *Chrysomelidæ* and *Galerucidæ*, from Peru. Tr. E. Soc. 1879, pp. 235–259.

33 new species and 3 new genera are described, chiefly from Chanchamayo.

Bedel, L. Faune des Coléoptères du bassin de la Seine et de ses bassins secondaires. *Carnivora* (*Cicindelidæ*, *Carabidæ*). Ann. Soc. Ent. Fr (5) ix. App. pp. 1–160.

The families are tabulated, the genera characterized, and the species arranged in dichotomous tables, and then catalogued, with notices of times of appearance, localities, &c. Remarks on variation, &c., are given in foot-notes. The portion already published extends to the commencement of the *Harpalides*.

Camerano, L. Note intorno ai caratteri sessuali secondari di alcuni Coleotteri. Atti Soc. Tor. xiii. pp. 751–764.

The species noticed are *Cicindela campestris*, *hybrida*, *chloris*, and *germanica*, and *Carabus olympiæ*.

——. Ricerche intorno alla struttura dei peliventose dei tarsi dei Coleotteri. *Op. cit.* xiv. pp. 1148–1161, pls. i. & ii.; *cf.* Bull. Ent. Ital. xi. pp. 231 & 232.

Species belonging to 12 different families of *Coleoptera* have been examined.

Dalla Torre, K. W. v. Systematisches Verzeichniss der in Oberösterreich bis jetzt beobachteten Käfer. Ber. Ver. Naturk. Oberösterreich x. pp. 1–125.

Extends to the *Dascillidæ*.

Duges, E. Descripcion de Coleopteros indigenas. Nat. Mex. iv. pp. 169–188, plate.

Includes species of several families.

Fairmaire, J. Descriptions des Coléoptères nouveaux ou peu connus du musée Godeffroy. J. Mus. Godeffr. xiv. pp. 80–114. (*Staphylinidæ* by Fauvel.)

The following known species are redescribed or diagnosed : *Hydrochus australis* and *kirgisicus*, Motsch., *Berosus australiæ*, Muls., p. 81, *Liparochrus geminatus* and *fossulatus*, p. 84, *sculptilis*, Westw., p. 85, *Cryptodus variolosus*, White (= *paradoxus*, Burm., and ? Macl.), p. 88, *piceus*, Germ., p. 89, *tasmanianus*, Westw. (= *anthracinus*, Er.), *politus*, Westw., p. 90, *passaloides*, Germ., *C.* (*Cryptodellus*) *caviceps*, Westw., *C. subcostatus*, Macl., p. 91, *C. obscurus* and *incornutus*, Macl., *Oryctoderus latitarsis*, Boisd., *O. coronatus*, H. W. Bates, *O. albertisi*, Gestro, p. 92, *Paracupta sulcata* and *æneiventris*, Saund., *pyroglypta*, *basicornis*, p. 94, and *pyrura*, Fairm., *prasina* and *flavipennis*, Heer, *marginipennis*, p. 95, *samoensis*, *foveicollis* and *flavo-foveata*, Saund., p. 96, *Telephorus imperialis*, Redt., p. 98, *Calochromus guerini*, Macl., p. 101, *Laius bellulus*, Guér., and *cinctus*, Redt. (= *mastersi*, Macl.), p. 103, *L. trisignatus*, Germ., p. 104, *Carphurus pallidipennis* and *elongatus*, p. 105, *apicalis*, Macl., p. 106, *cervicalis*, Germ., p. 107, *cyanipennis* and *azureipennis*, Macl., p. 108, *Balanophorus mastersi*, Macl., *Carphurus brevipennis*, Germ., p. 110, and *Pseudolycus marginatus*, Guér., p. 111.

——, L. Descriptions de quelques Coléoptères nouveaux recueillis en Espagne par D. Manuel Martorell y Peña. Ann. Soc. Ent. Fr. (5) ix. pp. 241–244.

——. Descriptions de Coléoptères nouveaux du nord de l'Afrique. *L. c.* pp. 155–172, 245–258.

The following known species (chiefly the author's) are redescribed : *Harpalus* (*Pangus*) *tingitanus*, *Feronia atlantica*, *Sphodrus prolixus*, *Bembidium tenuistriatum*, *Hydroporus acuminatellus*, *undecimlineellus*, *Quedius abietum* (Kies.), *Teretrius pulex*, *Hetærius lioderus*, *plicicollis*, *arachnoides*, *pluristriatus*, *lævidorsis*, *Choleva cannellina*, *Thorictus lethierrii*, *Eremazus unistriatus* (Muls.), *Tolisus æneus* (Sharp), *minor* (Sharp), *Millingenia fossor* (Sharp), *Coptognathus lefranci* (Muls.), *Schizonycha algirina*, *Pachydema nitidicollis*, *Rhizotrogus batnensis*, *Aphanisticus amblyderus*, *Cylindromorphus pinguis*, *Cebrio striatifrons*, *perustus*, *gracilispina*, *convexiusculus*, and *biskrensis*.

Frivaldszky, J. *Coleoptera* Nova ex Hungaria. Term. füzetek, iii. pp. 3–6.

——. *Coleoptera* nova ab E. Merkl in Balkan inventa. *L. c.* pp. 230–244.

Gestro, R. Descrizioni di nuove specie di Coleotteri raccolte nella regione Austro-Malese dal signor L. M. D'Albertis. Decade i. Ann. Mus. Genov. xiv. pp. 552–565.

The known species of *Cicindela* collected are also enumerated.

HAROLD, E. v. Bericht über die von A. v. Homeyer und Pogge in Angola und im Lunda-Reiche gesammelten Coleopteren. C. H. xvi. pp. 1–224, pls. i. & ii.

280 species are enumerated. A large proportion are new; and the species diagnosed in MT. Münch. ent. Ver. ii. and in MB. Ak. Berl. 1878, are redescribed in full. Other known species which are redescribed, or require special notice here, are as follows: *Mantichora livingstonii*, Cast. (distinct from *M. scabra* = *herculeana*, Kl.), *Cicindela poggii*, Har., pl. i. fig. 1, *Galerita attelaboides*, Fabr. (= *Drypta gracilis*, Murr.), *Tefflus delegorguii*, Guér., *T. muata*, Har., pl. i. fig. 3; *Eudema impictum* (= *Craspedophorus æqualitas*), *Chlænius gorii*, Buq., *C. ammon*, Fabr. (= *bruneti*, Gory), *Rhembus ægyptiacus* and *senegalensis*, Dej., are hardly distinct; *Hydaticus capicola* probably = *caffer*, Boh.; *H. congestus*, Klug (= *signatipennis*, Cast.); *Anachalcos procerus*, Gerst.; *A. cupreus*, Fabr., from the West Coast is probably distinct from the S. African form *convexus*, Boh., *Onthophagus brucii*, Reiche, *O. pugionatus*, Fabr., *O. catta*, Fabr. (= *gazella*, Fabr.), *Anomala pallida*, Fabr., *Ceratorrhina harrisi*, Westw. var., pl. i. fig. 4; *Dicranorrhina micans*, Dru., *Heterorrhina cincta*, Oliv. (= *cinctatus*, Voet), *Gnathocera cruda*, Jans., *Leucoscelis dysenterica*, Boh. (*nec* Macl., which = *hæmorrhoidalis*), *L. rufo-femorata*, Burm., *Cetonia poggii*, Har., pl. i. fig. 5; *Diplognatha cinnamomea*, Afzel., *D. gagates*, Forst., *D. silicea*, Macl., *D. maculatissima*, Boh., *Goniochilus rufiventris*, Har., pl. i. figs. 6 & 6 *a–c*; *Cœnochilus procerus*, Schaum (= *paulus*, Burm.). Table of species of *Steraspis* given; *S. brevicornis*, Klug, includes his *æruginosa*, *cuneata*, and *superbiens*, and *delegorguii*, Thoms., *Chrysaspis aurata*, Fabr., *Tetralobus flabellicornis*, Linn., *Prioscelis serrata*, Fabr., *Eupezus* ♂ ♂ of 4 species tabulated; *Aspidosternum antiquum*, Har., pl. i. fig. 7; *Praogena splendens*, Mäkl., *P. procera*, Har., pl. i. fig. 8; *Zonabris* (new name for *Mylabris*, Fabr., *nec* Geoff.) *bifasciata*, Oliv., *Z. dicincta*, Bert. (= *bizonata*, Gerst.), *Z. dentata*, Ol. (= *tortuosa*, Er.), *Cleonus sannio*, Herbst (= *mucidus*, Germ.). *Tithoes* and allied genera tabulated: *T. yolofus*, Dalm.; *Dorycera apicicornis*, Fabr., *Macrotoma palmata*, Fabr., *Mallodon downesi*, Hope, *Colpoderus forcipatus*, Har., pl. ii. fig. 1; *Sternotomis virescens*, Westw. (= *insularis*, Har.), *S. irrorata*, Fabr., *S. eremita*, Westw. (= *Freadelpha humeralis*, Thoms.), *Tragocephala nobilis*, Fabr. (= *histrionica*, Har.), *T. bicincta*, Fabr. (= *Lamia continua*, Ol.); *Ceroplesis*, table of species given, *C. quinquefasciata*, Fabr. (= *capensis*, var., Schön., and *tæniata*, Perroud); *Phryneta obscura*, Oliv., *Hecyrida appendiculata*, Gerst. (= *sordida*, Fähr.), *Nitocris leucostigma*, Har., pl. ii. fig. 3; *N. chrysostigma*, Har., pl. ii. fig. 4; *Antipus mandibularis*, Latr., *Clithra wahlbergi*, Latr., *Aulacophora bispinosa*, Fabr., *Aspidomorpha chlorotica*, Oliv. (♀ = *spectabilis*, Boh.), *Megalodacne magnifica*, Har., pl. ii. fig. 6. Many West Coast species are recorded from S.W. Africa for the first time.

HEYDEN, L. v. Die coleopterologische Ausbeute des Prof. Dr. Rein in Japan 1874–75. Deutsche E. Z. xxiii. pp. 321–365.

Contains a bibliography of the subject, and a list of 152 species, with remarks. Very few new species are described: the following synonymic

notes occur :—*Rhembus gigas*, Bates, = *zeelandicus*, Redt., *Harpalus japonicus*, Moraw., = *rugicollis*, Motsch., *Dioryche corrosa*, Bates, = *D.* (*Platymetopus*) *thunbergi*, Quens., *Stenolophus iridicolor* = *proximus*, Dej., *Triplogenius ingens*, Moraw., = *magnus*, Motsch., *Amara congrua*, Moraw., = *chalcites*, Zimm., *Dolichus flavicollis*, Fabr., = *halensis*, Schall., *Necrophorus quadripunctatus*, Kraatz, = *nepalensis*, Hope, *Ips chinensis*, Reitt., = *japonica*, Motsch., *Dermestes domesticus*, Germ., = *noxius*, Motsch., = *cadaverinus*, Fabr., *Eurytrachelus pilifer*, Snell., = *platymelus*, Saund. (*marginalis*, *lateralis*, and *obscurus*, Saund., are also synonyms), *Macrodorcus rugipennis*, Motsch., *nipponensis*, Snell., and *diabolicus*, Thoms., = *rectus*, Motsch., *Geotrupes purpurascens*, Waterh., = *auratus*, Motsch., *Anomala costata*, Har., *nec* Hope, = *testaceipes*, Motsch., *A. lucidula*, Motsch., = *lucens*, Ballion, *Mimelia gaschkewitschi*, Motsch., = *lucidula*, Hope, *Glycyphana albo-setosa*, Motsch., = *jucunda*, Fald., var. *argyrosticta*, Burm., *Chrysochroa fulgida*, Fabr., and *fulgidissima*, Schönh., = *elegans*, Thunb., *Melanotus laticollis*, Motsch., = *legatus*, Cand., *Luciola picticollis*, Kies., = *cruciata*, Motsch., *Cantharis luteipennis*, Kies., = *suturellus*, Motsch., *Plesiophthalmus aneus*, Mars., = *nigro-cyaneus*, Motsch., *Allecula velutina*, Mars., = *A.* (*Dictopsis*) *obscura*, Har., *Xanthochroa cyanipennis*, Mars., = *waterhousii*, Har., *Mylabris pectinicornis*, Linn., = *scutellaris*, Fabr., and *ornatus*, Boh., = *chinensis*, Linn., *Prionus tetanicus*, Pasc., = *insularis*, Motsch., *Toxotus vittatus*, Motsch., = *insitivus*, Boeb., var. *Melanaster punctator*, Fabr., var. *macularia*, Thoms., = *chinensis*, Forst., *Batocera chinensis*, Thoms., = *lineolata*, Chevr., *Chrysomela musiva*, Gebl., = *guttata*, Gebl., *Aulacophora similis*, Oliv., *flaveola*, Boisd., and *femoralis*, Motsch., = *coffeæ*, Hornst., *Ithone mirabilis*, Motsch., = *hexaspilota*, Hope, *Halyzia bisseptemguttata*, Schall., = *quindecimguttata*, Fabr.

Kiesenwetter, H. v. Coleoptera Japoniæ collecta a Domino Lewis et aliis. Deutsche E. Z. xxiii. pp. 305–320.

2 new genera and several new species are described.

Kittel, G. Systematische Uebersicht der Käfer welche in Baiern und in der nächsten Umgebung vorkommen (Fortsetzung). CB. Ver. Regensb. xxxiii. pp. 39, 40, 47–64, 93–96, 110–112, 115–128, & 183–192.

Extends from *Hybalides* to *Cyphonides*. Occasional notes on habits and transformations are added.

Kraatz, G. Neue Käfer vom Amur. Deutsche E. Z. xxiii. pp. 121–144, pl. ii.

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Mulsant, E., & C. Rey. Tribu des Brévipennes. 3me Famille. Pédériens et Évesthétiens. Ann. Soc. L. Lyon, xxiv. pp. 338, pls. vi. (for 1877, published in 1878).

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Rupertsberger, M. Catalog der bekannten europäischen Käfer-Larven. S. E. Z. xl. pp. 211–236.

1255 European *Coleoptera* of which the larvæ are now known are enumerated, as against 481 European species, out of the 600 *Coleoptera* of which the transformations were known to Chapuis and Candèze.

Schlosser, J. K. Fauna Croatica: *Coleoptera*. (Dr. J. K. Schlossera, Klevovskoga, Fauna Kornjasah Trojedne Kraljevine: Zagrebu.) Agram: 1877–79, 8vo, 3 pts. pp. lviii., 995, & plate of details.

This work, published by the Academy of Agram, appears to be an adaptation or translation of Redtenbacher's Fauna Austriaca. 1 new *Notiophilus* is described.

Schneider, O., & Leder, H. Beitrage zur Kenntniss der Kaukasischen Käfer-fauna. Verh. Ver. Brünn, xvii. pp. 1–104, pls. v. & vi.

The following known species of Stierlin's are redescribed or figured:—*Otiorrhynchus granulatostriatus*, fig. 45, p. 3, *simulans*, *schmarli*, p. 7, *lederi*, p. 8, *schœnherri*, p. 9, *cylindricus*, p. 10, fig. 43, *kirschi*, p. 12, fig. 46, *raddii*, p. 13, fig. 44, *crinaceus*, p. 14, fig. 48, *reitteri*, p. 15, *schneideri*, p. 16, fig. 47, *decoratus*, p. 18, *nasutus*, p. 19, *Paramira caucasica*, p. 21, *Peritelus caucasicus*, p. 22, fig. 49, *Mira caucasica*, p. 23, pl. v. Some new species are described by Kirsch and others; and the following known species are also specially noticed or redescribed:—*Trachodes hystrix*, Gyll., *Clytus lugubris*, Ménétr., *Phytœcia armeniaca*, Friv., p. 62, pl. vi. fig. 53, *Xylosteus illyricus*, Kraatz, p. 65, *Toxotus persicus*, Fald., p. 65, and *mirabilis*, Motsch., p. 66, *Leptura scutellata*, Fabr., v. *ochracea*, Faust, p. 69, *Timarcha armeniaca*, Fald., p. 75, *Chrysomela* various species, *Colaspidema hœfti*, Mén., *Galerucella fischeri*, Fald., var. *subnigra*, Weise, from Manglis, *Lyperus* several species, *Haltica bicarinata*, Kutsch., *Crepidodera* several species, *Aphthona nigriventris*, Motsch.

Sharp, D. The *Coleoptera* of Scotland. Scot. Nat. v. pp. 44–48, 137–144, 188–192.

Extends from *Tetratoma* to *Erirrhinus*.

——. On some *Coleoptera* from the Hawaiian Islands. Tr. E. Soc. 1879, pp. 77–105.

30 new species are described, and 1 new family and 4 new genera are defined. The author repeats his former suggestion that the small size, paucity of individuals, and ease with which most of the species of insular faunæ are exterminated, are due to deficiencies in the assimilative and reproductive powers in small isolated communities, caused by the absence of interbreeding between slightly different races.

Uhagon, S. de. Coleopteros de Badajoz: Segunda parte. An. Soc. Esp. viii. pp. 187–216, pl. iv.

Continued from vol. v. The list now given extends from the *Silphidæ* to the *Ptinidæ*; a few new species are described. The following known species are noticed in detail:—*Choleva angusticollis*, Kraatz, p. 187, *Hydroscapha gyrinoides*, Aubé, p. 192, *Myrmecoxenus picinus*, Aubé, p. 198, *Parnus luridus*, Er., p. 200, *Heterocerus curtus*, Rosenh., p. 201, *Crypto-*

hypnus exilis, Cand., p. 208, *Ebæus glabricollis*, Muls., p. 213, and *Henicopus privignus*, Kies., p. 214.

WATERHOUSE, C. O. Zoology of Kerguelen Island: *Coleoptera*. Phil. Tr. clxviii. pp. 230–234.

The following species (previously described in Ent. M. M. xii.) are redescribed and figured :—*Phytosus atriceps*, p. 230, fig. 15, *Canonopsis sericeus*, *Ectemnorrhinus viridis* (G. R. W.,= *Agonelytra longipennis*, C. O. W.), p. 232, *E. angusticollis*, *gracilipes*, *brevis*, p. 233, and *eatoni*, p. 234, figs. 9–14, pl. xiv.

——. Zoology of Rodriguez: *Coleoptera*. L. c. pp. 510–533, pl. liii. figs. 1–11.

265 specimens, including 60 species belonging to all the larger groups, were obtained during the Transit of Venus Expedition. None were apterous. 23 of the 60 species have been recorded from other localities, 8 being nearly cosmopolitan. The new species described in Ann. N. H. (4) xvii. are redescribed here; the following are figured :—*Probænus longicornis*, *Microporum nitens*, *Ascomma horrida*[*-dum*], *Endocoxelus variegatus*, *Æschyntelus ater*, *Lachnosterna rodriguezi*, *Malthacodes pictus*, *Xylodes alboscaria*, *Cis? a brunnea*, *Balanodes tomentosus*, and *Cryptonychus limbatus*. *ibid.*

——. An account of a Small Series of *Coleoptera* from the Island of Johanna. Ann. N. H. (5) iii. pp. 360–363.

Only 9 species noticed, collected by Bewsher.

WEISE, J. Beiträge zur Käferfauna von Japan. 5tes Stück. Deutsche E. Z. xxiii. pp. 147–152.

Captures of *Coleoptera* at Chatham; G. C. Champion, Ent. M. M. xv. pp. 203 & 204.

Captures of *Coleoptera* near Fontainebleau; A. Bonnaire, Bull. Soc. Ent. Fr. (5) ix. p. clvii. At various other localities in France, including the Paris Exhibition; Feuill. Nat. ix. pp. 90, 91, 109, 121, 122, 127–130, x. pp. 26 & 27.

Notes on various Dutch *Coleoptera*; Everts, Tijdschr. Ent. xxii. pp. lxxxii. & lxxxiii.

List of 524 *Coleoptera* new to the fauna of Würtemberg; E. Hofmann, J. H. Ver. Württ. xxv. pp. 198–217.

Additions to the list of *Coleoptera* of Galicia; A. M. Lomnicke, Sprawozd. Kom. fizyjogr. xiii. pp. 221–223.

Captures in the valley of the Bistrizza (Roumania); A. Montaudon, Feuill. Nat. ix. pp. 76 & 77.

Captures of *Coleoptera* occurring in the Valle di Fiemme; Bertolini, Bull. Ent. Ital. xi. pp. 36–43.

Revised catalogue of species of East Friesland, with introductory remarks on localities, authorities, &c.; A. Wessel, Abh. Ver. Brem. v. pp. 367–394.

List of the *Coleoptera* of Tromsö (134 species); J. Sparre-Schneider, Tromsö Museums Aarshefter, ii. pp. 1–58.

N. Kokujew publishes a supplementary list of the *Coleoptera* of Jaroslav ; Bull. Mosc. liv. pp. 218–233.

The following *Coleoptera* are noticed and figured, Feuill. Nat. ix. pp. 151 & 152, pl. vi. :—*Agnatus decoratus*, Germ., *Sympiezocera laurasi*, Luc., *Epuræa* 10-*guttata*, Fabr., *Cryptarcha strigata*, Fabr., and *Ptilomorphus regalis*, Duft., with cocoons of *P. imperialis* and *regalis*.

Notes on various North American *Coleoptera* ; Horn, Tr. Am. Ent. Soc. vii. pp. xi. & xii.

Notes on various *Coleoptera* of Kansas, &c. (not seen by the Recorder), occur in Tr. Kansas Ac. vi. pp. 29–33, 75–86.

Captures of *Coleoptera* in the White Mountains ; F. Gardiner, Psyche, ii. pp. 211–213.

The similarity of the *Coleoptera* of Guatemala to those of Europe noticed ; G. Champion, Ent. M. M. xvi. pp. 66 & 67.

Various *Coleoptera* from Guadeloupe noticed ; Chevrolat, Le Nat. i. pp. 84 & 85, 108 & 109.

Additions and corrections to Stein & Weise's Catalogue of *Coleoptera* ; C. Bergroth, Ent. Nachr. v. pp. 5 & 6, 40.

Short notes on European *Coleoptera* by various authors ; Deutsche E. Z. xxiii. pp. 417 & 418.

Observations on synonymy, with notes on that of a few European *Coleoptera* ; Kiesenwetter, *tom. cit.* pp. 285–287.

Synonymic notes on various species of *Cicindelidæ* and *Carabidæ* described in Latreille & Dejean's Hist. Nat. et Icones des Ins. Col. d'Europe (1822–24) ; L. Bedel, Bull. Soc. Ent. Fr. (5) ix. pp. lii. & liii.

Notes on the habits of various *Coleoptera* ; A. Chevrolat, Bull. Soc. Ent. Fr. (5) ix. pp. cxiii. & cxiv.

Notes on *Coleoptera* in 1878 ; T. H. Hart, Ent. xii. pp. 61 & 62.

Dark varieties of various species noticed ; *id. l. c.* p. 110.

Enormous number of various species of *Coleoptera* found among granary refuse ; T. R. Billups, Ent. xii. pp. 267–269.

Beetles inhabiting hot water ; Distant & Douglas, Ent. M. M. xvi. p. 113.

On collecting *Coleoptera* ; A. Dollfuss, Feuill. Nat. ix. pp. 78 & 79.

Hydrate of chloral recommended for preserving *Coleoptera* ; Gallois, Bull. Sci. Angers, Oct. 1878 ; Feuill. Nat. ix. p. 48.

On cleaning neglected collections of beetles ; W. Eichhoff, S. E. Z. xl. pp. 400–405.

Cicindelidæ.

Amblychila cylindriformis, Say. Anatomy described ; C. F. Gissler, Psyche, ii. pp. 233–244, pl. i. Ovipositor noticed ; W. H. Patton, *op. cit.* pp. 260 & 261.

Cicindela. Additions and corrections to Stein & Weise's Catalogue ; Kraatz, Deutsche E. Z. xxiii. p. 59. *C. auro-fasciata*, Dej., is distinct from *princeps* Vigors ; the *Cicindelæ* described by Hope and omitted from the Munich Catalogue are briefly noticed : C. A. Dohrn, S. E. Z. xl. pp. 456 & 457. *C. flexuosa* : habits ; J. Poussielgue & Bellier de la Chavignerie,

Le Nat. i. pp. 76 & 126. *C. riparia* and *trisignata* noticed; E. Honnorat, Feuill. Nat. ix. pp. 48 & 105.

Cicindela platycera, Cape York, and *albertisi*, New Guinea, Gestro, Ann. Mus. Genov. xiv. pp. 553 & 554; *C. willistoni*, Le Conte, Bull. U. S. Geol. Surv. v. p. 507, Wyoming: spp. nn.

Distypsidera papuana, sp. n., Gestro, *l. c.* p. 556, New Guinea.

Carabidæ.

Blackburn, T. Characters of New Genera and Descriptions of New Species of *Geodephaga* from the Hawaiian Islands (concluded). Ent. M. M. xvi. pp. 104–109.

49 species described in all in this series of papers.

Synonymic notes on various *Carabidæ*: Schaufuss, Nunq. Ot. iii. pp. 477 & 478; Haag, Deutsche E. Z. xxiii. pp. 481 & 482.

Elaphrides.

Notiophilus melanophthalmus, J. K. Schlosser, Fauna Kornjasah, p. 12, Croatia.

Carabides.

Heyden, L. v. Die *Carabus*-Arten der Hudson's Bay. Deutsche E. Z. xxiii. pp. 161–167.

The species noticed are *C. chamissonia*, Fisch., and var. *grœnlandicus*, Dej., *Orinocarabus tædatus*, F. (= *baccivorus*, Esch., and *seriatus*, Wiedem.), *O. gladiator*, Motsch., of which *agassizi* and *oregonensis*, Lec., are probably varr., *Car. meander*, Fisch., and varr. *lapilayi*, Lap., and *simoni*, Heyd., *C. incompletus*, Fisch. (= *palustris*, Dej., and *ehrenbergi*, Fisch.), *C. tatumi* and *hudsonicus*, Motsch.

Kraatz, G. Ueber die Arten der Carabiciden-Gattung *Tribax*, Thoms. Deutsche E. Z. xxiii. pp. 25–31, 385 & 386.

The species are discussed as follows:—*T. nordmanni*, Chaud. (= *robustus*, Deyr., and *productus*, Hampe), *bonplandi*, Mén. (= *spinolæ*, Christoph), *lamprus*, Chaud., *chalconotus*, Mannerh. (? = *chalcochlorus*, Chaud., *luxuriosus*, Mots., and *mœstus*, Christoph), *torosus*, Friv., *calleyi*, Fisch. (= *prasinus*, Mén.), *nigrinus*, Mots., *prevosti*, Gory, *renardi*, Chaud., *thermarum*, Mots., *manderstjernæ*, Mots. The second paper contains remarks on the varieties of *T. calleyi*, Fisch., and a list of species of *Tribax* as follows:—With distinct metallic lustre: *T. nordmanni*, Chaud. (varr. *robustus*, Deyr., and *productus*, Hampe), *bonplandi*, Mén. (*spinolæ*, Christoph), *lamprus*, Chaud., *chalconotus*, Mannerh. (*chalcochlorus*, Chaud., ♀, *luxuriosus*, Motsch., v. *mœstus*, Christoph). Metallic lustre indistinct, or none: *torosus*, Friv., *calleyi*, Fisch. (*prevosti*, Gory, var. maj. *renardi*, Chaud., ♀ *thermarum*, Motsch., var. min. *prasinus*, Mén., Chaud., *tschercassicus*, Er., v. *calleyi*, Mén., Fald., v. *manderstjernus*, Motsch., var. minima *nigrinus*, Motsch.).

Procrustes coriaceus. *P. cordicollis*, *angusticollis*, *rugosus*, Dej. (= *græcus*, Dej.), and *excavatus*, Charp., are all varr.; a new var. from the

mountains of Plisevisa is described under the name of *imminutus*; Kraatz, Deutsche E. Z. xxiii. pp. 63 & 64.

Carabus. Species occurring at Trebizond noticed; *id. l. c.* pp. 175 & 176. *C. amœnus*, Chaud., noticed, and palpi described; *id. l. c.* pp. 173 & 174. *C. auratus* taken in London; T. R. Billups, Ent. xii. pp. 158 & 159. *C. brevicornis*, Kraatz, = *hoppii*, Germ., = *alpestris*, Ziegl., according to Döbner, S. E. Z. xl. pp. 161 & 162; but *cf.* Kraatz, *op. cit. l. c.* pp. 506-508. *C. cancellatus*, variation described; Kraatz, Zeitschr. f. Ent. (n.s.) Heft vii. p. 58. *C. germari*, Sturm, and *neesi*, Hoppe: Von Harold severely criticises Thomson for placing these species together under the new and unnecessary name of *C. obliquus*; S. E. Z. xl. pp. 238–246, see also Ent. Nachr. v. p. 231. *C. irregularis*, var. major *bucephalus*, from Carniola discussed; Kraatz, *l. c.* p. 170. *C. maurus*, Adams, var. *discoideus*, Reitter, described, from the Caucasus; Verh. z.-b. Wien, xxix. p. 457. *C. monilis*, with 5 legs on the left side; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. cxxxvi. *C. nemoralis*, pupa described and figured; H. Kolbe, Deutsche E. Z. xxiii. p. 48, pl. i. *C. sibiricus*, and the forms allied to it, most of which are not truly distinct, discussed in detail; Kraatz, *op. cit.* pp. 387–391. *C. songaricus*, Motsch., is probably allied to *granulatus*, *C. scabripennis*, Motsch., = *inconspicuus*, Chaud., *C. breviformis*, Chaud., probably = *microchondrus*, Fisch., but *bari*, Mén., is distinct, *C. rhinopterus*, Hamp., = *connexus*, var., *C. smaragdinus*, blue var. noticed; Kraatz, *l. c.* pp. 171 & 172.

Megadontus purpurascens, var. *psilopterus*, Harz, p. 157, var. *aurichalceus*, Portugal, p. 160, and *M. violaceus*, var. *cyaneo-limbatus*, Salzburg, p. 158, *id. l. c.*

Callisthenes. List of Asiatic species, according to Solsky, Kraatz, *l. c.* p. 379; *C. seminovii*, Motsch., = *elegans*, Kirsch, *id. l. c.* p. 172.

Nebria rhilensis, sp. n., Frivaldszky, Term. füzetek, iii. p. 230, Balkan.

Carabus acutangulus, Chaudoir, Le Nat. i. p. 109, Erzeroum; *C. frater*, Kraatz, Deutsche E. Z. xxiii. p. 397, E. Siberia; *C. gossarii*, C. Haury, Ent. Nachr. v. p. 114, Amoor: spp. nn.

Cychrides.

Horn, G. H. Synopsis of the Species of *Cychrus* inhabiting Boreal America. Tr. Am. Ent. Soc. vii. pp. 168–185.

The known and new species of the genera or subgenera *Sphæroderus*, *Scaphinotus*, *Pemphus*, *Brennus*, and *Cychrus* are described in this paper. The following synonymy occurs:—*C. niagarensis*, Cast., *brevoorti*, Lec., *schaumi* and *granulosus*, Chaud., and *palpalis*, Mots., = *C.* (*Sph.*) *nitidicollis*, Chevr., varr.; *C. lecontii*, Dej., and *bicarinatus*, Lec., = *C.* (*S.*) *stenostomus*, Web., varr.; *C. unicolor*, Fabr., *flammeus*, Hald., *dilatatus*, Lec., and *heros*, Harr., = *C.* (*Scaph.*) *elevatus*, Fabr.; *C. unicolor*, Knoch *leonardi*, Harr., and *violaceus*, Lec., = *C.* (*Scaph.*) *viduus*, Dej.; *C. germari*, Chaud., = *C.* (*Scaph.*) *andrewsi*, Harr.; *C. velutinus*, Ménétr., = *Pemphus angusticollis*, Fisch.; *C. reticulatus*, Mots., *C.* (*Brennus*) *cristatus*, Harr., *C. ventricosus*, Mots., and *constrictus*, Lec., = *C.* (*B.*) *interruptus*, Ménétr.; *C. crenatus*, Mots., = *striatus*, Lec.; *C. alternatus* and *ovalis*, Mots., = *C.* (*B.*)

striato-punctatus, Chaud. Horn also (*l. c.* p. 179) describes *C.* (*Brennus*) *marginatus*, Fisch., var. *fulleri* from Oregon.

Cychrus rostratus, Linn. Its varieties described and classified; Kraatz, Deutsche E. Z. xxvi. pp. 60–63.

Cychrus armeniacus, Chaudoir, Le Nat. i. p. 109, Armenia; *C. hemphilli*, Horn, *l. c.* p. 184, Utah: spp. nn.

Odontacanthides.

Od[*ont*]*acantha dubia*, sp. n., Gestro, Ann. Mus. Genov. xiv. p. 558, New Guinea.

Galeritides.

Desera nepalensis, Hope, probably = *Dendrocellus discolor*, Schmidt Göbel; C. A. Dohrn, S. E. Z. xl. pp. 457 & 458.

Brachynides.

Brachynus crepitans, Oliv. Observations on its detonating organism; P. De Rougemont, Bull. Soc. Neuch. xi. pp. 471–478, pl.; Bull. Ent. Ital. xi. pp. 229 & 230.

Lebiides.

Dromius communimacula, sp. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 155, Bou-Saada.

Pseudomorphides.

Adelotopus marginatus. C. O. Waterhouse, = *Cryptocephalomorpha gaveri*, Ritsema; Ritsema, Tijdschr. Ent. xxii. p. lxxxvii.

Graphipterides.

Graphipterus distichus, sp. n., Harold, C. H. xvi. p. 15, Interior of Angola.

Anthiides.

Anthia calida, sp. n., id. *l. c.* p. 17, pl. i. fig. 2, Interior of Angola.

Morionides.

Morio and *Platynodes*. Generic characters revised; J. Putzeys, S. E. Z. xl. pp. 283 & 286.

Scaritides.

Chaudoir, E. de. Monographie des Scaritides (Scaritini). Ann. Ent. Belg. xxii. pp. 124–181.

General remarks on the group are followed by a table of genera, and detailed descriptions of known genera and species, as well as of new ones.

Spelæodytes, Mill. Reitter discusses this genus, which he regards as intermediate between *Dyschirius* and *Anophthalmus*; Verh. z.-b. Wien, xxix. pp. 547 & 548.

New genera and species :—

Otophthalmus, Chaudoir, *l. c.* p. 146. Allied to *Macromorphus*; anus impunctate in the middle. Type, *Scarites politus*, Wiedem. (redescribed, *l. c.* p. 147).

Haplogaster, id. *l. c.* p. 149. Allied to last; anus bipunctate in the middle; segments of the abdomen not transversely sulcate. For *H. ovatus*, p. 150, N. India, and *humeralis* (Putz., MS.), p. 151, note, Madras.

Holcogaster, id. *l. c.* p. 152. Allied to last, but resembling *Tæniolobus* in facies; segments of the abdomen transversely sulcate in front. To include *Scarites glypticus*, Perty, *Tæniolobus æquatorius*, Chaud., and *H. boliviensis*, Bolivia, *sulcipennis*, p. 155, and *convexiusculus*, p. 156, Bahia.

Anomoderus, id. *l. c.* p. 156. Remarkable for its heart-shaped prothorax. Type, *A. costato-granulatus*, id. *l. c.* p. 157, New Caledonia.

Oxylobus foveiger, p. 133, *alveolatus*, E. Indies, and *costatus*, Malabar, p. 134, *id. l. c.*

Geoscaptus macleayi, id. *l. c.* p. 138, N.W. Australia.

Ochyropus lucanoides (Putz., MS.), *id. l. c.* p. 141, note, Mount Cameron (? Cameroons).

Coptolobus anodon, p. 160, *taprobanæ* and *omodon*, p. 161, *id. l. c.*, Ceylon.

Haplotrachelus pasimachoides, p. 164, *rugoso-sulcatus*, Zulu, *rugoso-striatus*, Natal, p. 165, *gibbosus*, Caffraria, *ignobilis*, p. 169, *dregii*, Cape, p. 170, *grandini*, p. 171, *oviventris*, Natal, and *transwaalensis*, Transvaal, p. 172; *id. l. c.*

Mouhotia batesi, G. Lewis, Ent. M. M. xv. p. 186, Japan.

Scarites fatalis, Harold, C. H. xvi. p. 17, interior of Angola.

Dyschirius chaudoiri, id. S. E. Z. xl. p. 329, Madagascar; *D. montanus*, Le Conte, Bull. U. S. Geol. Surv. v. p. 507, Colorado.

Panagæides.

Euschizomerus metallicus, sp. n., Harold, S. E. Z. xl. p. 331, E. Indies.

Chlæniides.

Chlænius nepalensis, Hope, ? = *mellii*, Chaud.; C. A. Dohrn, S. E. Z. xl. p. 458.

Chlænius pugni, sp. n., Camerano, Atti Acc. Tor. xiv. p. 145, Mandalay, Burmah.

Rhysotrachelus patricius, sp. n., Harold, S. E. Z. xl. p. 330, Zanzibar.

Cnemacanthides.

Percus nepalensis, Hope, is a *Broscus*, near *punctatus*, Dej.; C. A. Dohrn, S. E. Z. xl. p. 458.

Anisodactylides.

Anisodactylus bewsheri, C. O. Waterhouse, Ann. N. H. (5) 9. p. 361, Island of Johanna; *A. gracilis*, Harold, C. H. xvi. p. 23, Pungo Andongo: spp. nn.

Harpalides.

Bradycellus cordicollis, Fairm., *nec* Lec., renamed *B. cordatus*; Schaufuss, Nunq. Ot. iii. p. 478.

Harpalus (*Scybalicus*) *oblongiusculus*, Dej., recorded as new to Britain, and its distinguishing characters pointed out; G. C. Champion, Ent. M. M. xv. p. 203.

Tachycellus subditus, sp. n., G. Lewis, Ann. N. H. (5) iv. p. 459, Hiogo.

Harpalus alienus, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 508, Colorado.

Feroniides.

Eudromus, Klug. H. W. Bates discusses this genus, which he regards, though neglected by recent authors, as the most remarkable development of the *Pterostichus* or *Feronia* type of *Carabidæ* known at present. He refers to it: *Feronia* (*Omalosoma*) *striatocollis*, Brullé (= *E. alternans*, Klug), and *F.* (*O.*) *lævicollis*, Brullé. He redescribes the latter, and adds two new species; Ent. M. M. xv. pp. 183–185.

Molops latiusculus, Kraatz, redescribed; Reitter, Verh. z.-b. Wien, xxix. p. 38.

Omaseus vulgaris, Linn., with 3 tibiæ and tarsi on the right front leg; N. Kokouyew, CR. Ent. Belg. xxii. pp. ii. & iii. woodcut.

New species:—

Ceneus speciliferus, Fairmaire, Le Nat. i. p. 70, Viti.

Eudromus minor, Harold, S. E. Z. xl. p. 331, *E. trisulcatus*, *emarginatus* (Putzeys, MS.), and *lucidipennis*, H. W. Bates, Ent. M. M. xv. pp. 184 & 185, & 251, all from Madagascar.

Feronia (*Pterostichus*) *merkli*, Frivaldszky, Term. füzetek, iii. p. 231, Balkan.

Pterostichus plitvicensis, Heyden, Verh. z.-b. Wien, xxix. p. 37, Croatia.

Molops latiusculus, Kraatz, Deutsche E. Z. xxiii. p. 154, Croatia.

Amara (*Percosia*) *cervini*, Stierlin, MT. schw. ent. Ges. v. p. 510, the Gorner Grat, Zermatt.

Anchomenides.

Preudhomme de Borre, A. Étude sur les espèces de la tribu des Féronides qui se rencontrent en Belgique. 1ère partie. Anchoméniens. Ann. Ent. Belg. xxii. pp. 31–76.

Treats of the Belgian species of *Anchomenus* (of which an analytical table is given), *Olisthopus*, *Taphria*, and *Dolichus* in a general manner, with special reference to their distribution throughout the world.

On the Hawaiian species of *Anchomenus*, with remarks on the allied genera *Dyscolus* and *Blackburnia*; T. Blackburn, Ent. M. M. xvi. p. 106.

Cyclothoraæ, g. n. (Motsch., MS.?), *id. ibid.* Allied to *Anchomenus*, but the surface of the prosternal projection is uneven. Type, *C. insu-*

laris, Motsch.: add *C. brevis*, Sharp, and *C. pele*, *bembidioides*, p. 107, *paradoxus*, *deverilli*, and *vulcanus*, p. 108, Hawaii, spp. nn.

Calathus semisericeus, sp. n., Fairmaire, Le Nat. i. (1) p. 5, & Ann. Soc. Ent. Fr. (5) ix. p. 157, Morocco.

Anchomenus lucipetens, Hawaii, and *incendiarius*, Kilauea, T. Blackburn, Ent. M. M. xvi. p. 105; *A.* (*Platynus*) *proximus*, Frivaldszky, Term. füzetek, iii. p. 230, Balkan: spp. nn.

Megalonychus angolensis, sp. n., Harold, C. H. xvi. p. 23, Loanda.

Trechides.

Anophthalmus: Hungarian localities for various species; E. Merkl, Term. füzetek, iii. pp. 112–114.

Trechus (*Anophthalmus*) *gounellii*, L. Bedel, Bull. Soc. Ent. Fr. (5) ix. p. cxxxvi., Lantes; *T.* (*A.*) *balcanicus*, Frivaldszky, Term. füzetek, iii. p. 231, Balkan: spp. nn.

Anophthalmus cognatus and *merkli*, id. *l. c.* pp. 3 & 246; *A. budæ*, Kenderesy, *op. cit.* pp. 6 & 32: all from Hungary, spp. nn.

Bembidiides.

Scotodipnus brevipennis, sp. n., Frivaldszky, Term. füzetek, iii. p. 4, Hungary.

Tachypus angulicollis, sp. n., Stierlin, MT. schw. ent. Ges. v. p. 441, Sicily.

Bembidium unicolor, Seine, and *B.* (*Limnæum*) *abeillii*, Toulon, L. Bedel, Ann. Soc. Ent. Fr. (5) ix. App. pp. 35 & 36, notes; *B. stabile*, *rubiginosum*, p. 508, *acutifrons*, *præcinctum*, Colorado, &c., *tigrinum*, California, p. 509, Le Conte, Bull. U. S. Geol. Surv. v.; *B.* (*Lopha*) *ignicola*, T. Blackburn, Ent. M. M. xvi. p. 109, Kilauea: spp. nn.

Dytiscidæ.

Régimbart's classification of the *Dytiscidæ* reprinted; Ent. Nachr. v. pp. 125–139.

Colymbetes fuscus will attack and devour *Dytiscus*; H. Donckier, CR. Ent. Belg. xxii. pp. clv. & clvi.

Ilybius angustior of German collections = *ænescens*, Thoms., and the true *angustior*, Gyll., is not a German insect; F. L. Lentz, Altpreuss. Monatschr. xv. p. 386, Ent. Nachr. v. pp. 19 & 20.

Dytiscus harrisi: popular description of transformations and habits; W. Saunders, Canad. Ent. xi. pp. 221–223, fig. 13. *D. latissimus*: its reputed occurrence in N. America requires confirmation; D. Sharp, Ent. M. M. xv. pp. 252 & 253; *cf.* G. H. Horn, *op. cit.* xvi. pp. 15 & 16. *D. marginalis*: a male with the left coxal apophysis deformed; A. Montaudon, Feuill. Nat. ix. p. 66.

Hydaticus subsignatus, sp. n., Harold, C. H. xvi., p. 24, Pungo Andongo.

Hydrovatus aristides, sp. n., C. E. Leprieur, Bull. Soc. Ent. Fr. (5) ix. p. lxxxii., Egypt.

HYDROPHILIDÆ.

Von Harold's remarks on Japanese *Hydrophilidæ* criticized by D. Sharp, Ent. M. M. xv. pp. 278 & 279.

Hydrophilus piceus: notes on habits and transformations; J. Fullagar, Sci. Gos. xv. pp. 132 & 133, woodcuts. Histological researches on the tracheæ; C. S. Minot, Bull. haut. études labor. d'histol. (2) iii., with plates. *H. triangularis*: habits and transformations popularly noticed; W. Saunders, Canad. Ent. xi. p. 223, fig. 14. *H. semicylindricus*, Esch.: characters discussed, it must be placed provisionally in *Hydrobius*; D. Sharp, Tr. E. Soc. 1879, p. 82.

Philhydrus melanocephalus, Ol. Variation; C. O. Waterhouse, Phil. Tr. clxviii. pp. 523 & 524.

Spercheus emarginatus and *Hydrous piceus*. Habits; V. R. Perkins, Ent. xii. pp. 214–216.

New genera and species :—

Omicrus, D. Sharp, Tr. E. Soc. 1879, p. 81. An aberrant form, which must be placed provisionally between *Anacæna* and *Volvulus*; middle and hinder tarsi very short and rather stout, the joints compressed, and adjusted to one another. Type, *O. brevipes*, id. *ibid.*, Oahu.

Prosthetops, F. H. Waterhouse, J. L. S. xiv. p. 533. Allied to *Helophorus*, but differs from all known *Philhydrida* by the presence of two frontal ocelli. Type, *P. capensis*, id. *ibid.*, Cape of Good Hope.

Hydrophilus brevispina, Brisbane, and *sabelliferus*, Viti-Levu, L. Fairmaire, J. Mus. Godeffr. xiv. p. 80.

Hydrochus obscuro-æneus, id. *l. c.*, Port Mackay; *H. smaragdinus*, El Amri, and *obtusicollis*, Morocco, *id.* Le Nat. i. (1) p. 5, and Ann. Soc. Ent. Fr. (5) ix. pp. 159 & 160.

Hydræna acutipennis, id. J. Mus. Godeffr. xiv. p. 81, Brisbane.

Berosus externe-spinosus (? = *Hygrotophus nutans*, Macl.), Rockhampton, *pallidulus*, p. 81, *sticticus*, *approximans*, and *stigmaticollis*, Peak Downs, and *ovipennis*, Port Mackay, p. 82, *id. l. c.*

Philhydrus sahariensis, id. Ann. Soc. Ent. Fr. (5) ix. p. 160, El Amri.

Laccobius thermarum, Hot springs of Baden (Switzerland), and *elongatus*, Tangiers, Tournier, MT. schw. ent. Ges. v. pp. 436 & 437.

Volvulus scaphiformis, Fairmaire, J. Mus. Godeffr. xiv. p. 83, Rockhampton.

STAPHYLINIDÆ.

Aleocharides.

Ilyobates glabriventris, Rye, has priority over *bonnairii*, Fauvel; and *Homalota planifrons*, Waterh., and *platycephala*, Thoms., are quite distinct, belonging respectively to Thomson's genera *Aloconota* and *Amischa*: E. C. Rye, Deutsche E. Z. xxiii. p. 168.

Homalogia egregia, Rye, = *Liota hypogæa*, Muls. & Rey, and probably

Aleuonota hypogæa, M. & R., in which case the latter name will have priority ; *id.* Ent. M. M. xv. pp. 279 & 280.

Phytosus darwini, sp. n., F. H. Waterhouse, J. L. S. xiv. p. 531, Falkland Islands.

Leptusa simoni, Eppelsheim, JH. Ver. Württ. xxv. p. 218, Black Forest, found under snow in November at an elevation of 2600–2700 feet above the sea ; *L. reitteri*, id. Verh. z.-b. Wien, xxix. p. 38, Croatia : spp. nn.

Myrmedonia læviceps, sp. n., *id. l. c.* p. 459, Caucasus.

Homalota (*Alaobia*) *heydeni*, Croatia, p. 39, *H.* (*Liogluta*) *trigemina*, p. 459, *H.* (*Atheta*) *chefsurica*, p. 461, *H.* (*Geostiba*) *tuberiventris*, Caucasus, p. 462, spp. nn., *id. l. c.*

Myllæna caucasica, sp. n., *id. l. c.* p. 463, Kasbek.

Tachyporides.

Hypocyptus nigritulus, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 510, Colorado.

Bolitobius prænobilis, sp. n., Kraatz, Deutsche E. Z. xxiii. p. 121, pl. ii. fig. 1, Amoor.

Mycetoporus (*Ischnosoma*) *thoracicus*, Helenendorf, and *M.* (*I.*) *myops*, spp. nn., Eppelsheim, Verh. z.-b. Wien, xxix. pp. 463 & 464, Caucasus.

Quediides.

Quedius ætolicus, Cr., = *cruentus*, Ol. ; *Q. nivicola*, Kies., is distinct ; *Q. proximus*, Kr., is a small specimen of *semi-æneus*, Steph. ; *Q. affinis*, Brancsik, MS., = *picipennis*, Scriba & Rey, *nec* Heer, which = *attenuatus* ; *Q. fallaciosus*, Kr., is a large *boops*, and a race of *brevipennis*, Fairm. ; *Q. muscorum*, Bris., = *suturalis*, Kies. ; *Q. marginalis*, Kr., = *obliteratus*, Er. : Eppelsheim, Ent. Nachr. v. p. 193.

Quedius fulgidus, Erichs., recorded from Discovery Bay ; R. McLachlan, J. L. S. xiv. p. 107.

Velleius dilatatus. Erné's account of its habits translated by J. W. Douglas from MT. schw. ent. Ges. v. (*cf.* Zool. Rec. xv. *Ins.* p. 45) ; Ent. M. M. xv. pp. 260 & 261.

Quedius grandiceps, sp. n., Kraatz, Deutsche E. Z. xxiii. p. 122, Amoor.

Staphylinides.

Emus hirtus. Habits at Boulogne ; G. Lewis, Ent. M. M. xvi. p. 80.

Cafius nasutus, sp. n., Fauvel, J. Mus. Godeffr. xiv. p. 84, Viti.

Gabrius pubens, sp. n., Mulsant & Rey, Ann. Soc L. Lyon, xxv. p. 259, St. Raphael, Var.

Xantholinides.

Sterculia simplicicollis, sp. n., C. O. Waterhouse, Cist. Ent. ii. p. 421, Medellin, Colombia.

Metoponcus semiruber, sp. n., Fauvel, J. Mus. Godeffr. xiv. p. 84, Viti.

Xantholinus nasutus, sp. n., Harold, C. H. xvi. p. 27, Interior of Angola.

Pæderides.

Eppelsheim, —. Ueber geflügelte und ungeflügelte *Lathrobium*. Deutsche E. Z. xxiii. pp. 182–192.

The length of the wing-cases varies extremely, so that many supposed species are only synonyms. The species enumerated in Stein & Weise's Catalogue are discussed with special reference to this variation.

Kraatz, G. Ueber einige Lathrobien mit verkürzten Flügeldecken, und die specifische Verschiedenheiten von *L. quadratum* und *terminatum*. Deutsche E. Z. xxiii. pp. 193–201, woodcuts.

Critical remarks on Eppelsheim's paper. Chiefly consisting of an analysis of the specific distinctions between *L. terminatum*, Payk., and *quadratum*, Grav.

Lathrobium. J. Sahlberg gives the following synonymy of various species: —*L. rufipes*, Mäkl., = *zetterstedti*, Rye, = *punctatum*, Zett.; *L. zetterstedti*, Sahlb., = *quadratum*, Payk., Kraatz, Thoms.; *L. quadratum* (Sahlb., olim) = *terminatum* var., Thoms.; *L. quadratum* var. *b* = *terminatum*, Grav., Kraatz, Thoms.; Deutsche E. Z. xxiii. p. 202. Sections of *Lathrobium* noticed; Le Conte, Tr. Am. Ent. Soc. vii. p. xxvi.

Lathrobium punctatum = *L. brunnipes*; Kiesenwetter, Deutsche E. Z. xxiii. p. 286 [long known: see Zool. Rec. viii. p. 248].

Domene aciculata, Hopffg., redescribed; Reitter, Verh. z.-b. Wien, xxix. p. 40.

Pæderus samoensis, Fauvel, renamed by him *P. vitiensis*, as it does not occur in Samoa, but in Viti; J. Mus. Godeffr. xiv. p. 84.

New genera and species:—

Lobrathium, Mulsant & Rey, Ann. Soc. L. Lyon, xxiv. p. 29. Subgenus of *Lathrobium*; fold of the elytra with a submarginal ridge; mesosternum of moderate size. To include *L. lusitanicum* and *multipunctatum*, Grav., *angusticolle*, Lac., *bicolor* and *picipes*, Erichs.

Throbalium, iid. *l. c.* p. 99. Allied to *Domene*; head more oblong, prothorax longer, metasternum more developed; base of venter not carinated; intermediate tibiæ distinctly spined on outer edge, hind tibiæ more compressed, and more enlarged towards their extremity, which is more obliquely truncated, and hind tarsi with the joints gradually diminishing, the first a little longer than the second. Type, *Lathrobium dividuum*, Er. (*pallidipenne*, Stierl.).

Pseudobium, iid. *l. c.* p. 104. Allied to *Medon*; head and prothorax unusually oblong, the latter not distinctly bordered at the sides; anterior femora and tibiæ simple; intermediate tibiæ spined; first joint of hind tarsi distinctly longer than 2nd; joints 2–4 shorter and more depressed than in *Medon*. Type, *Lathrobium labile*, Er.

Hypomedon, iid. *l. c.* p. 122. Subgenus of *Medon*; temples separated below by a moderate, smooth interval, gradually enlarged behind: mesosternal projection not carinated; prebasal segment smooth or nearly so; body generally shining. To contain *Lithocharis propinqua*, Bris., and allies.

Pseudomedon, iid. *l. c.* p. 122. Subgenus of *Medon*; temples separated

below by a large punctuated space, enlarged behind; mesosternal point not carinated; prebasal segment shagreened or finely punctuated; body dull, or nearly so. To contain *Lathrobium obsoletum*, Nordm., and *Lithocharis obscurella*, Er.

Pæderidus, iid. *l. c.* p. 245. Subgenus of *Pæderus*; base of venter simply raised into an obtuse carina; prothorax not bordered at the sides; mesosternal projection not carinated. To contain *P. ruficollis*, Fabr., and *gemellus*, Kraatz.

Lathrobium crassipes, iid. *l. c.* p. 32, Fréjus and Hyères.

Medon muscicolor and *incertus*, iid. *l. c.* pp. 128 & 137, France.

Sunius vestitus, Marseilles, p. 273, *unicolor*, S. France, p. 276, *subditus*, Lyons, p. 278, *iid. l. c.*

Lithocharis scolytina, Fauvel, J. Mus. Godeffr. xiv. p. 83, Viti.

Pinophilides.

Pinophilus opacus, Redt., *nec* Lec., = *australis*, Har.; P. de Borre, Bull. Soc. Ent. Fr. (5) ix. p. clxii.

Stenides.

Stenus maculiger, Weise, is distinct from *lævigatus*, Rey; *S. tylocephalus*, Kr., = *guynemeri*, Duval; *S. trivialis*, Kr., = *morio*, var.; *S. lepidus*, Weise, is distinct from *nigritulus*, and *reitteri*, Weise, is also a good species: Eppelsheim, Ent. Nachr. v. p. 194.

Stenus hopffgarteni, Croatia, p. 40, *micropterus* and *suramensis*, Caucasus, pp. 465 & 466, spp. nn., Eppelsheim, Verh. z.-b. Wien, xxix.

Oxytelides.

Bledius frater, Kr., represents small specimens of *B. fossor*; *B. pygmæus*, Fauv., = *pusillus*, Er., Kr., *nec* Fauv., which = *agricultor*, Heer, Kr., = *pygmæus*, Er.; *B. baudii*, Fauv., is also a form of the last: Eppelsheim, Ent. Nachr. v. p. 195.

Oxyporus procerus, sp. n., Kraatz, Deutsche E. Z. xxiii. p. 122, pl. ii. fig. 3, Amoor.

Platystethus quedenfeldti, sp. n., Weise, *op. cit.* p. 147, Japan.

Osorius sanguinipennis, sp. n., Fauvel, J. Mus. Godeffr. xiv. p. 83, Gayndah, Australia.

Homaliides.

Deliphrum expansum, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 510, Colorado.

Protinides.

Megarthrus stercorarius (Pandellé), sp. n., Mulsant & Rey, Ann. Soc. L. Lyon, xxv. p. 238, Hautes-Pyrénées.

Trigonus semicribrosus, Ovalau, *anthrax*, *æneo-niveus*, and *merophysioides*, Viti, spp. nn., Fairmaire, Le Nat. i. (3) p. 3.

Phlœocharides.

Pseudopsis obliterata, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 511, Colorado.

Piestides.

Siagonium haroldi, sp. n., Weise, Deutsche E. Z. xxiii. p. 148, Japan.

Pselaphidæ.

Heyden, L. v. Die europäischen Arten der Gattung *Mastigus*, Latr. Deutsche E. Z. xxiii. pp. 369–371.

The following species are admitted:—*M. palpalis*, Latr. (= *acuminatus*, Motsch.), *prolongatus*, Gory, *heydeni*, Rott., *ruficornis*, Motsch. (= *ligaricus*, Fairm.), and 2 new species.

Euplectus kirbii, Denny, redescribed; C. O. Waterhouse, Ent. M. M. xvi. p. 123.

New genera and species:—

Amicrops, Saulcy, Verh. z.-b. Wien, xxix. [not published till 1880], p. 467, intermediate between *Amaurops* and *Batrisus*; types, *Amaurops saulcii*, Reitt., and *Amicr. lederi*, sp. n., *l. c.*, Caucasus.

Scotoplectus, Reitter, *op. cit.* p. 44. Differs from *Euplectus* by the absence of eyes and wings; elytra short, united; antennæ slender; antennal forks on the sides of the head distinct. Type, *S. capellæ*, sp. n., *id. ibid.*, Mt. Capella, Croatia.

Pselaphus merkli, id. *l. c.* p. 536, Bulgaria.

Bythinus heydeni and *brusinæ*, Croatia, pp. 42 & 43, *elephas* and *giraffa*, Caucasus, pp. 467 & 469, *curticollis*, p. 533, *asturiensis* and *monstripes*, Asturia, p. 534, *sculptifrons*, *simoni*, and *bulgaricus*, Bulgaria, p. 535, *id. l. c.*

Trimium longipennis and *latiusculum*, id. *l. c.* p. 46, Croatia.

Euplectus garneysi, W. W. Fowler, Ent. M. M. xvi. p. 158, figs., banks of the Trent.

Paussidæ.

Paussus andreæ, sp. n., C. Ritsema, Notes Mus. Leyd. i. p. 44, Buitenzorg, W. Java.

Scydmænidæ.

Euthia scitula, Mäkl., and *colon*, Horn, noticed and figured; Le Conte, Bull. U. S. Geol. Surv. v. pp. 513 & 514, figs. 1 & 2.

New species:—

Scydmænus (?) *semicastaneus*, p. 47, *hopffgarteni*, Croatia, p. 48, *convexicollis*, Asturia, *plicicollis*, Bulgaria, p. 538, *subsulcatus*, p. 539, *asturiensis*, Asturia, *bulgaricus*, Bulgaria, *nodifer*, p. 540, and *ornatus*, Servia, p. 541, Reitter, Verh. z.-b. Wien, xxix.; *S. delphinus*, p. 469, *colchicus* and *cribrum*, p. 470, Saulcy, *op. cit.*, Caucasus.

Euconnus schlosseri, pp. 48 & 470, and *thomayi*, p. 49, Croatia, *simoni*, Asturia, and *tuerki*, Mersina, p. 542, Reitter, *l. c.*

Euthia parallela, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 161, Biskra; *E. longula*, Colorado, and *impressa*, California, Le Conte, Bull. U. S. Geol. Surv. v. p. 513, figs. 3 & 4.

Cephennium saulcii, Croatia, p. 47, *asturicum*, Asturia, *delicatulum*, Hungary, p. 537, and *fovangulum*, Bulgaria, p. 538, Reitter, *l. c.*

Mastigus dalmatinus (Saulcy, MS.), Dalmatia, and *pilifer*, Naples, Kraatz, Deutsche E. Z. xxiii. pp. 370 & 371.

Silphidæ.

Perrin, E. A. de. Notes sur les Leptodirites. Bull. Soc. Toulouse. [Not seen by the Recorder.]

Necrophorus nepalensis, Hope, noticed; C. A. Dohrn, S. E. Z. xl. p. 459.

Silpha. Larvæ of various species injurious to beet; O. Nickerl, Ent. Nachr. v. pp. 153–157.

Pholeuon merkli, sp. n., Frivaldszky, Term. füzetek, iii. p. 232, Balkan.

Ptomascopus plagiatipennis, Japan, Pekin, and *carbunculus*, Amazons, G. Lewis, Ann. N. H. (5) iv. p. 460, spp. nn.

Nodynus leuco-fasciatus [vox hybr.], sp. n., *id. ibid.*, Japan.

Apatetica brunnipes, sp. n., C. Ritsema, Notes Mus. Leyd. i. p. 46, Sumatra.

Choleva falklandica, F. H. Waterhouse, J. L. S. xiv. p. 531, Falkland Islands; *C. orchesioides*, Oran, p. 165, and *cuneiformis*, Etna, p. 166, note, Fairmaire, Ann. Soc. Ent. Fr. (5) ix., spp. nn.

Catopsimorphus bedeli, sp. n., *id. l. c.* p. 167, Oran.

Anisotomidæ.

Hydnobius apicicornis, Fairmaire, *l. c.* p. 165, and Le Nat. i. (1) p. 5, Lambessa; *H. longidens*, *curvidens*, *pumilus*, *obtusus*, Colorado, &c., *longulus*, California, &c., p. 511, *latidens*, Anticosti, p. 512, Le Conte, Bull. U. S. Geol. Surv. v., spp. nn.

Colenis foveicollis, sp. n., De Uhagon, An. Soc. Esp. p. 188, pl. iv. fig. 1, Badajoz.

Clambidæ.

Clambus vulneratus, sp. n., Le Conte, *l. c.* p. 512, Colorado.

Cybocephalus californicus, sp. n., Horn, Tr. Am. Ent. Soc. vii. p. 320, California.

Corylophidæ.

Sacium biguttatum, sp. n., Le Conte, *l. c.* p. 512, Colorado.

Scaphidiidæ.

Scaphidium reitteri, G. Lewis, Ann. N. H. (5) iv. p. 460, Japan; *S.*

cyanipenne, metallescens, and *atripenne*, pp. 559 & 560, New Guinea, and *atripenne*, Cape York, p. 561, R. Gestro, Ann. Mus. Genov. xiv., spp. nn.

Scaphisoma elongatum, sp. n., F. H. Waterhouse, J. L. S. xiv. p. 533, Rio Janeiro.

Histeridæ.

De Marseul, S. A. Énumération des Histérides rapportés de l'Archipel Malais, de la Nouvelle Guinée, et de l'Australie boréale, par MM. le Prof. O. Beccari et L. M. D'Albertis. Ann. Mus. Genov. xiv. pp. 254–286.

Hetærius ferrugineus, Ol., in nests of *Lasius fuliginosus*, Latr.; H. Gradl, Ent. Nachr. v. p. 225.

Saprinus virescens devours the larvæ of *Phædon betulæ* [long ago recorded by Gorham in England]; Levoiturier, Nouv. et faits, ii. p. 103. Habitat: Régimbart, Bull. Soc. Ent. Fr. (5) ix. pp. xcv. & xcvi.

Trypanæus albertisi, undaiensis, and *ferrarii* redescribed; Marseul, Ann. Mus. Genov. xiv. pp. 254, 256 & 257.

New species :—

Hololepta amurensis, Reitter, Deutsche E. Z. xxiii. p. 213, E. Siberia.

Monoplius pinguis, G. Lewis, Ent. M. M. xvi. p. 60, Cape of Good Hope.

Spathochus meridianus, id. *ibid.*, Zanzibar.

Teretriosoma festivum, Parana, and *facetum*, Canada, *id. l. c.* p. 61.

Phoxonotus fryi, id. *ibid.*, Rio Janeiro.

Plæsius lævis, Assam, *mouhoti*, Laos, and *planulus*, Nicobar Islands; *id. l. c.* p. 76.

Platysoma platypygum, p. 260, and *fallaciosum*, p. 261, New Guinea, *comes*, p. 261, Cape York, *soronense*, p. 262, *ramoicola*, p. 263, *hatamense*, and *jobiense*, p. 264, *hemistri*[*at*]*um* [vox hybr.], *tribistriatum, suturistri*[*at*]*um*, pp. 265–267, New Guinea, *retrospectum, discrepans*, and *contritum*, pp. 268–270, Australia; Marseul, Ann. Mus. Genov. xiv. *P. sibiricum*, Reitter, Deutsche E. Z. xxiii. p. 214, E. Siberia.

Macrosternus marseuli, Lewis, *l. c.* p. 76, Angola.

Apobletes angolensis, id. *l. c.* p. 77, Angola; *A. expansus*, New Guinea, and *diopsipygus*, Java, Marseul, *l. c.* pp. 258 & 259.

Pachychræus arabicus, Arabia, *raffrayi* and *cylindricus*, Abyssinia, Lewis, *l. c.* p. 77.

Epierus sylvanus, id. *l. c.* p. 78, New Zealand.

Phelister speculipygus, Marseul, *l. c.* p. 271, New Guinea.

Hister christophi, Reitter, *l. c.* p. 214, E. Siberia; *H. marginepunctatus*, and *simplicisterna*, Lewis, Ann. N. H. (5) iv. p. 461, Japan.

Paromalus leo, Java, p. 272, *clavis*, Ké, New Guinea, p. 274, *cyanescens*, Aru, p. 275, *vittula*, New Guinea, *acistrigus*, Java, p. 276, *honoratus*, Australia, and *keicola*, Ké, p. 277, *roberti*, New Guinea, and *teibodæ*, Java, p. 278, and *sculptipectus*, Java, p. 279, Marseul, l. c.; *P. debilis*, Le Conte, Bull. U. S. Geol. Surv. v. p. 515, Colorado.

Trypanæus gestroi, Dorey, p. 255, and *somerseti*, Australia, p. 281, Marseul, *l. c.*

Teretrius brunneus, Lewis, Ent. M. M. xvi. p. 78, El Hahaz, Arabia.

Onthophilus ordinarius, Irkutsk, and *ostreatus*, China, *id. ibid.*

Bacanius niponicus, id. Ann. N. H. (5) iv. p. 461, Nagasaki.

Acritus komai, id. *ibid.*, Nagasaki; *A. permirus*, Java, and *cingulidens*, New Guinea, p. 282, *wokanensis*, Aru, and *torquillus*, New Guinea, p. 283, *auctus*, Java, and *hemisphæroides*, New Guinea, p. 284, and *insipiens*, Aru, p. 285, Marseul, *l. c.*

Æletes flavitarsis, Lewis, Ent. M. M. xvi. p. 79, Honolulu.

Phalacridæ.

Phalacrus dispar, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 513, Colorado.

Nitidulidæ.

Horn, G. H. Revision of the *Nitidulidæ* of the United States. Tr. Am. Ent. Soc. vii. pp. 267–336, pl. iii., details.

The known and new species are described. Bibliography and synonymy are referred to the end of the paper, the latter is given as follows: *Rhizophagus corpulentus*, (Mots.) Reitt., = *Hesperobænus abbreviatus*, Mots., *R. nanus*, Er., = *Bactridium ephippigerum*, Guér., *Cerous pusillus*, Mels., = *Brachypterus urticæ*, Fabr., *C. crinitus*, Murr., = *pennatus*, Murr., ♂, *Strongylus ferrugatus*, Murr., = *tinctus*, Mann., *Carpophilus bimaculatus*, Murr., = *C. hemipterus*, Linn., *C. floralis*, Er., = *pallipennis*, Say, *C. mutilatus*, Er., and *luridus*, Murr., = *dimidiatus*, Fabr., *C. rufus*, Murr., = *melanopterus*, Er., *C. lugubris*, Murr., = *niger*, Say, *C. minutus*, Muls., = *marginatus*, Er., *C. humilis*, Er., and *carbonatus*, Lec., = *brachypterus*, Say, *Tribrachys caudalis*, Lec., = *C. discoideus*, Lec., *C. punctulatus*, Mels., = *antiquus*, Mels., *Colastus obscurus*, Er., = *unicolor*, Say, *C. limbatus* and *obliquus*, Lec., = *truncatus*, Rand., *Conotelus obscurus*, Er., = *Stenus spissicornis*, Fabr., *Omosita castanea*, Muls., = *Epuræa helvola*, Er., *O. badia*, Muls., and *rotundicollis*, Reitt., = *E. rufa*, Say, *E. infuscata* and *flavo-maculata*, Mäkl., = *E. immunda*, Sturm., *E. nubila*, Lec., = *avara*, Rand., *E. nigra*, Mäkl., = *truncatella*, Mann., *E. convexiuscula*, Mann., = *æstiva*, Linn., *E. texana*, Crotch, = *luteola*, Er., *Nitidula obscura*, Fabr., and *ossium*, Kirb, = *rufipes*, Linn., *N. uniguttata*, Mels., and *humeralis*, Lec., = *ziczac*, Say, *Stelidota biseriata*, Reitt., = *geminata*, Say, *Omosita inversa*, Lec., = *discoidea*, Fabr., *Lobiopa setulosa*, Lec., and *Soronia setosa*, Har., = *S. undulata*, Say, *Pocadius infuscatus*, *limbatus*, and *breviusculus*, Reitt., = *helvolus*, Er., *Meligethes mœrens*, Lec., and *californicus*, Reitt., = *rufimanus*, Lec., *M. ruficornis*, Lec., = *mutatus*, Har., *Nitidula unilineata*, Say, = *Amphicrossus ciliatus*, Ol., *Cryptarcha picta*, Mels., and *liturata*, Lec., = *concinna*, Mels., *Ips quadrisignatus*, Say, *bipustulatus*, Mels., and *sexpustulatus*, Reitt., = *fasciatus*, Oliv., *I. rubro-maculatus*, Reitt., = *sanguinolentus*, Oliv., *I. dejeani*, Kirby, and *sepulchralis*, Rand., = *vittatus*, Say.

Reitter, E. Verzeichniss der von H. Christoph in Ost-Sibirien gesammelten Clavicornier, &c. Deutsche E. Z. xxiii. pp. 209–226.

The following synonyms occur:—*Epuræa incompleta*, *trapezicollis*, and *subangulata*, Motsch., = *obsoleta*, Fabr., *Strongylus ater*, var. *aterrimus*, and *Pallodes hilleri*, var. *circumflexus* described, *Ips angusticollis*, *biguttatus*, and *cruciatus*, Motsch., = *quadripustulatus*, Fabr., varr.

Paromia dorcoides, Westw., *westwoodi*, Dohrn, and *polyglypta*, Germ., noticed; C. A. Dohrn, S. E. Z. xl. p. 248.

New genera and species:—

Anthonæus, Horn, Tr. Am. Ent. Soc. vii. p. 273. Allied to *Amartus*; form depressed; terminal ♂ segment rather large, visible above. Type, *Colastus agavensis*, Crotch.

Perthalycra, id. *l. c.* p. 309. Allied to *Thalycra*, but anterior tibiæ dentate externally, and anterior tarsi dilated in ♂ only. Type, *P. murrayi*, sp. n., *id. l. c.* p. 310, Western States.

Orthopeplus, id. *l. c.* p. 311. Resembles a glabrous *Epuræa* with protuberant prosternum, and anterior tarsi alone dilated. Type, O. *quadricollis*, sp. n., *id. l. c.* p. 312, Colorado.

Brachypeplus tinctus, Oahu, p. 83, *explanatus*, Honolulu, p. 84, and *protinoides*, Halea Kala, p. 85, D. Sharp, Tr. E. Soc. 1879.

Conotelus distinctus and *irregularis*, Schaufuss, Nunq. Ot. iii. pp. 478 & 479, Colombia.

Carpophilus decipiens, Horn, *l. c.* p. 279, California, Arizona; *C.* (*Ecnomorphus*) *sibiricus*, Reitter, Deutsche E. Z. xxiii. p. 215, E. Siberia.

Epuræa integra, Arizona, Colorado, p. 292, *fulvescens*, Canada, p. 296, *ovata*, N. America, *peltoides*, Maryland, Michigan, p. 298, *umbrosa*, Indian Territory, and *scaphoides*, Colorado, p. 300, Horn, *l. c.*

Ipidia variolosa, Reitter, *l. c.* p. 215, E. Siberia.

Stelidota sibirica, id. *l. c.* p. 216, E. Siberia.

Meligethes semirufus, id. *ibid.*, E. Siberia; *M. pinguis*, Horn, *l. c.* p. 314, Newfoundland.

Pocadius dorsalis, Horn, *l. c.* p. 311, California.

Cychramus zimmermanni, id. *l. c.* p. 319, pl. iii. figs. 18 *a–c*, S. Carolina.

Strongylus binotatus, Reitter, *l. c.* p. 217, E. Siberia.

Amphicrossus niger, Horn, *l. c.* p. 317, Arizona.

Cybocephalus reitteri, De Uhagon, Ann. Soc. Esp. viii. p. 190, Spain.

Cryptarcha pantherina, p. 217, *binæva* and *ipsoides* [*ipoides*], p. 218, Reitter, *l. c.*, E. Siberia.

Ips christophi and *rufiventris*, id. *l. c.* p. 219, E. Siberia.

Pityophagus verticalis, Horn, *l. c.* p. 325, Colorado.

Eunops longicollis, id. *l. c.* p. 264, California, Nevada.

Trogositidæ.

Peltastica amurensis, sp. n., Reitter, Deutsche E. Z. xxiii. p. 220, E. Siberia.

Colydiidæ.

Antilissus, g. n., D. Sharp, Tr. E. Soc. 1879, p. 86. Between *Bupala* and *Cicones*, though in form and sculpture it is nearer *Lado jelskyi*. Type, *A. aper*, sp. n., *id. ibid.*, Hawaiian Islands.

Xuthia niponia, sp. n., G. Lewis, Ann. N. H. (5) iv. p. 462, Nagasaki.

Teredus politus, sp. n., *id. ibid.*, S. Japan.

Pycnomerus verrucicollis, sp. n., (Faust, MS.) Reitter, Verh. z.-b. Wien, xxix, p. 543, Astrabad.

Cucujidæ.

Monanus, g. n., D. Sharp, Tr. E. Soc. 1879, p. 85. Allied to *Psammæcus*, basal joint of the antennæ less developed, and the apical joint of the maxillary palpi not dilated, but acuminate ; tarsi with joints 2 and 3 strongly lobed beneath, joint 4 small. Type, *M. crenatus*, sp. n., *id. ibid.*, Oahu.

Inopeplus (g. n., Smith, MS., = *Ino*, Lap., *nec* Leach) *æneomicans*, Jamaica, p. 213, *violaceipennis*, Dory, and *terminatus*, Java, p. 214, and *biguttatus*, Java, p. 215, C. O. Waterhouse, Ann. N. H. (5) iii.

Cucujus imperialis, sp. n., G. Lewis, Ent. M. M. xv. p. 234, Assam.

Læmophlæus weisii, Berlin, and *krueperi*, Greece, Reitter, Verh. z.-b. Wien, xxix. p. 78; *L. ribbei*, id. Deutsche E. Z. xxiii. p. 220, E. Siberia ; *L. convexulus*, Le Conte, North American Entomologist (Buffalo : Grote), i. p. 2, pl. i. fig. 2, New York, Michigan : spp. nn.

Silvanus reflexus, sp. n., Reitter, Verh. z.-b. Wien, xxix. p. 85, Sicily.

Æraphilus siculus, Sicily, and *grouvellii*, Cartagena, *id. l. c.* p. 83, spp. nn.

Cryptophagidæ.

Antherophagus convexulus redescribed; Le Conte, Bull. U. S. Geol. Surv. v. p. 512.

Atomaria bicolor, Er., = *tumulorum*, Villa ; E. Reitter, Deutsche E. Z. xxiii. p. 211.

Zavaljus, g. n., Reitter, Verh. z.-b. Wien, xxix. p. 544, intermediate between *Antherophagus* and *Leucohimatium* ; type, *Z. fausti*, sp. n., *l. c.*, Kasan.

Cryptophagus croaticus, Croatia, p. 51, *lapidicola*, Caucasus, p. 471, *id.* l. c. ; *obsoletus*, id. Deutsche E. Z. xxiii. p. 221, E. Siberia : spp. nn.

Emphylus americanus, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 513, Colorado.

Monotomidæ.

Horn, G. H. Synopsis of the *Monotomidæ* of the United States. Tr. Am. Ent. Soc. vii. pp. 257-267.

The known and new species are described, and the following synonymy occurs : *Monotoma foveata*, Lec., = *pictipes*, Herbst, *M. opaca*, Ziegl., =

fulvipes, Mels., *M. rufipennis*, Lec., = *Hesperobænus abbreviatus*, Mots., *Rhizophagus erythropterus*, Mels., and *nanus*, Er., = *Bactridium ephippigerum*, Guér.

Anommatus planicollis, Fairm., = *linderi*, Reitt.; P. Belou, Bull. Soc. Ent. Fr. (5) ix. pp. ciii. & civ.

Bactridium fryi, Rio Janeiro, and *cavicolle*, Pennsylvania, Horn. *l. c.* pp. 266 & 267, spp. nn.

Monotoma texana, sp. n., *id. l. c.* p. 261, Texas.

Lathridiidæ.

Corticaria amurensis, sp. n., Reitter, Deutsche E. Z. xxiii. p. 224, E. Siberia.

Myrmecoxenus beturiensis (Uhagon, MS.), sp. n., *id.* Verh. z.-b. Wien, xxix. p. 93, Spain.

Merophysia acuminata, sp. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 168, Biskra.

Mycetophagidæ.

Pseudotri yllus, g. n., Reitter, Verh. z.-b. Wien, xxix. p. 88. Allied to *Triphyllus*; to contain *T. suturalis*, Fabr., and *colchicus*, Reitt.

Litargops, g. n., *id. l. c.* p. 89. Allied to *Litargus*; type, *L. pictus*, Woll.

Propalticus, g. n., D. Sharp, Tr. E. Soc. 1879, p. 88. Form of *Soronia*; provisionally referred to the *Mycetophagidæ*, though with more the appearance of the *Nitidulidæ*. *P. oculatus*, sp. n., *l. c.*, Hawaiian Islands (*cf.* Horn, Tr. Am. Ent. Soc. vii. pp. x. & xi.).

Triphyllus curticollis, sp. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 167, Bona.

Litargus vestitus, sp. n., Sharp, *l. c.* p. 88, Oahu.

Thorictidæ.

Thorictus foveicollis, sp. n., Reitter, Verh. z.-b. Wien, xxix. p. 545, Baku.

Dermestidæ.

Dermestes. Note on Californian species; C. A. Dohrn, S. E. Z. xl. pp. 187 & 188.

Dermestes vorax, Mots., = *lardarius*, L., var.; E. Reitter, Deutsche E. Z. xxiii. p. 212.

Attagenus divided into groups by the number of joints to the antennæ; Bellevoye, Le Nat. i. pp. 93 & 94.

Trogoderma, sp. from Rodriguez described, but not named; C. O. Waterhouse, Phil. Trans. clxviii. pp. 522 & 523.

Attagenus posticalis, sp. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 169, Biskra.

Byrrhidæ.

Cisteïa (*Byrrhus*) *kamtchaticus*, Motsch., = *pilula*, var. *argenteo-fasciata*, Duftschm.; Reitter, *l. c.* p. 213.

Limnichus. Table of N. American species: *L. olivaceus*, Lec., = *punctatus*, Lec., *L. obscurus*, Lec., = *ater*, Lec.; Le Conte, Bull. U. S. Geol. Surv. v. pp. 514 & 515.

Syncalypta grisea, sp. n., *id. l. c.* p. 514, Colorado.

Limnichus montanus, Colorado, p. 514, *nebulosus*, *analis*, *californicus*, and *lutrochinus*, California, &c., p. 515, *id. l. c.* spp. nn.

Georyssidæ.

Georyssus canaliculatus (Dej., MS.), Spain, Algeria, and *cupreus*, Algeria; L. Reiche, Ann. Soc. Ent. Fr. (5) ix. p. 237, spp. nn.

Parnidæ.

Potamophilus abdominalis, sp. n., C. O. Waterhouse, Cist. Ent. ii. p. 529, Antananarivo, Madagascar.

Elmis brunneus, F. H. Waterhouse, J. L. S. xiv. p. 532, St. Helena; *E. velutinus*, Reiche, Ann. Soc. Ent. Fr. (5) ix. p. 238, Medeah, Algeria, spp. nn.

Limnius fuscipes and *villoso-costatus*, id. *l. c.*, Algeria, spp. nn.

Heterocerida.

Heterocerus maritimus, Mots., *nec* Guér., renamed *motschulskii*; Guérin's insect is perfectly distinct from *H. minutus*, Kies.; *H. flavidus*, Rossi, is also distinct from any of the above. Reiche, Ann. Soc. Ent. Fr. (5) ix. p. 239.

Heterocerus amœnus, id. *l. c.* p. 239, Algeria; *H. biskrensis*, Fairmaire, *op. cit.* p. 169, Biskra; *H. fausti*, Reitter, Verh. z.-b. Wien, xxix. p. 545, Baku: spp. nn.

Lucanidæ.

Reichenau, W. V. Welche Bedeutung haben die geweihartigen Kiefer und Hörner der Blatthorn Käfer? Kosmos, iv. pp. 55 & 56.

The writer argues that the appendages of the head of *Lucanus* are intended as a protection against birds, and other insectivorous animals.

Odontolabis duivenbodi, H. Deyr., sexes discussed; R. Oberthur, Ann. Mus. Genov. xiv. p. 566.

Dorcus platynodus, Saund., = *binervus*, Motsch.; Schaufuss, Nunq. Otios. iii. p. 477.

Mitophyllus sp. n., from New Zealand, noticed; C. A. Dohrn, S. E. Z. xl. p. 459.

Prosopocœlus bruijni, sp. n., R. Oberthür, Ann. Mus. Genov. xiv. p. 567, pl. i. figs. 4–6, Sanghir.

Macrodorcus vanvolxemi, sp. n., G. Lewis, Ann. N. H. (5) iv. p. 462, Yezo, Japan.

Nigidius lichtensteini, sp. n., Ritsema, Notes Mus. Leyd. i. p. 129, N. Celebes.

Trigulus marginalis, sp. n. (= *subcastaneus*, Voll., *nec* Westw.), *id. l. c.* p. 189, Java, Sumatra, Borneo.

Pelops gestroi, sp. n., T. Kirsch, Ann. Mus. Genov. xiv. p. 18, New Guinea.

Scarabæidæ.

Kraatz, G. Ueber die Scarabæiden des Amur-Gebietes. Deutsche E. Z. xxiii. pp. 229–240.

The following known species are specially noticed: *Geotrupes auratus* and *brevistriatus*, Motsch., *Hoplia* (*Decameria*) *rufipes*, Motsch., *Hoplia aureola*, Pall. (= 12-*punctata* and *sibirica*, Ol.), and varr. 8-*punctata* and *impunctata*, *Serica variabilis*, Fabr., = *holosericea*, Scop., *Anomala luculenta*, Er., = *daurica*, Mann., *A. testaceipes*, Motsch., *Glycyphana jucunda*, Fald., *Cetonia floricola*, Herbst, var. *daurica*, Motsch., *C. submarmorea*, var. ? *nigro-cyanea*, from Amoor (p. 238, described in full), *C. marmorata*, Fabr., *Gnorimus subopacus* and *Osmoderma barnabita*, Motsch.

Coprides.

Scarabæus sacer. Habits and mode of flight discussed; J. H. Fabre, Souvenirs Entomologiques, pp. 1–38.

Canthon volvens mounting on the pellet it was rolling, to reconnoitre; F. Brendel, Am. Nat. xiii. pp. 654 & 655.

Coprobius (*Tetraechma*) *sanguineo-maculata*, Blanch., discussed; H. Burmeister, S. E. Z. xl. pp. 195 & 196.

Epilissus morio, sp. n., Harold, C. H. xvi. p. 225, Madagascar.

Caccobius christophi, sp. n., *id.* Deutsche E. Z. xxiii. p. 229, Amoor.

Heliocopris sturleri, sp. n., *id.* C. H. xvi. p. 225, Java.

Catharsius timorensis, sp. n., Van Lansberge, CR. Ent. Belg. xxii. p. cxlviii., Timor.

Onthophagus penicillatus, p. 225, *remotus*, *birmanicus*, *pollicatus*, Burmah, and *niloticus*, Kordofan, p. 226, Harold, l. c.; *O. laminatus*, Taschenberg, Z. ges. Nat. (3) iv. p. 107, E. Indies, China: spp. nn.

Oniticellus martialis, Burmah, and *tessellatus*, Java (= *pictus*, Wiedem., *nec* Hausm.), spp. nn., Harold, *l. c.* p. 227.

Aphodiides.

D. Sharp remarks on the *Aphodii* of the Hawaiian Islands, only one of which is confined to the group; Tr. E. Soc. 1879, p. 91.

Aphodius melanostictus, Schupp., Er., recorded as new to Britain; E. C. Rye, Ent. M. M. xv. p. 280.

Aphodius pacificus, Sharp, *l. c.* p. 90, Hawaiian Islands; *A. brahminus* and *segmentarius*, Harold, C. H. xvi. p. 227, Burmah: spp. nn.

Oxyomus porcellus, sp. n., Frivaldszky, Term. füzetek, iii. p. 5, Hungary.

Rhyssemus madagassus, Harold, *l. c.* p. 228, Madagascar.

Liparochrus raucus, N. S. Wales, *crenatulus*, Rockhampton, *asperulus* (? = *Cœlodes bimaculatus*, Macl. var., note), and *aberrans*, Peak Downs, spp. nn., Fairmaire, J. Mus. Godeffr. xiv. p. 85.

Orphnides.

Hybalus granicornis, Batna, and *reclinans*, Morocco, spp. nn., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. pp. 171 & 172.

Hybosorides.

Phœochrous alternatus, sp. n., Fairmaire, J. Mus. Godeffr. xiv. p. 112, Duke of York Island.

Geotrupides.

Geotrupes pyrenæus, Charp., recorded from the German Vosges, and re-described; W. Eichhoff, S. E. Z. xl. pp. 156 & 157. *G. subarmatus*, Fairm., from Greece and Turkey, = *lateridens*, Guér., said to be from Chili; H. Gilnicki, Le Nat. i. p. 100.

Trogides.

Trox haroldi, sp. n., K. Flach, Deutsche E. Z. xxiii. p. 155, Aschaffenburg.

Melolonthides.

Lachnosterna fusca. Note on mode of walking, and unusual abundance of larvæ; L. O. Howard, Canad. Ent. xi. p. 200.

Phyllophaga farcta, Lec., = *Lachnosterna crassissima*, Blanch.; Schaufuss, Nunq. Ot. iii. p. 477.

Melolontha. Notes on the German species; Katter, Ent. Nachr. v. pp. 167–171. *M. vulgaris* and *hippocastani*: abundance in Rügen in 1879; *op. cit.* pp. 158 & 159.

Flatipalpus, g. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 248. Allied to *Pachydema*, but the last joint of the maxillary palpi enormously developed; ventral segments soldered together into a smooth and shining surface. Type, *F. albo-lanosus*, sp. n., *id. l. c.* p. 240, Biskra.

New species:—

Dichelus expositus, Harold, C. H. xvi. p. 43, Pungo Andongo.

Hoplia reini, Heyden, Ber. senck. Ges. 1878–79, p. 87, and Deutsche E. Z. xxiii. p. 339, Japan.

Serica rufo-lineata, Harold, *l. c.* p. 44, Pungo Andongo.

Camenta westermanni, id. *l. c.* p. 46, Angola.

Hymenoplia distincta, De Uhagon, An. Soc. Esp. viii. p. 203, pl. iv. figs. 2 & 2 *a*, Badajoz, Portugal.

Mœchidius bidentulus, Peak Downs, *bilobiceps*, Australia, and *albertisi*, Somerset, Australia, Fairmaire, J. Mus. Godeffr. xiv. p. 86.

Schizonycha modesta, Harold, *l. c.* p. 47, Cuanza.

Faula lineata, C. O. Waterhouse, Cist. Ent. ii. p. 421, Medellin, Colombia.

Apogonia lævicollis, Java and Sumatra, *heptagona*, Borneo, *cribrata* and *rugosa*, Java, Van Lansberge, CR. Ent. Belg. xxii. p. cxlix.; *A. sanghira*, R. Oberthur, Ann. Mus. Genov. xiv. p. 568, pl. i. fig. 1, Sanghir.

Exopholis pinguis, id. *l. c.* p. cl., Sumatra.

Ancylonycha flaviventris, Timor, and *celebensis*, Celebes and Sanghir Islands, *id. l. c.* p. cl.

Rhizotrogus bleicheri, Oran, p. 250, *thiebaulti*, Constantine, *obtusilobus*, p. 251, Algeria, *subscistatus*, Batna, *aria[d]næ*, Naxos (note), and *brucki*, Mount Taygetus (note), p. 253, *modestus*, Oran, p. 254, L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. (*R. arianæ* and *modestus* also described in Le Nat. i. 2, p. 4); *R. fallax* and *serrifunis*, p. 472, *arcilabrus*, p. 473, Marseul, Verh. z.-b. Wien, xxix., Caucasus.

Melolontha soror, Marseul, *l. c.* p. 474, Caucasus.

Rhopea uniformis, Duke of York Island, and *vitiensis*, Viti, Fairmaire, Le Nat. i. p. 70; *R. aruensis*, Van Lansberge, *l. c.* p. cl., Aru.

Pachydema xanthochroa and *rufina*, L. Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 247, and Le Nat. i. (2) pp. 3 & 4, Tunis.

Tanyproctus peltastes, Marseul, Nouv. et faits, ii. p. 99, Algeria ?.

Elaphocera martorellii, Carthagena, p. 241, *funebris*, Algeria, p. 249, Fairmaire, *l. c.*, and Le Nat. i. (1) p. 5; *E. rufidens*, Marseul, *l. c.* p. 474, Caucasus.

Rutelides.

CAMERANO, L. Studi intorno alle specie del genere *Geniates*, Kirb., esistente nel Museo zoologico di Torino. Atti Soc. Tor. xiv. pp. 229–274.

32 species are tabulated and described (9 new). Remarks on bibliography, and a table of geographical distribution, are prefixed.

Anisoplia austriaca. E. Metschnikoff has published a pamphlet on its diseases in Russian (Odessa: 1879, pp. 32, plate), extracted from the 3rd part of the report of a Commission of inquiry on insects injurious to agriculture. Its ravages at Taganrog; Nature, xx. p. 543.

Popilia bipunctata, Fabr., var. noticed; C. A. Dohrn, S. E. Z. xl. p. 188.

Cotalpa lanigera. Transformations popularly described and figured; W. Saunders, Canad. Ent. xi. pp. 21 & 22.

New species :—

Anomala anchoralis, Java, *luctuosa*, Amboina, Ceram, *ternatana*, Ternate, Batchian, and Gilolo, *A.* (*Euchlora*) *pulchripes*, E. Sumatra, Banka, Billiton, Borneo, p. cli., *A.* (*E.*) *scheepmakeri* and *A.* (*E.*) *crassa*, Java, p. clii., Van Lansberge, CR. Ent. Belg. xxii.

Spilota burmeisteri (= *irrorella*, Cast., ♂, sec. Burm.), *id. l. c.* p. clii., locality not stated.

Mimela nana, id. *l. c.* p. cliii., Java; *M. anomala*, Kraatz, Deutsche E. Z. xxiii. p. 234, Amoor.

Popilia minuscula, Harold, S. E. Z. xl. p. 333, Zanzibar.

Parastasia inconstans, Ninafou, and *dolens*, Viti, Fairmaire, J. Mus. Godeffr. xiv. p. 93.

Pimelopus hubneri, id. Le Nat. i. p. 46, Duke of York Island.

Geniates bituberculatus, p. 238, *multicornis*, p. 246, *truquii*, p. 248, *rugosus*, p. 253, *immaculatus*, p. 260, *affinis*, p. 261, *fuscescens*, p. 264, *incertus*, p. 267, and *lævis*, p. 273, Camerano, Atti Soc. Tor. xiv., Brazil.

Dynastides.

Oryctes haworthi, Hope, = *Phyllognathus dionysius*, F.; C. A. Dohrn, S. E. Z. xl. pp. 366 & 367.

Strategus sp. Transformations described; E. Duges, Nat. Mex. iii. pp. 49–52, figs. 2–6 (1876).

Chalcosoma beccarii, Gestro, ♀ described; Van Lansberge, CR. Ent. Belg. xxii. p. cliii.

Pentodon punctatus, Villa, in Spitalfields Market; T. R. Billups, Ent. xii. p. 230.

Xylotrupes gideon, Linn., variation noticed; R. Oberthür, Ann. Mus. Genov. xiv. p. 569.

New species:—

Oryctoderus obtusilobus, p. 92, *gracilior*, localities not stated, and *godeffroyi*, Mioko, Duke of York [Island], p. 93; Fairmaire, J. Mus. Godeffr. xiv.

Pentodon variolo-punctatus, id. Ann. Soc. Ent. Fr. (5) ix. p. 172, El-Aghouat.

Isodon subcornutus id. Le Nat. i. p. 46, Australia.

Horonotus variolicollis, id. *ibid.*, Port Bowen.

Dipelicus lobatus, Van Lansberge, CR. Ent. Belg. xxii. p. cliii., Amboina.

Temnorrhynchus integriceps, Fairmaire, J. Mus. Godeffr. xiv. p. 112, Duke of York Island.

Corynophyllus melas, id. *l. c.* p. 87, Sydney.

Oryctes trituberculatus, Van Lansberge, *l. c.* p. cliii., Sumatra, Celebes.

Xyloryctes florensis, id. *ibid.*, Flores.

Lycomedes burmeisteri, C. O. Waterhouse, Cist. Ent. ii. p. 421, pl. ix. figs. 1 & 1 *a*, Medellin, Colombia.

Cryptodus oblongoporus, Queensland, *neuter*, Peak Downs, Moreton Bay, *diffinis*, p. 87, *costulipennis*, Australia, *creberrimus*, Sydney, *platessa*, Gayndah, Peak Downs, p. 88, *protensus*, Australia, *rotundicollis*, *platyceroides*, p. 89, *decipiens*, Peak Downs, *fraternus*, Cleveland Bay, *cygnorum*, Swan River, p. 90, *C.* (*Cryptodellus*) *grossipes*, Cleveland Bay, Fairmaire, *l. c.*

Cetoniides.

Gestro, R. Nuove contribuzioni allo studio dei Cetonidi Malesi e Papuani. Ann. Mus. Genov. xiv. pp. 5–17.

In addition to new species, the following are noticed: *Ischiopsopha amesi*, Waterh. (distinct from *ignipennis*, Gestro), *Macronota ludekingi*, Vollenh., and *Anacamptorrhina ignipes*, Blanch.

HORN, G. H. A Monographic Revision of the Species of *Cremastochilus* of the United States. P. Am. Phil. Soc. xviii. pp. 382–397, pl. iv.

The genus is discussed, and the species are tabulated and described, including 1 new one. Westwood's species in Thes. Ent. Oxon. are specially noticed. 10 of the 18 admitted species are figured. The following synonymy occurs: *C. depressus*, Horn, = *planatus*, Lec., *polita*, Schaum, = *leucostictus*, Burm., *crassipes*, Westw., = *schaumi*, Lec., *armatus*, Walk., ? = *angularis*, Lec., *crenicollis*, Westw., = *knochi*, Lec.; *castanea*, G. & P., *sayi*, Harr., *percheroni* and *cicatricosus*, Westw., = *variolosus*, Kirby; *junior*, Westw., = *squamulosus*, Lec.; *castanea*, Schaum, and *hentzi*, Harr., = *canaliculatus*, Kirby; *walshi*, Westw., = *retractus*, Lec., *lecontii*, Westw., = *castaneæ*, Knoch, and *castaneæ*, Kirby, = *harrisi*, Kirby.

——. Synopsis of the *Euphoriæ* of the United States. *L. c.* pp. 397–408, pl. iv.

14 species admitted; 5 are figured, including *E. fascifera*, Lec. (fig. 16). The following synonymy occurs: *E. clarki*, Lec., and *texana*, Schauf., = *kerni*, Hald.; *lurida*, Oliv., and *reichii*, Gory & Perch., = *sepulchralis*, Fabr.; *antennata*, G. & P., and *pubera*, Gyll., = *herbacea*, Oliv.; and *barbata*, Say, *brunnea*, G. & P., and *marylandica*, Fröhl., = *inda*, L.

WATERHOUSE, C. O. A Third Contribution to the Knowledge of the *Cetoniidæ* of Madagascar.

Contains descriptions of new species, and remarks on the variation of *Stenotarsia discoidalis* and *Pantolia polita*, Waterh.

Ceratorrhina (*Stephanorrhina*) *guttata*, Ol., and *C.* (*Aphelorrhina*) *similima*, Westw., redescribed; C. O. Waterhouse, Ann. N. H. (5) iii. pp. 87 & 88.

Halonota bidens, Fabr., specimen with the angles of the scutellum depressed; C. A. Dohrn, S. E. Z. xl. pp. 188 & 189.

Epixanthis maculitarsis, Burm., redescribed and figured; J. O. Westwood, Tr. E. Soc. 1879, p. 203, pl. iii. fig. 5.

Ischiopsopha ignipennis, Gestro, = *Lomaptera jamesi*, Waterh.; Harold, C. H. xvi. p. 247, note.

Cetonia aurata. Kraatz discusses the following Asiatic forms, which he considers to be probably varieties: *Glycyphana viridi-opaca*, *viridi-obscura*, and *pilifera*, Motsch., *C. cupreola*, Kraatz, *Euryomia amouriensis*, Thoms., and *Protætia bensoni*, Westw.: Deutsche E. Z. xxiii. pp. 241–252 & 304. *C. opaca* and *cardui* very injurious to bee-hives; M. [illegible]rd, Bull. Soc. Ent. Fr. (5) ix. pp. cvii. & cviii. *C. palpalis*, Mohnike, = *bremii*, Schaum; C. A. Dohrn, S. E. Z. xl. p. 185.

Uloptera planata, Burm., may be congeneric with *Phymatopteryx*, Westw., in which case the latter genus will fall; J. O. Westwood, *l. c.* p. 202.

Cremastochilus saucius with malformed tarsi; Horn, Tr. Am. Ent. vii. pp. xxxi. & xxxii.

New genera and species :—

Neptunides, J. Thomson, Bull. Soc. Ent. Fr. (5) ix. p. cvi. Allied to *Cælorrhina*; head with three horns; mesosternal prominence rounded in front; legs thicker, tarsi larger, anterior femora with a depression and tooth at the outer extremity; and anterior tibiæ dentated on the inside. Types, *N. polychrous* and *abundans*, spp. nn., *id. l. c.* pp. cvi. & cvii., Zanzibar.

Mephistia, id. *l. c.* p. cxiii. Differs from *Ranzania* by its shorter head, less excavated above, and strongly tridentate in front; frontal horns recurved inwards instead of forwards, prosternum with a strong obtuse projection backwards before the front coxæ. Type, *Ranzania bertolonii*, sp. n., H. Lucas, *op. cit.* p. lxxxi., Bagomoyo.

Nyassinus, J. O. Westwood, Tr. E. Soc. 1879, p. 199. Allied to *Genuchus*, &c., anterior tibiæ simple, terminating in a sharp sickle-shaped point; tarsi 5-jointed, prosternum unarmed, mesosternum small and narrow, with the apex acute, and not prominent. Types, *N. maculipes* and *lugubris*, spp. nn., *l. c.* pp. 199 & 200, pl. iii. figs. 1 & 2, Nyassa.

Ceratorrhina batesi, D. G. Rutherford, Tr. E. Soc. 1879, p. 169, pl. i. fig. 2, Cameroons (H. W. Bates, *op. cit.* p. 170, supplements the description, and figures *C. hornimanni*, Ruth., fig. 1, and 4-*maculata*, Oliv., fig. 3); *C. gemina* (? = *aurata*, var.), G. Lewis, Ent. M. M. xv. pp. 198 & 234; *C. viridipygus* (= 4-*maculata*, Ruth., *nec* Fabr.), *id. op. cit.* xvi. p. 113; *C.* (*Aphelorrhina*) *julia*, p. 87, *bella* and *tibialis*, p. 88, C. O. Waterhouse, Ann. N. H. (5) iii.: all from W. Africa.

Cælorrhina excavata, Harold, C. H. xvi. p. 60, Pungo Andongo? [= *simillima*, Westw., which is distinct from *guttata*; Kraatz, Bull. Soc. Ent. Fr. (5) ix. p. cxxiv.].

Eudicella tetraspilota, Harold, *l. c.* p. 59, Pungo Andongo.

Plæsiorrhina septa, id. S. E. Z. xl. p. 332, E. Africa; *P. watkinsiana*, Lewis, *l. c.* xv. p. 198, W. Africa.

Heterorrhina hypoxantha, Harold, C. H. xvi. p. 64, note, Kittah.

Cotinis antonii, E. Duges, Nat. Mex. iv. p. 170, fig. 1, Mexico.

Gymnetis buckleyi, O. E. Janson, Cist. Ent. ii. p. 537, Ecuador.

Lomaptera brunneipennis, Timor, and *luctuosa*, India, J. Thomson, Bull. Soc. Ent. Fr. (5) ix. p. xxvii.; *L. aurata*, Gestro, Ann. Mus. Genov. xiv. p. 6, Cornwallis Island; *L. laglaizii*, Van Lansberge, CR. Ent. Belg. xxii. p. cliv., Amberbaki.

Ischiopsopha nigriloba, (*Lomaptera* ead., Voll., MS.) Dorey, and *emarginata*, New Guinea, Ritsema, Notes Mus. Leyd. i. pp. 185 & 186.

Clerota brahma, Gestro, *l. c.* p. 8, Sumatra.

Chalcothea bocki, Van Lansberge, *l. c.* p. cliv.; *C. virens* and *hasselti*, Ritsema, *l. c.* pp. 235 & 237 : all from Sumatra.

Macronota sumatrana, *ænea*, and *monticola*, Gestro, *l. c.* pp. 10–1[illegible] Sumatra.

Digenethle spilophora, id. *l. c.* p. 14, New Guinea.

Prigenia squamosa, Ritsema, *l. c.* p. 233, Rawas, Sumatra.

Liostraca (?) *rufo-plagiata*, J. O. Westwood, Tr. E. Soc. 1879, p. 206, fig. 4, Madagascar.

Stenotarsia picta, C. O. Waterhouse, *l. c.* iv. p. 74, Antananarivo, Madagascar.

Pygora bella and *puncticollis*, p. 77, *versicolor* and *hirsuta*, p. 78, *id. l.c.*, Antananarivo; *P. ignita*, Westwood, *l. c.* p. 204, pl. iv. fig. 1, Madagascar.

Anochilia hydrophiloides, and *herbacea*, id. *l. c.* p. 205, pl. iv. figs. 2 & 3, Madagascar.

Euchilia picipes and *costifera*, p. 75, *cupricollis* and *tarsalis*, p. 76, C. O. Waterhouse, *l. c.*, Antananarivo.

Pantolia rufo-basalis, id. *l. c.* p. 79, Antananarivo.

Coptomia elegans, Fianarantsoa, p. 79, *fulgida*, *lucida*, p. 80, *modesta* and *marginata*, p. 81, Antananarivo, *id. l. c.*

Schizorrhina neva, Gestro, *l. c.* p. 15, Thursday Island.

Gametis (?) *clytus*, Westwood, *l. c.* p. 206, pl. iv. fig. 5, Madagascar.

Glycyphana rugipennis, Ritsema, *l. c.* p. 153, Sumatra.

Euphoria verticalis, fig. 12, Arizona, California, *æstuosa*, fig. 14, Kansas, p. 400, *hirtipes*, fig. 13, Nebraska, p. 401, *devulsa*, fig. 15, Texas, p. 402, Horn, P. Am. Phil. Soc. xviii. pl. iv.

Leucocelis spoliata, Harold, *l. c.* p. 72, Pungo Andongo.

Tephræa ancilla, id. *l. c.* p. 68, Isle St. Thomé.

Neophonia duboulayi, J. Thomson, *l. c.* p. xcvi., Solomon Islands.

Cetonia brevitarsis, Nagasaki, and *insperata*, Yezo, G. Lewis, Ann. N. H. (5) iv. p. 463; *C. dominula*, Harold, *l. c.* p. 77, Pungo Andongo; *C. impavida*, India, p. 538, and *famelica*, Shantung, N. China, p. 539 O. E. Janson, l. c.; *C.* (*Protætia*) *culta*, C.O. Waterhouse, *l. c.* iv. p. 247, Takow, S. Formosa.

Pachnoda perdix, Harold, MT. Münch. ent. Ver. iii. p. 142, S. Africa.

Diplognatha pagana, id. C. H. xvi. p. 80, Pungo Andongo.

Anthracophora scheepmakeri, Van Lansberge, *l. c.* p. cliv., Soerabaya.

Scaptobius parrianus, J. O. Westwood, *l. c.* p. 201, pl. iii. fig. 3, Transvaal.

Phymatopteryx glaberrimus, id. *l. c.* p. 202, pl. iii. fig. 4, Lake N'Gami.

Cremastochilus westwoodi (= *schaumi*, Westw., *nec* Lec.), Horn, *l. c.* p. 389, California; *C. villadæ*, E. Duges, *l. c.* p. 171, fig. 2, Mexico.

Gnorimus donitzi, Harold, Deutsche E. Z. xxiii. p. 366, Japan.

Valgus pilosus and *vethi*, Ritsema, *l. c.* pp. 238 & 240, Sumatra.

Buprestidæ.

Kraatz, [illegible], is & Kiesenwetter, H. v. Ueber Buprestiden vom Amur. Deutsche E. Z. xxiii. pp. 253–256.

The known species are enumerated, and a few new ones described.

Notes on the *Buprestidæ* of Canada, with figures of *Agrilus bilineatus*, Web.; J. Fletcher, Rep. E. Soc. Ont. 1878, pp. 46–54.

Catoxantha gigantea, Scop., and *bicolor*, Fabr. Distinctive characters; J. Thomson, Bull. Soc. Ent. Fr. (5) ix. pp. lxx. & lxxi.

Psiloptera xerxes, Mars., var. (?) *viriditarsis* from Florence described; Schaufuss, Nunq. Ot. iii. p. 480.

Pœcilonota virgata, Motsch., redescribed; Kiesenwetter, Deutsche E. Z. xxiii. p. 253.

Ptosima novem-maculata. Variation in number of spots; C. Bland, Pet. Nouv. ii. p. 311.

Callistroma, g. n., Fairmaire, J. Mus. Godeffr. xiv. p. 97. Allied to *Pliona*, Deyr.; type, *C. oxypyra*, sp. n., *l. c.*, Samoa.

New species :—

Sternocera eschscholtzi, J. Thomson, Bull. Soc. Ent. Fr. (5) ix. p. cxii., Zanzibar; *S. pulchra*, C. O. Waterhouse, Tr. E. Soc. 1879, p. 319, Mountains of Usangara, E. Africa.

Catoxantha assamensis (Deyr., MS.), J. Thomson, *l. c.* p. lxx., Assam, Silhet; *C. purpurascens*, Ritsema, Notes Mus. Leyd. i. p. 48, Borneo; *C. netscheri*, Van Lansberge, CR. Ent. Belg. xxii. p. xlvii., Sumatra.

Chrysochroa bimanensis, id. *l. c.*, Isle of Bima.

Chrysodema foraminifera, id. *l. c.* p. cxlviii., Flores.

Chrysaspis ignipennis (*chrysipennis*, Hope, MS.), Harold, C. H. xvi. p. 92, note, locality not stated.

Chalcophora chinensis, Schaufuss, Nunq. Ot. iii. p. 480, S. China.

Paracupta bechuana, J. Thomson, *l. c.* p. cxxxi., Zambesi, Bechuana Land; *P. albilatera*, Fairmaire, J. Mus. Godeffr. xiv. p. 95, Viti.

Chalcotænia australis, Rockhampton, and *telamon*, Gayndah, *id. l. c.* p. 96; *C. africana*, Zambesi and Bechuana Land, p. cxxx., and *salamandra*, Australia, p. clviii., J. Thomson, *l. c.*

Iridotænia delia, id. *l. c.* p. lxiii., Andaman Islands.

Lampetis spissiformis, p. cxxxvii., *bechuanorum*, p. cxliii., *lethalis*, p. cxliv., *ocelligera*, p. cl., *chrysogastrica* and *subcatenulata*, p. cli., *id. l. c.*, Zambesi and Bechuana Land.

Dicercomorpha farinosa (Deyr., MS.), *id. l. c.* p. lxiii., Andaman Islands; *D. cæruleipennis*, Tonga, and *pyrochlora*, Viti, Fairmaire, *l. c.* p. 97.

Stigmodera sternoceroides, Australia, p. xiii., *imperator* (Cast., MS.), Swan River, and *menalcas* (Cast., MS.), Victoria, p. xiv., *alcyone* and *atalanta*, pp. lxxviii. & lxxix., *ostentatrix*, p. xciii., *delia* and *deyrollii*, Australia, pp. cxxiv. & cxxv., J. Thomson, *l. c.*

Sphenoptera pyrogastrica, *bechuana*, p. clxiv., and *validiapex*, p. clxv., *id. l. c.*, Bechuana Land and Zambesi.

Belionota intermedia, Sumatra, and *hilæ*, Amboina, Van Lansberge, *l. c.* p. cxlviii.

Agrilus peregrinus, p. 145, *impressifrons*, p. 254, and 186. [illegible] 255, Kiesenwetter, Deutsche E. Z. xxiii., Amoor; *A. sallæi*, E. Deyrolles, Nat. Mex. iv. p. 172, figs. 3 & 4, Mexico.

Endelus snellemanni, C. Ritsema, Notes Mus. Leyd. i. p. 155, Sumatra.

Brachys orichalcea, Kiesenwetter, Deutsche E. Z. xxiii. p. 255, Amoor.

Trachys bifrons, id. *l. c.* p. 256, Amoor; *T. denudata*, Ritsema, *l. c.* p. 156, Sumatra.

Throscidæ.

Trixagus longulus, sp. n., Weise, Deutsche E. Z. xxiii. p. 148, Japan.

EUCNEMIDÆ.

FRIVALDSZKY, J. A Magyarszági *Eucnemidæ*-Félék (*Eucnemidæ* Hungariæ). Term. füzetek, iii. pp. 204–229.

Tables are given of the Hungarian genera and species, which are subsequently described in full in Hungarian, with Latin diagnoses. No new species are mentioned.

Ceratophytum and *Perothops*. Position discussed; Horn, Tr. Am. Ent. Soc. vii. p. xxi.

ELATERIDÆ.

HEINEMANN, C. Estudio sobre les Órganos luminosos de los Cucuyos de Vera Cruz. Nat. Mex. iii. pp. 10–14, 54–58.

Contains general, anatomical, and chemical observations on the luminous organs of fireflies, and on the nature of their light.

Notes on *Elateridæ* from the Amoor; Kraatz, Deutsche E. Z. xxiii. p. 284.

Notes on *Elateridæ*; Horn, Tr. Am. Ent. Soc. vii. pp. xiv.–xvi. American species of *Adelocera* tabulated; synonyms of species of various genera given as follows:—*Alaus gorgops*, Lec., = *lusciosus*, Hope; *Cardiophorus dejeani*, Lec., = *cardisce*, Say; *C. amictus*, Mels., ? = *convexus*, Say; *mimeticus*, Horn, = *edwardsi*, Horn, var.; *Cryptohypnus nocturnus*, Esch., and *lucidulus*, Mann, probably = *bicolor*, Esch.; *C. colon*, Horn, = *ornatus*, Lec., var.; *Corymbites tristis*, Cand., ? = *Elater semivittatus*, Say; *E. sayi*, Lec., ? = *militaris*, Harr.; *E sacer*, Lec., = *impolitus*, Mels.; *E. manipularis*, Cand., = *hepaticus*, Mels.; *molestus*, Lec., = *luctuosus*, Lec.; *fuscatus*, Mels., = *pedalis*, Germ., ? = *nigricans*, Germ; *lacustris*, Lec., = *pullus*, Germ.; *palans*, Lec., ? = *collaris*, Say; *deletus* and *fusculus*, Lec., probably = *mixtus*, Herbst; *Anchastus fuscus*, Lec., is an *Ischiodontus*; *A. longulus*, Lec., = *digitatus*, Lec. ♂; *Isch. oblitus*, Cand., ? = *simplex*, Lec.; *Melanotus cuneatus*, *incertus*, and *decumanus*, Lec., ? = *M. tenellus*, Er., = *insipiens*, Say; *Limonius pubicollis*, Lec., = *auripilis*, Say; *L. ulkii*, Horn, = *mirus*, ♀, Lec.; *L. semiæneus*, Lec., = *basillaris*, Say, var.; *L. ectypus*, Say, = *agonus*, Say; *L. quadrimaculatus*, Horn, is a *Megapenthes*; *Athous reflexus*, Lec., = *rufifrons*, Rand.; *A. debilis*, Lec., is a *Monocrepidius*; *A. maculicollis*, Lec., and *flavangularis*, Horn, = *acanthus*, Say, varr. The double prosternal sutures of *Athous bicolor*, Lec., *A. discalceatus*, Say, and *Corymbites sulcicollis* and *rupestris*, are also noticed.

Athous niger, Linn., and allies are discussed by Heyden, Deutsche E. Z. xxiii. pp. 372–374. His views on their synonymy are as follows:—(1) *A. niger*, Linn. (somewhat doubtful) (*aterrimus*, Fabr., ? *hirtus*, Herbst, ? *nigrinus*, Marsh.); (2) *A. porrectus*, Thoms. (? *hirtus* and *nigrinus*, *læsus*, Germ., *niger*, Redt.); (3) *A. alpinus*, Redt. (*deflexus*, Thoms. v. ? *scrutator*, Herbst, Redt., ♂ *æneithorax*, Desbr.). Kraatz (*op. cit.* pp. 275 &

276), in some supplementary remarks, regards them all as one species, and *A. deflexus*, Thoms., as the true *niger*, Linn.

Corymbites cærulescens, Motsch., = *anxius*, Gebl. ; Candèze, Deutsche E. Z. xxiii. p. 283.

Morostoma, g. n., Candèze, Cist. Ent. ii. p. 485 (*Allotriites*). Distinguished by the extraordinary development of the 4th joint of all the palpi, which are longer and thicker than the antennæ, cylindrical, arched, and shining black. Type, *M. palpale*, sp. n., *l. c.* p. 486, pl. x. fig. 1 (head), Madagascar.

New species :—

Tetrigus grandis, G. Lewis, Ent. M. M. xvi. p. 155, Nagasaki.

Elater ryei, *rubridorsus*, p. 155, *puniceus* and *carbunculus*, p. 156, *id. l. c.*, Japan ; *E. candezei*, *simillimus*, p. 123, and *pallipes*, p. 124, Kraatz, Deutsche E. Z. xxiii., Amoor.

Cryptohypnus valesiacus, Stierlin, MT. schw. ent. Ges. v. p. 440, Simplon, St. Bernard ; *C. telluris*, Lewis, *l. c.* p. 156, Japan.

Cardiophorus rameus, id. *l. c.* p. 156, Japan.

Melanotus caudex, id. *l. c.*, Japan ; *M. bernhardinus*, Stierlin, MT. schw. ent. Ges. v. p. 439, St. Bernard.

Limonius kraatzi, Candèze, Deutsche E. Z. xxiii. p. 281, Amoor ; *L. atricolor*, Lewis, *l. c.* p. 157, Japan.

Athous ærosus, id. *l. c.*, Japan ; *A. lætus*, Candèze, *l. c.* p. 281, Amoor.

Corymbites mandulus, Lewis, *l. c.* p. 157, Japan ; *C. ligneus*, *ferrugineipennis*, p. 281, *puberulus*, Amoor, p. 282, *depressus* and *corpulentus*, p. 283, Candèze, l. c. ; *C.* (*Diacanthus*) *songaricus*, p. 283, and *C.* (*D.*) *informis*, p. 287, Kraatz, Deutsche E. Z. xxiii., all from Dzungaria ; *C. christophi*, Kiesenwetter, *op. cit.* p. 145, Amoor.

Agriotes sepes and *sericans*, Lewis, *l. c.* p. 157, Japan ; *A. puerilis*, Candèze, *l. c.* p. 282, Amoor.

Ectinus simoni, Stierlin, *l. c.* p. 511, Syria.

Lepturoides inæqualis, Candèze, *l. c.* p. 282, Amoor.

Cebrionidæ.

Cebrio hirundinis, Chevr., from Algeria, = *dimidiatus*, Luc., var., and the variations of the species are described ; E. Olivier, Bull. Soc. Ent. Fr. (5) ix. pp. liii. & liv.

Rhipidoceridæ.

Callirhipis vitiensis, Viti, *cylindroides*, Tonga, and *derasa*, Pelew Islands, Fairmaire, J. Mus. Godeffr. xiv. p. 98, spp. nn.

Dascillidæ.

Eubria palustris. One of the hooks of each pair of legs is bifid, and the other simple ; Horn, Bull. Soc. Ent. Fr. (5) ix. p. cxxxii.

Placonycha, g. n., Horn, Tr. Am. Ent. Soc. vii. p. xxii. Differs from all known *Dascillidæ* in having the claws furnished with a long membranous

appendage arising from the base, and a distinct onychium. Type, *Dicranopselaphus edwardsi*, Lec.

Eucinetus caucasicus, sp. n., Reitter, Verh. z.-b. Wien, xxix. p. 475, Caucasus.

Telephoridæ.

Lycides.

Bourgeois, J. Contribution à la Faune entomologique des États-Unis de Colombie. Catalogue des *Lycides* recueillis par E. Steinheil (1872–73) avec les diagnoses des espèces nouvelles. Ann. Soc. Ent. Fr. (5) ix. pp. 13–42, pl. iv.

The following notices of known species and genera occur :—*Lycus adumbratus*, Bourg., details figured (figs. 1–4), *Lygistropus succinctus*, Latr. (= *regalis*, Buq.), var., described, *Calopteron*, table of species, *C. fallax*, Kirsch, *segmentatum* and *dives*, Bourg., figs. 5, 6 & 8 (details), *steinheili*, *powcri*, and *fenestratus*, Bourg., figured, figs. 7, 9 & 10, *C. excellens*, Kirsch, redescribed, *C. cyaneum*, Er., var. *conithorax*, Kirsch, and *C. basale*, Kirsch, var. described, *variegatum*, Kirsch, *lebasi*, Bourg., and *palpale*, Kirsch, figs. 11–13, various details figured, *C. nigricauda*, Kirsch, redescribed, *subcruciatum*, Bourg., fig. 15, details, *posticum*, Kirsch, variation described, *melanoxanthum*, Kirsch, redescribed, *acuminatum*, Bourg., fig. 16, details, *amœnum*, Kirsch, fig. 19, *suave*, *rete*, *mesomelas*, and *melanurum*, Kirsch, variation noticed.

Waterhouse, C. O. Illustrations of typical specimens of *Coleoptera* in the Collection of the British Museum. Part i. *Lycidæ*. London : 1879, 8vo, pp. x. & 83, pls. xviii.

The following known species, in addition to new ones, are redescribed and figured in this work :—*Macrolycus bowringi*, Waterh., p. 1, fig. 1, *Calochromus basalis*, W., fig. 2, *melanurus*, W., figs. 5 & 5 *a* (details), p. 2, *orbatus*, W., fig. 3, *apicalis*, Hope, fig. 10, *æmulus*, W., fig. 11, p. 3, *rugatus*, W., figs. 4 & 4 *a* (details), *ruber*, W., figs. 6 & 6 *a* (details), p. 4, *velutinus*, figs. 7 & 7 *a* (details), p. 5, pl. i., *vestitus*, W., fig. 2, p. 6, *lepidus*, W., figs. 3 & 3 *a* (details), *longipennis*, W., figs. 4 & 4 *a* (details), p. 7, and *dispar*, fig. 1, p. 8 ; *Lycostomus similis*, Hope (synonyms, *triangularis*, Hope, *suturalis*, Redt., *geminus*, Walk., *cinnabarinus*, Caud., and *coccineus*, Motsch.), figs. 6 & 6 *a* (details), p. 10, pl. ii., *internexus*, Walk., fig. 4, *analis*, Dalm. (= *divisus* and *planicornis*, Walk.), figs. 5 & 5 *a* (details), and *nigripes*, Fabr., figs. 6 & 6 *a* (details), p. 13, pl. iii.; *Lycus pyriformis*, Murr., pl. iv. fig. 2, and *ustus*, Murr., pl. v. fig. 7, p. 16, *scapularis*, Murr., fig. 3, *palliatus*, Fabr., fig. 5, and *xanthomelas*, Dalm. (= *immersus*, Murr.), figs. 1 & 4, p. 17, *semi-amplexus*, Murr., figs. 6 & 9, *aspidatus*, Murr., fig. 8, and *subcostatus*, Murr., fig. 7, p. 18, pl. iv., *melanurus*, Dalm. (= *æolus*, Murr.), figs. 2 & 3, *elegans*, Murr., figs. 5 & 6, and *latissimus*, L., figs. 1 & 4 (= *præmorsus*, Dalm., with varr. *subdenticulatus* and *fenestratus*, Murr., and *harpago*, Thoms.), p. 19, *Calopteron notatum*, Waterh., figs 9 & 9 *a*, pl. v., *typicum*, Newm. (var. = *discrepans*, Newm.), fig. 1, p. 21, *dorsale*, Newm., fig. 2, and *divisum*, Newm., fig. 3, p. 22, *Cenia scapularis*, Newm., fig. 6, *Celetes basalis*, Leconte (= *marginellus*, Newm.), fig. 4,

p. 23; *Lyponia debilis*, Waterh., fig. 9, p. 25, pl. vi.; *Plateros lictor*, Newm., figs. 5 & 5 *a* (details), p. 25, *alatus*, Newm. (= ? *lictor*, ♀, nec *crenatus*, Germ.), fig. 4, pl. viii., *dispellens*, Walk., pl. vi. fig. 8, p. 26, *Eros præfectus*, Newm., p. 37, pl. ix. fig. 6, *Porrostoma brevirostre*, Waterh., figs. 4 & 4 *a* (details), *abdominale*, W., fig. 10, *elegans*, W., figs. 6 & 6 *a*, (details), p. 44, *uniforme*, W., figs. 7 & 7 *a* (details), *irregulare*, W., figs. 8 & 8 *a* (details), p. 45, *russatum*, W., figs. 11 & 11 *a* (details), pl. xi., and *apicale*, W., figs. 1 & 1 *a* (details), p. 46; *Metriorrhynchus fusco-lineatus*, Waterh. (= *lineatum*, W., nec *Homalisus lineatus*, Hope, which is congeneric), fig. 4, *togatus*, W., figs. 2 & 2*a* (details), p. 47, *scalaris*, W., figs. 3 & 3 *a* (details), *fallax*, W., figs. 5 & 5 *a* (details), *rufipennis*, Fabr. (= *salebrosum*, W.), figs. 6 & 6*a* (details), p. 48, *hæmorrhoidalis*, W., *plagiatus*, W., fig. 8, p. 49, *lugubris*, W., figs. 7 & 7 *a* (details), *kirschi*, W. (= *Dictyopterus lineatus*, Kirsch, *nec* Hope), p. 50, and var. ? from Batchian, figs. 10 & 10 *a* (details), p. 51, pl. xii., *lineatus*, Hope, fig. 9, p. 54, *astutus*, Walk., figs. 8 & 8 *a* (details), p. 55, pl. xiii., and *cinctus*, Waterh., p. 58, pl. xiv. figs. 9 & 9 *a* (details) & 10; *Taphes brevicollis*, W., p. 62, fig. 9, and *frontalis*, W., figs. 4 & 4 *a* (details); *Pyrophorus sculpturatus*, W. fig. 8, pl. xv. p. 63; *Cladophorus aberrans*, W., fig. 3, p. 65, and *restrictus*, W., figs. 5 & 5 *a* (details), p. 66; *Trichalus flavo-pictus*, W., fig. 11, *ampliatus*, W., figs. 7 & 7 *a* (details), p. 67, *sulcatus*, W., figs. 8 & 8 *a* (details), pl. xvi., *acutangulus*, W., pl. xvii. fig. 1, p. 68, *æmulus*, W., pl. xvi. figs. 9 & 9 *a* (details), *anceps*, W., figs. 2 & 2 *a* (details), p. 69, pl. xvii., and *serraticornis*, Fabr., p. 71, pl. xvi. figs. 10 & 10 *a* (details); *Atelius expansicornis*, Walk., p. 76, fig. 5; *Scarelus longicornis*, Waterh., fig. 6, and *orbatus*, W., fig. 7; *Libnetis pumilio*, W., fig. 10, p. 77; *Lyropœus fallax*, W., fig. 4, p. 78, and *Dexoris insignis*, W., fig. 11, p. 79, pl. xviii.

List of *Lycides* collected in Brazil by Van Volxem; J. Bourgeois, CR. Ent. Belg. xxii. pp. xv.–xix.

Lycus ferrugineus, Fabr., *melanurus*, Blanch, and *bivittatus*, Kirsch, are probably synonyms or varieties of *Lycostomus marginatus*, Fabr.; C. O. Waterhouse, Ill. typ. Col. p. 10.

Lycus schœnherri, *semiustus*, and *loripes*, Chevr., redescribed; E. Duges, Nat. Mex. iv. pp. 177–179.

New genera and species:—

Lucaina, E. Duges, Nat. Mex. iv. p. 180. Allied to *Lycus*; type, *L. schini*, sp. n., *ibid.* fig. 7, Mexico.

Demosis, C. O. Waterhouse, Ill. typ. Col. p. 7. Between *Calochromus* and *Lipernes*; antennæ short, compact, dentate, of equal width throughout, 3rd joint rather longer than broad, joints 4-10 transverse; rostrum short, distinct; thorax transverse, quadrangular, disk smooth, margins reflexed; elytra flattened, subparallel, with moderately distinct costæ, the intervals punctured. Type, *D. peltatus*, sp. n., *l. c.* p. 9, pl. ii. fig. 5, Lake N'Gami.

Lipernes, id. *l. c.* p. 9. Allied to *Lycostomus*; palpi short and thick; last joint of maxillary palpi broad, convex, nearly straight on the outer side, and rounded on the inner side; thorax with a mesial impressed line, the margins thickened and narrowly reflexed; each elytron with four

costæ, the fourth not elevated at the shoulder. Type, *L. perspectus*, sp. n., *l. c.* pl. ii. fig. 11, Shanghai.

Broxylus, id. *l. c.* p. 20. Allied to *Calopteron*; apical joint of palpi very large, long, and knife-shaped. Type, *C.* (?) *pfeifferæ*, Waterh., redescribed and figured, *l. c.* p. 21, pl. v. figs. 8 & 8 *a*.

Eurrhacus, id. *l. c.* p. 24. Differs from *Emplectus* by its flabellate antennæ, and the cultriform apical joint of the palpi. Type, *Lycus tristis*, Waterh., redescribed and figured, *l. c.* pl. vi. fig. 5.

Dihammatus, id. *l. c.* p. 29. Differs from *Plateros* in having the 3rd joint of antennæ small. Types, *D. cribripennis*, Java, fig. 6, and *pallens*, Sarawak, figs. 7 & 7 *a* (details), spp. nn., *l. c.* pl. vii.

Melampyrus, id. *l. c.* p. 30. Allied to *Plateros*, but more pubescent, and antennæ broader. Types, *Lycus alternans*, Waterh., fig. 7, and *misellus*, Waterh., figs. 6 & 6 *a* (details), redescribed and figured, *l. c.* pl. viii.

Ditoneces, id. *l. c.* p. 31. Differs from *Melampyrus* in having the alternate costæ of the elytra less elevated. To contain: *Lycus punctipennis*, Waterh., redescribed and details figured, *l. c.* figs. 10 & 10 *a*; *D. rufescens*, Java, figs. 8 & 8 *a* (details), p. 31, *propinquus*, China, figs. 11 & 11 *a* (details), pl. vii., and *sobrinus*, Burma, pl. viii. figs. 2 & 2 *a* (details), spp. nn.; *pubicornis*, Walk. (= *Lycus melanopterus*, *duplex*, and *revocans*, Walk.), redescribed and figured, pl. vii. fig. 9, p. 32, *pubipennis*, Walk., redescribed and figured, fig. 1, and *terminalis*, Ceylon, fig. 3, pl. viii. p. 33.

Ditua, id. *l. c.* p. 33. Allied to *Ditoneces*, but thorax broad, margins not incrassate, with a discoidal lanceolate areolet, from the lateral angle of which proceeds an indistinct oblique carina. Elytra with 9 regular and nearly equal costæ, the interstices with a single line of punctures. Type, *Lycus deplanatus*, Waterh., redescribed and figured, *l. c.* p. 34, pl. viii. fig. 8.

Bulenides, id. *l. c.* p. 34. Differs from *Ditua* in having the margins of the thorax more or less reflexed and incrassate, and in the costæ of the elytra being unequal. Type, *Lycus obsoletus*, redescribed and figured, *l. c.* pl. ix. fig. 1; also *B. pauper*, figs. 2 & 2 *a* (details), fig. 4 (thorax), Sumatra, and *dubius*, figs. 5 & 5 *a* (details), Borneo, *l. c.* p. 35, pl. ix. spp. nn.

Cautires, id. *l. c.* p. 36. Elytra as in *Bulenides*; antennæ in ♂ with a long compressed branch rising from base of joints 3-10, in ♀ very strongly dentate; thorax with 7 areolets, the 2 lateral sometimes obsoletely divided. Type, *Lycus excellens*, Waterh., redescribed and figured, *l. c.* pl. viii. fig. 9 (antenna, ♀), and pl. ix. fig. 3 (♂); also *C. congener*, sp. n., *l. c.* pl. ix. figs. 7 & 7 *a* (details), Java.

Erotides, id. *l. c.* p. 37. Allied to *Platycis*; elytra parallel, each elytron with 4 strong costæ, the interstices with transverse costæ placed rather dear together, frequently oblique, or divided so as to form a horizontal Y (≺). Type, *Eros oblitus*, Newm., redescribed and figured, *l. c.* p. 38, pl. ix. fig. 9.

Xylobanus, id. *l. c.* p. 38. Next to *Erotides*; no rostrum, antennæ dentate, thorax with 5 or 7 areolets, the lateral ones sometimes obliterated; each elytron with 4 costæ, the interstices with regular transverse

p. 23; *Lyponia debilis*, Waterh., fig. 9, p. 25, pl. vi.; *Plateros lictor*, Newm., figs. 5 & 5 *a* (details), p. 25, *alatus*, Newm. (= ? *lictor*, ♀, nec *crenatus*, Germ.), fig. 4, pl. viii., *dispellens*, Walk., pl. vi. fig. 8, p. 26, *Eros prafectus*, Newm., p. 37, pl. ix. fig. 6, *Porrostoma brevirostre*, Waterh., figs. 4 & 4 *a* (details), *abdominale*, W., fig. 10, *elegans*, W., figs. 6 & 6 *a*, (details), p. 44, *uniforme*, W., figs. 7 & 7 *a* (details), *irregulare*, W., figs. 8 & 8 *a* (details), p. 45, *russatum*, W., figs. 11 & 11 *a* (details), pl. xi., and *apicale*, W., figs. 1 & 1 *a* (details), p. 46; *Metriorrhynchus fusco-lineatus*, Waterh. (= *lineatum*, W., nec *Homalisus lineatus*, Hope, which is congeneric), fig. 4, *togatus*, W., figs. 2 & 2*a* (details), p. 47, *scalaris*, W., figs. 3 & 3 *a* (details), *fallax*, W., figs. 5 & 5 *a* (details), *rufipennis*, Fabr. (= *salebrosum*, W.), figs. 6 & 6*a* (details), p. 48, *hæmorrhoidalis*, W., *plagiatus*, W., fig. 8, p. 49, *lugubris*, W., figs. 7 & 7 *a* (details), *kirschi*, W. (= *Dictyopterus lineatus*, Kirsch, *nec* Hope), p. 50, and var. ? from Batchian, figs. 10 & 10 *a* (details), p. 51, pl. xii., *lineatus*, Hope, fig. 9, p. 54, *astutus*, Walk., figs. 8 & 8 *a* (details), p. 55, pl. xiii., and *cinctus*, Waterh., p. 58, pl. xiv. figs. 9 & 9 *a* (details) & 10; *Taphes brevicollis*, W., p. 62, fig. 9, and *frontalis*, W., figs. 4 & 4 *a* (details); *Pyrophorus sculpturatus*, W. fig. 8, pl. xv. p. 63; *Cladophorus aberrans*, W., fig. 3, p. 65, and *restrictus*, W., figs. 5 & 5 *a* (details), p. 66; *Trichalus flavo-pictus*, W., fig. 11, *ampliatus*, W., figs. 7 & 7 *a* (details), p. 67, *sulcatus*, W., figs. 8 & 8 *a* (details), pl. xvi., *acutangulus*, W., pl. xvii. fig. 1, p. 68, *æmulus*, W., pl. xvi. figs. 9 & 9 *a* (details), *anceps*, W., figs. 2 & 2 *a* (details), p. 69, pl. xvii., and *serraticornis*, Fabr., p. 71, pl. xvi. figs. 10 & 10 *a* (details); *Atelius expansicornis*, Walk., p. 76, fig. 5; *Scarelus longicornis*, Waterh., fig. 6, and *orbatus*, W., fig. 7; *Libnetis pumilio*, W., fig. 10, p. 77; *Lyropæus fallax*, W., fig. 4, p. 78, and *Dexoris insignis*, W., fig. 11, p. 79, pl. xviii.

List of *Lycides* collected in Brazil by Van Volxem; J. Bourgeois, CR. Ent. Belg. xxii pp. xv.–xix.

Lycus ferrugineus, Fabr., *melanurus*, Blanch, and *bivittatus*, Kirsch, are probably synonyms or varieties of *Lycostomus marginatus*, Fabr.; C. O. Waterhouse, Ill. typ. Col. p. 10.

Lycus schœnherri, *semiustus*, and *loripes*, Chevr., redescribed; E. Duges, Nat. Mex. iv. pp. 177–179.

New genera and species:—

Lucaina, E. Duges, Nat. Mex. iv. p. 180. Allied to *Lycus*; type, *L. schini*, sp. n., *ibid.* fig. 7, Mexico.

Demosis, C. O. Waterhouse, Ill. typ. Col. p. 7. Between *Calochromus* and *Lipernes*; antennæ short, compact, dentate, of equal width throughout, 3rd joint rather longer than broad, joints 4-10 transverse; rostrum short, distinct; thorax transverse, quadrangular, disk smooth, margins reflexed; elytra flattened, subparallel, with moderately distinct costæ, the intervals punctured. Type, *D. peltatus*, sp. n., *l. c.* p. 9, pl. ii. fig. 5, Lake N'Gami.

Lipernes, id. *l. c.* p. 9. Allied to *Lycostomus*; palpi short and thick; last joint of maxillary palpi broad, convex, nearly straight on the outer side, and rounded on the inner side; thorax with a mesial impressed line, the margins thickened and narrowly reflexed; each elytron with four

costæ, the fourth not elevated at the shoulder. Type, *L. perspectus*, sp. n., *l. c.* pl. ii. fig. 11, Shanghai.

Broxylus, id. *l. c.* p. 20. Allied to *Calopteron*; apical joint of palpi very large, long, and knife-shaped. Type, *C.* (?) *pfeifferæ*, Waterh., redescribed and figured, *l. c.* p. 21, pl. v. figs. 8 & 8 *a*.

Eurrhacus, id. *l. c.* p. 24. Differs from *Emplectus* by its flabellate antennæ, and the cultriform apical joint of the palpi. Type, *Lycus tristis*, Waterh., redescribed and figured, *l. c.* pl. vi. fig. 5.

Dihammatus, id. *l. c.* p. 29. Differs from *Plateros* in having the 3rd joint of antennæ small. Types, *D. cribripennis*, Java, fig. 6, and *pallens*, Sarawak, figs. 7 & 7 *a* (details), spp. nn., *l. c.* pl. vii.

Melampyrus, id. *l. c.* p. 30. Allied to *Plateros*, but more pubescent, and antennæ broader. Types, *Lycus alternans*, Waterh., fig. 7, and *misellus*, Waterh., figs. 6 & 6 *a* (details), redescribed and figured, *l. c.* pl. viii.

Ditoneces, id. *l. c.* p. 31. Differs from *Melampyrus* in having the alternate costæ of the elytra less elevated. To contain: *Lycus punctipennis*, Waterh., redescribed and details figured, *l. c.* figs. 10 & 10 *a*; *D. rufescens*, Java, figs. 8 & 8 *a* (details), p. 31, *propinquus*, China, figs. 11 & 11 *a* (details), pl. vii., and *sobrinus*, Burma, pl. viii. figs. 2 & 2 *a* (details), spp. nn.; *pubicornis*, Walk. (= *Lycus melanopterus*, *duplex*, and *revocans*, Walk.), redescribed and figured, pl. vii. fig. 9, p. 32, *pubipennis*, Walk., redescribed and figured, fig. 1, and *terminalis*, Ceylon, fig. 3, pl. viii. p. 33.

Ditua, id. *l. c.* p. 33. Allied to *Ditoneces*, but thorax broad, margins not incrassate, with a discoidal lanceolate areolet, from the lateral angle of which proceeds an indistinct oblique carina. Elytra with 9 regular and nearly equal costæ, the interstices with a single line of punctures. Type, *Lycus deplanatus*, Waterh., redescribed and figured, *l. c.* p. 34, pl. viii. fig. 8.

Bulenides, id. *l. c.* p. 34. Differs from *Ditua* in having the margins of the thorax more or less reflexed and incrassate, and in the costæ of the elytra being unequal. Type, *Lycus obsoletus*, redescribed and figured, *l. c.* pl. ix. fig. 1; also *B. pauper*, figs. 2 & 2 *a* (details), fig. 4 (thorax), Sumatra, and *dubius*, figs. 5 & 5 *a* (details), Borneo, *l. c.* p. 35, pl. ix. spp. nn.

Cautires, id. *l. c.* p. 36. Elytra as in *Bulenides*; antennæ in ♂ with a long compressed branch rising from base of joints 3-10, in ♀ very strongly dentate; thorax with 7 areolets, the 2 lateral sometimes obsoletely divided. Type, *Lycus excellens*, Waterh., redescribed and figured, *l. c.* pl. viii. fig. 9 (antenna, ♀), and pl. ix. fig. 3 (♂); also *C. congener*, sp. n., *l. c.* pl. ix. figs. 7 & 7 *a* (details), Java.

Erotides, id. *l. c.* p. 37. Allied to *Platycis*; elytra parallel, each elytron with 4 strong costæ, the interstices with transverse costæ placed rather near together, frequently oblique, or divided so as to form a horizontal Y (≺). Type, *Eros oblitus*, Newm., redescribed and figured, *l. c.* p. 38, pl. ix. fig. 9.

Xylobanus, id. *l. c.* p. 38. Next to *Erotides*; no rostrum, antennæ dentate, thorax with 5 or 7 areolets, the lateral ones sometimes obliterated; each elytron with 4 costæ, the interstices with regular transverse

costæ. To include *Lycus costifer*, Walk. (type), figs. 10 & 10 *a* (details), p. 38, and *humerifer*, Walk., figs. 8 & 8 *a* (details), both redescribed, and the following new species: *X. gratiosus*, Andaman Islands, fig. 11, pl. ix., *fastidiosus*, fig. 3, p. 39, *rigidus*, figs. 1 & 1 *a* (details), Java, *foveatus*, Bar[illegible]rackpore ?, figs. 2 & 2 *a* (details), *fastidiosus*, Java, fig. 3, p. 39, *rubens*, Siam, figs. 4 & 4 *a* (3 *a* on plate, details), *humilis*, Sarawak, figs. 5 & 5 *a* (details), p. 40, *regularis*, Dorey, fig. 8, *privatus*, Java, figs. 6 & 6 *a* (details), *senex*, figs. 7 & 7 *a*, p. 41, *clusus*, figs. 9 & 9 *a* (details), pl. x., *fumigatus*, figs. 1 & 1 *a* (details), Borneo, pl. xi. *indutus*, Sumatra, figs. 10 & 10 *a* (details), pl. x., *intricatus*, Java, figs. 3 & 3 *a* (details), p. 42, *confusus*, Batchian, fig. 2, and *mixtus*, Waigiou, fig. 5, pl. xi. p. 43.

Eniclases, id. *l. c.* p. 66. Next to *Cladophorus*, but differs from every other genus in the shape of the scutellum, which is somewhat rounded behind, with a small notch at the apex. Type, *Lycus luteolus*, W., redescribed and figured, *l. c.* pl. xvi. fig. 12.

Enylus, id. *l. c.* p. 72. Allied to *Trichalus*, but with parallel costæ to the elytra. Type, *E. segregatus*, sp. n., *l. c.* pl. xvii. fig. 10, Mysol.

Strophicus, id. *l. c.* p. 73. Allied to *Xylobanus* and *Trichalus*; antennæ linear, thorax with a single lanceolate mesial areolet, elytra parallel, each with 4 distinct costæ, the third abbreviated behind; the interstices with punctures, which are divided from each other by transverse carinæ; these punctures are here and there in double lines, but are generally transverse, and extend across the whole interstice. Type, *S. nigellus*, sp. n., *l. c.* pl. xvii. figs. 11 & 11 *a* (details), Mysol.

Metanæus, id. *l. c.* p. 73. Next to *Strophicus*; eyes large, antennæ long, ♂ with a long compressed branch rising from the base of joints 3–10; thorax pubescent, with 7 shallow impressions; elytra pubescent, with 4 parallel costæ, the interstices each with a line of obscure punctures on each side. To contain *Lycus dispar* and *conformis*, W., figs. 1 & 3, and *fulvus*, sp. n., Penang, fig. 2 (thorax), p. 74, pl. xviii.

Dilophotes, id. *l. c.* p. 75. Next to *Metanæus*: thorax rugosely punctured in front, with a smooth mesial anterior carina: elytra very slightly narrowed towards the apex (where they do not meet at the suture), or parallel, each with 3 costæ, the intervals flat and pubescent. Type, *Lycus exilis*, W., redescribed and figured, *l. c.* fig. 8; add *Celetes pectinifer*, Kiesenw., and *D. pygmæus*, sp. n., Borneo, *l. c.* p. 76, fig. 9 (thorax), pl. xviii.

Synchonnus, id. *l. c.* p. 59. Allied to *Metriorrhynchus*; no rostrum, antennæ dentate, thorax with a lozenge-shaped mesial areolet, extending from the base to the anterior margin; a straight carina, extending to the middle of the side, running from each lateral angle of the areolet, thus dividing the surface into 5 areolets, elytra with 4 costæ, the interstices irregularly punctured. Type, *Porrostoma clientulum*, Waterh., figured and redescribed, *l. c.* pl. xv. fig. 2.

Conderis, id. *l. c.* Allied to last; antennæ strongly dentate; thorax with 5 distinct areolets; elytra each with 4 costæ, the interstices with a line of indistinct punctures on each side, or with a double row of quadrate punctures. Type, *Calopteron signicolle*, Kirsch (= *Metriorrhynchus*

festivus and *velutinus*, Waterh.), redescribed and figured, *l. c.* fig. 1; add *C. major*, sp. n., *l. c.* figs. 6 & 6 *a* (details), India, pl. xv.

Stadenus, id. *l. c.* p. 61. Allied to last; thorax rather broad, with a mesial lanceolate areolet; elytra parallel, with 4 costæ, the interstices with 2 lines of punctures, the lines divided by a very fine costa. To contain *Porrostoma dichroum*, Waterh. (type), fig. 5, and *P. inquinulum*, W., figs. 3 & 3 *a* (details), figured and redescribed, *l. c.* pl. xv.

Achras, id. *l. c.* Allied to last; thorax small, with 5 areolets; elytra rather narrow at base, and gradually enlarged posteriorly, each elytron with 4 costæ, the intervals with rugose punctuation. Type, *Porrostoma limbatum*, Waterh., redescribed and figured, *l. c.* p. 62, pl. xv. fig. 7.

Haplobothris, J. Bourgeois, CR. Ent. Belg. xxii. p. xvii. Allied to *Emplectus*, but with antennæ serrated in both sexes. To contain *H. humeralis*, *scapularis*, and *pumila* (Dej. Cat.), spp. nn., *l. c.* p. xviii., Brazil.

Plateros (C. O. Waterh., MS.), *id. l. c.* p. xix. Allied to *Eros*; to include *Lycus sanguinipennis*, Say, *Dictyopterus crocatus* and *decoratus*, Er., *Calopteron thoracicum*, and *Eros bogotensis* and *phœnicurus*, Kirsch, *D. melanura*, Blanch. (?), *E. brasiliensis*, Luc., and several undescribed species. Add *P. planatus*, Shanghai, Penang, figs. 1 & 1 *a* (details), *languidus*, Ceylon, figs. 2 & 2 *a* (details), and *fuscipennis*, Sylhet, figs. 3 & 3 *a* (details), p. 27, *expletus*, Sarawak, figs. 4 & 4 *a* (details), *carbonarius*, India (?), figs. 5 & 5 *a* (details), p. 28, pl. vii., and *chinensis*, Hong Kong, p. 29, pl. vi. fig. 7, C. O. Waterhouse, *l. c.*, spp. nn.

Cerceros, Kraatz, Deutsche E. Z. xxiii. p. 126. Allied to *Eros* (*aurora*); narrower, of uniform breadth, antennæ long, strongly pectinated, wings weakly ribbed, with no rows of punctures, and sculptured as in *Dictyoptera*. Type, *C. pectinicornis*, sp. n., *l. c.* pl. ii. fig. 2, Amoor.

Xantheros, Fairmaire, J. Mus. Godeffr. xiv. p. 99. Allied to *Eros*, but with broad, compressed antennæ, the second joint indistinct. Types, *X. ochreatus*, Sydney, *nubicollis*, Queensland, p. 99, and *angulicollis*, Brisbane, p. 100, spp. nn.

Melaneros, id. *l. c.* p. 100. Allied to *Eros*, but penultimate joint of the tarsi entire, antennæ more slender, third joint not smaller than the following, prothorax not areolated, legs more compressed, tibiæ sulcate, and last joint of the maxillary palpi rather less conical and distinct. Types, *M. acuticollis*, Upolu, *atro-violaceus*, *prælongus*, and *lugubris*, Viti, p. 100, *quadraticollis* and *angustiformis*, Tongatabu, &c., p. 101, spp. nn.

Calochromus discicollis, Rockhampton, and *insidiator*, Sydney, *id l. c.* p. 101; *C. segregatus*, figs. 8 & 8 *a* (details), Java, and *tarsalis*, figs. 9 & 9 *a* (details), India, C. O. Waterhouse, *l. c.* pp. 5 & 6, pl. i.

Lycus inermis and *spinosus*, Harold, C. H. xvi. p. 104, Pungo Andongo; *L. fernanditzi*, E. Duges, Nat. Mex. iv. p. 175, figs. 5 & 6, Mexico.

Dictyoptera atricollis, Amoor, p. 125, *ruficentris*, Kŭlek, p. 125, note, Kraatz, Deutsche E. Z. xxiii.

Lygistopterus umhangi, Bourgeois, Ann. Soc. Ent. Fr. (5) ix. p. 18, Colombia.

Lycostomus æqualis, China, figs. 7 & 7 *a* (details), p. 10, *vulpinus*, Sumatra, figs. 8 & 8 *a* (details), *modestus*, Bhutan, fig. 10, pl. ii., *ambiguus*, Cachar, pl. iii. figs. 3 & 3 *a* (details), p. 11, *singularis*, S. India, pl. ii. figs. 9 & 9 *a* (details), *rufiventris*, Burma, fig. 2, p. 12, *placidus*, Hong Kong, figs. 7 & 7 *a* (details), p. 14, *angustatus*, Java, fig. 9 (*angustulus* on plate), *debilis*, N. China, figs. 8 & 8 *a* (details), *striatus*, India, fig. 11, p. 15, and *thoracicus*, fig. 1, p. 16, pl. iii., C. O. Waterhouse, *l. c.*

Porrostoma textile, id. *l. c.* p. 46, pl. xi. figs. 9 & 9 *a* (details), Moreton Bay.

Metriorrhynchus flavicollis, pl. xii. figs. 9 & 9 *a* (details), Batchian, *rusticus*, Mysol, figs. 2 & 2 *a* (details), p. 51, *cribripennis*, Ternate, Batchian, fig. 6, *philippinensis*, Philippines, figs. 4 & 4 *a* (details), *sericeus*, Java, figs. 5 & 5 *a* (details), p. 52, and var., India, *sericans*, figs. 7 & 7 *a* (details), India, *immersus*, fig. 1, Aru and Dorey, p. 53, *nobilis*, New Guinea, fig. 3, *vagans*, Sumatra, figs. 10 & 10 *a* (details), p. 54, *simulans*, Penang, fig. 11, p. 55, pl. xiii., *atro-fuscus*, Borneo, fig. 1, *rubicundus*, Sylhet, figs. 2 & 2 *a* (details), and *flavo-lateralis*, Aru, figs. 4 & 4 *a* (details), p. 56, *ater*, Dorey and Aru, figs. 7 & 7 *a* (details), *angustulus*, figs. 5 & 5 *a* (details), and *puncticollis*, fig. 3, Dorey, p. 57, *orientalis*, Siam, fig. 8, and *dilutus*, Mysol, figs. 6 & 6 *a* (details), p. 58, pl. xiv., *id. l. c.*

Calopteron semivittatum, Rio Negro, fig. 14, p. 26, *vagipictum*, Ubaque, p. 28, *pyrrhomelas*, p. 31, fig. 17, *pennatum*, p. 32, fig. 18, *rubro-testaceum*, p. 33, *insidiosum*, p. 34, *lepidum*, p. 35, *blandulum*, p. 37, *muhlenbecki*, p. 38, *exile* and *acupalpe*, fig. 20, Colombia, p. 39, J. Bourgeois, *l. c.* pl. iv. details; *C. volxemi* and *juvenile*, p. xvi., and *anxium* (Dej. Cat.), p. xvii., *id.* CR. Ent. Belg. xxii., Brazil; *C. jimenezi*, E. Duges, *l. c.* p. 181, fig. 8, Mexico.

Cania dondonensis and *calida*, Harold, C. H. xvi. pp. 105 & 106, Dondo; *C. bourgeoisi*, id. S. E. Z. xl. p. 333, Japan.

Cladophorus ingenuus, Dorey, figs. 2 & 2 *a* (details), *fuscatus*, Waigiou, fig. 6, *detractus*, Aru, figs. 4 & 4 *a* (details), p. 64, and *ornatus*, New Guinea, fig. 1, p. 65, C. O. Waterhouse, *l. c.* pl. xvi.

Eros wankowiczi, Bourgeois, Bull. Soc. Ent. Fr. (5) ix. p. xxxix., Lithuania; *E. granicollis* and *atro-rufus*, Kiesenwetter, Deutsche E. Z. xxiii. p. 305, Japan.

Trichalus griseus, Dorey, fig. 3, p. 69, *nigrescens*, Mysol, figs. 4 & 4 *a* (details), *perturbatus*, Dorey, Mysol, Amboina, figs. 7 & 7 *a* (details), and *detractus*, Waigiou, figs. 5 & 5 *a* (details), p. 70, *niger*, Java, Banda, figs. 8 & 8 *a* (details), *communis*, Java, fig. 9, p. 71, and *cyaneiventris*, Philippines, fig. 6, p. 72, pl. xvii., C. O. Waterhouse, *l. c.*

Lampyrides.

Glow-worms and fire-flies, their enemies and their prey; Nature, xx. pp. 197, 219, 220, & 243.

Luciola fuscipes, sp. n., Harold, C. H. xvi. p. 106, Pungo Andongo.

Drilides.

Drilaster, g. n., Kiesenwetter, Deutsche E. Z. xxiii. p. 310. Type, *D. axillaris*, sp. n., *l. c.* p. 311, Japan.

Cyphonocerus, g. n., *id. l. c.* p. 311. Allied to last; type, *C. ruficollis*, sp. n., *l. c.* p. 312, Japan.

Telephorides.

Ritsema, C. On Five New Species of the Genus *Ichthyurus*, Westw. Notes Mus. Leyd. i. pp. 75–85.

Includes a list of the described species.

Chauliognathus excellens, C. O. Waterhouse, figured by him; Cist. Ent. ii. pl. ix. fig. 1.

Selenurus, g. n., Fairmaire, J. Mus. Godeffr. xiv. p. 99. Allied to *Ichthyurus*, but palpi not securiform, elytra nearly three times as long as the prothorax, and attenuated at the tip; and the abdomen not distinctly furcate at the tip. Type, *S. luteo-pictus*, sp. n., *l. c.*, Peak Downs.

Podabrus heydeni, Kiesenwetter, Deutsche E. Z. xxiii. p. 306; *P. reini*, Heyden, *op. cit.* p. 351, and Ber. senck. Ges. 1878-79, p. 87: spp. nn., both from Japan.

Silis madagascariensis, sp. n., C. O. Waterhouse, Ann. N. H. (5) iii. p. 380, Madagascar.

Ichthyurus niponicus, Lewis, *op. cit.* iv. p. 463, Hiogo; *I. octo-punctatus* (Voll., MS.), p. 76, and *bifasciatus*, p. 77, Java, *suturalis*, p. 78, and *planifrons*, p. 81, Sumatra, and *gestroi*, p. 82, Bogos, N. Abyssinia, C. Ritsema, *l. c.*

Malthinides.

Malthinus mutilatus and *mucoreus*, spp. nn., Kiesenwetter, Deutsche E. Z. xxiii. pp. 308 & 309, Japan.

Malthodes rubricollis, sp. n., *id. l. c.* p. 309, Japan.

Malachiides.

Tholin, A. Tableau synoptique des espèces françaises du genre *Malachius*. Feuill. Nat. ix. pp. 133–135.

Charopus multicaudis, Kies., figured; De Uhagon, An. Soc. Esp. viii. pl. iv. figs. 4 & 5.

New species:—

Hapalochrus formosus, Harold, C. H. xvi. p. 107, Pungo Andongo.

Laius guttulatus, p. 101, *rugulipennis*, Peak Downs, *plagiaticollis*, Australia, *quinque-notatus*, Rockhampton, *quinque-plagiatus*, Queensland, p. 102, *verticalis* and *insignicornis*, Peak Downs, *rufo-virens*, Gayndah, p. 103, *fastidiosus* and *oblongo-signatus*, Peak Downs, and *asperipennis*, Queensland, p. 104. Fairmaire, J. Mus. Godeffr. xiv.

Malachius oberthuri, De Uhagon, An. Soc. Esp. viii. p. 209, pl. iv. fig. 3 *a*, Badajoz; *M.* (?) *sibiricus* and *M.* (?) *christophi*, Kiesenwetter, Deutsche E. Z. xxiii. p. 146, Amoor.

Attalus xanthopus, id. *ibid.*, Amoor; *A. australis*, Fairmaire, *l. c.* p. 104, Sydney.

Ebæus caspius, (Kies., MS.) Reitter, Verh. z.-b. Wien, xxix. p. 475, Caucasus.

Pseudebœus obscurus, Le Conte, Bull. U. S. Geol. Surv. v. p. 515, Colorado.

Carphurus xanthochrous, Gayndah, *tachypor[o]ides*, Peak Downs, *cristatifrons*, p. 105, *segmentarius* and *nubipennis*, Peak Downs, *marginiventris*, Sydney, *telephoroides*, p. 106, *æneipennis* and *læsifrons*, Peak Downs, *diophthalmus*, Gayndah, and *facialis*, p. 107, *r[h]agonychinus*, Sydney, *alterniventris*, Peak Downs, *philonthoides*, Rockhampton, p. 108, *armipennis*, Queensland, *atronitens*, Sydney, *scapulatus*, Rockhampton, *basipennis* and *fasciipennis*, Peak Downs, p. 109, *id.* l. c.; *C. rubro-segmentatus*, id. Le Nat. i. p. 46, Duke of York Island.

Balænophorus janthinipennis, Sydney, and *B.* (?) *biplagiatus*, Peak Downs, *id.* J. Mus. Godeffr. xiv. p. 110.

Melyrides.

Melyris sansibarica, Zanzibar, and *nigripes*, Lake Nyassa; Harold, S. E. Z. xl. pp. 334 & 335, spp. nn.

Prionocerus fuscipennis, sp. n., Lewis, Ann. N. H. (5) iv. p. 464, Yokohama.

Cleridæ.

Pseudoclerops mutillarius, var. ? *dealbatus* from the Amoor described; Kraatz, Deutsche E. Z. xxiii. p. 128.

New genera and species:—

Pseudosclerosomus, A. Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. xxxii. Form of *Sclerosomus*; prothorax truncated in front, without bristles; femora short and thick, with no spine at the inner margin below. Type, *P. rufo-setosus*, sp. n., *l. c.*, Brazil.

Achlamys, C. O. Waterhouse, Cist. Ent. ii. p. 530. Allied to *Pallenis*, but with prominent eyes, and distinct club to the antennæ. Type, *A. uniformis*, sp. n., *l. c.* p. 531, Antananarivo, Madagascar.

Lissaulicus, id. *l. c.* p. 532. Allied to *Aulicus*; thorax without impressed lines, elytra smooth, antennæ with a large short-oblong club, and labial palpi strongly securiform. Type, *L. lævis*, sp. n., *l. c.*, Fianarantsoa, Madagascar.

Cladiscus rugosus, id. *l. c.* p. 529, Antananarivo.

Pallenis-bipenicillatus, id. *l. c.* p. 530, Antananarivo.

Stenocylidrus frontalis, id. *l. c.* p. 531, Antananarivo.

Eburifera tuberculicollis, p. 532, *lævicollis* and *inclita*, p. 533, *id. l. c.* p. 533, Antananarivo.

Clerus pilosellus, Kiesenwetter, Deutsche E. Z. xxiii. p. 312, Japan.

Tillus lewisi, id. *l. c.* p. 313, Japan.

Cymatodera strangulata, id. *l. c.* p. 314, Japan.

Corynetes (*Opetiopalpus*) *morulus*, id. *ibid.*, Japan.

Ptinidæ.

Xestobium plumbeum, Ill., noticed; Buddeberg, Ent. Nachr. v. p. 144.

New species :—

Ternobia magnifica, Reitter, Verh. z.-b. Wien, xxix. p. 476, Caucasus ; *Sp. uristata* and *exilis*, Kiesenwetter, Deutsche E. Z. xxiii. p. 316, Japan.

Ptinus capellæ, Croatia, p. 52, *biformis*, Caucasus, p. 476, Reitter, *l. c.*; *P.* (*Gymnopterus*) *senilis*, Kiesenwetter, *l. c.* p. 317, Japan.

Episernus analis, id. *l. c.* p. 319, Japan.

Trichodesma lewisi, id. *l. c.* p. 315, Japan.

Ernobius tristis, *gracilis*, Colorado, *luteipennis*, p. 516, *filicornis*, Massachusetts, p. 517, Le Conte, Bull. U. Geol. Surv. v.

Gastrallus marginipennis, id. *l. c.* p. 517, Colorado.

Ptilinus ramicornis, Kiesenwetter, *l. c.* p. 317, Japan.

Xyletinus pectiniferus, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 258, Djemorah.

Dorcatoma sibirica, Reitter, Deutsche E. Z. xxiii. p. 226, E. Siberia; *D.* (*Cænocara*) *granulum*, Kiesenwetter, *op. cit.* p. 318, Japan.

Bostrychidæ.

Rarity of males of *Bostrychidæ* ; Buddeberg, Ent. Nachr. v. pp. 268 & 269.

Sinoxylon bicuspidatum, sp. n., F. C. Ancey, Le Nat. i. p. 139, Alexandria, Arabia.

Bostrychus unicornis, sp. n., C. O. Waterhouse, Ann. N. H. (5) iii. p. 361, Island of Johanna.

Lyctidæ.

Lyctus serie-hispidus, sp. n., Kiesenwetter, Deutsche E. Z. xxiii. p. 319, Japan.

Cioidæ.

Cis pruinosus, Mots., = *boleti*, Scop., *C. flavipes*, Mots., = *hispidus*, Payk. ; Reitter, Deutsche E. Z. xxiii. p. 226.

Cis seriatulus, Kiesenwetter, *l. c.* p. 320, Japan ; *C. lederi*, Reitter, Verh. z.-b. Wien, xxix. p. 477, Caucasus; *C. alienus* and *pacificus*, Honolulu, p. 91, *porcatus* and *signatus*, Oahu, Kauai, &c., p. 92, *bicolor*, Honolulu and *tabidus*, Kauai, p. 93, *diminutivus* and *læticulus*, Honolulu, p. 94, and *evanescens*, Oahu and Kauai, p. 95, D. Sharp, Tr. E. Soc. 1879: spp. nn.

Sphindidæ.

Sphindus obesus, sp. n., Kiesenwetter, Deutsche E. Z. xxiii. p. 318, Japan.

Tenebrionidæ.

Bates, F. Descriptions of new genera and species of *Tenebrionidæ* from the Island of Madagascar. Tr. E. Soc. 1879, pp. 277–307.

Several known genera and species are recharacterized, in addition to the new ones. A table of the species of *Dolichoderus* is given (pp. 278

& 279), *D. klugi*, Cast., approaches *longicornis*, Fairm., *D. klugi*, Sol., is distinct and near *D. mucronatus*, F. Bates ; *D. acuminatus*, Klug, defined (p. 279) ; *D. longicornis*, Fairm. (p. 282), *D. atro-æneseens*, Fairm., and *Nycteropus lævisternus*, Fairm. (p. 286), and *N. anthracinus*, Kraatz (p. 287), redescribed ; *Porphyr[o]hyba*, Fairm., recharacterized (p. 292), and *P. violaceicolor*, Fairm., redescribed ; *Tetraphyllus*, Cast. & Brullé, re-characterized, *T. formosus*, C. & B., being taken as the type (p. 293) ; *T. pyropterus*, Fairm., defined (p. 294). *Nesogena* : several species are discussed (pp. 304 & 305) ; *N. purpureo-limbata*, Dej., = *indelimbata*, Fairm. (p. 307).

[Bates, F.] Characters of the new genera and species of *Heteromera* collected by Dr. Stoliczka during the Forsyth Expedition to Kashgar, in 1873–74. Cist. Ent. ii. pp. 467–484.

Haag-Rutenberg, G. Neue Heteromeren aus dem Museum Godeffroy. J. Mus. Godeffr. xiv. pp. 115–137, pl. vii.

27 species are enumerated in the text, and figured on the plate, and several more are described in the notes ; but as all (with the exception of some of the latter, which will be noticed in their places) have been already described in Verh. Ver. Hamb. iii., there is no occasion to enumerate them here, especially as, by some oversight, no references are given to the plate.

Haag-Rutenberg (Deutsche E. Z. xxiii. pp. 411 & 412) publishes brief synonymic notes on *Heteromera*, of which the following are the most important :—*Epitragus lucens*, Er., = *olivaceus*, Er. ; *Pimelia exanthematica* and *urticata*, Klug, = *tuberosa*, Klug, *P. milearis* and *aggregata*, Klug, = *asperata*, Sol. ; *Amarygmus rugosus*, Germ., = *cupripennis*, Germ. ; *Metriopus platynotus*, Gerst., = *Adesmia gerstæckeri*, Haag, *A. baccata*, Gerst., = *foveicollis*, Haag ; *Phaleria bisignata*, Boh., = *brasiliensis*, Cast., var. ; *Othelecta*, Pasc., = *Cylindrothorus*, Sol., *Apellatus*, Pasc., = *Evomma*, Boh. ; *Cantharis capitata*, Cast., = *philæmata*, Klug, *spectabilis*, Cast., = *eucera*, Chevr., *semivittata*, Fairm., = *hemigramma*, Mäkl., *sulcifrons*, Chevr., = *excavata*, Klug ; *Eletica gigantea*, Dohrn, = *testacea*, Oliv.

Erodiides.

Arthrodeis cicatrix, Yemen, *bidentulus* and *crypticoides*, Arabia and Egypt, Fairmaire, Le Nat. i. (2) p. 4, spp. nn.

Adesmiides.

Stenocara nervosa, S. Benguela, and *verrucilifera*, S. Africa, Haag-Rutenberg, Deutsche E. Z. xxiii. pp. 295 & 296, spp. nn.

Tentyriides.

Syachis, g. n., F. Bates, Cist. Ent. ii. p. 467. *Tentyrinæ* : intermediate between *Ascelosodis* and *Capnisa*. To contain *S. himalaicus* and *picicornis*, spp. nn., *l. c.*, Dras, Kargil, and Leh.

Anatolica montivaga, sp. n., *id. l. c.* p. 470, Yangi Hissar and Kogyar.

Microdera lateralis and *parvicollis*, spp. nn., *id. l. c.* p. 470, Kashgar.

Gnophota angolensis, sp. n., Harold, C. H. xvi. p. 110, Loanda, &c.

Ascelosodis concinnus, Pamir, *assimilis*, *ciliatus*, p. 468, *grandis* and *intermedius*, all from Dras, Kargil, and Leh, and *haagi*, Ladak, p. 469, spp. nn., F. Bates, *l. c.*

Adelostomatides.

Adelostoma grande, sp. n., Haag-Rutenberg, Deutsche E. Z. xxiii. p. 294, Mesopotamia.

Leptodides.

Leptodopsis, g. n., Haag-Rutenberg, Deutsche E. Z. xxiii. p. 409. Allied to *Leptodes*; type, *L. insignis*, sp. n., *l. c.*, Tarbagatai.

Akisides.

Cyphogenia plana, Leh, &c., and *humeralis*, Yangi Hissar, spp. nn., F. Bates, Cist. Ent. ii. p. 471.

Scaurides.

Trogloderus, g. n., Le Conte, N. Am. Ent. ii. p. 2. Type, *T. costatus*, sp. n., *l. c.* p. 3, pl. i. fig. 3, Idaho.

Blaptides.

Eleodes gigantea and *dentipes*. The repugnatorial glands and their secretion described; C. F. Gissler, Psyche, ii. pp. 209 & 210, fig. 10.

Cœlocnemodes, g. n., F. Bates, Cist. Ent. ii p. 474. Allied to *Cœlocnemis* and *Iblis*; surface granulose; anterior femora toothed. Type, *C. stoliczkanus*, sp. n., *l. c.* p. 475, Murree.

Blaps stoliczkana, Pamir, p. 471, *indicola*, Sind Valley, *perlonga* and *ladakensis*, Pankong Valley, p. 472, and *kashgarensis*, Yangi Hissar, p. 473, *id.* l. c.; *B. japonensis*, Marseul, Nouv. et faits, ii. p. 99, Japan: spp. nn.

Prosodes trisulcata, Dras, &c., and *vicina*, Sind Valley, F. Bates, *l. c.* pp. 473 & 474.

Asidides.

Asida syriaca, Allard, is not from Syria, but Marseilles, and probably = *grossa* or *dejeani*; Kraatz, Deutsche E. Z. xxiii. p. 169.

Pimeliides.

New genera and species:—

Bioramix, F. Bates, Cist. Ent. ii. p. 478. Allied to *Platyscelis*; to contain *B. pamirensis*, Pamir, *ovalis*, p. 478, *puncticeps*, Dras, Kargil, and Leh, and *asidioides*, Sind Valley, p. 479, spp. nn., *l. c.*

Chianalus, id. *l. c.* p. 479. Allied to last; type, *C. costipennis*, sp. n., *l. c.* p. 480, Dras, Kargil, and Leh.

Myatis, id. *l. c.* p. 480. Next *Chianalus*; to contain *M. humeralis*, locality unknown, p. 480, *quadraticollis*, between Leh and Yarkand, and *variabilis*, Sirikol, &c., p. 481, spp. nn., *l. c.*

Trigonoscelis setosa, Kashgar, and *lacerta*, Yangi Hissar, *id. l. c.* p. 475.

Pterocoma tibialis, Sanju, *serrimargo*, Kogyar, *convexa*, Kogyar?, p. 476, and *semicarinata*, Yangi Hissar, p. 477, *id. l. c.*

Ocnera sublævigata, id. *l. c.* p. 477, Kashgar.

Molyrides.

Oncosoma planicolle, sp. n., Haag-Rutenberg, Deutsche E. Z. xxiii. p. 289, Nyassa.

Psammodes giganteus, p. 290, *transversicollis*, Delagoa Bay, *lævipennis*, Bechuana Land, p. 291, *gibbus*, Nyassa, p. 292, *crinicollis*, Bechuana Land, p. 293, spp. nn., *id. l. c.*

Trachynotus mœrens, sp. n., *id. l. c.* p. 294, Graham's Town.

Pedinides.

Opatrinus rufimanus, sp. n., Harold, C. H. xvi. p. 116, Pungo Andongo.

Opatrides.

Halonomus lineicollis, sp. n., Fairmaire, Le Nat. i. (2) p. 4, Hedjaz.

Opatrum kashgarense, sp. n., F. Bates, Cist. Ent. ii. p. 481, Kashgar.

Penthicus (*Loboderus*) *gracilis*, sp. n., *id. l. c.* p. 482, Kogyar.

Diaperides.

Diaperis rubro-fasciata, sp. n., Reitter, Deutsche E. Z. xxiii. p. 226, E. Siberia.

Phrenapatides.

Pycnochilus, g. n., C. O. Waterhouse, Tr. E. Soc. 1879, p. 263. Intermediate between *Phrenapates* and *Delognatha*; type, *P. advenus*, sp. n., *l. c.* p. 264, Antananarivo, Madagascar.

Tenebrionides.

Tenebrio elateroides, sp. n., Harold, C. H. xvi. p. 119, Interior of Angola.

Dolichoderus mucronatus, p. 279, and *puncticeps*, Madagascar, *politipennis*, p. 280, *heterocerus* and *lucifugus*, p. 281, and var. (?) *tumidicollis*, p. 282, and *approximatus*, Fianarantsoa, *distinctus*, p. 283, *pectoralis* and *connexus*, p. 284, *pulchripes* and *gibbipennis*, Antananarivo, p. 285, spp. nn., F. Bates, Tr. E. Soc. 1879.

Cnodalonides.

New genera and species :—

Pseudocamaria, F. Bates, Tr. E. Soc. 1879, p. 287. Allied to *Camaria*; type, *C. alternata*, Fairm.; add *P. consobrina*, sp. n., *l. c.* p. 288, Fianarantsoa, Madagascar.

Actanorie, id. *l. c.* p. 289. Allied to last; type, *Camaria undaticollis*, Fairm.

Thettea, id. *l. c.* p. 290. Allied to last; type, *T. tenuitarsis*, sp. n., *l. c.*, Antananarivo.

Drocleana, id. *l. c.* p. 291. Allied to last; type, *Camaria chalchoptera*, Klug; also *C. violaceipennis*, Waterh., and *parvicollis*, Fairm. (redescribed, *l. c.*).

Chemolanus, id. *l. c.* p. 296. Allied to *Tetraphyllus*; type, *T. consobrinus*, Fairm.

Charianus, id. *l. c.* p. 297. Allied to last; type, *T. purpuratus*, Coq.

Amarsenes, id. *l. c.* Allied to last; type, *T. oblongo-camelus*, Fairm. not described, *l. c.* p. 298).

Tetraphyllus fairmairii, Madagascar, and *tuberculipennis*, Antananarivo, p. *l. l. c.* p. 295.

Helopides.

BATES, F. Notes on the *Adeliinæ*, with descriptions of new species. Ent. M. M. xvi. pp. 30–33, 71–75.

The species of *Cardiothorax*, Motsch. (= *Thoracophorus*, Hope, and *Atryphodes* and *Otrintus*, Pasc.) are first tabulated, and afterwards noticed in greater detail, several new species being described.

Helops (*Catomus*) *puber*, All., = *villosus*, Schauf.; Schaufuss, Nunq. Ot. iii. p. 477.

Cardiothorax armipes, Rockhampton, pp. 30 & 71, *femoratus*, Wide Bay, pp. 30 & 71, *valgipes*, New Holland, pp. 31 & 72, *fraternalis*, Queensland, pp. 31 & 72, *politicollis*, Upper Hunter River, N. S. Wales, pp. 31 & 73, *longipes*, Richmond River, Queensland, pp. 31 & 73, *curvipes*, N. S. Wales, pp. 31 & 73, *chalceus*, pp. 31 & 74, and *crassicornis*, pp. 31 & 74, Queensland, *angulatus*, pp. 32 & 75, N. Australia, *grandis*, pp. 32 & 75, N. S. Wales, *acutangulus*, pp. 32 & 131, Brisbane, *captiosus*, pp. 33 & 131, Cape York, &c., *æneus*, pp. 33 & 131, New Holland, *distinctus*, pp. 33 & 132, N. S. Wales, *crenulicollis*, pp. 33 & 132, Endeavour River, *humeralis*, pp. 33 & 133, Australia, and *haagi*, pp. 33 & 133, New Holland, Bates, *l. c.*, spp. nn.

Helops montanus, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 518, Colorado.

Thesilea impressicollis, sp. n., Fairmaire, Le Nat. i. p. 70, Duke of York Island.

Megacanthides.

Hoplonyx angolensis, sp. n., Harold, C. H. xvi. p. 123, Loanda.

Amarygmides.

Amarygmus foveo-seriatus, sp. n., Fairmaire, J. Mus. Godeffr. xiv. p. 114, Duke of York Island.

Strongyliides.

MÄKLIN, F. W. Nya arter af slägtet *Pœcilesthus*, Blanchard. Œfv. Finsk. Soc. xx. pp. 64–94.

One new genus and 22 new species are described in this paper.

——: Några bidrag till kännedom af slägtet *Talanus*, Dej. Cat. *L. c.* pp. 95–103.

The genus is recharacterized, and *T. cribrarius* (Dej., MS.), Duval, and 5 new species are described.

New genera and species :—

Platyesthus, id. *l. c.* p. 92. Allied to *Pœcilesthus*; type, *P. pallidipennis*, sp. n., *l. c.*, Brazil.

Azonoderus, Harold, C. H. xvi. p. 125. Allied to *Strongylium*, before which it should be placed; type, *A. tristis*, sp. n., *l. c.* p. 126, Pu[illegible] xiii. Andongo.

Psilonesogena, F. Bates, Tr. E. Soc. 1879, p. 305. Connecting *Nesogena* and allies with the *Lagriidæ*, through *Statyra*. Type, *P. hybrida*, sp. n., *l. c.* p. 306, Antananarivo.

Pœcilesthus decoratus, Santa Catharina, Brazil, p. 65, *flavo-maculatus*, Paramaribo and Cayenne, p. 66, *albo-marginatus* (Mannerh., MS.), Bahia, p. 68, *laticornis*, Colombia, p. 69, *angulicollis*, Ega, p. 70, *gibbosus*, Rio Janeiro, p. 71, *curvipes*, p. 73, *quadrisignatus*, Peru, p. 74, *infimus*, St. Paulo, p. 75, *basalis*, p. 76, *brevicornis*, p. 78, *octo-punctatus*, p. 79, *octo-notatus*, p. 80, *marginicollis*, p. 81, *decem-signatus*, p. 83, *lineolatus*, p. 84, *pygmæus*, Brazil, p. 85, *tumidus*, Peru, p. 87, *circumcinctus*, Ega, p. 88, *eximius*, Peru, p. 89, and *marginipennis* (Dej., MS.), Cayenne, p. 91; Mäklin, *l. c.*

Talanus insularis, Porto Rico, *columbianus*, Colombia, *brasiliensis*, Brazil, *humilis*, and *subexaratus*, Colombia; *id. l. c.* pp. 98–102.

Nesogena gigantea (Fairm., MS.), Madagascar, *speciosa*, Antananarivo, p. 299, *rutilia* (Fairm., MS.), *lucida*, p. 300, *venusta*, Madagascar, *fairmairii*, p. 301, *castaneipes*, Fianarantsoa, *geniculata*, p. 302, Antananarivo, *varicolor* (Fairm., MS.), p. 303, and *haagi* and *crœsus* (Fairm., MS.), p. 304, Fianarantsoa; F. Bates, *l. c.*

Aspidosternum costatum, Harold, C. H. xvi. p. 131, note, Cape Palmas.

Cistelidæ.

Mycetochares bipustulatus, Ill., var. *croceipes*, from the Caucasus, described; Weise, Verh. z.-b. Wien, xxix. p. 478.

New genera and species :—

Hypocistela, F. Bates, Cist. Ent. ii. p. 482. Near *Cteniopus*, but joint 3 of antennæ much shorter than 4; 3–6 obliquely truncated at apex; palpi slender, terminal joint elongate-oval; eyes larger, more approximate beneath, and more coarsely facetted; prothorax narrower at base than base of elytra, and not curvedly narrowed in front. Type, *H. tenuipes*, sp. n., *l. c.* p. 483, Kogyar.

Labetis, C. O. Waterhouse, Ent. M. M. xv. p. 267. Allied to *Allecula*, but the anterior tibiæ slightly resemble those of *Microzoum*, in the *Opatrides*, but are longer, and without any mesial tooth. Type, *L. tibialis*, sp. n., *l. c.*, Honolulu.

Lisa, Haag-Rutenberg, J. Mus. Godeffr. xiv. p. 134, note; third joint of maxillary palpi very large, thorax convex, cushion-like, antennæ and legs long. Type, *L. singularis*, sp. n., *l. c.* p. 135, note, Queensland.

Allecula (*Dietopsis*) *costipennis*, F. Bates, *l. c.* p. 482, Murree.

Licymnius strigicollis, Fairmaire, J. Mus. Godeffr. xiv. p. 110, Peak Downs.

Anaxo fusco-violaceus, id. *l. c.* p. 111, Peak Downs, Rockhampton.

Homotrysis maculata, Haag-Rutenberg, J. Mus. Godeffr. xiv. p. 136, note, Cape York.

Heliotaurus puncto-sulcatus, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 242, Sierra-Morena.

Monommatidæ.

Monomma quadrimaculatum, Philippines, *pilosum*, p. 379, and *abstrusum*, p. 380, both from Madagascar; C. O. Waterhouse, Ann. N. H. (5) iii., spp. nn.

Pythidæ.

Rhinosimus viridiæneus, Randall, noticed and figured by Le Conte, N. Am. Ent. i. p. 4, pl. i. fig. 5 (*R. nitens*, Lec., is probably not distinct).

Melandryidæ.

Opsigonus krueperi, Baudi, = *Neogonus plasoni*, Hampe; Heyden, Deutsche E. Z. xxiii. p. 167.

Lederia, g. n., Reitter, Verh. z.-b. Wien, xxix. p. 478. Allied to *Orchesia*; type, *L. suramensis*, sp. n., *l. c.* p. 479, Caucasus.

Amblyctes, g. n., Le Conte, N. Am. Ent. i. p. 3. Type, *A. præses*, sp. n., *l. c.* pl. i. fig. 4, Buffalo.

Tetratoma concolor, sp. n., Le Conte, Bull. U. S. Geol. Surv. v. p. 518, Colorado.

Neogonus fausti, sp. n., Reitter, Verh. z.-b. Wien, xxix. p. 546, Baku.

Nothus luteus, sp. n., Horn, Tr. Am. Ent. Soc. vii. p. 339, California.

Lagriidæ.

Mäklin, F. W. Diagnoser öfver förut obeskrifna *Statira*-arter från Nya Granada. Œfv. Finsk. Soc. xx. pp. 104–117.

28 new species are described.

——. Fabricii och Erichsons *Statira*-arter ånyo beskrifna. *L. c.* xxi. pp. 243–247.

The species redescribed are: (*Anthicus*) *ruficollis*, *fulvicollis* (and var. *abdominalis*), *fuscipennis*, Fabr., and *Statira cælata*, Er.

Lagria. 4 Indian species described by Hope are omitted from the Munich Catalogue, one of which, *L. basalis*, probably = *L. bicolor*, Koll.; C. A. Dohrn, S. E. Z. xl. p. 366.

Lagria elliptica, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 242, Central Spain; *L. indicola*, F. Bates, Cist. Ent. ii. p. 483, Murree; *L. apicata*, Harold, C. H. xvi. p. 133, Loanda: spp. nn.

Statira sum[p]tuosa, *nubeculosa*, p. 105, *brevicollis*, *impressicollis*, *hilaris*, p. 106, *terminalis*, *cupripennis*, p. 107, *gratiosa*, *steinheili*, p. 108, *nigella*, *picipennis*, p. 109, *cribripennis*, *fusca*, p. 110, *ferruginea*, *lævigata* p. 111, *virescens*, *trilineata*, *lateralis*, p. 112, *medialis*, *sordida*, p. 113, *quadrimaculata*, *sexmaculata*, p. 114, *literata*, *exigua*, p. 115, *cyanipennis*,

trifasciata, *cylindricollis*, p. 116, and *validicornis*, p. 117 ; Mäklin, Œfv. Finsk. Soc. xxi., New Granada: spp. nn.

Egestria griseo-lineata, Peak Downs, *pallitibia*, Rockhampton, Fairmaire, Le Nat. i. p. 70, spp. nn.

Pedilidæ.

Ischalia patagiata, sp. n., G. Lewis, Ann. N. H. (5) iv. p. 463, S. Japan.

Anthicidæ.

Marseul, S. de. Monographie des Anthicides de l'ancien-monde. L'Ab. xvii. pp. 1–268, pls. i. & ii.

The known genera and species are redescribed, and tables of species are prefixed to each genus. The genus *Anthicus* is divided into 19 groups. A complete catalogue and index of species are added. The plates represent the following species: *Notoxus mauritanicus*, Luc., ♂, and horn of ♀, figs. 1 & 1 *a*, *Mecynotarsus bicinctulus*, Mars., fig. 2, *Amblyderus scabricollis*, Laf., fig. 3, *Formicomus ninus*, Laf., fig. 4, *Tomoderus compressicollis*, Mars., fig. 5, *Anthicus rodriguesi*, Latr., (prothorax) fig. 6, *humilis*, Germ., (prothorax) fig. 7, pl. i., *tenuipes*, Laf., fig. 1, *instabilis*, Schmidt, ♂, fig. 2, *sellatus*, Panz., fig. 3, *nectarinus*, Panz., fig. 4, *4-guttatus*, Rossi, (prothorax) fig. 6, *genæi*, Laf., (prothorax) fig. 7, *olivaceus*, Laf., (prothorax) fig. 8, and *Ochthenomus bivittatus*, Truq., fig. 5, pl. ii.

New species :—

Formicomus suratus, F. Baudi, Ann. Ent. Belg. xxii. p. lxxxvii., Northern Africa; *F. parallelus*, Marseul, L'Ab. xvii. p. 50, Mesopotamia.

Tomoderus italicus, id. *l. c.* p. 61, Naples.

Notoxus haagi, id. *l. c.* p. 28, Japan.

Mecynotarsus truquii (Laf., MS.), Syria, Cyprus, *mellii* (Laf., MS.), Egypt, p. 41, and *bicinctulus*, Mesopotamia, *id. l. c.*

Anthicus (*Leptaleus*) *arabs*, Hedjaz, p. 72, *A.* (*Stenidius*) *saulcii*, Jerusalem, p. 75, *A. inderiensis* (Mots., MS.), Caspian, p. 78, *femoralis*, Montpellier, p. 82, *coniceps*, Algeria, Portugal, p. 83, *larvipennis*, Alexandria, p. 85, *bicarinula*, Cyprus, p. 86, *phoxus*, Mesopotamia, Hedjaz, p. 87, *lameyi*, p. 88, *lucidicollis*, Algeria, p. 89, *thessaleus*, Salonica, p. 97, *rhagis*, Mesopotamia, *lotus*, Sarepta, p. 98, *turca*, Turkey, p. 90, *4-spilus*, p. 104, *læviceps*, Mesopotamia, p. 105, *cinctomus*, Jerusalem, p. 106, *lateriguttatus* (Mots., MS.), Volga, p. 107, *rufivestis*, p. 108, *collaciculus*, Algeria, p. 113, *velatus*, Hedjaz, p. 115, *tobias*, Mesopotamia, p. 125, *peplifer* and *rare-punctatus*, p. 126, *megalops*, Hedjaz, p. 127, *capilliger*, Jedda, p. 128, *heydeni*, Andalusia, p. 132, *desertus* (Mots., MS.), Transbaikal, p. 134, *flavisternus*, Mesopotamia, p. 149, *steppensis* (Mots., MS.), Kirghis Steppes, p. 151, *simplex* (Mots., MS.), Dauria p. 156, *luteipes*, Jerusalem, p. 159, *maurus* (Reiche, MS.), Algeria, p. 160, *lucasi* (Laf., MS.), Algeria, p. 163, *sabulosus* (Laf., MS.), Dauria, p. 172, *inæqualis* (Mots., MS.), S. Russia, p. 173, *diversus* (Laf., MS.), Russia, p. 174, *difformis* (Mots., MS.), Sea of Azof, p. 178, *proximus*, Turkey,

Greece, p. 179, *laticollis*, Hedjaz, p. 186, *tumidipes*, Algiers, p. 195, *fuscipes*, Spain, Sicily, p. 199, *cantabricus*, Andalusia, p. 212, *melanocephalus* (Mots., MS., ? = *piciceps*, Desb.), S. Russia, p. 216, *caspius* (Becker, MS.), Sarepta, p. 223, *funerarius* (Laf., MS.), locality not stated, *calliger*, S. France, Greece, p. 225, *ovatus* (Kies., MS.), Greece, p. 229, *mohammedis*, Hedjaz, p. 232, *id.* l. c.; *A. wollastoni*, F. H. Waterhouse, J. L. S. xiv. p. 532, St. Helena.

Pyrochroidæ.

Pyrochroa japonica, sp. n., Heyden, Ber. senck. Ges. 1878–79, p. 88, Deutsche E. Z. xxiii. p. 354, Kioto, Japan.

Rhipidophoridæ.

Metœcus paradoxus and other insects found in wasps' nests; H. Gradl, Ent. Nachr. v. pp. 224 & 225, 326 & 330.

Myodites subdipterus. The larva is parasitic on that of *Halictus sexcinctus*, Latr.; J. H. Fabre, C. R. lxxxix. p. 1081.

Cantharidæ.

Duges, E. Descripcion de algunos Meloideos indigenas. Nat. Mex. i. pp. 100-113, 125-128, 157-171 [omitted from Zool. Rec. vii. 1870]; iv. pp. 57–67, pl. (1879).

The following known species are redescribed and figured (with details): *Henous conferta*, Say, p. 102, pl. i. fig. 3, *Horia maculata*, Fab., p. 103, pl. i. fig. 4, *Tetraonyx frontalis*, Chevr., p. 105, *Cantharis bifasciata*, Sturm, p. 106, pl. i. fig. 6, *Cantharis quadrimaculata*, Dej., p. 108, *eucera*, Chevr., p. 109, pl. i. fig. 9, *cardinalis*, Chevr., p. 111, pl. i. fig. 12, *mylabrina*, Chevr., p. 125, *funesta* (iv. p. 67, fig. 5), and *cinctipennis*, Chevr., p. 126, pl. ii. fig. 3, *rufipennis*, Chevr. p. 127, and *obesa*, Chevr., p. 128 (iv. p. 67, fig. 4), *terminata*, Sturm, p. 157, pl. ii. fig. 12, and *C. punctum*, Deyr., p. 158, pl. ii. fig. 9; *Nemognatha versicolor*, Chevr., p. 167, pl. ii. fig. 12; *C. ochreipennis*, Sturm, p. 57, fig. 1, *marginata*, Fabr., fig. 2, and *cinctella*, Dej., fig. 3, p. 59, *tenuicostata*, Deyr., p. 58, fig. 6, *albo-lineata*, Sturm, p. 64, fig. 9, and *ebenina*, Chevr., p. 66, fig. 10.

Haag-Rutenberg, —. Beiträge zur Kenntniss der Canthariden. *Tetraonyx*. S. E. Z. xl. pp. 249–279, 287–314.

A complete monograph of the genus, all the species being described, and a table of species prefixed. Out of 31 species previously described, *T. dispar*, Germ., is a true *Cantharis*; *bipunctatus*, Serv., = *trinotatus*, Klug, var.; *cubensis*, Chevr., = *cruciatus*, Cast.; *ventralis*, Chevr., = *bicolor*, Serv.; and *rufus*, Dug., = *fulvus*, Lec. On the other hand, 49 new species are described, raising the total number now known to 75 species.

——. Beiträge zur Kenntniss der Canthariden. II. *Spastica*, Luc. *L. c.* pp. 513–519.

The species are tabulated and described, being raised to 16 by the addition of several new ones.

Riley, C. V. Notes on the Life-History of the Blister Beetles, and on the structure and development of *Hornia*. Canad. Ent. xi. pp. 30 & 31.

Medical value of various Mexican *Cantharidæ*; H. Gonzalez, El Repertorio, i. p. 12, and Nat. Mex. iv. Rivista Cientifica, pp. 6 & 7.

Tricrania stansburii found abundantly among buffalo bones and skulls; S. W. Williston, Am. Nat. xiii. p. 25.

Cantharis vesicatoria. Transformations described or noticed; Lichtenstein, C. R. lxxxviii. pp. 1089-1092; Ann. N. H. (5) iv. pp. 169 & 170; Bull. & Ann. Soc. Ent. Fr. (5) ix. pp. xxv., lxv., lxxii., lxxvi., & 44; CR. Ent. Belg. xxii. p. lxxxviii.; An. Soc. Esp. viii. pp. 36–38; P. E. Soc. 1879, pp. xxx. & xxxi.; Ent. M. M. xv. p. 34; SB. z.-b. Wien, xxix. pp. 31 & 32. The young larva feeds on honey, and is certainly parasitic in the nests of bees; afterwards it becomes a pupa which gives birth to another form of larva, which eats nothing, and soon changes into a second form of pupa, from which the perfect insect emerges.

Its powerful and offensive odour; V. R. Perkins, Ent. xii. p. 274. Its ravages on lilac, &c., at Lyons; P. Tillet, Feuill. Nat. ix. pp. 37 & 38.

Hornia minutipennis, Riley. Habits and transformations noticed by him; P. Am. Ass. 1878, pp. 284 & 285.

Sitaris apicalis. Larva parasitic on *Colletes fodiens*; J. Lichtenstein, Pet. Nouv. ii. p. 298, and Bull. Soc. Ent. Fr. (5) ix. p. xxv.

New genera and species :—

Iselma, Haag-Rutenberg, Deutsche E. Z. xxiii. p. 402. Allied to *Nemognatha*, *Cantharis*, and *Mylabris*; maxillary palpi not threadlike; claws not dentated; eyes rounded, body hairy, antennæ slender. To contain *Meloe ursus*, Thoms., and *hirsuta*, Thunb. (redescribed, pp. 403 & 404), and the following new species:—*I. flavipennis* (Dej., MS.), p. 404, *rufipennis* (Germ., MS.; ? = *Meloe rugosus*, Thunb.), *brunneipes* (Chevr., MS.), p. 405, *rubripennis* (Dej., MS.), *pallidipennis*, p. 406, and *erythroptera*, p. 407, Cape.

Treiodons barranci, g. & sp. nn., Duges, Nat. Mex. i. pp. 102 & 169, pl. i. figs. 1 & 2, Mexico (1870).

Meloe servulus, F. Bates, Cist. Ent. ii. p. 483, between Leh and Yarkand?.

Tetraonyx pectoralis (Buq., MS.), Colombia, *anthracinus* (Buq., MS.), p. 257, *albo-maculatus* (Buq., MS.), Brazil, *undulatus*, Cayenne, p. 258, *lugubris*, Brazil, p. 259, *proteus*, Mexico, Honduras, Guatemala, p. 260, *krausi*, p. 262, *borrii* (with varr. *oculatus* and *ornatus*), p. 263, *zonatus*, p. 264, Brazil, *haroldi*, Rio Janeiro, p. 265, *intermedius*, S. Catharina, Brazil, *croceicollis*, Rio Janeiro, p. 266, *bipartitus*, Mexico, *batesi*, Guatemala, Mexico, p. 267, *brunnescens*, Parana, p. 268, *decipiens*, Mexico, p. 269, *angulicollis*, Mexico (?), p. 270, *rogenhoferi*, Brazil, *badeni*, Mexico, Ecuador, p. 271, *mniszechi*, Colombia, p. 273, *variabilis*, Brazil, Venezuela, p. 274, *nigricornis* (Klug, MS.), Colombia, Brazil, p. 275, *brucki*, Brazil, p. 288, *clythroides*, Salto-Grande, *dohrni*, St. João de Rey, p. 290, *humeralis* (Buq., MS.), p. 291, *pallidus*, p. 294, Brazil, *kirschi*, Mendoza, *dey-*

rollii, locality unknown, p. 295, *chevrolati*, Bolivia, p. 296, *cyanipennis* (Mor., MS.), Colombia, *nigrifrons*, Peru, p. 298, *thoracicus* and var. *sanguinicollis*, Brazil, *sallæi*, Cordova, p. 299, *nanus* and *telephoroides*, p. 300, *maculicollis*, p. 301, *chrysomelinus* (Klug, MS.), p. 302, *nigriceps*, p. 303, *albo-marginatus* (Chevr., MS.), Brazil, *moritzi*, Venezuela, p. 304, *minor*, Bahia, *circumscriptus*, St. Paulo, p. 305, *quadrinotatus*, Colombia, p. 308, *dilutus*, La Guayra, *marseuli*, Bolivia, p. 309, and *bilineatus*, Pernambuco, p. 311, Haag-Rutenberg, S. E. Z. xl.; *T. femoralis* and *rufus*, Duges, Nat. Mex. i. pp. 104 & 105, pl. i. figs. 8 & 7, Mexico (1870).

Epicauta taishoensis, Lewis, Ann. N. H. (5) iv. p. 464, Tsusima, Japan; *E. haagi*, F. Bates, Cist. Ent. ii. p. 483, Murree.

Cantharis fasciolata, Jimenez, Gaz. med. Mex. ii. No. 16, and Duges, Nat. Mex. i. p. 107, pl. i. fig. 5, *cuadrinervata*, Herrera & Mendoza, Gaz. med. Mex. ii. No. 17, and Duges, *l. c.* p. 109, *variabilis*, p. 111, pl. i. fig. 11, and *cupræola*, p. 112, pl. ii. fig. 6, *stigmata* (= *Epicauta nigritarsis*, Chevr.; sec. Duges, *l. c.* iii. p. 48), p. 159, pl. ii. fig. 8, *cinerea*, pl. ii. fig. 5 (*cf.* also iii. p. 49), and *ocellata*, p. 160, pl. ii. fig. 10, *punctuata*, pl. ii. fig. 1, and *nigra*, p. 161, pl. ii. fig. 7, *nigerrima*, p. 162, pl. i. fig. 10, *rufipedes*, p. 163, pl. ii. fig. 4, *ochreaceipennis*, p. 164, pl. ii. fig. 2, Duges, *l. c.*, *divergata*, Villada & Peñafiel, Gaz. med. Mex. iii. No. 1, and Duges, *l. c.* p. 164, and *eryt*[*h*]*rot*[*h*]*orax*, Mendoza & Herrera, *l. c.* iii. No. 1, and Duges, *l. c.* p. 166, Mexico (1870) (*C.* "*erytrotorax*" = *bisignata*, Sturm; sec. Duges, *l. c.* iii. p. 49); *C. protarsalis*, Duges, *l. c.* iv. p. 62, figs. 7 & 8, Mexico; *C. posticalis*, Fairmaire, Le Nat. i. p. 46, Queensland; *C. reini*, Kiesenwetter, Deutsche E. Z. xxiii. p. 307, Japan.

Spastica chilensis, Chili, *variabilis*, Bahia, p. 514, *globicollis* (Germ., MS.), p. 515, *marginalis*, p. 518, and *corallicollis*, p. 519, Brazil, Haag-Rutenberg, S. E. Z. xl.

Palæstra eucera, Fairmaire, J. Mus. Godeffr. xiv. p. 111, Gayndah.

Zonabris andongoana, Harold, C. H. xvi. p. 138, Pungo Andongo.

Zonitis bipartita, Australia, *obscuripes*, Peak Downs, *seminigra*, Swan River, *splendida*, *rugosipennis*, *flavicrus*, and *nigro-ænea*, Australia, Fairmaire, Le Nat. i. p. 46; *Z. rubra*, Duges, *l. c.* i. p. 166, pl. ii. fig. 13, Mexico (1870).

Sitaris (*Criolis*) *pectoralis*, F. Bates, Cist. Ent. ii. p. 484, Kogyar.

Nemognatha angolensis, Harold, C. H. xvi. p. 142, Loanda?; *N. zonitoides*, Duges, *l. c.* iii. p. 47, figs. *a*.1–*h*.1, Mexico (1876).

ŒDEMERIDÆ.

Ditylus lævis, Fabr. Locality; Rosenhauer, CB. Ver. Regensb. xxxiii. pp. 37 & 38.

Sessinia holoxantha, sp. n., Harold, C. H. xvi. p. 143, Loanda.

MYCTERIDÆ.

HORN, G. H. Notes on the *Mycteridæ* and other *Heteromera*. Tr. Am. Ent. Soc. vii. pp. 336–339.

Relates to *Mycterus scaber*, Hald., *concolor* var. *flavipennis*, Horn, *quad-*

ricollis, Horn, *Lacconotus punctatus*, Lec., and a few new species. The *Mycteridæ* appear to be allied to the *Melandryidæ* and *Pythidæ*, but nearest to the former. The writer regards it as an open question whether these two families themselves should remain separated.

Mycterus canescens, sp. n., Horn, Tr. Am. Ent. Soc. vii. p. 337, California, Nevada.

Lacconotus pinicola, sp. n., *id. l. c.* p. 338, Colorado, W. Nevada.

Aglycyderidæ.

Proterhinus. D. Sharp discusses the characters of this genus, and reasserts his opinion that it should be placed with *Aglycyderes* in an isolated family at the beginning of the *Rhynchophora*. Tr. E. Soc. 1879, pp. 78–81.

Proterhinus nigricans, p. 95, and *callaris*, Kauai, *humeralis*, p. 96, *pusillus* and *longulus*, p. 97, Honolulu, *basalis*, Kauai, *sternalis*, p. 98, and *lecontii*, p. 99, Maui, and *paradoxus*, Honolulu, p. 100, *id. l. c.*, spp. nn.

Curculionidæ.

Aulessanty (L'Arbé de). Rhyncophores de l'Amerique du nord du Mexique. Mem. Soc. Aube, xlii.

[Not seen by the Recorder.]

Hypera rumicis and *Cionus scrophulariæ*. The cocoons formed by these species, and by various parasites of the former, are described by J. A. Osborne, Ent. M. M. xvi. pp. 16–18.

Brachyderides.

Naupactus darius, Germ., is a *Eurymetopus*; *N. lacertosus*, Er., is a *Pantoplanes*; *N. stupidus*, *nobilis*, and *crudelis*, Boh., belong to *Pantomerus*. A. Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. cxxx.

Polydrosus binotatus, Thoms. (1868), = *melanostictus*, Chevr. (1869), = *arvernicus*, Desbr. (1869): Heyden, Deutsche E. Z. xxiii. p. 167.

Cyphus hilaris, Perty, is distinct from 16-*punctatus*, L.; C. A. Dohrn, S. E. Z. xl. p. 247.

New genera and species :—

Hoplopactus (Jekel), Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. lxxxiv. Allied to *Naupactus* and *Plectrophorus*; to include *N. injucundus*, Sch. (of which *N. temperans*, Sch., is the ♀), *N. pavidus*, Boh., *Mimographus dentipes*, Kirsch, and *H. inustus*, Caraccas, and *impuber*, N. Granada, spp. nn., *l. c.* p. lxxxv.

Cyphopsis, Roelofs, CR. Ent. Belg. xxii. p. lii. Allied to *Cyphus*; types, *C. jekeli* and *clathratus*, spp. nn., *l. c.*, Brazil.

Cnemidothrix, Fairmaire, Le Nat. i. (3) p. 3. Allied to *Apocyrtis*; type, *C. protensus*, sp. n., *l. c.*, Viti.

Blosyrus æqualis, Harold, C. H. xvi. p. 143, Interior of Angola.

Pseudocneorrhinus setosus and *minimus*, Japan, and *adamsi*, Manchuria. W. Roelofs, CR. Ent. Belg. xxii. p. liii.

Lemarus carinatus, Haag-Rutenberg, J. Mus. Godeffr. xiv. p. 134, note, Adelaide.

Strophosomus ocularis, Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. cxxxix., Hungary.

Platytarsus cruciatus, Stierlin, Verh. z.-b. Wien, xxix. p. 481, & MT. schw. ent. Ges. v. p. 431, Suram, Caucasus.

Pholicodes quadrivittatus and *elongatus*, Tournier, Verh. Ver. Brünn, xvii. pp. 27 & 28, Armenia.

Eusomus pulcher, Kirsch, Verh. Ver. Brünn, xvii. p. 29, Caucasus.

Brachyderes circumcinctus, p. cxix., *cinctellus*, *apicalis* (Reiche, MS.), p. cxx., and *cinereus*, p. cxxi., *id. l.* c., Spain; *B. nigro-sparsus*, Béziers, *aquilus*, Blidah, and *palliditarsus*, Algiers, Chevrolat, Le Nat. i. p. 93.

Plectrophorus bifasciatus, *unicolor*, *acuminatus*, Colombia, *impressicollis*, Cayenne, Amazon, p. lxxvii., *albilabris*, Bogota, p. lxxviii., *humeralis*, p. cxlviii., Amazons, *id.* Bull. Soc. Ent. Fr. (5) ix.

Metallites lusitanicus, id. *l. c.* p. cxxxix., Portugal.

Polydrosus ionicus, id. *ibid.*, Greece.

Thylacites inflaticollis, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 243, Sierra Morena.

Piazomias lewisi, Roelofs, CR. Ent. Belg. xxii. p. liii., Japan.

Tanymecus setulosus, Chevrolat, Le Nat. i. p. 126, Spain; *T. angustulus*, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 243, Sierra Morena.

Polycleis livingstonii and *angusticollis*, F. C. Ancey, Le Nat. i. p. 140, Zambesi; *P. vittatus*, Harold, C. H. xvi. p. 144, Interior of Angola.

Siderodactylus gravidus, id. *l. c.* p. 145, Loanda; *S. ornatus*, Pascoe, Ent. M. M. xv. p. 185, injurious to grape vines (imported from the Cape of Good Hope), in Ascension.

Platyaspistes limbatus, *validus*, and *lateralis*, Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. cxxvi., Chili.

Hadropus (?) *brevipennis*, id. *l. c.* p. cv., Cayenne.

Cyphus oliveiræ and *elegans*, Roelofs, *l. c.* p. lii., Brazil.

Præpodes annulo-notatus, C. O. Waterhouse, Cist. Ent. ii. p. 423, pl. ix. fig. 3, Medellin, Colombia.

Exophthalmus sulphuratus, Cuba, *hieroglyphicus*, St. Domingo, p. xcvii., *maculosus*, Cuba, and *martinicensis*, Martinique, p. xcviii., Chevrolat, *l. c.*

Rhinoscapha schmeltzi, Fairmaire, J. Mus. Godeffr. xiv. p. 112, Duke of York Island.

Psalidium planicolle, Rhodes, *rufescens*, Levant, and *subfa*[*s*]*ciatum* (Reiche, MS.), Syria, Chevrolat, Le Nat. i. p. 133.

Pachyrrhynchus decempustulatus, R. Gestro, Ann. Mus. Genov. xiv. p. 562, New Guinea; *P. crœsus*, R. Oberthür, *op. cit.* p. 570, pl. i. fig. 2, Sanghir.

Apocyrtus impressus and *viridis*, Chevrolat, *l. c.* pp. 133 & 134, Dorey.

Otiorrhynchides.

TOURNIER, H. Matériaux pour servir à une monographie des espèces européennes et circumeuropéennes du genre *Myllocerus*, Schönh. Ann. Ent. Belg. xxii. pp. 109–114.

The range of the genus is discussed, its characters defined, and the Palæarctic species tabulated. Four are described as new.

Otiorrhynchus fuscipes and *niger* taken in cop.; *O. francolinus* is a var. of the former; Stierlin, MT. schw. ent. Ges. v. p. 433.

New species :—

Elytrurus acuticauda, *dentipennis*, and *granatus*, Fairmaire, Le Nat. i. p. 46, Fiji.

Otiorrhynchus tricarinatus, A. Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. cxxxix., Spain; *O. tristriatus*, p. 427, *dispar*, p. 428, *bidentatus*, p. 429, *cinereus*, Caucasus, p. 430, and *attenuatus*, Syria, p. 435, *auro-guttatus*, p. 512, Turkey, *longicornis*, Greece, and *rugirostris*, Croatia, Banat, p. 514, Stierlin, MT. schw. ent. Ges. v. (the first 4 species are also described in Verh. z.-b. Wien, xxix. pp. 480–482); *O. kasbekianus*, Stierlin, Verh. Ver. Brünn, xvii., p. 5, Kasbek.

Phyllobius rufipennis, Baku, and *armeniacus*, Borshom, Kirsch, Verh. Ver. Brünn, xvii. pp. 24 & 25; *P. monstruosus*, Tournier, CR. Ent. Belg. xxii. p. iii., Calabria.

Myllocerus sibiricus, Siberia, and *similis*, Lake Baikal, p. 112, *millengeni*, p. 113, and *biformis*, p. 114, both from Arabia and Asia Minor, *id.* Ann. Ent. Belg. xxii.; *M. reitteri*, Kirsch, *l. c.* p. 26, Caucasus.

Leptopides.

Tropidophorus cæsius, sp. n., Frivaldszky, Term. füzetek, iii. p. 232, Balkan.

Byrsopides.

Scaphosternus, g. n., Roelofs, CR. Ent. Belg. xxii. p. liii. Types, *S. rugosus* and *scrobiculatus*, spp. nn., *id. ibid.*, Japan.

Rhyparasomatides.

TOURNIER, H. Descriptions de quelques Curculionides nouveaux, appartenant au genre *Dichotrachelus*, Stierlin. Ann. Ent. Belg. xxii. pp. 115–123.

This paper is prefaced by general remarks on the genus.

Dichotrachelus concavicollis, p. 116, Valais, *gallicus*, S. France, p. 117, *seminudus*, Col de Balme, p. 118, *depressipennis*, p. 119, and *arbutus*, Valais, *sulcirostris*, Col de Balme, p. 121, and *minutus*, Jura, p. 122; *id. l. c.*, spp. nn.

Lithinides.

Lithinus penicillatus, sp. n., C. O. Waterhouse, Ann. N. H. (5) iii. p. 38, Madagascar.

Molytides.

Meleus schneideri, Tournier, Verh. Ver. Brünn, xvii. p. 36, Baku.

Anchonus delaunayi, *rufescens*, *rudis*, *leprosus* (Dej. Cat.), *trossulus*, p. 84, *therninieri*, p. 85, Chevrolat, Le Nat., Guadeloupe.

Tanyrrhynchides.

Myorrhinus schneideri, sp. n., Kirsch, Verh. Ver. Brünn, xvii. p. 36, Caucasus.

Trachodes ovatus, sp. n., Weise, Verh. z.-b. Wien, xxix. p. 482, Caucasus.

Scythropides.

Scythropus nodicollis, sp. n., A. Chevrolat, Le Nat. i. p. 126, Portugal.

Hyperides.

Chloropholus bi-oculatus, sp. n., C. O. Waterhouse, Cist. Ent. ii. p. 534, Antananarivo, Madagascar.

Phoropholus major, sp. n., Roelofs, CR. Ent. Belg. xxii. p. liii., Japan.

Cleonides.

Curculio cleonus. Tenacity of life; C. O. Waterhouse, P. E. Soc. 1879, p. lii.

Sternechus hamatus, Schönh., = *Liparus uncipennis*, Germ.; C. A. Dohrn, S. E. Z. xl. p. 365.

New species :—

Cleonus martorellii, Fairmaire, Ann. Soc. Ent. Fr. (5) ix. p. 244, Carthage.

Larinus acuminatus, Harold, C. H. xvi. p. 146, Interior of Angola.

Lixus validus, Interior of Angola, p. 147, *hildebrandti*, Zanzibar, p. 148, note, and *pungoanus*, Pungo Andongo, p. 149, *id.* l. c.; *L. curtirostris*, Tournier, Verh. Ver. Brünn, xvii. p. 34, Lenkoran and Mesopotamia.

Chrysolopus detritus, Chevrolat, Pet. Nouv. ii. p. 305, Australia.

Myniops depressicollis, Rhodes, and *opulenta*, Beyrut, Reiche, Ann. Soc. Ent. Fr. (5) ix. p. 240.

Erirrhinides.

Procas armillatus, Fabr. (= *picipes*, Marsh., *steveni*, Gyll, and *cottii*, Perris), noticed; L. Bedel, Bull Soc. Ent. Fr. (5) ix. p. xviii. *P. picipes*, auct. Amer., is a distinct species, and may be called *P. lecontii*; id. *l. c.* p. lii.

Echinocnemus squamosus, Bilb., redescribed; Chevrolat, Le Nat. i. p. 117.

Bagous diglyptus, Boh., recorded as new to Britain; G. C. Champion, Ent. M. M. xv. p. 235.

New species :—

Echinocnemus truncatus, N. China, *adustus*, Siam, and *dorsalis*, Thibet, Chevrolat, Le Nat. i. p. 117.

Aoplocnemis dorso-notatus, semicinctus, albo-guttatus and *fulvus*, id. Pet. Nouv. ii. p. 305, Australia.

Phytotribus lineatus and *rectirostris*, J. Thomson, Bull. Soc. Ent. Fr. (5) ix. p. cxliv., Cayenne.

Bagous brevipennis, Kirsch, Verh. Ver. Brünn, xvii. p. 38, Borshom.

Smicronyx albo-fasciatus, Chevrolat, Le Nat. i. p. 100, Oran.

Rhachiodes conformis, Swan River, *posticus*, *dentiferus* (Sch., MS.), Australia, *granulifer* and *multidentatus*, Van Diemen's Land, p. 309, *signaticollis* and *nigro-punctatus*, Victoria, p. 310, *id.* Pet. Nouv. ii.

Ambatides.

Ambates cholidiformis, Amazon, and *vitticollis*, N. Granada, spp. nn., Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. cxlix.

Apionides.

Apion hookeri: habits; W. G. Blatch, Ent. M. M. xv. p. 204. *A. pisi*: habits, &c.; H. Gilnicki, Le Nat. i. pp. 140 & 141.

Apion ærugineum, p. 48, Mangliss, and *lederi*, p. 51, Mamudly, Kirsch, Verh. Ver. Brünn, xvii.; *A. schneideri*, Tournier, *tom. cit.* p. 50, Tiflis; spp. nn.

Rhinomacerides.

Ita kirschi, sp. n., Tournier, Verh. Ver. Brünn, xvii. p. 33, Caucasus.

Rhynchites haroldi, sp. n., W. Roelofs, CR. Ent. Belg. xxii. p. liii., Japan.

Lxalma hilleri, Japan, and *indica*, N. India, spp. nn., *id. l. c.* p. liv.

Lychnuchus fasciularis, sp. n., *id. ibid.*, Japan.

Erodiscides & Otidocephalides.

CHEVROLAT, A. Essai sur la tribu des Erodiscides, et descriptions de nouvelles espèces de cette division des Curculionites, suivis de quelques remarques sur le genre *Otidocephalus*. Ann. Soc. Ent. Fr. (5) ix. pp. 5–12.

The genera *Atenistes*, Pasc., *Ludovix*, Cast., and *Erodiscus*, Schönh., are recharacterized, and a list of the species added. One new genus, and a few new species are described, and Horn's list of American species of *Otidocephalus* is reproduced.

Erodiscus disjunctus, Oliv., redescribed; *id. l. c.* p. 10.

Hammacerus, g. n., *id. l. c.* p. 7. Placed between *Atenistes* and *Ludovix*; to contain *Toxeutes gronowii*, Sch. (= *T. brenthoides*, ♂, Buq.), *argula*, Er., and *H. esau*, sp. n., *l. c.* p. 8, Brazil.

Erodiscus ventricosus, Para, *ardea*, Brazil, and *E.* (?) *granatensis*, Colombia, spp. nn., *id. l. c.* pp. 9–11.

Atenistes scutellaris, Brazil, and *filirostris*, Java, spp. nn., *id. l. c.* pp. 6 & 7.

Magdalinides.

Magdalis fallax, sp. n., Kirsch, Verh. Ver. Brünn, xvii. p. 39, Caucasus.

Tychiides.

Tychius ephippiatus, Fairm., = *Jekelia notata*, Muls. & Rey, and is probably not from Italy, but Algeria; L. Bedel, Bull. Soc. Ent. Fr. (5) ix. p. civ.

Pachytychius erythropterus, Oran, *hirtulus*, Egypt, and *lineipennis*, Valladolid, spp. nn., Chevrolat, Le Nat. i. p. 100.

Cionides.

Cionus. Various species attacking exotic plants; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. cviii.

Microphyes, g. n., Weise, Verh. z.-b. Wien, xxix. p. 482. Allied to *Cionus* and *Nanophyes*, though more resembling *Orobitis cyaneus*. Type, *M. cyanipennis*, sp. n., *id. l. c.* p. 485, Caucasus.

Nanophyes testaceus, Roelofs, Deutsche E. Z. xxiii. p. 297; *N. japonicus*, id. CR. Ent. Belg. xxii. p. liv.: spp. nn., both from Japan.

Alcidides.

Pocoesthes, g. n., Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. lxiv. Type, *P. frigidus*, sp. n., *l. c.* p. lxv., Caraccas.

Alcides gemmatus, Interior of Angola, and *homeyeri*, Loanda, spp. nn., Harold, C. H. xvi. pp. 150 & 151.

Haplonychides.

Haplonyx spencii, Gyl., redescribed; Chevrolat, Le Nat. i. p. 30.

Haplonyx rubiginosus, Adelaide, *waterhousii*, Australia, p. 30, *macleayi*, Adelaide, *donovani*, Australia, *rusticula*, Queensland, *occipitalis*, Adelaide, and *insolitus*, Australia, p. 31, *punctum*, *anormis*, *melaspis*, Adelaide, and *frontalis*, Van Diemen's Land, p. 38, *cioniformis*, King George's Sound, *sexvittatus*, Adelaide, and *posticalis*, Australia, *medio-cinctus* and *albo-fasciatus*, Tasmania, *suturalis*, Victoria, p. 54, and *rufulus*, Fiji, p. 55, *vicinus*, Adelaide, *albo-guttatus* and *pectoralis*, Australia, *tubicen*, Port Augusta, and *nigrirostris*, Victoria, p. 60; Chevrolat, *l. c.*: spp. nn.

Cholides.

Archarias porcus, var. *subscutellaris* from New Friburg described; Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. xv.

Erethistes basalis, Chevrolat (name preoccupied), is renamed by him, *E. sexualis*; Bull. Soc. Ent. Fr. (5) ix. p. xxxiii.

New genera and species :—

Lonchocerus, id. *l. c.* p. xl.; type, *Cholus rhomboidalis*, Fabr.

Acrotemopus, id. *l. c.* p. xliv.; type, *A. graniger*, sp. n., *l. c.* p. xlv., Montevideo.

Gymnonotus, id. *l. c.* p. xxxix. Differs from all known *Cholides* by its black, shining, polished surface. Type, *Cholus geometricus*, Germ.

Sternoxus, id. *l. c.* p. xvi. Allied to *Archarias*; type, *Curculio laticollis*, Ol.; add *S. pleuroleucus*, Amazon, and *S.* (?) *trilineatus*, Cayenne, Surrnam, N. Granada, *l. c.*; and *S. nivisparsus*, Cayenne, and *nigro-fasciatus*, Mexico, *l. c.* p. xxviii., spp. nn.

Platypachys, id. *l. c.* p. xliii. Type, *Amerrhinus bohemanni*, Mann.; add *P. trifasciatus*, sp. n., *l. c.* p. xliv., Santa Catarina, Brazil.

Aphyorrhamphus biflexuosus, id. *l. c.* p. xxxiii., Rio Janeiro.

Archarias glandulosus, Amazon, and *hypocrita*, Brazil, *id. l. c.* p. xx.

Dionychus 12-*guttatus*, Amazon, *rojasi*, Caraccas, *albo-notatus* (Duj., MS.), p. v., and *carinatus*, Brazil, p. vi. *id. l. c.*

Sclerosomus albo-marginosus, *tuberculosus*, p. 293, *humeralis*, and *albo-scutellatus*, p. 294; Chevrolat, Pet. Nouv. ii., Brazil.

Cryptorrhynchides.

Rhynchænus gazella, Oliv., is not a *Tragopus*, but = *Asytesta vittata*, Pasc.; C. A. Dohrn, S. E. Z. xl. pp. 364 & 365.

Trichodocerus, g. n., Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. xcii. Allied to *Conotrachelus*; types, *T. spinolæ* (Buq., MS.) and *lateralis*, spp. nn., *l. c.* p. xciii., Cayenne.

New species :—

Ithyporus asperulatus, Harold, C. H. xvi. p. 149, Interior of Angola.

Nettarrhinus rojasi, Caraccas, *denticollis*, *collaris*, p. lv., and *bisignatus*, Brazil, p. lvi., Chevrolat, *l. c.*

Acalles rufipes, id. *l. c.* p. cxl., Spain; *A. gonoderus*, *lævirostris*, p. 108, *costulatus* and *clunaris*, p. 109, *leporinus*, p. 126, Guadeloupe; *id.* Le Nat. i.

Lembodes furcicollis, Colombia, p. cv., *albo-signatus*, Chili, p. cxxvii., *ulula*, St. Domingo, p. cxliii.; *id.* Bull. Soc. Ent. Fr. (5) ix.

Eusepes frontalis, id. *l. c.* p. cl., St. Domingo; *E. pilosellus*, p. 126, *crassirostris* and *ornatipennis*, Guadeloupe, p. 109, *id.* Le Nat. i.

Asytesta doriæ, Kirsch, Ann. Mus. Genov. xiv. p. 19, New Guinea.

Cryptorrhynchus nigricollis, Roelofs, Deutsche E. Z. xxiii. p. 298; *C. annulipes* and *obscurus*, id. CR. Ent. Belg. xxii. p. liv., Japan.

Zygopides.

Arachnopus melanospilus and *acutipennis*, Gestro, Ann. Mus. Genov. xiv. pp. 563 & 564 : spp. nn.

Copturus pulcher and *brevis*, C. O. Waterhouse, Cist. Ent. ii. pp. 423 & 424, Medellin, Colombia : spp. nn.

Timorus saltator, p. lxxi., *personatus*, Brazil, and *pluto*, Cayenne, p. lxxii.; A. Chevrolat, Bull. Soc. Ent. Fr. (5) ix. : spp. nn.

Ceuthorrhynchides.

Diastenia japonica, Bates, = *Apheles gracilis*, Solsky; Heyden, Deutsche E. Z. xxiii. p. 167.

New species :—

Cœliodes massageta, Kirsch, Verh. Ver. Brünn, xvii. p. 43, pl. vi. fig. 51, Elisabetpol.

Ceuthorrhynchus auritus and *caucasicus*, id. *l. c.* pp. 45 & 46, Caucasus; *C. venedicus*, Weise, Deutsche E. Z. xxiii. p. 153, Sommerfeld.

Pantoteles diplostigma and *melanostictus*, Brazil, and *P.* (?) *variabilis*, Guadeloupe; Chevrolat, Bull. Soc. Ent. Fr. (5) ix. p. clxiii.

Baris maculata and *flavo-signata*, Roelofs, Deutsche E. Z. xxiii. pp. 299 & 301, Tokio, Japan.

Baridius reini, id. *l. c.* p. 356, CR. Ent. Belg. xxii. p. liv.; Heyden, Ber. senck. Ges. 1878–79, Japan.

Calandrides.

Sitophilus granarius and *S. oryzæ*. E. A. Fitch, Ent. xii. pp. 41–50, discusses the destruction caused by these and other *Coleoptera*, &c., found in granaries, and the best means of extirpating them. See also E. A. Ormerod, *op. cit.* pp. 51–54, 206 & 207.

Perissoderes, g. n., C. O. Waterhouse, Ann. N. H. (5) iii. p. 362. Allied to *Barystethus* and *Diathetes*; scutellum entirely concealed; thorax not narrowed anteriorly, and pygidium deflexed and not transverse. Type, *P. ruficollis*, sp. n., *l. c.* p. 363, Island of Johanna.

Rhynchophorus velutinus, Fairmaire, J. Mus. Godeffr. xiv. p. 112, Duke of York Island.

Sphenophorus seminitidus, Harold, C. H. xvi. p. 152, Pungo Andongo; *S. costatus* and *tibialis*, C. O. Waterhouse, Cist. Ent. ii. pp. 425 & 426, Medellin, Colombia.

Stromboscelides.

Dryophthoroides, g. n., W. Roelofs, CR. Ent. Belg. xxii. p. liv. Type, *D. sulcatus*, sp. n., *l. c.*, Japan.

Sipalides.

Nassophasis, g. n., C. O. Waterhouse, Tr. E. Soc. 1879, p. 17. Intermediate between *Sipalus* and *Rhynchophorus*; type, *N. foveata*, sp. n., *l. c.* p. 18, India (?) and Ceylon.

Mesocordylus gracilicornis, sp. n., C. O. Waterhouse, Cist. Ent. ii. p. 425, Medellin.

Cossonides.

Acrodrya brucki, Tourn., = *Aparopion costatum*, Schönh., and *Trachodes horridus*, Mannerh., is also an *Aparopion*; Heyden, Deutsche E. Z. xxiii. p. 167.

Phlœophagus spadix, Herbst, destructive to piles at Harwich; J. J. Walker, Ent. M. M. xvi. p. 40.

Scolytidæ.

Lindeman, D. Monographie der Borkenkäfer Russlands. Die Gattung *Dendroctonus*. Bull. Mosc. liv. pp. 53–87, pl. ii. & 17 woodcuts.

Contains an exceedingly elaborate account of the anatomy, habits, &c., of *D. micans*, the only European species.

Eichhoff, W. Zur Entwicklungsgeschichte der Borkenkäfer. S. E. Z. xl. pp. 501–506.

Phlœophthorus tarsalis, Först., attacks laburnum as well as broom; Buddeberg, Ent. Nachr. v. p. 109.

Hypothenemus eruditus, Westw., occurs in the Hawaiian Islands. It appears to be widely distributed throughout the world. *Cryphalus aspericollis*, Woll., *H. hispidulus*, Lec., and *Stephanoderes seriatus*, Eich., are probably synonymous; *Bostrychus ruficollis*, Fabr., appears to be distinct. D. Sharp, Tr. E. Soc. 1879, p. 102.

Scolytus unispinosus, Le Conte, noticed; Bull. U. S. Geol. Surv. v. p. 519.

New species :—

Phlœotribus puberulus, Le Conte, Bull. U. S. Geol. Surv. v. p. 519, Colorado.

Hypothenemus maculicollis, D. Sharp, Tr. E. Soc. 1879, p. 101, Hawaiian Islands.

Cryphalus mucronatus, Le Conte, *l. c.* p. 518, Colorado.

Pityophthorus deletus, id. *l. c.* p. 519, Colorado.

Tomicus mansfeldi, F. Wachtl, SB. z.-b. Wien, xxix. p. 51, Lower Austria (feeds on *Pinus laricio*).

Xylocleptes cucurbitæ, Le Conte, *l. c.* p. 519, Utah.

Brenthidæ.

Diastrophus sp. bred from a gall on *Centaurea scabiosa*; E. A. Fitch, Ent. xii. p. 131.

Baryrrhynchus lineicollis (Deyr., MS.), Moluccas, p. 297, *deyrollii*, Menado, *andamanicus*, Andamans, and *rugosicollis*, Malacca, p. 298, G. Power, Pet. Nouv. ii.; *B. poweri*, Roelofs, CR. Ent. Belg. xxii. p. liv., Japan: spp. nn.

Anthribidæ.

New species :—

Litocerus japonicus and *rufescens*, Roelofs, CR. Ent. Belg. xxii. p. lv.; *L. roelofsi*, Lewis, Ann. N. H. (5) iv. p. 465: all from Japan.

Deuterocrates cavicollis, Harold, C. H. xvi. p. 153, Interior of Angola.

Anthotribidus (*Anthribidus*, Fåhr.) *sellatus*, Roelofs, Deutsche E. Z. xxiii. p. 302, Tokio, Japan.

Phlœobius gibbosus, id. CR. Ent. Belg. xxii. p. lv., Japan.

Brachytarsus niveo-variegatus, id. *ibid.*, Japan.

Bruchidæ.

Bruchus bivulneratus, Horn, stands in many collections under the unpublished name of *abbreviatus*, Mels.; C. A. Dohrn, S. E. Z. xl. p. 187. *B. obtectus*, Say, injurious to beans in Vaucluse; M. Girard, Bull. Soc. Ent. Fr. (5) ix. pp. xxxiii. & xxxiv., xxxix., xlv. & xlvi.

Bruchus fulvipes, sp. n., Roelofs, CR. Ent. Belg. xxii. p. lv., Japan.

CERAMBYCIDÆ.

BURMEISTER, H. Nachträge zu dem Aufsatz: Longicornia Argentina. (S. E. Z. 1865, pp. 156–181). S. E. Z. xl. pp. 196–209.

Remarks on species of *Micropsalis*, *Torneutes*, *Trachyderes*, *Xylocharis*, *Trachelia*, *Callichroma*, *Orthostoma*, *Clytus*, *Cyllene*, *Neoclytus*, and *Cylindrorrhinus*. *Orthostoma thyrsophora*, Burm., = *Compsocerus aulicus*, Dej., Thoms.; *Cyllene multiguttatus*, Burm., is a slight var. of *C. proximus*, Gory; *Cylindrorrhinus angulatus*, Guér., var. *scrobiculatus*, from the Straits of Magellan, described (p. 203); *C. clathratus*, Blanch., and other species, from Patagonia, briefly noticed.

KRAATZ, G. Ueber die Bockkäfer Ost-Siberiens, namentlich die von Christoph am Amur gesammelten. Deutsche E. Z. xxiii. pp. 77–120, pl. i.

The Longicorns of the Amoor show a greater preponderance of European affinities than might have been expected. After a preliminary geographical discussion, the writer enumerates the species taken by Christoph. His observations are too short and numerous for abstraction, but appear to be, in most cases, of comparatively little importance. The paper concludes with descriptions of various new species. The genera allied to *Xylosteus* are discussed at p. 118, and the species of *Popilia* at pp. 119 & 120.

H. W. Bates (in Godman & Salvin's "Biologia Centrali-Americana," *Coleoptera*, v. pp. 1–16) has commenced a revision of the Longicorns of Central America. One plate only is issued with this part; but unpublished plates referred to in the text will be cited here for convenience. Many new genera and species are described, and the known genera and species are also discussed.

Mimicry of *Lampyridæ* by Longicorns; *id.* P. E. Soc. 1879, p. lii.

Abundance of Longicorns in Bewdley Forest in 1879; W. Lennon, Ent. M. M. xvi. p. 134.

Prionides.

The following species are specially noticed by H. W. Bates in Biol. Centr. Am.:—*Parandra polita*, Say, fig. 3; *P. punctata*, Bates (*nec* White), renamed *P. angulicollis*, and redescribed, p. 2; *Derobrachus longicornis*, Bates, fig. 9, and *asperatus*, Bates, fig. 5, p. 4; *Macrodontia dejeani*, Gory, p. 5, fig. 6; *Callipogon barbatum*, Fabr., var. *ornatum*, from Nicaragua, p. 5, fig. 8, pl. i.; *Strongylaspis scobinatus*, Thoms., pl. i. fig. 7, pl. ii. fig. 9; *S. bullatus*, Bates, pl. ii. fig. 10, and *Mallodonopsis mexicanus*, Thoms., pl. i. figs. 1 & 2; *Halonotus nigro-æneus*, Bates, p. 13, fig. 11; *Otheostethus mexicanus*, p. 12, fig. 12; *Mallaspis præcellens*, Bates, fig. 8, *belti*, Bates, figs. 1–3, and *paradoxa*, Bates, fig. 6, p. 11, pl. ii.

Prionus. Old World species discussed; Schaufuss, Nunq. Ot. iii.

Cryptobelus gestroi, J. Thomson, ♀ described; Bull. Soc. Ent. Fr. (5) iv. pp. iv. & v.

Pœcilominæ, H. W. Bates, *l. c.* p. 10. New subfamily of *Prionidæ*; to

include the genera with finely facetted eyes, and equivalent to Lacordaire's "Cohorte iii. Prionides vrais Pœcilosomes." Bates includes the following Central American genera under it:—*Mallaspis*, *Pyrodes*, *Otheostethus*, and *Holonotus*.

New genera and species:—

Tereticus, C. O. Waterhouse, Cist. Ent. ii. p. 534. Resembles a small *Polyarthron*, with short legs and antennæ, but its real position is close to *Microplophorus*. Type, *T. pectinicornis*, sp. n., *l. c.* p. 535, Antananarivo, Madagascar.

Jamiconus, Harold, C. H. xvi. p. 158. Affinities uncertain; the mandibles of ♂ resemble those of *Callipogon* or *Orthomegas*; it may be placed at the end of the *Acanthophoridæ*. Type, *J. subcostatus*, sp. n., *l. c.* p. 159, Interior of Angola [country of Muata Jamwo or Yanvo].

Sobarus, id. *l. c.* Of doubtful position, being intermediate between the *Tragosomini* and *Pyrodini*. Type, *S. poggii*, sp. n., *l. c.* p. 165, pl. ii. fig. 2, Interior of Angola.

Psephactus, id. Deutsche E. Z. xxiii. p. 367. Allied to *Tragosoma*; type, *P. remiger*, sp. n., *l. c.* p. 368, Japan.

Parandra striatifrons, Fairmaire, Pet. Nouv. ii. p. 289, Viti.

Micropsalis durnfordi, Burmeister, S. E. Z. xl. p. 196, Interior of Patagonia.

Prionus henkii, Schaufuss, Nunq. Ot. iii. p. 475, Kirghis Steppes.

Tithoes frontalis, Harold, C. H. xvi. p. 154, Interior of Angola.

Derobrachus apterus, H. W. Bates, *l. c.* p. 4, Guatemala.

Mallodonopsis corrosus, id. *l. c.* p. 7, Guatemala, British Honduras.

Aplagiognathus hybostoma, id. *l. c.* p. 8, Guatemala.

Mallodon molarium, id. *l. c.* p. 11, pl. i. figs. 10 & 11.

Opheltes cariosicollis, Fairmaire, J. Mus. Godeffr. xiv. p. 111, Viti.

Mallaspis rhombodera, figs. 4 & 5, Panama, Colombia, and *trichostetha*, fig. 7, Costa Rica; H. W. Bates, *l. c.* pp. 10 & 11, pl. ii.

Cerambycides.

Bates, H. W. New genera and species of *Callichrominæ* (*Coleoptera Longicornia*). Cist. Ent. ii. pp. 395–419.

The characters of the genus *Hypocrites*, Fahræus, are discussed, many misplaced species are referred to their appropriate genera, and the following specific synonyms are noted:—(*Hypocrites*) *claviger*, Dalm., and *pauper*, Fabr., ? = *viridis*, Pasc.; *Ionthodes clavipes*, White, = *Rhopalizus chevrolati*, Thoms., = *Promeces nitens*, F., Ol.,; *Callichroma assimile*, Hope, = *afrum*, L., *C. gorii*, White, = *speciosum*, Gory, = *hottentota*, Buq., *C. scitulum*, Pasc., = *rugicolle*, Guér.; *Entactus lineatus*, Fabr., = *Zosterius latus*, Th.

Kraatz, G. Ueber die Verwandten der Bockkäfer-Arten *Pachyta interrogationis*, L., und *variabilis*, Gebl. Deutsche E. Z. xxiii. pp. 65–76, pl. i. Abth. ii.

The following species are discussed:—*P. interrogationis*, L. (with figures of several forms, inclusive of *P.* 12-*maculata*, F., and *curvilineata* and *bimaculata*, Muls., figs. 16–20), *punctata*, Fald. (3 varr. figured from

Irkutsk, including *cruciata* and *bi-oculata*, Kr.), *scapularis*, Mann. (probably = *striolata*, Gebl., and *comosa*, Mann., *mutabilis*, Mots., is uncertain), fig. 14, *variabilis*, Gebl. (figs. 12 & 13), and *spinicornis*, Gebl.

H. W. Bates (Biol. Centr. Amer. pl. iii.) notices and figures *Malacopterus lineatus*, Guér., p. 15, fig. 17, *Tristachycera viridis*, Bates, fig. 7, and *Hammaticherus castaneus*, fig. 2, p. 16.

Cerambyx scopolii, Laich. (*cerdo*, Fabr.). Varieties described; Stierlin, MT. schw. ent. Ges. v. pp. 440 & 441.

Hesperophanes nebulosus injurious to furniture, &c., in France; A. Carret, Bull. Soc. Angers, vi. & vii. pp. 86–93.

Toxotus minutus, Gebl., var. *reini* from Japan described; Heyden, Ber. senck. Ges. 1878–79, p. 88, Deutsche E. Z. xxiii. p. 359.

Leptura ustulata, Mén., redescribed; it is quite distinct from *Strangalia jægeri*, Humm.; *L. nigro-pictus*, Fairm., = *philibensis*, Friv., MS., = *silbermanni*, Lef.; *L. jægeri*, Humm., = *mingrelica*, Tourn., = *oxyptera*, Fald., ♀; Heyden, Deutsche E. Z. xxiii. pp. 167 & 168.

Fallacia longicollis, Motsch., and 2 new species described; Kraatz, *op. cit.* pp. 279 & 280.

Desmocerus auripennis. Dimorphism in ♀; Horn, Tr. Am. Ent. Soc. vii. p. xxx.

Rosalia alpina. Range, &c.; Pet. Nouv. ii. pp. 290, 291, & 295.

Callidium variabile ?. Larva injurious to hickory hoops of powder barrels at St. Louis; McGinnis, Am. Nat. xiii. p. 262.

Clytus gracilipes, Fald., noticed and figured, Kraatz, Deutsche E. Z. xxiii. p. 91, pl. i. fig. 2: *C. admirabilis*, Heyd., = *bartholomæi*, Motsch., *Strangalia angulicollis*, Heyd., = *Leptura imberbis*, Mén., and *Heydenia crassicornis*, Tourn., = *Callirrhophalus sedakovi*, Hochhuth; J. Faust, Deutsche E. Z xxiii. pp 414–416.

Clytarlus, Sharp. Generic characters discussed by him; Tr. E. Soc. 1879, pp. 77, 102, & 103.

Crossidius algewahri, Le Conte, redescribed by him; N. Am. Ent. i. p. 1, pl. i. fig. 1.

Trachyderes morio, F. (*thoracicus*, Oliv.), noticed; C. A. Dohrn, S. E. Z. xl. p. 461.

Vesperus xatarti, Muls. Notes on transformations, &c.; M. Girard, Bull. Soc. Ent. Fr. (5) ix. pp. vi. & vii., xvii., xxv. & xxvi., & cxxxviii.

New genera and species:—

Megasemum, Kraatz, Deutsche E. Z. xxiii. p. 97. Allied to *Asemum* and *Criocephalus*; much larger, head broader, antennæ much longer and thicker, joint 3 twice as long as joint 4; maxillary palpi rather thick, and longer than the thorax. Type, *M. quadricostulatum*, sp. n., *l. c.* p. 98, Amoor.

Xenambyx, H. W. Bates, Biol. Centr. Amer. *Col.* v. p. 14. Allied to *Diploschema*, from which it is distinguished by the absence of prosternal process, and the exserted fore coxæ; but, except in essential characters, it resembles a Prionid allied to *Macrotoma*. Type, *X. laticauda*, sp. n., *l. c.*, Guatemala.

Opsamatus, C. O. Waterhouse, Tr. E. Soc. 1879, p. 264. Affinities doubtful; may be placed provisionally before *Taurotagus*. Type, *O. dimidiatus*, sp. n., *l. c.* p. 265, Fianarantsoa, Madagascar.

Bionesus, Fairmaire, Le Nat. i. p. 70. Allied to *Dicyrtis*; body pubescent; elytra not tuberculated, and antennæ filiform. Type, *B. cinereo-sparsus*, sp. n., *l. c.*, Viti.

Xylostylon, Reitter, Verh. z.-b. Wien, xxix. [1880] p. 484. Allied to *Xylosteus*; type, *X. lederi*, sp. n., *l. c.* p. 485, Caucasus (*cf.* also Ent. Nachr. v. p. 82).

Psilo[r]rhabdium, Kraatz, Deutsche E. Z. xxiii. p. 118. Allied to *Xylosteus*; antennæ inserted at the front margin of the eyes; forehead not sloping; palpi filiform; eyes moderately emarginate. Type, *Xylosteus caucasicus*, Kraatz.

Lepto[r]rhabdium, id. *l. c.* p. 118. Differs from *Psilo[r]rhabdium* by the last joint of the palpi being securiform; and the eyes being strongly emarginate (reniform). Type, *Xylosteus gracilis*, Kraatz.

Micro[r]rhabdium, id. *l. c.* pp. 99 & 118. Resembles a very small *Xylosteus gracilis*, to which it is allied; being one of the narrowest *Lepturides* known. Differs from *Lepto[r]rhabdium* by its rounded and scarcely emarginate eyes. Type, *M. macilentum*, sp. n., *l. c.* p. 99, pl. i. fig. 8, Amoor.

Anthribola, H. W. Bates, Ent. M. M xv. p. 251. Differs from *Sagridola* by the elongated parallel rostrum and slender antennæ, with elongated scape. Type, *S. decoratus*, sp. n., *l. c.* p. 251, Madagascar.

Letzneria, Kraatz, Z. f. Ent. (n.s.) vii. p. 63. Allied to *Necydalis* and *Molorchus*; type, *Leptura lineata*, Kraatz.

Amphionthe, H. W. Bates, Cist. Ent. ii. p. 395. Allied to *Polyschisis*, but resembling *Callichroma* in the length of the antennæ and the style of coloration. Type, *A. doris*, sp. n., *l. c.* p. 396, Colombia.

Synaptola, id. *l. c.* Allied to *Philematium*: antennæ in ♂ shorter than the body, thorax with the sides expanded, not sharply pointed. To include *S. brevicornis*, Sierra Leone, *armipes*, Angola, *l. c.* p. 400, *rugulosa* and *chlorina*, Cameroons, and *obtusa*, Gaboon, *l. c.* p. 401: spp. nn.

Eulitopus, id. *l. c.* p. 407. Allied to *Callichroma longissimum*; type, *Litopus glabricollis*, Murr.

Amblyontium, id. *l. c.* p. 409. Allied to *Leontium*; type, *A. inerme*, sp. n., *l. c.* p. 410, Sarawak.

Mombasius, id. *l. c.* p. 417. Allied to *Promecis*; type, *M. frontalis*, sp. n., *l. c.*, Ribé.

Brachyclytus, Kraatz, Deutsche E. Z. xxiii. p. 107, pl. i. fig. 6. Short and compressed; shaped like a *Callidium*; elytra bifasciate, tip concolorous. Type, *B. singularis*, sp. n., *l. c.* pl. i. fig. 6, Amoor.

Elitroleptus [*Elytr-*], E. Duges, Nat. Mex. iv. p. 182. Allied to *Pteroplatus*; types, *E. alfredi* and *luteus*, spp. nn., *l. c.* p. 185, figs. 9 & 10, Mexico.

Chlidoninæ (subfam. n.). Type, *Chlidones*, g. n., C. O. Waterhouse, Tr. E. Soc. 1879, p. 320. Somewhat intermediate between *Cylindropomus* (*Lamiidæ*) and *Selethrus*, but its affinities appear to be with the

Tillomorphinæ or *Clytinæ*, and it may be placed after the latter family. Type, *C. lineolatus*, sp. n., *l. c.* p. 321, Fianarantsoa, Madagascar

Spondylus mexicanus, H. W. Bates, Biol. Centr. Amer. *Col.* v. p. 15, Mexico.

Asemum amurense, Amoor, p. 97, and *tenuicorne*, Crimea, p. 97, note; Kraatz, Deutsche E. Z. xxiii.

Pachydissus ternatensis, Fairmaire, Le Nat. i. p. 70, Ternate, &c.

Obrium oblongo-guttulum, id. Pet. Nouv. ii. p. 289, Viti.

Stephanops marginipennis, Peak Downs, *striicollis*, Australia, *id.* Le Nat. i. p. 75.

Tritocosmia late-costata, id. *ibid.*, Sydney.

Mastododera coccinea and *difformipes*, H. W. Bates, Ent. M. M. xv. p. 262, Madagascar.

Toxotus amurensis, Kraatz, *l. c.* p. 100, Amoor.

Pachyta amurensis = *mannerheimi* (Mots.), Amoor, figs. 21–23, and *solskii*, Baikal, fig. 15, *id. l. c.* pp. 69 & 71, pl. i.

Elacatis (*Othnius*) *kraatzi*, Reitter, Deutsche E. Z. xxiii. p. 226, E. Siberia.

Leptura succedanea, Lewis, Ann. N. H. (5) iv. p. 464, Nipon; *L. tuerki*, Heyden, Verh. Ver. Brünn, xvii. p. 70, Astrabad.

Pidonia rufa, Amoor, and *spectabilis*, E. Siberia, Kraatz, *l. c.* pp. 101 & 221.

Fallacia mingrelica, Mingrelia, and *lederi*, Caucasus; *id. l. c.* pp. 279 & 280. (*F. lederi* also noticed; Verh. z.-b. Wien, xxix. p. 485.)

Grammoptera similis, p. 102, *alticollis*, p. 103, and varr. *tristicula* and *malthinoides*, pl. i. fig. 11, *G. debilis*, p. 104, and *elegantula*, p. 105, *id.* Deutsche E. Z. xxiii., Amoor.

Strangalia angulicollis and *scapularis*, Heyden, *l. c.* pp. 67 & 69, Persia.

Necydalis pennata, Lewis, *l. c.* p. 464, Japan; *N. morio*, Kraatz, *l. c.* p. 106, Amoor.

Molorchus rufescens, Kiesenwetter, Verh. Ver. Brünn, xvii. p. 60, Borshom (? = *minor* var.).

Colobus fulvus, H. W. Bates, Cist. Ent. ii. p. 395, Sylhet.

Mecaspis fusco-ænea, Cameroons, p. 396, *chrysina* (? = *læta*, pt. Hope), Sierra Leone, *plutina* (? = *læta*, pt.), p. 397, *chrysogaster*, Cameroons, *subvestita*, Cameroons and Angola, p. 398, *crœsus*, Gaboon, and *explanata*, Cameroons, p. 399, *id. l. c.*

Pachyteria javana, id. *l. c.* p. 396, Java; *P. polychroma* and *collaris*, Harold, C. H. xvi. p. 228, Borneo.

Callichroma dives, p. 168, *poggii*, p. 169, *longinum* and *conforme*, p. 170, *id. l. c.*, Interior of Angola; *C. japonicum*, id. S. E. Z. xl. p. 335, Japan; *C. sapphira*, Mexico, *chiriquina*, Chiriqui, p. 402, *euthalia*, Venezuela, *trilineata*, Minas Geraes, p. 403, *viridipes*, N. Granada, *chloropus*, Venezuela, *gracilipes*, Parana, Brazil, *buckleyi*, Ecuador, p. 404, *pilicentris* and *chrysaspis*, Gaboon, *lamprodera*, Lagos, p. 405, *discoidalis*, Loango, *prolixa*, Angola, and *longissima*, Cameroons, p. 406, H. W. Bates, *l. c.*

Phyllocnema semifulva, id. *l. c.* p. 396, Angola.

Philematium natalense (= *albitarse*, Fabr., Fahræus), *id. l. c.* p. 402, Natal.

Rhopalizus tricolor, Harold, C. H. xvi. p. 171, Interior of Angola.

Closteropus argentatus, H. W. Bates, *l. c.* p. 418, Cordillera of Venezuela (the genus is intermediate between the *Callichrominæ* and *Rhopalophorinæ*, being closely allied to *Cosmiosoma* in the latter).

Chloridolum vittigerum, Cambodia, and *everetti*, Cebu, Philippines, *id. l. c.* pp. 407 & 408.

Leontium robustum, Darjeeling and N.W. India, *subtruncatum*, Hong Kong, p. 408, and *optimum*, Laos, p. 409, *id. l. c.*

Oxyprosopus chloreus, Sierra Leone and Guinea, *cylindricus*, p. 410, *angulicollis* and *comis*, Cameroons, *protractus*, Mozambique, p. 411, *id.* l. c.; *O. lutulentus* and *filiformis*, Harold, *l. c.* p. 172, Interior of Angola.

Anubis dissitus, Caffraria, *rostratus*, Saigon, *fimbriatus*, Cochin China, and *unifasciatus*, Cochin China and Saigon, H. W. Bates, *l. c.* p. 412.

Polyzonus meridionalis, Hong Kong, *saigonensis* and *obtusus*, Saigon, *id. l. c.* p. 413.

Hypocrites porphyrio, Limpopo, p. 414, *obtusipennis*, Delagoa Bay, *manicatus*, Natal, p. 415, *alveolatus*, Cape, &c., *cyanellus* and *tenuis*, Natal, &c., p. 416, *id. l. c.*

Ipothalia esmeralda, id. *l. c.* p. 418, N.W. Borneo.

Euporus liobasis, id. *l. c.* p. 417, Sierra Leone, &c.; *E. simplex*, Harold, *l. c.* p. 173, Interior of Angola.

Phrosyne poriferus and *tenellus*, H. W. Bates, *l. c.* pp. 417 & 418, Lagos, Guinea.

Callidium maaki, Kraatz, Deutsche E. Z. xxiii. p. 106, Amoor.

Clytus nivipictus, p. 91, note, pl. i. fig. 3, Kasbek, *C.* (*Plagionotus*) *christophi*, fig. 4, *C. nigritulus*, *C.* (*Xylotrechus*) *cuneipennis*, fig. 5, and *C.* (*X.?*) *acutivittis*, fig. 1, pp. 108–111, pl. i., Amoor, Kraatz, l. c.; *C. schneideri*, Kiesenwetter, Verh. Ver. Brünn, xvii. p. 57; *C. admirabilis*, Heyden, *op. cit.* p. 58, pl. vi. fig. 52, both from the Caucasus; *C.* (*Cyllene*) *murinus*, H. Burmeister, S. E. Z. xl. p. 201, Paraguay.

Clytarlus microgaster, Honolulu, p. 103, and *modestus*, Maui, p. 104, D. Sharp, Tr. E. Soc. 1879.

Cylindrorrhinus dentipennis and *obesus*, p. 205, *sordidus* and *lactifer*, p. 206, Rio Chico, *melanoleucus* and *farinosus*, p. 207, *horridus*, Rio Santa Cruz, and *gravidus*, N. Patagonia, p. 208, H. Burmeister, *l. c.*

Cryptobius ocellatus, C. A. Dohrn, S. E. Z. xl. p. 460, Brazil.

Tylosis jimenezi, E. Duges, Nat. Mex. iv. p. 186, fig. 11, Mexico.

Lamiides.

Thomson, J. Typi Cerambycidarum. Appendix i. R. Z. (3) vii. pp. 1–26.

Entirely devoted to the genus *Glenea*.

Dorcadion abakumovi, Thoms., redescribed; Kraatz, Deutsche E. Z. xxiii. p. 169.

Monochamus australis. Transformations described; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. cii. & ciii.

Apriona punctatissima, Kaup, noticed and figured; R. Oberthür, Ann. Mus. Genov. xiv. p. 572, pl. i. fig. 3.

Sternotomis pulchra, Dru., and *chrysopras*, Voet, live on the leaves of

the bread-fruit (*Arctocarpus incisa*); H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. cxlv.

Pogonochœrus dentatus, Fourcr. Habits, H. du Buysson, Feuill. Nat. ix. p. 66; *P. dimidiatus*, var. (?) *bicristatus* from the Amoor described, Kraatz, *l. c.* p. 114.

Astynomus ædilis. Habits; Lascols, Pet. Nouv. ii. pp. 298 & 299. Attacked by a small red mite; V. Henon, Feuill. Nat. ix. pp. 105 & 106.

New genera and species:—

Pseudocalamobius, Kraatz, Deutsche E. Z. xxiii. p. 116. Allied to *Phytœcia* and *Agapanthia*; type, *Calamobius japonicus*, Bates, figured, pl. i. fig. 7, 7 *a* & 7 *b*.

Callundine, J. Thomson, Bull. Soc. Ent. Fr. (5) ix. p. lvi. Allied to *Malloderma*, Luc., much larger, longer, and less convex; 3rd joint of antennæ much longer than 4th, prothorax nearly cylindrical, scutellum nearly square, sides of elytra not longitudinally carinated. Type, *C. lacordairii*, sp. n., *l. c.* p. liii., Madagascar.

Pinacosterna, Harold, C. H. xvi. p. 189. An aberrant form, allied to *Sternotomis*; type, *P. nachtigali*, sp. n., *l. c.* p. 190, Interior of Angola.

Phrissoma retro-spinosum, Harold, *l. c.* p. 175, Interior of Angola.

Leprodera discoidea, id. *l. c.* p. 178, Interior of Angola.

Monochamus sellatus, id. *l. c.* p. 177, Interior of Angola; *M. deyrollii*, Thomson, Bull. Soc. Ent. Fr. (5) ix. p. xxvi., locality unknown.

Hammoderus batesi, id. *l. c.* p. lxxxiii., Colombia.

Prosopocera aliena, Harold, *l. c.* p. 180, Interior of Angola.

Sternotomis polyspila, p. 181, *confluens*, p. 183, and *chloroleuca*, pl. ii. fig. 5, p. 188, *id. l. c.*, Interior of Angola.

Tragocephala opulenta, id. *l. c.* p. 228, Chinchoxo; *T. io*, Thomson, *l. c.* p. lvii., Madagascar.

Ceroplesis arcuata, Pungo Andongo, and *fissa*, Interior of Angola, pp. 196 & 197, *heroica*, Zanzibar, p. 228, Harold, *l. c.*

Mœcha adusta, id. *l. c.* p. 198, Interior of Angola. (Allied species tabulated.)

Gnathoenia zonifera, id. *l. c.* p. 200, Interior of Angola.

Phryneta macularis, id. *l. c.* p. 202, Interior of Angola.

Homelix fusca, id. *l. c.* p. 203, Interior of Angola.

Cylindropomus oxypterus, Fairmaire, Le Nat. i. p. 75, Duke of York Island.

Apomecyna macularia, Harold, *l. c.* p. 204, Pungo Andongo.

Oopsis striatellus, *semigranosus*, p. 289, *granicornis*, *brunneo-caudatus*, *lateripictus*, *fusco-apicatus*, and *variivestis*, p. 290, Fairmaire, Pet. Nouv. ii., Viti and Tonga.

Pogonochœrus tristiculus, Kraatz, Deutsche E. Z. xxiii. p. 115, Amoor.

Liopus albivittis, id. *l. c.* p. 112, pl. i. fig. 9, Amoor.

Rhopaloscelis bifasciatus, id. *l. c.* p. 113, pl. i. fig. 10, Amoor.

Agapanthia amurensis, id. *l. c.* p. 115, Amoor.

Asaperda stenostola, id. *l. c.* p. 227, pl. ii. figs. 14 & 14 *a*, Amoor.

Saperda tetrastigma, H. W. Bates, Ann. N. H. (5) iv. p. 466, Japan.

Glenea clytia, Malaysia, p. 3, *beatrix*, Mindanao, *corona*, Nicobar Islands, p. 4, *hygia*, Bouru, p. 6, *parthenope*, New Guinea, *thetis*, Borneo, p. 7, *bellona*, Sumatra, p. 8, *maia*, Moluccas, *niobe*, Borneo, p. 9, *calliope*, Malacca, *sylvia*, Gaboon, p. 10, *biapicalis*, Malacca, *mephisto*, Gaboon, p. 11, *trincomalica*, Trincomali, Ceylon, p. 12, *tenuilineata*, Malacca, *palæographa*, Ceram, p. 13, *newmanni*, Ceram, *alcyone*, Singapore, p. 14, *sophia*, *cleanthe*, Borneo, *laodice*, Laos, p. 15, *jacintha*, p. 16, *cryllis*, Andaman Islands, *brunnea*, Malacca, *anna*, p. 17, *theodosia*, Borneo, *colenda*, Japan, p. 18, *georgiana*, Malacca ?, *æolis*, Burma, p. 19, *simplex*, Malacca, *mouhoti*, Laos, p. 20, *chloromelas*, China, p. 21, Thomson, R. Z. (3) vii.; *G. chrysochloris*, H. W. Bates, *l. c.* p. 467, Yozo.

Nupserha homeyeri, Harold, C. H. xvi. p. 205, Pungo Andongo.

Phytœcia simplonica, Stierlin, MT. schw. ent. Ges. v. p. 438, Simplon.

Oberea morio, Kraatz, *l. c.* p. 117, Amoor.

Chrysomelidæ.

Baly, J. S. List of the Phytophagous *Coleoptera* collected in Assam by A. W. Chennell, with notes and descriptions of the uncharacterized Genera and Species. Cist. Ent. ii. pp. 435–465.

Except notes on locality, the most important on known genera and species are as follow: *Aulacophora testacea*, Fabr., is distinct from *foveicollis*, Küst., as well as from *abdominalis*, Fabr., which is an undetermined South Sea species, p. 445, and note; *Cneorane fulvicollis*, Baly, ♂ described, p. 448; *Haplosonyx*, Chevr., *Sphenoraia*, Clark, and *Leptarthra*, Baly (of which *Merista*, Chap., is but a section), characters discussed, pp. 452–454; *Sphenoraia bicolor*, Hope, and *fulgida*, Redt., varieties described, pp. 453 & 454; *Macr[oh]ispa saundersi*, Baly, described from an unknown locality, proves to be from Assam.

——. Descriptions of Genera and Species of Australian Phytophagous Beetles. J. L. S. xiii. pp. 458–479 (1878).

Jacoby, M. On Phytophagous *Coleoptera* collected by M. Thamm, at Chanchamayo, Peru. Cist. Ent. ii. pp. 513–527.

In addition to new species, varieties of the following are noticed: *Chalcoplacis ruficentris*, Erichs., p. 513, *Doryphora euchalia*, Stål, and *D. amabilis*, Baly, p. 518.

Donaciides.

Rhæbus gebleri may be a European species. The genus should probably be placed at the head of the *Chrysomelidæ*. Kraatz, Deutsche E. Z. xxiii. pp. 276-278.

Criocerides.

Pedrillia murrayi, Clark, and *annulata*, Baly, noticed, and the last figured; Kraatz, Deutsche E. Z. xxiii. pp. 119 & 120, pl. ii. fig. 7.

Clythrazeloma, g. n., Kraatz, Deutsche E. Z. xxiii. p. 143. Allied to *Megalopus* and *Temnaspis*; type, *C. cyanipennis*, sp. n., Amoor.

New species :—

Zeugophora bimaculata, id. *l. c.* p. 129, pl. ii. fig. 6, Amoor ; *Z. reineckii*, Große, N. Amer. Ent. i. p. 5, pl. i. fig. 6, Buffalo.

Lema championi, p. 773, *antennalis*, Zapote, Guatemala, and *nicaraguensis*, Chiriqui, p. 774, Jacoby, P. Z. S. 1879 ; *L. pygmæa*, Kraatz, *l. c.* p. 129, Amoor.

Crioceris scutellaris, id. *l. c.* p. 130, pl. ii. fig. 4, Amoor.

Pedrillia biguttata and *bicolor*, id. *l. c.* pp. 119 & 120, pl. ii. figs. 8 & 9, Amoor.

Lema peruana, Jacoby, Cist. Ent. ii. p. 513, Chanchamayo, Peru.

Clithrides.

Coptocephala hilaris, sp. n., Kraatz, Deutsche E. Z. xxiii. p. 288, N. Persia.

Urodera godmani, sp. n., Jacoby, P. Z. S. 1879, p. 775, Guatemala.

Cryptocephalides.

Kraatz, G. Die Cryptocephalen von Sibirien und Japan, und ihre geographische Verbreitung. Deutsche E. Z. xxiii. pp. 257–265.

Illustrated by a table of distribution of *Monachus*, *Cryptocephalus*, and *Pachybrachys*. Short notes on various species are added.

Chapuis, F. Cryptocephalides Australiens du Musée Godeffroy. J. Mus. Godeffr. xiv. pp. 75–79.

The notices of known species are limited to names and localities.

New species :—

Prasonotus morbillosus, Chapuis, *l. c.* p. 75, W. Australia.

Bucharis chapuisi, S. Australia, *granulosus*, Champion Bay, p. 462, *martius* (Suffr., MS.), Moreton Bay, p 463, Baly, J. L. S. xiii.

Polyachus marginicollis, id. *l. c.* p. 463, Swan River.

Elaphodes murinus and *vittiger*, Rockhampton, *sanguinolentus*, p. 75, and *dohrni*, Gayndah, &c., *convexiusculus*, Peak Downs, p. 76, Chapuis, *l. c.*

Ditropidus obsidianus, *antennarius*, *baccæformis* [*bacci-*], and *lateritius*, Gayndah, *nitiduloides*, Sydney, *bicolor*, *trabeatus*, p. 76, *godeffroyi* and *schmelzi*, p. 77, Peak Downs, *id.* l. c.; *D. phalacroides* and *lutus*, S. Australia, p. 464, *costipennis*, Champion Bay, p. 465, *facialis*, S Australia, *jansoni*, Rockhampton, and *semicircularis* (Suffr., MS.), Australia, p. 466, *ornatus*, W. Australia, p. 467, *pulchellus*, Adelaide, and *serenus*, S. Australia, p. 468, Baly, *l. c.*

Piconorphus putridus and *pallens*, Chapuis, *l. c.* p. 77, Peak Downs, &c.

Cadmus amplicollis, *quadrivittis*, and *lacertinus*, Rockhampton, p. 78, and *verrucosus*, Gayndah, p. 79, *id. l. c.*

Cryptocephalus discoideus, Peak Downs, *hispidus*, p. 77, *terminalis*, *facialis*, and *cyanophanus*, Gayndah, p. 78, *id.* l. c.; *C. euchirus*, Persia, p. 288, *haroldi*, fig. 12, *raddii*, fig. 11, *nobilis*, *pallescens*, and *splendens*, pp. 130–134, pl ii., Amoor, Kraatz, Deutsche E. Z. xxiii.

Schizosternus coccineus, Chapuis, *l. c.* p. 79, Gayndah.

Loxopleurus pectoralis and *plaginotus*, id. *l. c.* p. 79, Rockhampton.
Idiocephala nigripennis, Baly, *l. c.* p. 459, Rockhampton.
Rhombosternus sulphuripennis (Suffr., MS.), Adelaide, *antennatus*, N.W. Australia, and *gracilicornis*, W. Australia, pp. 459–461, *id. l. c.*

Chlamydides.

Chlamys sextuberculata, sp. n., Jacoby, P. Z. S. 1879, p. 775, Guatemala.

Lamprosomatides.

Lamprosoma nicaraguense, sp. n., *id. l. c.* p. 776, Chontales.

Eumolpides.

Adoxus vitis, Kirby. Natural history; Lichtenstein & Mayet, CR. Congres Internat. de l'Agric. 1878, i. pp. 335–342, woodcuts.

New species:—

Chalcoplacis instabilis, Jacoby, P. Z. S. 1879, p. 777, Guatemala.
Amasia falcata, Harold, C. H. xvi. p. 230, Burma.
Chrysolampra piceipes, Baly, Cist. Ent. ii. p. 440, Assam.
Noda tasmanica, Jacoby, *l. c.* p. 777, Tasmania.
Terillus foveolatus, p. 469, *squamosus* and *perplexus*, p. 470, *duboulayi*, W. Australia, *vittatus*, Rockhampton, p. 471, Baly, J. L. S. xiii.
Colaspis haroldi, Jacoby, Cist. Ent. ii. p. 514, Chanchamayo.
Prionodera godmani, id. P. Z. S. 1879, p. 778, Zapote, Guatemala.
Fidia guatemalensis, id. *l. c.*, Guatemala.
Geloptera igneo-nitens, W. Australia, *vestita*, Port Bowen, Baly, J. L. S. xiii. pp. 472 & 473.
Chalcophana gigas and *unifasciata*, Jacoby, Cist. Ent. ii. pp. 514 & 515, Peru.
Otilea tarsalis, id. *l. c.* p. 515, Chanchamayo.
Rhyparida luteola, Viti, *punctatissima*, Tonga, p. 75, *subæneicollis*, Samoa, and *trapezicollis*, Ovalau, Fairmaire, Le Nat. i.; *R. maculicollis*, Baly, J. L. S. xiii. p. 473, Rockhampton.
Colasposoma ardens and *subsericum*, Cape, *antiquum*, Natal, *barbatum*, Queensland, p. 229, *sansibaricum*, Zanzibar, p. 230, Harold, C. H. xvi.; *C. cæruleatum*, Baly, Cist. Ent. ii. p. 440, Assam.
Corynodes assamensis, id. *l. c.* p. 439, Assam.
Colaspoides batesi, Costa Rica, *peruana*, Chanchamayo, p. 779, *australis*, Queensland, *unicolor*, Chontales, p. 780, *decem-maculata* and *variabilis*, locality unknown, p. 781, Jacoby, P. Z. S. 1879; *C. xanthopus*, Harold, C. H. xvi. p. 230, Queensland.

Chrysomelides.

Baly, J. S. An attempt to point out the differential characters of some closely-allied species of *Chrysomela*, principally those contained in Suffrian's 11th group; also descriptions of some hitherto uncharacterized forms belonging to the same and other genera of the family. Tr. E. Soc. 1879, pp. 171–197, pl. ii. (details).

The author discusses the causes of variation of species. The characters

of most importance in the *Chrysomelidæ* are to be found in the tarsi, the palpi, the margination, and shape of the sides of the thorax, in the arrangement of the punctuation of the elytra, in the apical segment of the abdomen, and more rarely in the antennæ; the telum, or male organ (the general structure of which is described in a note) is likewise important in the *Chrysomelidæ*, though useless for classification in many other groups. The following known species of *Chrysomela* are first tabulated, and then noticed in greater detail, and generally redescribed :—*C. speciosa*, Fabr., p 175, *nivalis*, Suffr., p. 177, *gloriosa*, Fabr., p. 178, *bifrons*, Fabr., p. 179, *sulcata*, Gebl., p. 180, *intricata*, Germ., and *alcyonea*, Suffr., p. 182, *tristis*, Fabr., p. 183, *coxalis*, Schrank, p. 184, *elongata*, Ziegl., p. 185, *speciosissima*, Scop., p. 186, *elegans*, Arag., p. 187, *guttata*, Gebl., p. 188, *marginata*, Linn., and *vishnu*, Hope, p. 189, and *flavo-marginata*, Say, p. 190.

Kraatz, G. Vier neue spanische Timarcha-Arten. Deutsche E. Z. xxiii. pp. 380–384.

Preceded by animadversions on the localities given in Weise's Catalogue for European species; and by remarks on *Timarcha lugens*, Rosenh.

Ambrostoma and *Crosita*, Motsch., recharacterized, and the species enumerated; J. S. Baly, Tr. E. Soc. 1879, p. 194.

Gastrophysa raphani. Parthenogenesis, and development of ovum. J. A. Osborne, Nature, xx. p. 430.

Chrysomela kowarowii, Faust., and *hochhuthi*, Suffr., = *discipennis*, Fald.; Schaufuss, Nunq. Ot. iii. p. 477.

Orina cacaliæ, Schrank, is not exclusively a sub-Alpine species; J. Bourgeois, Bull. Soc. Ent. Fr. (5) ix. pp. lxxii. & lxxiii.

Entomoscelis orientalis, Motsch., and *discoidea*, Gebl., noticed; Kraatz, Deutsche E. Z. xxiii. p. 266.

Phytodecta viminalis and allies discussed; Kraatz, Z. f. Ent. (n.s.) vii. pp. 45–56.

Doryphora decemlineata. False reports of its appearance noticed; F. v. Krauer, J. H. Ver. Württ. xxv. pp. 351–353, *cf.* also Troudy Ent. Ross. xi. pp. ix.–xiv.

Cyclonoda, g. n., Baly, J. L. S. xiii. p. 474. Allied to *Chalcomela*, apterous, with closely united elytra; eyes distant, narrow, and elongate. Type, *Chalc. pilula*, Clark.

Paralepta, g. n., *id. l. c.* p. 474. Intermediate between *Callimela*, Hope, and *Carystea*, Baly, but differs from both in the crenulate lateral border of the thorax. Type, *P. foveicollis*, sp. n., *l. c.* p. 475, N. S. Wales.

New species :—

Chrysomela kenderesii, Kiesenwetter, Deutsche E. Z. xxiii. p. 256, Siebenbürgen; *C. lederi*, Weise, Verh. Ver. Brünn, xvii. p. 76, Armenia and Caucasus; *C. adamsi*, Oo Bay, Chinese Tartary, and E. Siberia, and *rufo-marginata*, Mesopotamia, Baly, Tr. E. Soc. 1879, pp. 190 & 191.

Crosita cælestina, id. *l. c.* p. 193, N. China, India, Persia.

Zygogramma championi, Jacoby, P. Z. S. 1879, p. 781, Guatemala.

Stilodes belli, Chontales, and *flavo-marginata*, Brazil, *id. l. c.* p. 782 ; *S. fulvipennis*, id. Cist. Ent. ii. p. 519, Chanchamayo.

Leptinotarsa kirschi, Baly, Tr. E. Soc. 1879, p. 237, Chanchamayo.

Doryphora approximata, Parana, *godmani*, Trinidad, p. 194, and *[illegible] pustulata*, Colombia, p. 195; *D. anchoralis*, p. 235, *thammi*, p. 236, and *decipiens*, p. 237, Chanchamayo, *id.* l. c. ; *D. opacicollis, fulvicollis*, p. 516, *transverso-fasciata, elegantula*, p. 517, *glabrata*, p. 518, and *fulvonotata*, p. 519, Jacoby, Cist Ent. ii., Peru.

Timarcha kiesenwetteri, Jaen, p. 382, *seidlitzi*, Sierra Nevada, *paulinoi*, Portugal, p. 383, and *asturiensis*, Asturia, p. 384 ; Kraatz, Deutsche E. Z. xxiii.

Entomoscelis assamensis, Baly, Cist. Ent. ii. p. 437, Assam.

Phytodecta gracilicornis and *rufa*, Kraatz, Deutsche E. Z. xxiii. pp. 135 & 139, Amoor.

Paropsis chennelli, Baly, Cist. Ent. ii. pp. 438, Assam.

Arsipoda piceipes, id. J. L. S. xiii. p. 477, W. Australia.

Halticides.

Haltica oleracea attacking vine ; Feuill. Nat. ix. pp. 132 & 153, x. pp. 14 & 15.

Thyamis dorsalis, habits ; W. G. Blatch, Ent. M. M. xv. p. 204.

Phyllotreta vittula and *atra*. Damage caused by these insects to barley fields in Sweden, phenic acid recommended to destroy them ; J. Spångberg, An. Soc. Esp. viii. pp. 339–341.

Ocnoscelis cyanoptera, Erichs., ♂ described, *purpurata*, Er., is probably distinct ; Baly, Tr. E. Soc. 1879, p. 250.

Orestia. Austro-Hungarian species tabulated; Reitter, Verh. z.-b. Wien, xxix. pp. 54 & 55.

New genera and species :—

Cyclophysa, J. S. Baly, Tr. E. Soc. 1879, p. 241. Agrees with *Nephrica* in the form of the eyes, and in many other characters, but the form of the body closely resembles that of *Sphæroderma*. Type, *C. albicornis*, sp. n., *l. c.* p. 242, Peru.

Stegnea, id. *l. c.* p. 247. Allied to *Crepidodera*, but apices of the 4 anterior tibiæ unarmed, and prosternum of a different shape. Type, *S. nigripes*, sp. n., *l. c.* p. 348, Chanchamayo.

Eugonia [twice preoccupied in *Lepidoptera*], id. *l. c.* p. 248. Allied to *Crepidodera* ; apices of 4 anterior tibiæ unarmed, hind femora slender. Type, *E. dimidiatipennis*, sp. n., *l. c.* p 249, Chanchamayo.

Platycepha, id. *l. c.* p. 475. Differs from all known genera of *Halticides* by the very short antennæ and the short robust legs : face flattened between the eyes, and thoracic grooves absent. Type, *P. eximia*, sp. n., *l. c.* p. 476, W. Australia.

Sphærophyma, id. *l. c.* p. 478. Allied to *Argopistes*, Motsch., but with punctate-striate elytra. Type, *S. simoni*, sp. n., *l. c.* p. 479, Rockhampton.

Euphitrea birmanica, Harold, C. H. xvi. p. 231, Burma.

Crimissa nigro-ornata, Jacoby, P. Z. S. 1879, p. 783, Colombia.

Notozona bivittata, id. *l. c.* p. 439, Peru ?; *N. jansoni* Baly, Tr. E. Soc. 1879, p. 238, Peru.

Nisotra badia, Ceylon, and *goudoti*, Madagascar, p. 230, and *unicolor*, Siam, p. 231, Harold, *l. c.*

Epitrix carinata, Baly, Tr. E. Soc. 1879, p. 238, Peru.

Haltica facialis, id. *l. c.* p. 239, Chanchamayo.

Pelonia elegantula, Baly, *l. c.* p. 240, Chanchamayo.

Nephrica basalis, id. *ibid.*, Peru; *N. marginata*, Jacoby, P. Z. S. 1879, p. 440, Peru.

Disonycha erichsoni, Peru, and *tristis*, Brazil, *id. l. c.* pp. 439 & 440; *D. pulchella*, Peru, and *erichsoni*, Napo, Baly, *l. c.* pp. 242 & 243.

Lactica jacobii and *clypeata*, p. 244, Chanchamayo, and *peruviana*, p. 245, Peru, *id. l. c.*

Hermæophaga nitidissima, id. *l. c.* p. 246, Chanchamayo.

Trichaltica thammi, id. *l. c.* p. 247, Peru.

Longitarsus peruvianus, id. *l. c.* p. 249, Chanchamayo.

Phyllotreta caucasica, Harold, Verh. z.-b. Wien, xxix. p. 486, & C. H. xvi p. 231, Caucasus.

Sebæ[illegible] pallidipennis, Baly, Cist. Ent. ii. p. 442, Assam.

Sebæthe[illegible]ia indica, id. *ibid.*, Assam.

Hyphasis [illegible]nigrifrons and *æneola*, Le Conte, Bull. U. S. Geol. Surv. v. pp. 517 & 518, Colorado; *C. cristata*, Zanzibar, and *mexicana*, Mexico, p. 231, *fraterna*, Madagascar, and *solida*, Colombia, p. 232, Harold, C. H. xvi.

Chætocnema cribr[illegible], Canada, and *æneola*, Mexico, and *mexicana*, Mexico, p. 231, *fraterna*, Madagascar, and *solida*, Colombia, p. 232, Harold, C. H. xvi.

Blepharida flavo-pustulata, Baly, Cist. Ent. ii. p. 441, Assam.

Asphæra octo-punctata and *maculipennis*, Jacoby, Cist. Ent. ii. pp. 522 & 523, Chanchamayo; *A. apicalis*, Brazil, *balii*, Peru, *amazonica* Amazon, p. 442, and *pallida*, Costa Rica, p. 443, *id.* P. Z. S. 1879; *A. thammi*, *disco-fasciata*, p. 251, and *limbifera*, p. 252, Baly, Tr. E. Soc 1879, all from Peru.

Homophœta variabilis (? = *equatorialis*, Harr.), Venezuela, Colombia, Brazil, and (var.) Mexico, and *albo-fasciata*, Cache, Costa Rica; Jacoby, *l. c.* pp 440 & 441.

Œdionychis quadrifasciata, Peru, *fusco-notata*, Rio Janeiro, *transversalis*, Nicaragua, p. 444, *insularis*, Mexico, *nicaraguensis*, Nicaragua and Costa Rica, p. 445, and *septem-maculata*, Peru, p. 446, *id.* l. c.; *Œ. signifera*, p. 252, Chanchamayo, and *pulchra*, p. 253, Peru, Ecuador, Baly, l. c.; *Œ. howitti*, id. J. L. S. xiii. p. 478, Sydney.

Monoplatys fulvus, Baly, *l. c.* p. 254, Chanchamayo.

Rhacus trifasciatus, Jacoby, Cist. Ent. ii. p. 520, Chanchamayo.

Homammatus clarki, id. P. Z. S. 1879, p. 783, Amazons.

Omotyphus erichsoni, Baly, *l. c* p. 255, Chanchamayo.

Octogenotes limbatus, id. *l. c.*, Chanchamayo.

Hapalotrius flavo-fasciatus, Jacoby, Cist. Ent. ii. p. 521, Peru.

Allochroma bimaculata, id. P. Z. S. 1879, p. 784, Nicaragua.

Omototus rufo-limbatus and *rubripennis*, id. Cist. Ent. ii. pp. 521 & 522, Chanchamayo.

Cerichrestus thammi, Baly, *l. c.* p. 256, Chanchamayo.
Euphitrea assamensis, id. Cist. Ent. ii. p. 443, Assam.
Dibolia maculata, Harold, C. H. xvi. p. 232, Natal.
Orestia carpathica, Carpathians, *puncticollis*, Transylvania, p. 55, *caucasica*, Caucasus, p. 417, Reitter, Verh. z.-b. Wien, xxix. (1880).

Galerucides.

Baly, J. S. Descriptions of New Genera and Species of *Gallerucinæ*. Ann. N. H. (5) iii. pp. 73–84, iv. pp. 108–120.

The following known species are noticed or redescribed in the second paper: *Mesodonta limbata*, Baly, p. 111, *Momæa purpurascens* and *Menippus cervinus*, p. 112, and *Antipha bennetti* (all of Hope), p. 120.

Lyperus viridipennis, var. *caucasicus*, described; Weise, Verh. z.-b. Wien, xxix. p. 486.

Galeruca capreæ: extraordinary swarm at Cairn Baan, in Argyleshire; C. W. Mapleton, Ent. M. M. xv. pp. 18 & 19.

New genera and species :—

Euphyma, Baly, Cist. Ent. ii. p. 457. Form of *Emathea*; joints of antennæ cylindrical; palpi ovate; base of thorax with longitudinal grooves. Type, *E. collaris*, sp. n., *l. c.*, Assam.

Eustena, id. *l. c.* p. 458. Belong to Chapuis's 22nd section, but its narrow elongate form separates it from the other genera which are placed in it. Type, *E. pretiosa*, sp. n., *l. c.* p. 458, Assam.

Parastetha, id. *l. c.* p. 461. Differs from *Hylaspes* by its much shorter antennæ, which scarcely exceed half the body in length. Type, *P. nigricornis*, sp. n., *l. c.* p. 461, Assam.

Acroxena, id. *l. c.* p. 462. Belongs to Chapuis's 26th section, but is separated from *Platyxantha* and *Stenoplatys* by the shape of its antennæ, which are stout, and tapering at the tip; and from *Doridea* and *Ænidea* by its elongate form. Type, *A. nasuta*, sp. n., *l. c.* p. 463, Assam.

Triaplatyps, Fairmaire, J. Mus. Godeffr. xiv. p. 113. Allied to *Phyllobrotica*, but the tarsal hooks are cleft, and the antennæ differently formed (1st joint thick, arched; 2nd minute; 3–5 nearly equal, compressed, angularly dilated outwards; the remainder elongated, slightly pilose, nearly equal; the last longer). Type, *T. quadripartita*, sp. n., *l. c.*, Duke of York Island.

Botanoctona, id. *l. c.* p. 113. Belongs to the *Cœlomerites*, near *Pachytoma* by the form of the epipleura, but with the facies of the *Adoriites*. Type, *B. pallido-cincta*, sp. n., *l. c.*, Duke of York Island.

Oides indica and *inornata*, Baly, Cist. Ent. ii. pp. 443 & 444, Assam; *O. albertisi*, Jacoby, P. Z. S. 1879, p. 388, Somerset, Australia.

Aulacochilus decoratus and *sibiricus*, Reitter, Deutsche E. Z. xxiii. pp. 223 & 224, E. Siberia.

Aulacophora cornuta, *pulchella*, and *perplexa*, Baly, *l. c.* pp. 445–447, Assam.

Diacantha aperta, Harold, C. H. xvi. p. 210, Pungo Andongo.

Diabrotica eximia, Bolivia, p. 73, *rufo-limbata*, La Plata, and *viridilimbata*, locality unknown, p. 74, *nigriceps*, Guatemala, and *interrupto-*

fosciata, Oaxaca, p. 75, *octo-signata*, Oaxaca, and *jacobii*, Ecuador, p. 76, *generosa*, Ecuador, and *fulvo-signata*, Guatemala, p. 77, *pascoii*, Cayenne, p. 78, *speciosissima*, Ecuador, and *fraterna*, Guatemala, p. 79, *elegans* and *buckleyi*, Ecuador, p. 80, *sexmaculata*, Guatemala, and *dilaticornis*, Amazons, p. 81, *erythrodera*, Peru, and *opacipennis*, Ecuador, p. 82, *divisa*, p. 83, and *rugata*, p. 84, Ecuador, Baly, Ann. N. H. (5) iii.; *D. limbifera* and *setifera*, id. Tr. E. Soc. 1879, p. 257; *D. dorsalis*, p. 523, *undecimpunctata*, *sanguinicollis*, p. 524, *terminalis*, *abdominalis*, *balii*, p. 525, *viridipennis* and *minuta*, p. 526, Jacoby, Cist. Ent. ii., all from Chanchamayo; *D. marginella*, Costa Rica, p. 789, *foveipennis* and *tripunctata*, Guatemala, p. 790, *imitans*, Venezuela, and *fenestralis*, Chontales and Costa Rica, p. 791, *id.* P. Z. S. 1879.

Agelastica humeralis, Moreton Bay, and *melanocephala*, Rockhampton and Murray Island, Baly, Ann. N. H. (5) iv. pp. 108 & 109.

Agetocera flaviventris, Jacoby, P. Z. S. 1879, p. 788, India.

Mimastra quadripartita, *limbata*, and *chennelli*, Baly, Cist. Ent. ii. pp. 448–450, Assam.

Œdicerus apicipennis, Baly, Ann. N. H. (5) iv. p. 110, India.

Chthonius jansoni, Chontales, and *smaragdipennis*, Guatemala, Jacoby, P. Z. S. 1879, p. 786.

Trijo viridis, id. *l. c.* p. 787, Mexico.

Monotia viridis, id. *l. c.*, Guatemala.

Lyperus armeniacus, Kiesenwetter, Verh. Ver. Brünn, xvii. p. 81, Transcaucasia; *L. elegans*, Harold, S. E. Z. xl. p. 336, Zanzibar; *L. nigro-cyaneus*, Le Conte, Bull. U. S. Geol. Surv. v. p. 517, Colorado.

Monocesta sublimbata and *approximata*, Baly, Tr. E. Soc. 1879, p. 258, Chanchamayo.

Cœlomera nigricollis, Irazu, Costa Rica, and *godmani*, Chontales, Jacoby, P. Z. S. 1879, p. 785.

Nestinus flavo-marginatus, id. *l. c.* p. 789, Mexico.

Doryxena geniculata, Baly, Cist. Ent. ii. p. 451, Assam.

Mesodonta marginata, id. Ann. N. H. (5) iv. p. 111, Cameroons.

Pachytoma dircemoides, Harold, C. H. xvi. p. 213, Cuanza.

Galeruca submetallescens and *tarsalis*, Baly, Cist. Ent. ii. pp. 451 & 452, Assam.

Galerucella tropica, Baly, Ann. N. H. (5) iv. p. 110, Guinea, Cameroons; *G. parvicollis*, Harold, C. H. xvi. p. 214, Dondo.

Malacosoma flavipes, Heyden, Verh. Ver. Brünn, xvii. p. 80, Transcaucasia.

Haplosonyx scutellatus, id. *l. c.* p. 452, Assam; *H. adustus*, Harold, *l. c.* p. 211, Interior of Angola; *H. concinnus* and *speciosus*, Celebes, p. 113, *mouhoti*, Siam, Cambodia, p. 114, and *sexplagiata*, Flores, p. 115, Baly, Ann. N. H. (5) iv.

Leptarthra fraternalis, id. Cist. Ent. ii. p. 455, Assam.

Cerotoma atro-fasciata, Jacoby, P. Z. S. 1879, p. 792, Guatemala.

Galerucida eburata, Harold, Deutsche E. Z. xxiii. p. 368, Japan.

Antipha chinensis, N. China, p. 115, *nietneri*, Ceylon, and *pulchella*, p. 116, *pretiosa* and *discoidalis*, p. 117, *costata*, Borneo, *bretinghami*, India, p. 118, and *frontalis*, Singapore, p. 119, Baly, Ann. N. H. (5) iv.; *A.*

posticata, p. 455, *flavo-fasciata* and *histrio*, p. 456, *id.* Cist. Ent. ii., Assam.

Monolepta cavipennis, id. *l. c.* p. 459, Assam.

Hylaspes assamensis, id. *l. c.* p. 460, Assam.

Eustetha limbata, id. *l. c.* p. 462, Assam.

Ænidia barbata and *eximia*, id. *l. c.* p. 464, Assam; *Æ. bipartita*, Jacoby, P. Z. S. 1879, p. 792, Sumatra.

Hispides.

Prosopodonta costata and *punctata*, pl. ix. fig. 4, spp. nn., C. O. Waterhouse, Cist. Ent. ii. p. 428, Medellin, Colombia.

Arescus lævicollis, sp. n., *id. l. c.* p. 427, Medellin.

Monochirus caucasicus, sp. n., Heyden, Verh. Ver. Brünn, xvii. p. 87, pl. vi. fig. 54, Elisabetpol, Caucasus.

Hispa excisa, sp. n., Kraatz, Deutsche E. Z. xxiii. p. 140, pl. ii. fig. 10, Amoor.

Cassidides.

Kraatz, G. Die Cassiden von Ost-Sibiriens und Japan. Deutsche E. Z. xxiii. pp. 267–275.

A list of species, with descriptions of all which are not likewise European.

Cassida erudita and *consociata*, Baly, = *C. rugoso-punctata* and *fusco-rufa*, Motsch., respectively; Lewis, Anu. N. H. (5) iv. p. 465.

Aspidomorpha vicaria, sp. n., Harold, C. H. xvi. p. 216, Interior of Angola.

Cassida stictica, id. *l. c.* p. 216, Interior of Angola; *C. diabolica*, Amoor, p. 142, *angulifera*, Japan, p. 274, and *biguttulata*, Amoor, p. 275, Kraatz, Deutsche E. Z. xxiii.: spp. nn.

Erotylidæ.

Harold, E. von. Beiträge zur Kenntniss der *Languria*-Arten aus Asien und Neuholland. MT. Münch. ent. Ver. iii. pp. 46–94.

The known and new species are described in detail, the total number amounting to 59. The genus *Pachylanguria*, Crotch, is rejected. Many names are sunk as synonyms or varieties. The following species are described as new:—*Languria borneensis* and *amœna*, Sarawak, p. 56, *punctata*, Darjeeling, p. 58, *geniculata*, Hiogo, Japan, p. 59, *bipartita*, E. Indies, p. 62, *stenosoma*, Sarawak, and *elegantula*, Luzon, p. 64, *atro-cyanea*, Celebes, p. 65, *picea*, Somerset, Australia, and *beccarii*, p. 66, *papuana* and *violaceipennis*, p. 68, *pavida*, p. 69, New Guinea, &c., *timorensis*, Timor and Ternate, p. 70, *cordicollis*, p. 71, *tenuis* and *glabricollis*, p. 72, Ternate, &c., *ceylonica*, Ceylon, p. 73, *birmanica*, Burma, p. 74, *crotchi*, N. Guinea, p. 75, *nietneri*, Ceylon, and *manicata*, p. 76, *serratula*, N. Guinea, p. 77, *trifoliata*, Ceylon, *doriæ*, p. 78, and *brevis*, Sarawak, p. 79, *militaris*, p. 80, and *albertisi*, Australia, &c., p. 81, *melanosterna*, Luzon, p. 82, *pulona* [Penang is the name; Pulo merely means island—Ed.], Pulo Penang, p. 83, *filaria*, Java, p. 84,

gestroi, Celebes, and *dohrni*, Burmah, p. 85, *insularis*, N. Guinea, p. 86, *plebeia*, Ternate and Amboina, and *capitalis*, Celebes, p. 87, *verticalis*, p. 89, *futilis*, N. Guinea, &c., and *vulgaris*, Somerset, Australia, p. 90, *parvula*, N. Guinea, p. 91, and *guineensis*, Guinea, p. 94.

Megalodacne flavo-fasciata, Reitter, Deutsche E. Z. xxiii. p. 223, E. Siberia; *M. rufo-vittata*, Harold, C. H. xvi. p. 219, Interior of Angola: spp. nn.

Episcapha hamata, Hakodaté, and *gorhami*, Yezo, Lewis, Ann. N. H. (5) iv. p. 465, spp. nn.

Coptocycla amurensis, Amoor, and *crucifera*, Japan, Kraatz, Deutsche E. Z. xxiii., spp. nn.

Triplax signaticollis, p. 221, *seminigra*, *amurensis*, *nigrina*, *cinnabarina*, p. 222, and *fulvus*, p. 223, spp. nn., Reitter, *l. c.* E. Siberia.

Tritoma irrorata and *atra*, p. 224, *antennata*, p. 225, spp. nn., *id. l. c.*, E. Siberia.

Cyclomorphus glabratus, sp. n., C. O. Waterhouse, Cist. Ent. ii. p. 428, Medellin, Colombia.

Endomychidæ.

Trycherus recticollis, sp. n., Harold, C. H. xvi. p. 220, Loanda.

Lycoperdina crassicornis, sp. n., Reitter, Verh. z.-b. Wien, xxix. p. 97, Transylvania.

Dapsa lederi, id. *l. c.* pp. 97 & 487; *D. nigripennis*, id. Verh. Ver. Brünn, xvii. p. 89, both from the Caucasus: spp. nn.

Coccinellidæ.

Weise, J. Bestimmungs- Tabellen der europäischen Coleopteren. ii. *Coccinellidæ*. Z. f. Ent. (n.s.) vii. pp. 88–156.

One new genus and a few new species are described. The following synonymy is given: *Bulæa pallida*, Motsch., = *lichatschovi*, var.; *Novius* 10-*punctatus*, Kraatz, = *cruentatus*, Muls.; *Hyperaspis marginella*, Fabr., and *illecebrosa*, Muls., = *reppensis*, Herbst; *concolor*, Suffr., = *campestris*, Herbst.

Antonina purpurea, its transformations, and ontogenesis; J. Lichtenstein, Ann. Soc. Ent. Fr. (5) ix. pp. 45 & 46.

Cleothera abendrothi, Kirsch, ? = *gacognii*, Muls.; Schaufuss, Nunq. Ot. iii. p. 480.

Scymnus analis, Fab.; its larva as a wax-producer, E. Schindler, MT. schw. ent. Ges. v. pp. 494–496. *S. hilaris*, Motsch., amended description, and *S. ferrugatus*, Müll. (*analis*, Fabr.), var. (?) *japonicus*, noticed; Weise, Deutsche E. Z. xxiii. p. 151.

Cnoodes abendrothi, Kirsch, = *Scymnus apicalis*, Muls.; Schaufuss, nanq. Ot. iii. p. 480.

Chilocorus intermediate between *renipustulatus* and *bipustulatus*; E. L., *parvula*, Fabr., =15.

Rossi; *Nomioides flavi*eise, Z. f. Ent. (n.s.) vii. p. 126. Differs from *garica*, Mocs., ♂, = *mut* scutellum, and from *Halyzia* by its stout and

less distinctly articulated antennæ. Type, *H. venusta*, sp. n., *l. c.* p. 127, Pyrenees and Apennines.

New species:—

Adalia apicalis, Weise, *l. c.* p. 104, & Verh. z.-b. Wien, xxix. p. 486, Caucasus.

Coccinella schneideri, id. Verh. Ver. Brünn, xvii. p. 91, Tiflis, &c.; *C. crotchi*, Lewis, Ann. N. H. (5) iv. p. 486, Japan.

Exochomus undulatus, Weise, *l. c.* p. 93, pl. vi. fig. 55, Tiflis, &c.

Pentilia nigra, id. Deutsche E. Z. xxiii. p. 149, Nagasaki.

Hyperaspis testaceicornis, id. *l. c.* p. 149, Yokohama; *H. transverso-guttata*, id. Verh. Ver. Brünn, xvii. p. 94, pl. vi. fig. 56, Helenendorf.

Scymnus plagiatus, id. *l. c.* p. 95, pl. vi. fig. 57, Erivan, &c.; *S. globosus*, Caucasus, and *damrii*, Corsica, *id.* Z. f. Ent. (n.s.) vii. pp. 145 & 149; *S. hareja*, Hagi, *dorcatomoides*, Hagi, Yokohama, *hoffmanni*, Japan, and *ludii*, Greece, *id.* Deutsche E. Z. xxiii. pp. 150–153; *S. politus*, Schaufuss, Nunq. Ot. iii. p. 480, Granada.

Novius concolor, Lewis, *l. c.* p. 466, Hiogo.

Lithophilus caucasicus, Weise, Verh. Ver. Brünn, xvii. p. 97, Borshom; *L. weisii*, Caucasus, and *græcus*, Greece, Asia Minor, Reitter, Verh. z.-b. Wien, xxix. p. 94.

Epilachna bituberculata, C. O. Waterhouse, Cist. Ent. ii. p. 429, Medellin, Colombia.

HYMENOPTERA.

BY

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

The General Subject.

André, E. Species des Hyménoptères d'Europe et d'Algérie, enrichi de planches coloriées donnant d'après nature outre un ou plusieurs specimens des insectes de chaque genre, de nombreux dessins un trait des caractères utiles à l'intelligence du texte; redigé d'après les principales collections, les mémoires les plus recents des auteurs, et les communications des entomologistes spécialistes. Tom. 1^ière, fasc. i.–iii., Beaune (Côte-d'Or): 1879, 8vo, pp. cxlviii., 48, 8*, pls. i.–lia, plain (details), & vii.–ix. col.

The work contains a very elaborate introduc[illegible] as the name; Pulo *filaria*, Java, p. 84, including, among other matter, a good biblio[illegible]

mencement of the special part, containing *Tenthredinidæ*. The latter comprises an introduction to the family, a special bibliography, a table of genera, and descriptions of species, dichotomously arranged, as far as the genus *Schizocera*; larvæ are also described, and parasites enumerated. A synonymic catalogue of species, separately paged, is added, the present instalment of which extends to the genus *Lophyrus*.

CAMERON, P. On some new or little known British *Hymenoptera*. Tr. E. Soc. 1879, pp. 107–119.

Relates to *Tenthredinidæ*, *Cynipidæ*, and *Chalcididæ*.

CRESSON, E. T. Descriptions of new North American *Hymenoptera* in the Collection of the American Entomological Society. Tr. Am. Ent. Soc. vii. pp. 201–214.

Calliopsis lateralis, Cress., is noticed as a var. of *edwardsi*, Cress.; and *Melecta pacifica*, Cress., var. *fulvida*, and *Anthidium emarginatum*, Say, var. *atripes*, both from Nevada, are described.

FABRE, J. H. Souvenirs Entomologiques; Études sur l'instinct et les mœurs des insectes. Paris: 1879, 12mo, pp. 324.

Except the two first chapters, which relate to *Scarabæus*, the whole of this work is devoted to observations on the habits, nidification, &c., of different species of *Cerceris*, *Sphex*, *Ammophila*, *Bembex*, and *Chalicodoma*. Four new species are described in an appendix.

GIRARD, M. Traité élémentaire d'Entomologie. Tom. ii. Fasc. 2, Hymenoptères porte-aiguillon. Paris: 1879, 8vo, pp. 577–1028, pls. 7.

GRIBODO, G. Note imenotterologiche. Ann. Mus. Genov. xiv. pp. 325–347.

LUBBOCK, J. Observations on the Habits of Ants, Bees, and Wasps. Pt. vi. J. L. S. xiv. pp. 607–626.

One function of plant-hairs is probably to prevent ants climbing up the stems, as they cannot climb up far with the hairs pointing downwards. Worker ants frequently lay eggs, but these usually produce only males. The relations between Ants and their domestics, their longevity, and the manner of recognition of friends, is then discussed, and the result of various experiments is detailed. Observations are added on the relation of the second "knot" and sting; on sounds emitted by ants; and on their occasional manifestation of kindness. The paper concludes with an account of some experiments indicating that Wasps are less guided by colour than Bees, but are much more fastidious in their food.

MOCSÁRY, A. Data nova ad Faunam Hymenopterologicam Hungariæ meridionalis comitatu Temesiensis. Term. Közl. xvi. pp. 1–70.

Relates principally to *Apidæ*. Several interesting species are redescribed, and the following synonyms, &c., occur:—*Eucera tomentosa*, Mor., *nec* Dours, is renamed *spectabilis*; *Tetralonia grandis*, Fourcr., = *rufi-cornis*, Brullé; *Lasius difformis*, Panz., = *Nomia femoralis*, Pall.; *Apis parvula*, Fabr., = *Nomia pulchella*, Schenck, = *Nomioides minutissimus*, Rossi; *Nomioides flavo-pictus*, Dours, = *pulchellus*, Jur.; *Chalicodoma hungarica*, Mocs., ♂, = *muraria*, Fabr., var.; *C. hungarica*, ♀, is a good species;

Lithargus hæmorrhoidalis, Lep., = *monoceros*, Mor., pt., = *chrysurus*, Fonsc. ; *L. cornutus*, Fonsc., *nec* Fabr., = *nasutus*, Dup., = *monoceros*, Ev., Mor., pt., = *dohrni*, Rad., = *fuscipennis*, Lep. ; *Anthidium flavilabrum*, Latr., = *integrum*, Ev., = *curvipes*, Schneid., = *interruptus*, Fabr.; *Epeolus luctuosus*, Ev. (*nec* Spin.), = *speciosus*, Grav., = *tristis*, Sm.; *Cœlioxys pulchellus*, Mor., = *hæmorrhoa*, Först. ; *C. conspersa*, Mor., = *polycentris*, Först. ; *C. coronata*, Först., = *mandibularis*, Chevr. ; *C. robusta*, Mor., = *emarginata*, Först. Many new species are also described.

[Mocsáry, A.] Hymenoptera Nova e Fauna Hungarica. Term. füzetek, iii. pp. 115-141.

Patton, W. H. List of a Collection of Aculeate *Hymenoptera* made by S. W. Williston in North-western Kansas. Bull. U. S. Geol. Surv. v. pp. 349–370.

The following synonyms occur :—*Meria collaris* and *Sapyga sabulata*, Say, = *Myzine namea*, Fabr., ♂ & ♀, *Meria costata*, *Myzine hamata*, Say, and *My. menechma*, Lep., = *My. interrupta*, Say, *Ceropales texana*, Cress., ? = *nigripes*, Cress., *Ammophila gryphus*, Sm., = *procera*, Dahlb., *procera*, Lep. *nec* D., = *interrupta*, Lep., *Cerceris bidentata*, Say, = *Eucerceris canaliculatus*, Say, *Monedula formosa*, Cress., = *speciosa*, Cress., *Nomia cressoni*, Westw., = *nortoni*, Cress. The following known species are redescribed :—*Paratiphia albilabris*, Spin. (♀), *Ammophila aberti*, Hald., *Harpactopus rufiventris*, Cress. (♂), *Larra æthiops*, Cress. (♂), *Eucerceris superbus* (♂), *laticeps*, ♀, Cress., and *canaliculatus*, Say, *Cerceris fulvipes*, Cress. (♀), and *sexta*, Say (♂), *Monedula speciosa*, Cress., *Bembex sayi*, Cress. (♀), *Colletes armata*, Patt. (♂), *Planiceps concolor*, Sm., *Ceropales elegans*, Cress. (♂), *Tachytes texanus*, Cress. (♂), *Monedula emarginata*, Cress. (♂).

Radoszkovsky, O. Les Chrysides et Sphégides du Caucase. Hor. Ent. Ross. xv. pp. 140–156.

60 *Chrysididæ* and 67 *Sphegidæ* enumerated, some new. The *Sphegidæ* are made to include the *Mutillidæ*, *Scoliidæ*, and *Sapygidæ* as sub-families.

Service, R. The Aculeate *Hymenoptera* of the district surrounding Dumfries. Scot. Nat. v. pp. 63–68.

A good local list.

Smith, F. Descriptions of New Species of *Hymenoptera* in the Collection of the British Museum. London : 1879, 8vo, pp. xxi., 240.

661 species are described, including a few previously published in P. Z. S. and J. L. S. The present work was published after the author's death, under the supervision of C. O. Waterhouse.

——. Scientific Results of the Second Yarkand Mission, based upon the Collections and Notes of the late F. Stoliczka : *Hymenoptera*. Published by order of the Government of India. Calcutta : 1878, 4to, pp. 22, plate.

The following known species are mentioned :—*Crocisa histrio*, Fabr., *Bombus altaicus*, Eversm., *Camponotus bacchus*, Sm. (♂ described, p. 10),

Mutilla suspiciosa, Sm., *M. 6-maculata*, Swed. (*nec* Radoszk., but ? = *M. rufo-gastra*, St. Farg., *cf.* p. 13), *Scolia hæmorrhoidalis*, Fabr., *Larrada aurulenta*, Fabr., *Polistes chinensis*, Fabr. (var., p. 17), and *Vespa germanica*, Fabr.

——. Descriptions of New Species of Aculeate *Hymenoptera* collected by T. Blackburn in the Sandwich Islands. J. L. S. xiv. pp. 674–685.

The known species are enumerated, as well as new ones, and show chiefly North American affinities. There is, however, a slight admixture of Tropical American forms, and a few wide-ranging, and even European species, probably introduced. Short notes on habits, localities, &c., are added.

——. Zoology of Rodriguez: *Hymenoptera*. Phil. Tr. clxviii. pp. 534–538.

15 species were obtained; the new species (described in Ann. N. H. 4, xvii.) are redescribed here.

——. Descriptions of Hymenopterous Insects from Japan. Ent. iv. [1869] pp. 205–208. [Omitted from Zool. Rec. vi.]

Vollenhoven, S. C. Snellen van. Pinacographia [Zool. Rec. xi. p. 444, xii. p. 384, xiv. *Ins.* p. 86, xv. *Ins.* p. 124]. Part 8, pp. 57–63, pls. xxxvi.–xl. s'Gravenhage: 1879, 4to.

The plates, as usual, consist to a great extent of details.

Westwood, J. O. On some minute Hymenopterous Insects. Tr. L. Soc. Zool. (2) i. pp. 583–593, pl. lxxiii.

The following known species are discussed in this paper:—*Walkerella* (*Polynema*) *natans*, Lubb. (figs. 1 & 2, antenna and tarsus), *Mymar pulchellus*, Curt. (fig. 3), *taprobanicus*, A. O. Ward (figs. 4–7); *Prestwichia æquatica*, Lubb., belongs not to the *Mymarides*, but to the *Eulophides*, and may possibly belong to *Oligosita*; *Trichogramma*, Westw., allied genera and species discussed.

Aberrations of neuration in *Hymenoptera*; Rudow, Ent. Nachr. v. pp. 209–211.

Notes on various *Hymenoptera* bred from galls of *Cynips kollari*, *Prosopis rupestris*, Smith, being the most interesting; E. A. Fitch, Ent. xii. pp. 113–119.

Pompilius consobrinus, Dahlb., *P. chalybeatus*, Schiödte, *Mimesa equestris*, Fab., *apud* Wesm., *nec* Shuck., *Oxybelus mandibularis*, Dahlb., and *Halictus pauxillus*, Schenk, recorded as new to Britain, and redescribed; E. Saunders, Ent. M. M. xv. pp. 199 & 200.

Notes on the *Hymenoptera* of Yorkshire, including a list of the chief publications in each family; W. D. Roebuck, Tr. Yorksh. Nat. Union, i. ii. Series D, pp. 23–64.

Notes on *Hymenoptera* in Norfolk; J. B. Bridgman, Ent. xi. pp. 54 & 55.

Captures of rare and interesting *Hymenoptera* at Hastings in 1879; E. Saunders, Ent. M. M. xvi. pp. 97 & 98.

Notes on *Hymenoptera* of the neighbourhood of Hamburg; E. Beuthin, Verh. Ver. Hamb. iv. pp. 239-241.

Captures of *Hymenoptera* at Quebec; Nat. Canad. xi. p. 268.

Bombus balteatus, Dahlb. (= *kirbiellus*, Curt.), *B. polaris*, Curt., *Ichneumon erythromela*, sp. n., *Cryptus arcticus*, Schiodte ?, and *Microgaster halli*, recorded from Hayes Sound, &c.; R. MacLachlan, J. L. S. xiv. pp. 106 & 107.

Apidæ.

Bramson, K. L. Hymenoptera Mellifera der Umgegend von Jekaterinoslaw. Bull. Mosc. liv. pt. i. pp. 253–306, 4 tables.

A rather elaborate paper, treating of the comparative numbers of the genera, the times of appearance, and abundance of the species and groups (illustrated by the tables), and the flowers which they frequent. Varieties of the following species are mentioned:—*Hylæus ciliatus*, Mus. Ber., p. 281, *Andrena rosæ*, Sm., p. 286, and *mixta*, Schenck, p. 288, *Anthidium manicatum*, Linn., and *cingulatum*, Latr., p. 293, *Ceratina ænea*, Brullé, p. 294, *Nomada rufiventris*, K., p. 295, *Cœlioxys coronata*, Först., p. 297, *Anthophora quadrifasciata*, De Vill., p. 298, and *Bombus terrestris*, L., p. 300.

Cresson, E. T. Catalogue of North American *Apidæ*. Tr. Am. Ent. Soc. vii. pp. 215–232.

Mocsáry, A. Mellifera Nova in Collectione Musaei Nationalis Hungarici. Term. füzetek, iii. pp. 8–12, 233–244.

Perez, J. Contribution à la Faune des Apiaires de France. Act. Soc. L. Bord. xxxiii. pp. 119–229.

Includes descriptions of several new species and varieties. Many amended descriptions and corrections of synonymy occur, which will not be further noticed here.

Ritsema, C. Naamlijst der tot heden in Nederland waargenomen Bijensoorten (*Hymenoptera*, *Anthophila*). Tijdschr. Ent. xxii. pp. 21–57.

190 species enumerated, 1 new. Several supplementary lists of reputed or doubtful species are added.

Utility of Bees in fertilizing flowers; JB. Bienenwirthschaftliche Hauptverein im Königr. Sachsen, 1878; Nature, xx. p. 424.

Andrenides.

Fabre, J. H. Mœurs et parthénogénèse des Halictes. C. R. lxxxix. pp. 1079–1081.

Nidification, &c., is described in *Halictus lineolatus*, Lep., and *sexcinctus*, Latr. Two broods occur in the year, one being parthenogenetic.

Saunders, E. Notes on the genus *Cœlioxys*, and an additional species to the list of British *Hymenoptera*. Ent. M. M. xvi. pp. 1 & 2.

5 species are admitted as British, and their leading characteristics pointed out. *C. acuminata*, Nyl., is recorded as new to Britain; and *C. umbrina*, Smith, is sunk as a small form of *rufescens*.

——. Notes on the genus *Prosopis*, and on an additional species (*P. confusa*, Nyl.) to the list of British *Hymenoptera*. L. c. pp. 38 & 39.

9 species are admitted as British, inclusive of *P. confusa*, not previously recorded. *P. rupestris*, Smith, is excluded, as probably only a var. of *P. communis*, Nyl.; and *P. variegata* and *bifasciata*, Smith, are excluded as doubtfully British.

Colletes. Table of New England species; W. H. Patton, P. Bost. Soc. xx. p. 142.

Andrena flossæ, male, stylopized on one side, had the generative organs atrophied on that side. J. Perez, Act. Soc. L. Bord. xxxii. p. lxv.

Macropis. Habits and characters discussed; W. H. Patton, Am. J. Sci. (3) xviii. pp. 211–214, and Ann. N. H. (5) iv. pp. 286–290. The author rejects the subdivision of the Bees into *Andrenidæ* and *Apidæ*, and proposes to place *Macropis* between the *Andrenoides* and *Scopulipedes*.

New genera and species :—

Mydrosoma, F. Smith, Descr. New Hym. p. 5. Allied to *Ptiloglossa*; forewings with the second submarginal cell subquadrate, tongue blunt. Type, *M. metallicum*, sp. n., *l. c.* p. 6, Ega.

Stilpnosoma, id. *l. c.* p. 16. Allied to *Prosopis*, div. 2; head large, subglobose; labrum broadly obtuse at apex. Type, *S. lævigatum*, sp. n., *l. c.*, Queensland.

Cacosoma, id. *l. c.* p. 39. Allied to *Halictus*, abdomen petiolate in both sexes; clavate in male; maxillary palpi 6-jointed, the three basal joints short, stout, and clavate: the three last joints slender. For *C. discolor*, Mexico, *agile*, Brazil, and *abdominale*, Chili, p. 40, *marginatum*, Chili, and *jucundum*, St. Paulo, p. 41, spp. nn.

Colletes nitidus, E. Florida, and *perplexus*, p. 1, *intricatus*, and *griseus*, Orizaba, p. 2, *rufipes*, Bahia, *senilis*, Para, Petropolis, and *bicolor*, Mendoza, p. 3, *id.* l. c.; *C. perforator*, id. Ent. iv. p. 205, Japan (1869); *C. æstivalis*, *armata* (= *inæqualis*, Cress.; *nec* Say, which = *propinqua*, Cress.), and *scitula*, W. H. Patton, P. Bost. Soc. ii. pp. 142–144, Connecticut, &c.; *C. ciliata*, id. Bull. U. S. Geol. Surv. v. p. 369, Kansas.

Paracolletes nitidus, N.W. Australia, p. 3, *fervidus*, New Holland, and *marginatus*, Queensland, p. 4, and *abdominalis*, Champion Bay, p. 5; F. Smith, Descr. New. Hym.

Lioproctus fimbriatus, locality not stated, and *vigilans*, Swan River; *id. l. c.* pp. 6 & 7.

Caupolicana pubescens, *funebris*, Chili, p. 7, and *lugubris*, Uruguay; p. 8, *id. l. c.*

Lamprocolletes metallicus and *providus*, p. 8, *amabilis*, Australia, *fulvus*, Queensland, and *nanus*, p. 9, *ruficornis*, W. Australia, *bimaculatus*, *bicolor*, and *antennatus*, p. 10, and *argentifrons*, Swan River, p. 11, *id.* l. c.; *L. peregrinus*, id. Second Yark. Miss. Hym. p. 2, fig. 5, Yangihissar.

Dasycolletes humerosus, Melbourne, and *vitrifrons*, Swan River; *id.* Descr. New Hym. p. 11.

Euryglossa quadrimaculata, Queensland, *simillima* and *rubricata*, p. 12, *nigra*, Australia, *blanda*, W. Australia, *jucunda*, Champion Bay and Swan River, and *maculata*, p. 13, *rubricata*, Swan River, *nitidifrons*, Australia,

and *flavo-picta*, Champion Bay, p. 14, *halictiformis*, *villosula*, and *tricolor*, Swan River, p. 15; *id. l. c.*

Prosopis obtusata, Swan River, *quadriceps*, Australia, *purpurata*, p. 17, *elongata*, Adelaide, *cognata*, Champion Bay and Swan River, *bituberculata*, p. 18, *rotundiceps*, Melbourne, *honesta*, Tasmania, *amicula*, Champion Bay, *insularis*, Macassar, p. 19, *blackburni* and *fuscipennis*, p. 20, *facilis*, *hilaris*, and *volatilis*, p. 21, Sandwich Islands (these 5 spp. also described in J. L. S. xiv. pp. 682 & 683), *rugosa*, St. Paulo, *vigilans*, Central America, p. 22, *maculipennis* and *trepanda*, Oajaca, *lateralis*, p. 23, *proxima*, Champion Bay, *albo-maculata*, Swan River, and *varicolor*, p. 24, *torrida*, Queensland, *rubricata*, Swan River, *penetrata*, p. 25, *morosa*, Australia, and *simillima*, Moreton Bay, p. 26, *id.* l. c.; *P. fervidus*, id. Second Yark. Miss. Hym. p. 1, Kashmir.

Sphecodes volatilis, Trans-Baikal, and *rufiventris*, Natal, p. 26, *montanus* and *iridipennis*, N. India, *albifrons*, p. 27, and *crassicornis*, Bombay, *pilosulus*, Oajaca, and *sodalis*, Calcutta, p. 28, *id.* Descr. New Hym.; *S. perversus*, C. Ritsema, Tijdschr. Ent. xxii. p. 56, Holland.

Temnosoma smaragdinum, S. Mexico, *æruginosum*, Ega, p. 20, and *lævigatum*, St. Paulo, p. 21; F. Smith, Descr. New Hym.

Halictus senescens, Bombay, *vernalis*, p. 30, and *timidus*, Ceylon, *proximatus* and *familiaris*, Hakodaté, p. 31, *albo-zonatus*, Punjab, *torridus*, Natal, and *niloticus*, White Nile, p. 32, *albo-fasciatus*, Burghersdorp, S. Africa, *diversus*, Natal, and *communis*, S. Africa, p. 33, *lanuginosus* and *conspicuus*, Australia, *vitripennis*, p. 34, and *urbanus*, Champion Bay, *convexus*, Victoria, *oblitus* and *vividus*, Swan River, p. 35, *inclinans*, *humilis*, and *punctatus*, Champion Bay, p. 36, *exiguus*, Mexico, *agilis* and *vagans*, p. 37, *politus* and *desertus*, Oajaca, p. 38, *providens*, Guatemala, and *placidus*, Chili, p. 39, *id.* l. c.; *H. longiceps*, *breviceps*, and *punctigollis*, E. Saunders, Ent. M. M. xv. p. 200, England; (the last has been previously described by Morawitz under the same name, *id. l. c.* p. 236); *H. kessleri*, K. L. Bramson, Bull. Mosc. liv. pt. 1, p. 286, Ekaterinoslav.

Augochlora acidalia, p. 41, *berenice*, Uruguay, *callisto*, Monte Video, p. 42, *acis*, Uruguay and Monte Video, *atropos* and *deidamia*, St. Paulo, p. 43, *feronia*, Constancia, Brazil, *chryseis*, Guatemala, *calypso*, p. 44, *festiva*, Santarem, *læta*, Ega, and *alcyone*, St. Domingo, p. 45, *nana*, Santarem, *thalia* and *briseis*, St. Paulo, p. 46, *aspasia* and *aurora*, Mexico, and *hebescens*, Amazons, p. 47, F. Smith, Descr. New Hym.; *A. humeralis*, Patton, Bull. U. S. Geol. Surv. v. p. 365, Kansas.

Megalopta purpurata and *nigro-femorata*, Ega, *vivax*, Para, and *pilosa*, p. 48, *cuprifrons* and *ornata*, St. Paulo, p. 49; F. Smith, *l. c.*

Hylæus nigrifacies, Bramson, *l. c.* p. 281, Ekaterinoslav.

Andrena torrida and *mollis*, Bombay, *communis*, Masuri, p. 50, *vitiosa*, N. China, *dentata*, Yokohama, and *fastuosa*, p. 51, *discreta*, *sodalis*, and *simulata*, p. 52, *agilis* and *modesta*, Mexico, *commoda*, p. 53, *flavo-clypeata*, *miranda*, and *mœsta*, Canada, p. 54, *errans*, *cærulea*, and *subtilis*, p. 55, *candida* and *auricoma*, Vancouver's Island, *arrogans*, Burghersdorp, S. Africa, p. 56, *fausta* and *neglecta*, Natal, F. Smith, l. c.; *A. familiaris*, Yarkand, and *floridula* (*floricula* on plate), Ladak, *id.* Second Yark. Miss. Hym. p. 2, figs. 3 & 4; *A. halictoides*, id. Ent. iv. p. 205, Japan (1869); *A.*

holosericea and *squamigera*, Bramson, *l. c.* pp. 287 & 289, Ekaterinoslav; *A. dilecta*, Mocsáry, Term. füzetek, iii. p. 11, Hungary.

Clenoplectra apicalis, Burma, and *terminalis*, Natal, F. Smith, Descr. New Hym. pp. 57 & 58.

Megacilissa vestita, Peru, *tenuimarginata*, p. 58, *clypeata*, Mexico, and *generosa*, Venezuela, p. 59, *id. l. c.*

Apides.

Bowles, C. J. Notes on Humble Bees. Canad. Ent. xi. pp. 134–137.

General notes, followed by a list of the *Bombi* and *Apathi* of Quebec.

Henneberg, W. Chemische Untersuchungen auf apistischem Gebiete. Götting Nachr. 1878, pp. 341–354. (Several articles on the same subject have since appeared in the "Bienenzeitung," &c.)

Holmberg, E. L. Sobre las especies del género *Bombus* halladas en la República Argentina. An. Soc. Arg. viii. pp. 154–162.

The species described are *B. violaceus*, St. Farg., *thoracicus*, Sich., *caiennensis*, Fabr., and *dahlbomi*, Guér.

Hunter, J. On the Queen Bee, with especial reference to the Fertilization of her Eggs. J. Quek. Club, v. pp. 127–132.

A summary of our present knowledge on the subject.

Müller, H. *Bombus mastrucatus*, ein Dysteleolog unter den alpinen Blumenbesuchern. Kosmos, v. pp. 422–431.

This species is far more prejudicial than useful to the flowers which it robs of its honey; but some are structurally protected against its attacks.

Patton, W. H. Generic Arrangement of the Bees allied to *Melissodes* and *Anthophora*. Bull. U. S. Geol. Surv. v. pp. 471–479.

The genera characterized (exclusive of new ones) are grouped as follows:—

Euceræ: *Melissodes* (type, *rustica*, Say), *Tetralonia* (type, *antennata*, Latr.), *Xenoglossa* (type, *fulva*, Smith; *pruinosa*, Say, may not be congeneric).

Anthophoræ: *Habropoda* (type, *ezonata*, Sm.), *Anthophora* (type, *retusa*, Linn.).

Latsina, F. Una cuestion de Minima que las Abejas resuelven en la construccion de sus celdas. Period. Zool. Argent. iii. pp. 23–30, plate.

Stein, J. Eine Hummelart in Zaunkönigs Nestern. MT. Münch. ent. Ver. iii. pp. 139–141.

Records the occurrence of broods of *Bombus pratorum* (?) in the supposed nests of the Golden-crested Wren, but suggests the possibility of the nests being similar structures formed by the bees themselves.

Taschenberg, E. Die Arten der Gattung *Xylocopa*, Latr., des Hallé-schen Zoologischen Museums. Z. ges. Nat. (3) iv. pp. 563–599.

34 species (1 new) are described in detail. The following synonyms

occur :—*X. frontalis*, Ol. (♂ = *fasciata*, Lep.), *fimbriata*, F. (= *cor*[illegible] and *caiennæ*, Lep.), *brasilianorum*, L. (= *chrysoptera*, Latr.), *virgilor*, Dru. (= *carolina*, Lep.), *collaris*, Lep. (♂ = *dejeani*, Lep.), *latipes*, [illegible] (= *gigas*, Deg.), *flavo-rufa*, Deg. (= *trepida*, F.), *æstuans*, L. (= *leu*[illegible], *thorax*, Deg., = *verticalis*, Sm.), *africana*, Sm. (♀ = *varipes*, Sm.). The following notes on species wrongly identified by Taschenberg are made by Ritsema at pp. 897 & 898 :—*X. capensis* ? = *torrida*, ♀ Westw., = *crassa*, Lep.; *X. virescens*, ♀, = *latipes*, ♀, Dru., and *latipes*, ♀, = *tenuiscapa*, ♀, Westw.

Tomaschek, A. Ein Schwarm der amerikanischen Bienenart *Trigona lineata*, Lep., lebend in Europa. Zool. Anz. ii. pp. 582–587.

The swarm appears to have been introduced accidentally in timber. Some details of the habits and economy of the insects are given.

Collecting excursions in Switzerland in 1879, with notes on the species of *Osmia* captured, including a very large variety of ? *O. inermis*, Zett.; Frey-Gessner, MT. schw. ent. Ges. v. pp. 515–540.

Chalicodoma. Habits and nidification described, with experiments on the power of the insect to rediscover its nest; Fabre, Souv. Ent. pp. 275–319; *cf.* Lucas & Lichtenstein, Bull. Soc. Ent. Fr. (5) ix. pp. xxiii., xxiv., xxxv., xxxvi., cliii., cliv., clxvi. & clxvii.

Megachile centuncularis (?). Note on nidification; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. xxxv. Nesting in a window-frame; Johanson, SB. Ges. Dorp. v. p. 119.

Ceratina albilabris, Jur., and *Osmia leucomelana*, Kirby (= *parvula*, Duf.), bred from dead shoots of vine; A. Laboulbène, Bull. Soc. Ent. Fr. (5) ix. pp. cviii. & cix.

Macrocera, Latr. This name has priority over *Tetralonia*, Spin., and must be retained*; Perez, Act. Soc. L. Bord. xxxiii. p. 146.

Anthophora nigro-cinctula, Dours, ♂ described; *id. l. c.* p. 139.

Xylocopa purpurea, Cress., = *vidua*, Lep., = *micans*, Lep.; W. H. Patton, Canad. Ent. xi. p. 60. *X. viridipennis*, De Geer, ♂ described; F. Smith, J. L. S. xiv. p. 684.

Apis mellifica and *ligustica*. Notes on parthenogenesis and hybridism, militating against Dzierzon's theory; J. Perez, Act. Soc. L. Bord. xxxii. p. lxv. *A. mellifica* : parthenogenesis, oviposition, Dzierzon's theory of the production of drones, &c., discussed; Am. Nat. xiii. pp. 260, 261, 393 & 394. Oviposition of queen-bee, and Dzierzon's theory; J. G. Fischer, Verh. Ver. Hamb. iv. pp. 181–191. Supposed inefficient character of the sting of the bee as a weapon of defence; Nature, xix. pp. 289, 290, 340, & 385. Notes on apiculture in the Valley of the Saone; P. Faivre, Mém. Soc. Saone-et-Loire, ii. pp. 31–39. Swarming of bees at Rouen; Nature, xx. pp. 582 & 583.

New genera and species :—

Bombolecta, Patton, Bull. U. S. Geol. Surv. v. p. 370. Allied to *Melecta*; type, *M. thoracica*, Cress. (= *pacifica*, Cress.).

Synhalonia (= *Macrocera*, Lep., *nec* Latr., and *Tetralonia*, Sm., *nec*

* Macrocera, Latr., 1825, preoccupied by Meigen in *Diptera*, 1803.—Ed.

holo.), *id. l. c.* p. 473. Follows *Xenoglossa*; type, *Melissodes fulvitarsis*, *A. dr.* (♀ described, p. 474); *M. albata*, Cress. (generic characters noticed, *Cl.* will form a separate section.

Neviadasia, id. *l. c.* p. 475. Allied to *Habropoda*, to include *Melissodes lavata*, Cress. (= *M.* (?) *ursina* and *M.* (?) *densa*, Cress.), *australis* and *diminuta*, Cress.

Emphor, id. *l. c.* p. 476. Type, *Melissodes bombiformis*, Cress.

Entechnia, id. *ibid.* Type, *Anthophora taurea*, Say.

Clisodon, id. *l. c.* p. 479. Allied to *Anthophora*; type, *A. terminalis*, Cress.

Pachymelus, F. Smith, Descr. New Hym. p. 116. Placed between *Melissodes* and *Habropoda*; types, *P. micrelephas*, Madagascar, and *conspicuus*, Nyassa, *id. l. c.* p. 117.

Panurgus nevadensis, Cresson, Tr. Am. Ent. Soc. vii. p. 214, Nevada.

Perdita gracilis, id. *l. c.* p. 202, Nevada.

Calliopsis cinctus, Nevada, *zonalis*, and *obscurellus*, California, p. 201, *id. l. c.*

Systropha difformis, F. Smith, Descr. New Hym. p. 60, Burma.

Osmia argyropyga, p. 175, *laticincta*, Marseilles, p. 177, *entoprocta*, locality not stated, p. 179, *bidens*, p. 181, *labialis*, p. 182, *niveo-cincta*, Pyrenees, p. 184, and *cyanoxantha*, S. France, Spain, p. 185, *anceyi*, p. 187, *detrita*, Marseilles, p. 188, *lævifrons*, Pyrenees, p. 190, *lanosa*, S. France, Algeria, p. 194, *brachypogon*, Marseilles, p. 195, *morawitzi*, S. France, p. 199, *hybrida*, Marseilles, p. 200, *difformis*, Pyrenees, p. 202, and *bacillus*, Marseilles, p. 203, Perez, Act. Soc. L. Bord. xxxiii.; *O. minuta*, K. L. Bramson, Bull. Mosc. liv. pt. i. p. 292, Ekaterinoslav; *O. ephippiata* and *rubripes*, p. 60, and *rufitarsis*, p. 61, F. Smith, *l. c.*, Angara River, Siberia; *O. laboriosa*, id. Second Yark. Miss. Hym. p. 3, fig. 6, Yarkand.

Chalicodoma perezi, J. Lichtenstein, Bull. Soc. Ent. Fr. (5) ix. p. clxvi., Arragon; *C. rubescens*, Perez, *l. c.* p. 219, S. E. France.

Megachile dorsalis, Bordeaux, and *albo-cincta* (? = *pacifica*, Panz.), S. France, *id. l. c.* p. 223 & 234; *M. vicina*, *dacica*, and *squamigera*, Mocsáry, Term. füzetek, iii. pp. 8–10, Hungary; *M. antinorii*, G. Gribodo, Ann. Mus. Genov. xiv. p. 342, Shoa; *M. intricata*, Cape, *nasalis*, Zulu, p. 61, *cordata*, Natal, *terminata*, Burghersdorp, S. Africa, *albescens*, p. 62, and *modesta*, White Nile, *consanguinea*, Natal, *tuberculata*, Sierra Leone, p. 63, *calida*, Queensland, *ferox*, Swan River, p. 64, *pictiventris*, Richmond River, *rugosa* and *oblonga*, W. Australia, *albo-basalis*, Murray Island, Torres Strait, p. 65, *similis*, Aneiteum, New Hebrides, *albo-marginata*, New Caladonia, and *scutellata*, South Sea Islands, p. 66, *diligens* (also J. L. S. xiv. p. 684), Honolulu, *ardens*, Ceylon, and *penetrata*, N. India, p. 67, *femorata*, Bombay, *fulvipennis*, Nicobar Islands, and *relata*, p. 68, *humilis* and *remota*, Shanghai, and *determinata*, Java, p. 69, *barbatula*, Ega, and *pulchra*, p. 70, *opifex*, *pallipes*, and *crassipes*, St. Paulo, p. 71, *compacta* and *hilaris*, Santarem, p. 72, *strenua*, *agilis*, and *rubicunda*, St. Paulo, p. 73, *moderata* and *pullata*, Ega, *propinqua*, Amazons, p. 74, *ventralis*, Ega, *rubriventris* and *fossoris*, p. 75, *urbana*, Santarem, *lobitarsis*, St. Paulo, p. 76, *pilosa*, Fonteboa, *vigilans*, Para, and *con-*

structrix, Villa Nova, p. 77, *incongrua*, Tunantins, *cornuta*, Mendoza, and *anthidioides*, Parana, p. 78, *peruviana*, Peru, *sedula* and *concinna*, p. 79, *solitaria* and *elongata*, St. Domingo, *armata*, Oajaca, Mexico, p. 80, *deceptrix* and *orbata*, St. Domingo, *valida*, p. 81, *breviuscula*, *irritans*, and *candida*, p. 82, and *bipartita*, p. 83, Mexico, F. Smith, Descr. New Hym. ; *M. rescindus*, p. 3, *fulva*, *dentiventris*, and *serrata*, p. 4, Yarkand, and *vigilans*, p. 5, Ladak, *id.* Second Yark. Miss. Hym. ; *M. carbonaria*, *subnigra*, p. 208, *legalis* and *nevadensis*, p. 209, Cresson, Tr. Am. Ent. Soc. vii., Nevada.

Anthidium tenellum and *nanum*, Mocsáry, Term. Közl. xvi. pp. 48 & 51, S. Hungary; *A. compactum*, Sierra Leone, p. 83, *lanificum*, Old Calabar, and *apicatum*, Natal, p. 84, *imitator*, N. India, *ardens* and *rufipes*, Bombay, p. 85, *japonicum*, Yokohama, and *ordinatum*, p. 86, *lachrymosum*, Bombay, and *multiplicatum*, St. Paulo, p. 87, *flavo-marginatum*, Petropolis, *bicoloratum* and *confusum*, Mendoza, p. 88, *elegantulum*, Santarem, and *cognatum*, St. Paulo, p. 89, *flavo-lineatum*, *impatiens*, and *atriventre*, Mexico, p. 90, and *deceptum*, Peru, p. 91, F. Smith, Descr. New Hym. ; *A. vigilans*, id. Second Yark. Miss. Hym. p. 5, fig. 7, Yarkand ; *A. californicum*, California, *placitum*, *blanditum*, and *illustre*, p. 206, *conspicuum*, *singulare*, p. 207, *pudicum* and *pudens*, p. 208, Cresson, *l. c.*

Chelostoma quadrifidum, Kriechbaumer, Ent. Nachr. v. p. 312, Botzen.

Heriades (?) *rotundiceps* and *H.* (?) *cubiceps*, Cresson, *l. c.* p. 205, Nevada, &c.

Ceratina hungarica, Mocsáry, *l. c.* p. 21, S. Hungary; *C. compacta*, Philippines, p. 91, *lepida*, N. India, *sexmaculata*, Hong Kong and Celebes, and *perforatrix*, Burma, p. 92, *flavipes*, Hakodaté, *unimaculata*, and *rugifrons*, p. 93, *cognata*, Macassar, *pubescens*, Ega and Tunantins, p. 94, *rotundiceps*, Para, *viridula*, St. Paulo, and *bicolorata*, p. 95, *longiceps* and *cupreiventris*, Ega, *diligens*, Santarem, and *capitosa*, p. 96, *rufipes*, Oajaca, and *strenua*, Texas, p. 97, F. Smith, Descr. New Hym.

Allodape candida, Abyssinia, p. 97, *cordata*, Cape, *jucunda*, Zulu Land, and *parvula*, Bombay, p. 98, *id. l. c.*

Nomada dentipes, Rudow, Ent. Nachr. v. p. 211, Germany ; *N. subpetiolata*, Bombay, *infrequens*, St. Paulo, *nigro-cincta*, Arctic America, p. 99, *intercepta*, Vancouver's Island, *volatilis* and *albo-fasciata*, Canada, p. 100, and *montezumia*, Orizaba. p. 101, F. Smith, l. c. ; *N. maculifrons*, id. Ent. iv. p. 206, Japan (1869) ; *N. vinnula*, *jocularis*, p. 202, *verecunda* and *suda*, p. 203, Cresson, *l. c.*, Nevada.

Ammobates rufitarsis, F. Smith, Descr. New Hym. p. 101, Angara.

Phileremus productus, Cresson, *l. c.* p. 203, Nevada.

Epeolus natalensis, Natal, p. 101, *fervidus*, Bombay, and *intrepidus*, p. 102, *flavo-fasciatus*, Mexico, *nigriceps*, California, Texas, and *vagans*, Ega, p. 103, and *albifrons*, Para, p. 104, F. Smith, *l. c.*

Cœlioxys fallax, Mocsáry, *l. c.* p. 67, Hungary; *C. scioensis*, Gribodo, *l. c.* p. 342, Shoa ; *C. clypeata*, Tunantins, and *ignava*, Ega, p. 104, *agilis*, St. Paulo, and *vigilans*, St. Domingo, p. 105, *argentipes*, Sierra Leone, *penetratrix*, Natal, and *minuta*, Bombay, p. 106, F. Smith, *l. c.*

Stelis interrupta, Cresson, *l. c.* p. 205, Nevada.

Crocisa elegans, Bombay, Sumatra, Borneo, *lugubris*, Australia, p. 107, and *quinque-fasciata*, Madagascar, p. 108, F. Smith, l. c. ; *C. intrudens*, id. Second Yark. Miss. Hym. p. 6, fig. 8, Yarkand.

Melissa insignis, id. Descr. New Hym. p. 108, Mexico.

Melecta separata, *maculata*, p. 204, and *M.* (?) *mucida*, p. 205, Cresson, *l. c.*, Nevada.

Osiris tarsatus, F. Smith, *l. c.* p. 109, Tunantins.

Eucera chrysopyga, Perez, *l. c.* p. 157, S. France; *E. sedula*, Mocsáry, *l. c.* p. 17; *E. curvitarsis*, p. 238, *excisa*, p. 239, *favosa* (? = *subrufa*, Lep.), p. 240, and *nitidiventris*, p. 242, *id.* Term. füzetek, iii., Hungary; *E. terminalis*, S. France, and *deceptrix*, Italy, p. 109, *rufipes*, Polish Ukraine, *nigrifrons*, Dalmatia, and *velutina*, Syria (Magdala), F. Smith, Descr. New Hym.

Macrocera dufouri, Lot, Spain, p. 148, *julliana*, Marseilles, *griseola*, Bordeaux, p. 150, Perez, *l. c.*

Tetralonia scabiosæ, Mocsáry, Term. közl. xvi. p. 20; *T. biroi*, p. 233, *tenella*, p. 235, *tarsata* (nec Spin., which = *Habropoda ezonata*, Sm.), p. 236, and *lyncea*, p. 237, *id.* Term. füzetek, iii., Hungary; *T. reversa*, Brazil (Tejuca), *flagellicornis*, Oajaca, *gyrosa*, p. 111, and *decorata*, Ega, *melectoides*, Villa Nova, and *fervens*, Mendoza and Santiago, p. 112, F. Smith, *l. c.*

Melissodes obscura, St. Paulo, *rubricata*, Oajaca, and *pubescens*, Villa Nova, p. 113, *californica*, California, and *assimilis*, p. 114, *atrata* and *modesta*, Oajaca, and *atropos*, Santarem, p. 115, *ambigua* and *hirsuta*, Mexico, p. 116, *id.* l. c.; *M. nevadensis* and *acerba*, Cresson, *l. c.* pp. 209 & 210, Nevada.

Meliturga caudata, Perez, *l. c.* p. 174, S.E. France.

Habropoda montezumia and *agilis*, p. 118, *bombyformis* [*bombif-*] and *terminata*, Oajaca, and *fulva*, Guatemala, p. 119, F. Smith, *l. c.*

Anthophora leucophæa, S. France, Spain, p. 137, *punctilabris*, Mediterranean Coast, *ochroleuca*, Landes, Gironde, p. 140, *nigripes*, locality not stated, and *candida*, Montpellier, p. 142, Perez, l. c.; *A. bombylans* and *pipiens*, Mocsáry, Term. közl. xvi. pp. 7 & 9, S. Hungary; *A. vivida* and *torrida*, Sierra Leone, and *fallax*, Natal, Sierra Leone, p. 120, *rapida* and *terminata*, Natal, and *modesta*, St. Vincent, Cape Verdes, p. 121, *advena*, Lake Nyassa, *fimbriata*, Silhet, and *candida*, Punjab, p. 122, *florea*, Shanghai, *hilaris*, St. Domingo, and *emendata* (= *cincta*, Dours, *nec* Fabr., which is an African species), Australia, p. 123, *insularis* and *cineraria*, p. 124, Vancouver's Island, F. Smith, l. c.; *A. vigilans*, Ladak, and *senex*, Yarkand, *id.* Second Yark. Miss. Hym. pp. 6 & 7; *A. carbonaria*, *pernigra*, *ignava* (? = *pacifica*, ♀), *maculifrons*, p. 210, *flexipes*, *exigua*, p. 211, *sodalis* and *centriformis*, p. 212, Cresson, *l. c.*, Nevada.

Xylocopa bomboides, F. Smith, Descr. New Hym. p. 124, Formosa; *X. nitidiventris* (figured as *X. dubiosa*, ♀), fig. 10, Yarkand, *dubiosa*, fig. 9, Yangihissar, p. 7, and *convexa*, p. 8, Kogiar, *id.* Second Yark. Miss. Hym.; *X. armata*, E. Taschenberg, Z. ges. Naturw. (3) iv. p. 574, Cape? (= *capensis*, Lep., *sec.* Ritsema, *op. cit.* p. 897); *X. varipuncta*, W. H. Patton, Canad. Ent. xi. p. 60, Arizona; *X. arizonensis*, Arizona, and *subvirescens*, Mexico, Cresson, *l. c.* pp. 212 & 213.

Exomalopsis iridipennis, Ega, *planiceps*, Tunantins, and *tarsata*, Santarem, p. 125, *artifex*, Para, and *rufitarsis*, Jamaica, p. 126, *flava*, St. Paulo, *fulvo-fasciata*, Bahia, and *fulvescens*, Oajaca, p. 127, F. Smith, Descr. New Hym.

Tetrapedia volatilis and *fervida*, Constancia, Brazil, and *amplipennis*, Ega and Tunantins, p. 128, *basalis*, Fontiboa, *plumipes* and *flavipennis*, Ega, p. 129, *lævifrons*, St. Paulo, and *punctifrons*, Santarem, p. 130, *id. l. c.*

Epicharis lateralis, id. *l. c.* p. 130, Trinidad.

Centris montezuma, *totonaca*, p. 213, and *otomita*, p. 214, Cresson, *l. c.*, Mexico.

Apathus (?) *californicus*, id. *l. c.* p. 214, California.

Bombus pyrenæus and *mollis*, Perez, *l. c.* pp. 127 & 129, Pyrenees; *B. ignitus*, *tersatus*, and *diversus*, F. Smith, Ent. iv. p. 207, Japan (1869); *B. bellicosus*, Sumatra or India, *montivagus*, Moolai, and *senilis*, Japan, p. 131, *buccinatus* and *personatus*, Kunáwar, and *bicoloratus*, Formosa, p. 132, *ardens*, Japan, *unifasciatus*, Guatemala, &c., *excellens*, Venezuela, and *opifex*, Santiago and Mendoza, p. 133, and *lateralis*, Guatemala, p. 134, *id.* Descr. New Hym.; *B. vallestris*, Kashmir, *longiceps*, Ladak, *elongatus* and *oppositus*, fig. 11, p. 9, locality not indicated, *id.* Second Yark. Miss. Hym.

Trigona beccarii, Gribodo, *l. c.* p. 340, Abyssinia.

Vespidæ.

Kriechbaumer, —. Eumeniden-Studien. Ent. Nachr. v. pp. 1–4, 57–59, 85–89, 201–204, 309–312.

Includes notes on the construction, provisioning, &c., of a nest constructed behind a shutter (species of wasp not satisfactorily ascertained); *E. arbustorum*, Panz., probably = *E. amedei*, Lep.; *E. arbustorum*, Herr.-Schäff. (*nec* Panz.), renamed *E. laminata*; *E. frivaldszkii*, H. S., is probably a slight var. of the former. *E. pomiformis*, Fabr.: his types are confounded with *E. arbustorum*, Panz., and *mediterranea*, Kriechb. *E. coarctata*, Linn., and *pomiformis*, Panz., are also discussed.

Ritsema, C. Naamlijst der tot heden in Nederland waargenomen soorten van plooivleugelige Wespen (*Hymenoptera Diploptera*). Tijdschr. Ent. xxii. pp. 186–192.

37 species enumerated, besides 3 doubtful *Odyneri*.

Saunders, E. Notes on the British species of the genus *Odynerus*. Ent. M. M. xv. pp. 249 & 250.

15 species are mentioned, and the leading character of each pointed out.

Eumenes germaini. Transformations noticed; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. lxv.

Eumenes amedei noticed; J. Lichtenstein, Pet. Nouv. ii. p. 311.

Symmorphus crassicornis, Panz.; Löw, SB. z.-b. Wien, xxix. p. 33.

Rhynchium lefebvrii, St. F., probably = *oculatum*, Fabr.; *id. l. c.* p. cxlvi.

Polistes poeyi mimicked by the moth *Horama panthalon*, Fabr., in Antigua; T. A. Marshall, Ent. M. M. xvi. p. 19.

Vespa. On the nervous system of wasps; E. Brandt, Hor. Ent. Ross. xix. pp. ix.-xi. Tenacity of life in the wasp; J. D. O., Sci. Goss. xv. pp. 20 & 92. Wasp-stings alkaline instead of acid; A. H. Church, Nature, xix. p. 410. Wasp dragging cockroach; H. Turner, Am. Nat. xiii. p. 710. Observations on wasps' nests; L. J. Kristof, MT. Ver. Steierm.; Ent. Nachr. v. pp. 130–134, 139–141. On collecting wasp's nests; Ent. Nachr. v. pp. 249–252, 300 & 301.

Polybia, sp. Nest from Cayenne described and figured; H. Lucas, Am. Soc. Ent. Fr. (5) ix. pp. 370–372, pl. ix. fig. 3.

Euparagia, g. n., Cresson, Tr. Am. Ent. Soc. vii. p. vi. Allied to *Masaris* (?); type, *E. scutellaris*, sp. n., *l. c.*, Nevada.

Eumenes mediterranea, sp. n., p. 85, and varr. *heri* and *neesi*, p. 88, Kriechbaumer, Ent. Nachr. v., Tyrol, Dalmatia, Syria, Palestine, and Libyan Desert.

Belonogaster meneleki, sp. n., G. Gribodo, Ann. Mus. Genov. xiv. p. 342, Shoa.

Polybia emaciata, sp. n., H. Lucas, Ann. Soc. Ent. Fr. (5) ix. pp. 363–369, pl. ix. figs. 1 & 2 (imago and nest), Brazil.

Odynerus localis, Kauai, p. 678, *maurus*, Honolulu, &c., *rubritinctus*, Kauai, p. 679, *montanus*, Oahu, *congruus*, p. 680, *dubiosus*, Honolulu, and *agilis*, Maui, p. 681, spp. nn., F. Smith, J. L. S. xiv., also Descr. New Hym. pp. 134–137.

Pterochilus mirandus, p. xvii., *decorus*, *zonatus*, *comptus*, p. xviii., *morrisoni*, Nevada, and *biplagiatus*, California, p. xix., Cresson, Tr. Am. Ent. Soc. vii.; *P. albo-fasciatus*, F. Smith, Second Yark. Miss. Hym. p. 17, fig. 12, Yangihissar: spp. nn.

Crabronidæ.

Maindron, M. Notes pour servir à l'histoire des Hyménoptères de l'Archipel Indien et de la Nouvelle-Guinée, ii. Observations sur quelques Sphégiens. Ann. Soc. Ent. Fr. (5) ix. pp. 173–182, pl. v.

The nests, habits, transformations, &c., of *Macromeris splendida*, Lep., *Larrada modesta*, *Tachytes morosus*, and *Pison nitidus*, Smith, are described and figured.

Pompilides.

New species:—

Pompilus luctuosus, p. 124, *læsus*, and *lateritius*, p. 125, Mocsáry, Term. füzetek, iii., Hungary; *P. pilosus*, S. Africa, p. 140, *ornatipennis*, Central Africa, *ruficeps*, Zulu, *subpetiolatus*, Gambia, and *abdominalis*, Congo, p. 141, *torridus* and *fasciatus*, Algeria, *frontalis*, Nyassa, and *candidus*, Gambia, p. 142, *proximatus*, Algeria, *viridicatus*, W. Africa, and *insidiosus*, Natal, p. 143, *vindex* and *iridipennis*, Sierra Leone, *crudelis*, S. Africa, and *hilaris*, Natal and Zulu, p. 144, *sepulchralis*, *fervidus*, and

frustratus, Natal, p. 145, *clotho*, *lachesis*, and *atropo*; p. 146, and *familiaris*, Sumatra, *pruinosus*, India, *capitosus*, Burma, and *pullatus*, Trebizond, p. 147, *mitis*, *ephippiatus*, and *multipictus*, p. 148, *decoratus*, Bombay, and *simillimus*, Calcutta, p. 149, *alienus* and *propinquus*, Japan, *elegans*, India, p. 150, *cæruleus*, New Hebrides (?), *fulvipennis*, S. Australia, and *labilis*, p. 151, *consimilis*, Queensland, *nubilipennis*, Adelaide, *sanguinolentus*, Swan River, and *papuensis*, New Guinea, p. 152, *latus*, Uruguay, *tuberculatus*, Mendoza, and *rubricatus*, Peru, p. 153, *inauratus*, Cordova (Argentine Confederation), *representans*, Uruguay, and *unicolor*, Guatemala and Guyaquil, p. 154, *coruscus*, Guatemala, *imperialis* and *virulentus*, p. 155, and *flavo-pictus*, p. 156, Costa Rica, F. Smith, Descr. New Hym.; *P. arrogans*, Ladak, and *atripes*, Murree, Punjab Hills, p. 14, and *divisus*, Kashmir, p. 15, *id.* Second Yark. Miss. Hym.; *P.* (?) *subserricornis*, F. F. Kohl, Verh. z.-b. Wien, xxix. p. 401, Botzen; *P. ichneumoniformis* and *willistoni*, Patton, Bull. U. S. Geol. Surv. v. pp. 351 & 352, Kansas.

Priocnemis lævis, F. Smith, Descr. New Hym. p. 157, Costa Rica; *P. rufo-femoratus*, id., Second Yark. Miss. Hym. p. 15, Ladak.

Cyphononyx abyssinica, Gribodo, Ann. Mus. Genov. xiv. p. 343, Shoa.

Agenia personata, id. *l. c.* p. 344, Shoa.

Ceropales pygmæa, F. F. Kohl, Verh. z.-b. Wien, xxix. p. 402, Botzen; *C. brevicornis*, Patton, Bull. U. S. Geol. Surv. v. p. 368, Kansas.

Mygnimia alecto, F. Smith, Second Yark. Miss. Hym. p. 15, Yanghihissar.

Pepsis solitarius and *optimus*, id. Descr. New Hym. pp. 156 & 157, Costa Rica.

Sphegides.

Ammophila. Habits, nidification, and migrations discussed; Fabre, Souv. Ent. pp. 195–220.

Pelopœus javanus, Lep. Note on nidification; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. xl. & xli.

Synatus, Spin., discussed; *Stethorectus*, Smith, and *Podium*, Sauss., are synonymous; Gribodo, Ann. Mus. Genov. xiv. pp. 340 & 341.

Chlorion (*Ampulex*) *compressum*, Fabr. Larva parasitic on *Blatta americana*; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. clix.

Sphex. Habits, nidification, transformations, intelligence, &c., of various species discussed; *Tachytes niger* is a parasite in the nests of *S. flavipennis*; Fabre, Souv. Ent. pp. 81–179.

Ammophila julii, Fabre, Souv. Ent. p. 322, locality not stated [Avignon?]; *A. rhætica*, F. F. Kohl, Verh. z.-b. Wien, xxix. p. 400, Botzen; *A. spinipes*, F. Smith, Second Yark. Miss. Hym. p. 16, Ladak: spp. nn.

Chlorion funereum, Gribodo, Ann. Mus. Genov. xiv. p. 343, Shoa; *C. ærarium*, Patton, Canad. Ent. xi. p. 133, Connecticut: spp. nn.

Sphex scioensis, sp. n., Gribodo, Ann. Mus. Genov. xiv. p. 343, Shoa.

Larrides.

Tachytes strigosus, Mocsáry, Term. füzetek, iii. p. 126, Hungary; *T.*

cœlebs, Patton, Bull. U. S. Geol. Surv. v. p. 355, Kansas (? = *abdominalis*, Say, ♂): spp. nn.

Pison iridipennis and *hospes*, spp. nn., F. Smith, Descr. New Hym. p. 139, and J. L. S. xiv. p. 676, Sandwich Islands.

Dryudella modesta and *lineata*, spp. nn., Mocsáry, *l. c.* iii. pp. 127 & 128, Hungary.

Bembicides.

PATTON, W. H. The American *Bembecidæ*: Tribe *Stizini*. Bull. U. S. Geol. Surv. v. pp. 341–347.

The groups *Sphecii* and *Stizi*, and the genera *Sphecius* (type *speciosus*, Dru.), *Bembecinus* (type *tridens*, Fabr.), *Stizus* (type *dentatus*, Fabr.), and 2 new genera are characterized, and the species belonging to them enumerated. [Smith treated *Sphecius* as a synonym of *Stizus*, which he referred to the *Nyssonidæ*.] *Sphecius speciosus*, Dru. (= *tricincta*, Fabr.), variation and habits noticed; *grandis*, Say, *fervidus*, Cress, and probably *nevadensis*, Cress., *hogardi*, Latr. (= *rufescens*, Lep.), and *spectabilis*, Tasch., are varr. A new var. *convallis*, from California, is described. *Sphecius*, Costa, *nec* Dahlb., is renamed *Sphecienus* (p. 345); type, *Stizus nigricornis*, Duf.

Bembex. Habits and nidification of several species described, Fabre, Souv. Ent. pp. 221–273. *B. oculata* and *latreillii* are sexes; J. Lichtenstein, Ann. Soc. Ent. Fr. (5) ix. p. 43.

Megastizus, g. n., Patton, Bull. U. S. Geol. Surv. v. p. 344. Intermediate between *Sphecius* and *Stizus*; type, *St. brevipennis*, Walsh (= *brendeli*, Tasch.), ♀ and var. described, p. 345; add *St. texanus*, Cress.

Microbembex, g. n., *id. l. c.* p. 364. Differentiated from *Bembex* and *Stenioiia*; type, *B. monodonta*, Say (redescribed, p. 362).

Bembex julii, sp. n., Fabre, Souv. Ent. pp. 234 & 321, Avignon.

Nyssonides.

Nysson lateralis, Pack., and *Spilomena pusilla*, Say, ♀ ♀ described: Patton, Canad. Ent. xi. p. 213.

Nysson æqualis, sp. n., Patton, Canad. Ent. xi. p. 212, Massachusetts.

Larra divisa, sp. n., *id.* Bull. U. S. Geol. Surv. v. p. 368, Kansas.

Nysson chevrieri, sp. n., F. F. Kohl, Verh. z.-b. Wien, xxix. p. 399, Botzen.

Hoplisus anceps, p. 133, *nigrifacies*, p. 134, *minutus*, p. 136, Hungary, and *ottomanus*, Asia Minor, p. 136, note, Mocsáry, Term. füzetek, iii.; *H. gracilis*, Patton, Canad. Ent. xi. p. 210, Connecticut: spp. nn.

Alyson festivum, sp. n. (? = *bimaculatum*, Panz., var.), *l. c.* p. 129, Hungary.

Crabronides.

Crabro dimidiatus, var. from Dumfries noticed; R. Service, Scot. Nat. . 64.

Cerceris. Several species provision their nests with *Curculionidæ*, h remain paralysed, but not killed by the sting, being stung between first and second pair of legs, and the thoracic ganglions pierced.

frustratus, Natal, p. 145, *clotho*, *lachesis*, and *atropo*; p. 146, and *familiaris*, Sumatra, *pruinosus*, India, *capitosus*, Burma, and *pullatus*, Trebizond, p. 147, *mitis*, *ephippiatus*, and *multipictus*, p. 148, *decoratus*, Bombay, and *simillimus*, Calcutta, p. 149, *alienus* and *propinquus*, Japan, *elegans*, India, p. 150, *cæruleus*, New Hebrides (?), *fulvipennis*, S. Australia, and *labilis*, p. 151, *consimilis*, Queensland, *nubilipennis*, Adelaide, *sanguinolentus*, Swan River, and *papuensis*, New Guinea, p. 152, *latus*, Uruguay, *tuberculatus*, Mendoza, and *rubricatus*, Peru, p. 153, *inauratus*, Cordova (Argentine Confederation), *representans*, Uruguay, and *unicolor*, Guatemala and Guyaquil, p. 154, *coruscus*, Guatemala, *imperialis* and *virulentus*, p. 155, and *flavo-pictus*, p. 156, Costa Rica, F. Smith, Descr. New Hym.; *P. arrogans*, Ladak, and *atripes*, Murree, Punjab Hills, p. 14, and *divisus*, Kashmir, p. 15, *id.* Second Yark. Miss. Hym.; *P.* (?) *subserricornis*, F. F. Kohl, Verh. z.-b. Wien, xxix. p. 401, Botzen; *P. ichneumoniformis* and *willistoni*, Patton, Bull. U. S. Geol. Surv. v. pp. 351 & 352, Kansas.

Priocnemis lævis, F. Smith, Descr. New Hym. p. 157, Costa Rica; *P. rufo-femoratus*, id., Second Yark. Miss. Hym. p. 15, Ladak.

Cyphononyx abyssinica, Gribodo, Ann. Mus. Genov. xiv. p. 343, Shoa.

Agenia personata, id. *l. c.* p. 344, Shoa.

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Mygnimia alecto, F. Smith, Second Yark. Miss. Hym. p. 15, Yanghihissar.

Pepsis solitarius and *optimus*, id. Descr. New Hym. pp. 156 & 157, Costa Rica.

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Pelopæus javanus, Lep. Note on nidification; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. xl. & xli.

Synatus, Spin., discussed; *Stethorectus*, Smith, and *Podium*, Sauss., are synonymous; Gribodo, Ann. Mus. Genov. xiv. pp. 340 & 341.

Chlorion (*Ampulex*) *compressum*, Fabr. Larva parasitic on *Blatta americana*; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. clix.

Sphex. Habits, nidification, transformations, intelligence, &c., of various species discussed; *Tachytes niger* is a parasite in the nests of *S. flavipennis*; Fabre, Souv. Ent. pp. 81–179.

Ammophila julii, Fabre, Souv. Ent. p. 322, locality not stated [Avignon?]; *A. rhætica*, F. F. Kohl, Verh. z.-b. Wien, xxix. p. 400, Botzen; *A. spinipes*, F. Smith, Second Yark. Miss. Hym. p. 16, Ladak: spp. nn.

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Sphex scioensis, sp. n., Gribodo, Ann. Mus. Genov. xiv. p. 343, Shoa.

Larrides.

Tachytes strigosus, Mocsáry, Term. füzetek, iii. p. 126, Hungary; *T.*

cælebs, Patton, Bull. U. S. Geol. Surv. v. p. 355, Kansas (? = *abdominalis*, Say, ♂): spp. nn.

Pison iridipennis and *hospes*, spp. nn., F. Smith, Descr. New Hym. p. 139, and J. L. S. xiv. p. 676, Sandwich Islands.

Dryudella modesta and *lineata*, spp. nn., Mocsáry, *l. c.* iii. pp. 127 & 128, Hungary.

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Microbembex, g. n., *id. l. c.* p. 364. Differentiated from *Bembex* and *Steniolia*; type, *B. monodonta*, Say (redescribed, p. 362).

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Hoplisus anceps, p. 133, *nigrifacies*, p. 134, *minutus*, p. 136, Hungary, and *ottomanus*, Asia Minor, p. 136, note, Mocsáry, Term. füzetek, iii.; *H. gracilis*, Patton, Canad. Ent. xi. p. 210, Connecticut: spp. nn.

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Crabronides.

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erceris. Several species provision their nests with *Curculionidæ*, h remain paralysed, but not killed by the sting, being stung between first and second pair of legs, and the thoracic ganglions pierced.

Different species of beetles inoculated with ammonia were more or less similarly affected. Fabre, Souv. Ent. pp. 51–79.

"Cerceris bupresticide." An insect thus called by Fabre provisions its nests with *Buprestidæ*, which always remain limp, being preserved by the antiseptic properties of the venom of the sting of the *Cerceris*; id. *l. c.* pp. 39–50.

Oxybelus elegans and *meridionalis*, spp. nn., Mocsáry, Term. füzetek, iii. pp. 138 & 140, Hungary.

Crabro kriechbaumeri and *bulsanensis*, F. F. Kohl, Verh. z.-b. Wien, xxix. pp. 395 & 397, Botzen; *C. vagatus*, F. Smith, Ent. iv. p. 208, Japan (1869); *C. affinis* and *mandibularis*, p. 138, and *denticornis*, p. 139, *id.* Descr. New Hym., also J. L. S. xiv. pp. 677 & 678, Sandwich Islands; *C. bigeminus*, Patton, Canad. Ent. xi. p. 213, Connecticut: spp. nn.

Blepharipus unicus, sp. n., *id. l. c.* p. 214, Connecticut.

Cerceris antoniæ, Avignon, and *julii*, Carpentras, Fabre, Souv. Ent. p. 320; *C. penicillata* and *cribrata*, Mocsáry, Term. füzetek, iii. pp. 130 & 131, Hungary: spp. nn.

Eucerceris fulviceps, New Mexico, *rubripes*, Colorado, *elegans*, p. xxiii., *similis* and *vittatifrons*, Nevada, p. xxiv., Cresson, Tr. Am. Ent. Soc. vii.; *E. unicornis*, Patton, Bull. U. S. Geol. Surv. v. p. 359, Kansas: spp. nn.

Philanthus inversus, id. *l. c.* p. 355, Kansas; *P. sublimis*, *californicus*, California, &c., *pacificus*, Nevada, Oregon, p. xxxii., *scelestus*, *basilaris*, Colorado, *zebratus*, Nevada, p. xxxiii., and *scutellaris*, Kansas, p. xxxiv., Cresson, *l. c.*: spp. nn.

Scoliides.

Scolia flaviceps, Ev., var. *mangichlakensis*, from Daghestan and Mangichlak, and *Sapyga prisma*, Klug, var. from Erivan, described; Radoszkovsky, Hor. Ent. Ross. xv. pp. 153 & 156.

Scolia rufa, St. Farg., ♂ described; F. Smith, Phil. Tr. clxviii. p. 536.

New species:—

Myzine ruficornis and *nigrifrons*, Sicily, *torrida*, Gambia, and *insularis*, Madagascar, p. 178, *combusta*, India or Africa (?), *pallida*, N.W. India, and *orientalis*, Beluchistan, p. 179, *simillima* and *jucunda*, St. Paulo, p. 180, *albo-maculata*, Amazons, and *iridipennis*, p. 181, *confusa*, Ega, *agilis*, Nicaragua, and *bicincta*, Brazil (?), p. 182, *fallax*, Mexico, and *flavicornis*, Chili, p. 183, F. Smith, Descr. New Hym.

Tiphia fulvipennis, Albania, Servia, *consueta*, Ceylon, and *natalensis*, Natal, p. 184, *rugosa*, Zulu, *penetratrix*, Sierra Leone, *solitaria* and *parallela*, p. 185, *salutatrix* and *campanula*, Ega, p. 186, *oblonga*, Colombia, *clypeata* and *subspinosa*, p. 187, and *intricata*, p. 188, Mexico, *id. l. c.*

Dimorphoptera cognata, Swan River, and *lævifrons*, S. Australia, *id. l. c.* p. 188.

Scolia albo-fimbriata, id. *l. c.* p. 189, Costa Rica; *S.* (*Discolia*) *erivensis* and *S.* (*D.*) *caucasica*, Radoszkovsky, Hor. Ent. Ross. xv. pp. 153, 154, Caucasus.

Pseudoscolia ferruginea, id. *l. c.* p. 154, Caucasus.

Sapyga caucasica, id. *l. c.* p. 156, Erivan.

T.

THYNNIDÆ.

New species :—

Thynnus penetratus, Hunter River, and *vastator*, p. 158, *rufo-pictus*, *protervus*, and *decoratus*, p. 159, *fulvo-pilosus*, *multipictus*, and *propinquus*, p. 160, Adelaide, *tuberculifrons*, *suspiciosus*, and *vividus*, p. 161, *oppositus* and *irregularis*, p. 162, *excellens* and *insidiator*, p. 163, *aterrimus*, *perplexus*, and *petulans*, p. 164, and *nigro-pectus*, Swan River, and *vespoides*, p. 165, *molestus*, *strangulatus*, and *pavidus*, p. 166, S. Australia, *nubilipennis* and *perelegans*, Queensland, *simplex*, p. 167, *rixosus*, *morosus*, and *impatiens*, p. 168, *deceptor*, Champion Bay, *indistinctus*, W. Australia, p. 169, *medius*, *flavo-variegatus*, and *fastuosus*, p. 170, Australia, *nanus*, Tasmania, *candidus*, Morty Island, and *strenuus*, p. 171, *nigro-fasciatus*, *nigripennis*, and *macilentus*, p. 172, *intaminatus* and *albo-fasciatus*, Chili, and *ingenuus*, N. Patagonia, p. 173, F. Smith, Descr. New Hym.

Elaphroptera carbonaria, id. *l. c.* p. 177, Rio.

Ælurus anthracinus, id. *l. c.* p. 174, Queensland.

Anthobosca errans, Zulu, Natal, *antennata*, Brazil, p. 174, and *æthiops*, W. Australia, Champion Bay, p. 175, *id. l. c.*

Rhagigaster fuscipennis, Queensland, *æthiops*, p. 175, *rugosus*, Adelaide, and *lævigatus*, N.W. Australia, Champion Bay, p. 176, and *clypeatus*, Australia, p. 177, *id. l. c.*

MUTILLIDÆ.

BLAKE, C. A. Catalogue of the *Mutillidæ* of North America, with Descriptions of New Species. Tr. Am. Ent. Soc. vii. pp. 243–254.

Mutilla parvicollis, Costa, = *capitata*, Luc., var. ; *M. rubricans*, Lep., probably = *continua*, Fabr., ♂ ; *M. manderstierni*, Rad., ♀ described.

RADOSZKOVSKY, Hor. Ent. Ross. xv. pp. 148 & 149.

(Revis[illegible] *species :—*

[illegible]*a binotata* and *cæca*, Radoszkovsky, Hor. Ent. Ross. xv. p. 150, (A[illegible]; *M. oblonga*, Cape, p. 189, *angulata*, Cape (?), *purpurata* and iii. p[illegible]90, *comparata*, *prædatrix*, and *inconspicua*, p. 191, Natal, *stimu*-Contain[illegible]frica, *petulans*, W. Africa, and *horrida*, Zambesi and Lake undergrou[illegible]192, *guttata* and *penetrata*, Madagascar, *decipiens*, p. 193, the leaves[illegible]d *speculatrix*, Natal, *crudelis*, Africa, p. 194, *irritabilis*, Egypt, which [illegible], Natal, *conspicua*, Damara Land, and Namaqua Land, p. 195, N[illegible]a, Lake N'Gami, *deformis*, Zambesi, and *fossulata*, Angola, p. 196, *rufo-femorata* and *versuta*, W. Africa, and *ignava*, Lake Nyassa, p. 197, *placida* and *aurifex*, p. 198, *argenteo-maculata*, Bombay, and *rufitarsis*, [illegible]dia, p. 199, *decora*, Pulo Penang, *strangulata*, N. China, *deserta*, Celebes, [illegible]*basalis*, Sarawak, p. 200, *exacta*, Shanghai, and *auriceps*, Australia, [illegible]201, *scabrosa*, Swan River, *pallidicornis*, N. S. Wales, and *hospes*, 202, *depressa* and *fragilis*, Champion Bay, and *jucunda*, Adelaide, 203, *notabilis*, Tasmania, *pacificatrix* and *auro-pilosa*, p. 204, *albolineata*,

bipartita, and *nitida*, p. 205, Champion Bay, *quadriceps*, Adelaide, *scrutata*, Melbourne, and *bicolorata*, Victoria, p. 206, *æruginosa*, Moreton Bay, *vivida*, Champion Bay, and *splendida*, New Guinea, p. 207, *crassicornis*, Amazons, *ambigua*, Obydos, and *subtilis*, p. 208, *investigatrix* and *vivax*, Ega, and *detracta*, St. Paulo, p. 209, *vindex* and *venatrix*, Ega, *discursa*, Para, and *armanda*, Constancia, Brazil, p. 210, *insidiosa*, St. Paulo, Ega, *pectoralis*, Rio Janeiro, and *crenulata*, p. 211, *auro-maculata*, Venezuela, *pertinax*, Mendoza, and *mansueta*, p. 212, *simulatrix*, Ega, *parasitica*, Constancia, and *spinifera*, Para, p. 213, *solitaria*, Obydos, *vagabunda*, Santarem, *albata*, Ega, and *diligens*, p. 214, *perfidiosa*, Venezuela, and *sociata*, Ecuador, p. 215, *albo-maculata*, Chili, *erratica*, Mendoza, and *rufo-scutellata*, Parana, p. 216, *sordidula*, Mendoza, *fascinata*, Peru, *marginipennis*, Para, and *tenuis*, Ega, p. 217, *irregularis*, S. America, and *oblita*, Villa Nova, p. 218, *dentata*, St. Paulo, *maculipennis* and *excellens*, p. 219, *maligna*, Ega, *impetuosa*, *fugax*, and *proxima*, p. 220, *midas*, Para, *mandibularis*, Ega, and *hæmarioides*, p. 221, *gracilescens*, Uruguay, *pubescens* and *incana*, Mendoza, p. 222, *melancholica*, St. Domingo, *araneoides*, Nicaragua, *macrocephala* and *munifica*, Mexico, p. 223, *ducalis*, Orizaba and S. America, and *luxuriosa*, p. 224, *vulpina*, *sapiens*, *ordinaria*, and *terminata*, p. 225, *nana* and *ferruginea*, Mexico, *derelicta*, Central America, p. 226, *salutatrix*, *separata*, and *blandina*, Mexico, p. 227, F. Smith, Descr. New Hym.; *M. quadriceps*, Panama, *marpesia*, Kansas, Utah, *ochracea*, p. 247, *auraria*, Nevada, *rutilans*, California, *gabbi*, Costa Rica, pp. iv. & 248, *floridensis*, Florida, *tisiphone*, Texas, *euterpe*, Florida, p. 249, *texana*, *caneo*, *pygmæa*, Texas, &c., *aspasia*, Nevada, *zenobia*, California, p. 250, *mixtura*, Colorado, *phædra*, Nevada, *clio*, Vancouver's Island, *erato*, p. 251, and *puteola*, Texas, p. 252, Blake, Tr. Am. Ent. Soc. vii.

Agama bicolor, Texas, *ampla*, Colorado, *rustica*, California, p. 252, *contracta*, *atrata*, Nevada, *uro*, p. 253, *astyanax*, Texas, and *ferruginea*, Nevada p. 254, Blake, *l. c.*

Apterogyna mloko sevitzii, Radoszkovsky, *l. c.* p. 151, Caucasus.

Myrmosa rufiventris, Crosson, Tr. Am. Ent. Soc. vii. p. 254, Nevis W. India,

Methoca nigriceps, Brazil (?), and *constricta*, Ega, F. Smith, *l. c.* St. Paulo,

Formicidæ.

Dewitz, H. Über die Bildung der Brustgliedmassen bei den Ameisen. SB. Nat. Fr. 1878, pp. 122–125.

The rudiments of the legs may be traced in very young larvæ as hemispherical thickenings of the hypodermis on the under-surface of the three thoracic segments. These soon become differentiated into an inner nucleus and an outer sheath, and in fully developed larvæ the nucleus is conical and already presents a segmented appearance. During the pupal state the legs become freed from the sheath, and grow rapidly. The wings appear in young larvæ as two pairs of elliptical thickenings of the hypodermis on the sides of the 2nd and 3rd thoracic segments. These retract so as to form a case in which lie the flat heart-shaped rudiments of the

wings. During the pupa-state the case opens at the extremity, flattens out, and allows the wing to develop in the male and female, but in the worker the rudiments of wings become wholly aborted.

——. [Vide "General Subject," *anteà*, p. 2.]

Emery, C., & Forel, A. Catalogue des Formicides d'Europe. MT. schw. ent. Ges. v. pp. 441–481.

This work is divided into three sections: indigenous species, introduced species, and bibliography. The following observations occur in notes:— *Camponotus pubescens* is connected with *herculeanus* by *pennsylvanicus*, and is probably a race of the same species; *Lasius affinis* and *incisa*, Schenck, are identical, and = *L. bicornis*, Först., var.; *Phidole pallidula*, Moggr., probably does not belong to that genus; *Typhlopone europæa*, Rog., = *punctata*, Sm.

Lubbock, Sir J. The Habits of Ants. P. R. Inst. ix. pp. 174–190.

Discusses the character of Ants, recognition of friends, &c., and their organs of vision. Much of this paper has appeared elsewhere. As regards their vision, the author concludes that they have the power of distinguishing colour, and are very sensitive to violet light, but that their perceptions differ very much from our own.

——. On the Anatomy of Ants. (Abstract.) J. L. S. xiv. pp. 738 & 739.

McCook, H. C. The Natural History of the Agricultural Ant of Texas. A Monograph of the Habits, Architecture, and Structure of *Pogomyrmex barbatus*. Philadelphia: 1879 [1880 on title], 8vo, pp. 311, pls. xxiv.

An exceedingly elaborate monograph, comprising chapters on the literature of the subject, surface architecture, harvesting habits, the ancient belief in harvesting ants, architecture of formicaries, mining, food, toilet, sleeping, and funeral habits, queens, and the founding of new colonies, migrations and movements, sting and its anatomy, and wars. (Review by A. R. Wallace, Nature, xx. p. 501.)

——. On the Architecture and Habits of the Cutting Ant of Texas (*Atta fervens*). P. Ac. Philad. 1879, pp. 33–40, and Ann. N. H. (5) iii. pp. 442–449 (*cf.* also G. T. Bettany, Nature, xx. p. 583).

Contains observations on the external and internal architecture, the underground galleries, and the gates of the nests; the manner in which the leaves are cut, and on the origin of the various castes by evolution, which the writer regards as an impossible hypothesis in this case.

Norton, E. Notas sobre las Hormigas Mexicanas. Nat. Mex. iii. pp. 179–190.

Translated from Am. Nat. by A. Moreno, who adds notes on the habits of *Œcodoma mexicana*.

Several papers on the habits of Ants have appeared in "Die Natur." Intelligence in Ants dragging burdens; W. Winder, Sci. Goss. xv. p. 262.

Division of labour among Ants ; W. W. Bailey, Nature, xx. p. 244.

Ants feeding on honey contained in leaf-glands of *Catalpa bignonioides* ; J. A. Ryder, P. Ac. Philad. 1879, p. 161.

On the marriage-flights of *Lasius flavus* and *Myrmica lobicornis*, &c., H. C. McCook, P. Ac. Philad. 1879, pp. 140–143, Ann. N. H. (5) iv. pp. 326–328.

McCook on the Parasol Ants of Texas ; G. T. Bettany, Nature, xxi. pp. 17 & 18.

Formica fusca, *Lasius fuliginosus*, and *L. niger*. V. Hagens points out their differences ; *Hetærius* is commonest in nests of the first, but although found sparingly in those of several other species, the writer doubts its occurrence in those of *L. fuliginosus*. Ent. Nachr. v. pp. 259 & 260.

Formica sanguinea and *fusca*. Battle between the inhabitants of two nests ; M. Treat, Am. Nat. xiii. pp. 707 & 708.

Formica exsectoides. Notes on habits, mounds, food, &c. ; McCook, P. Ac. Philad. 1879, pp. 154–156.

Camponotus pennsylvanicus. Mode of oviposition, longevity of the queen ; *id. l. c.* p. 140.

Myrmecocystus mexicanus, Westw. Habits, &c. ; *id. l. c.* pp. 197 & 198, Ann. N. H. (5) iv. p. 474, and Tr. Am. Ent. Soc. vii. p. xxii.

Tetramorium cæspitum. Combats and nidification, with remarks on the fertilizing influence of Ants on the soil ; *id.* P. Ac. Philad, 1879, pp. 156–161.

Cremastogaster lineolata. On the adoption of an Ant-queen ; *id. l. c.* pp. 137 & 138, and Ann. N. H. (5) iv. p. 252.

Eciton mexicana. Habits ; P. de la Llave, Nat. Mex. iii. pp. 247 & 248.

Atta. A species found at Pisa collecting small snail-shells, J. J. Weir, P. E. Soc. 1879, p. xlix. ; *A. barbara*, mode of harvesting seeds, G. H. Bryan, Sci. Goss. xv. p. 238 ; *A. cephalotes*, its habits ; the decayed leaf-beds from a distant ant-hill are the best protection against its ravages, R. B. White, P. Z. S. 1879, pp. 713–715 ; *A. insularis*, Guér., larva with abnormal development of a leg, H. Dewitz, Zool. Anz. ii. pp. 134–136, woodcut.

Pogonomyrmex barbatus ; wearing away of mandibles, McCook, Tr. Am. Ent. Soc. vii. pp. x. & xi. *P. occidentalis*, Cress., is a harvesting Ant, *id. l. c.* pp. xxii. & xxiii.

New species :—

Camponotus basalis, F. Smith, Second Yark. Miss. Hym. p. 9, fig. 1, Kashmir.

Formica simulata, Pámir, Yarkand, p. 10, *defensor* and *candida*, Pámir, and *fraterna*, locality not indicated, p. 11 ; *id. l. c.*

Stenamma gallarum, Patton, Am. Nat. xiii. p. 126, note. Found in galls of *Gelechia gallæsolidaginis*, Riley, and *Cynips spongifica*, Osten Sacken.

Leptogenys insularis, F. Smith, J. L. S. xiv. p. 675, and Descr. Ne Hym. p. 228, Island of Oahu.

T.

Myrmica cursor, p. 11, and *breviceps*, p. 12, no locality stated; *M. luctuosa*, p. 12, Murree, Punjab; *id.* Second Yark. Miss. Hym. p. 12.

Cremastogaster apicalis, id. *l. c.* p. 12, Jhilam Valley, Punjab.

Dorylus (*Typhlopone*) *lævíceps*, id. *l. c.* p. 13, fig. 2, Jhilam Valley.

Chrysididæ.

Norton, E. On the Chrysides of North America. Tr. Am. Ent. Soc. vii. pp. 233–242.

A list, with descriptions, of new species, and sexes and varr. of old ones belonging to the genera *Elampus*, *Holopyga*, *Hedychrum*, and *Chrysis*. The following synonymy occurs:—*Hed. janus*, Hald., = *Elampus sinuosum*, Say, *Holopyga dohrni*, Dahlb., and *compacta*, Cress.; *Hedychrum zimmermanni*, Dahlb., = *H. obsoletum*, Say; *Chr. carinata*, Say, *tridens*, Lep. & Serv., 3-*dentata*, Dahlb., and *virens*, Cress., = *parvula*, Fabr.

Perrin, E. A. de. Synopsis critique et synonymique des Chrysides de France. Ann. Soc. L. Lyon, xxvi. pp. 1–132, 2 pls.

[Not seen by the Recorder.]

Tournier, H. Descriptions d'Hyménoptères nouveaux appartenant à la famille des Chrysides. Ann. Ent. Belg. xxii. pp. 87–100.

Besides new species, the following notes occur:—*Cleptes ærosus*, Först., previously known only from Hungary, has occurred at Peney, near Geneva; the genera *Notozus*, Först., and *Elampus*, Spin., are discussed; *Chrysogona*, Först., discussed; and characters of *Spintharis*, Dahlb., noticed.

Remarks on various *Chrysididæ* (anonymous); Le Nat. i. pp. 92 & 93, 107 & 108.

Chrysis fulgida, *ignita*, and *austriaca*: the two former are parasites of *Odynerus* (*Symmorphus*) *crassicornis*, Panz., and the last of *Osmia anthocopoides*, Schenck; A. Mocsáry, Ent. Nachr. v. pp. 92 & 93. *C. analis*, Spin., varr. *perrisi*, *rubescens*, and *incerta*, from the Caucasus described; Radoszkovsky, Hor. Ent. Ross. xv. pp. 144 & 145.

Hedychrum (*Homalus*) *auratum* bred from gall of *Cynips kollari*; E. A. Fitch, Ent. xii. p. 24.

Parnopes carnea, Rossi, var. *unicolor*, from Algeria, described: G. Gribodo, Ann. Mus. Genov. xiv. p. 338.

New species:—

Cleptes semicyanea, Tournier, Ann. Ent. Belg. xxii. p. 88, Sarepta; *C. aliena*, Patton, Canad. Ent. xi. p. 66, Wyoming; *C. purpurata*, Vancouver's Island, and *americana*, Colorado, Nevada, Cresson, Tr. Am. Ent. Soc. vii. p. x.

Holopyga similis and *bellipes* (? = *flavipes*, Ev.), Mocsáry, Term. füzetek, iii. pp. 120 & 121, Hungary.

Notozus rufitarsis, Sarepta, and *bipartitus*, Peney, near Geneva, Tournier, *l. c.* pp. 90 & 91; *N. marginatus*, Patton, *l. c.* p. 66, Connecticut.

Chrysis lativentris, *similaris*, *æneipes*, *superba*, and *brevidens*, Tournier, *l. c.* pp. 92–96, Peney, near Geneva; *C. patriarchalis*, p. 142, *pulchra*,

p. 143, *undulata*, p. 145, *apicalis* and *crivanensis*, p. 146, Radoszkovsky, Hor. Ent. Ross. xv., Caucasus; *C. smithi*, p. 326, E. Africa, *anceps*, p. 327, Brazil, *cognata*, p. 328, locality unknown, *texana*, p. 329, Texas, *imperforata*, p. 330, Cayenne, *opaca*, p. 331, E. Africa, *abeillii*, p. 332, Syria, *frey-gessneri*, p. 333, Texas, *longirostris*, p. 334, Minas Geraes, *ghiliani*, Natal, and *radoszkowskii*, Australia, p. 335, *resecta*, Mariposa, and *californica*, California, p. 336, and *pruna*, Algeria, p. 337, *scioensis*, Shoa, p. 344, Gribodo, Ann. Mus. Genov. xiv.; *C. striatellus*, Norton, Tr. Am. Ent. Soc. vii. p. 240, United States; *C. verticalis*, Connecticut, and *martia*, Lower Canada, Patton, *l. c.* p. 67; *C.* (*Tetrachrysis*) *placida*, Mocsary, Term. füzetek, iii. p. 122, Central Hungary; *C.* (*Gonochrysis*) *gogoriæ*, J. Lichtenstein, Bull. Soc. Ent. Fr. (5) ix. p. clxv., Nova-Cerrada.

Pyria drewseni, Australia, and *simillima*, E. Africa; Gribodo, *l. c.* pp. 325 & 326.

Euchræus edwardsi, Cresson, *l. c.* p. iv., California. (Is a *Parnopes*; id. *l. c.* p. x.)

Chrysogona tarsata, Tournier, *l. c.* p. 99, Syracuse.

Spintharis pallipes, id. *ibid.*, Sarepta.

Hedychrum cirtanum, Gribodo, *l. c.* p. 338, Algeria; *H. louisianæ*, Louisiana, p. 238, *cæruleum*, Dacota, and *cressoni*, Mexico, p. 239, Norton, *l. c.*

Homalus curtiventris, Tournier, *l. c.* p. 88, Sarepta.

Elampus iridescens, *coruscans*, Connecticut, &c., p. 234, *versicolor*, Dacota, and *viridicyaneus*, Massachusetts, p. 235, Norton, *l. c.*

Ichneumonidæ.

Provancher, —. Faune Canadienne. Les Insectes—Hyménoptères. Nat. Canad. xi. pp. 2–13, 33–42, 65–76, 119–125, 129–143, 109–122, 141–150, 173–185, 205–233, 248–266, & 269–281.

Includes the *Ichneumonidæ* from *Hoplismenus* to *Orthocentrus*. A few new species are described, and occasional woodcuts of generic details are added; but as two parts of the journal, including the genera *Trogus* to *Phygadeuon*, have failed to reach England, a full record of the contents of these numbers must be deferred for the present.

On the oviposition of the *Ichneumonidæ*; H. Brischke, Ent. Nachr. v. pp. 221 & 222.

Ichneumonides.

Tischbein, —. Zusätze und Bemerkungen zu der Uebersicht der europäischen Arten des Genus *Ichneumon*. S. E. Z. xl. pp. 20–46.

In addition to new species, the following are noticed:—*I. percussor*, Tischb., ♂ described, p. 21, *consimilis*, Wesm., varieties noticed, including *I. explorator*, Tischb., p. 22, *melanobatus*, Grav., *tuberculipes*, Wesm., *cuneatus*, Tischb., p. 31, *nivatus*, Grav., p. 32, sexes noticed, *Amblyteles trifasciatus*, Wesm., ♀ var. described, p. 33.

Snellen van Vollenhoven remarks on the difference between the sexes

in *Ichneumon*, and figures *I. sarcitorius*, Linn., figs. 1–3, *latrator*, Fabr., figs. 4 & 5, *brachypterus* = *means*, Grav., fig. 6, *xanthorius*, Grav. fig. 7, and *Oronotus coarctatus*, Wesm., figs. 8 & 9, Pinacographia, p. 57, pl. xxxvi.

Ichneumon guttatus, Dresden ?, p. 20, *cærulescens*, Thuringia, p. 22, *lineatus*, Eutin, &c., *brunnipes*, Switzerland, p. 23, *piceatus*, Vienna, p. 24. *intermixtus* and *finitimus*, p. 25, *examinator*, Birkenfeld, p. 26, *affector*, Hungary, p. 27, *alius*, Fulda, *flaviceps*, Syra, p. 28, *albiornatus*, Tyrol, p. 29, *I.* ? (*Amblyteles* ?) *infinitus*, Vienna, p. 30, *pulcher*, Hungary, p. 32, and *albatus*, Birkenfeld, p. 33, Tischbein, S. E. Z. xl. ; *I. erythromelas*, R. McLachlan, J. L. S. xiv. p. 106, Arctic Regions (1878) ; *I. bimaculatus*, F. Smith, Second Yark. Miss. Hym. p. 20, Murree, Punjab Hills: spp. nn.

Joppa hilaris, *variolosa*, and *pulchripennis*, p. 232, *elegantula*, *modesta*, and *maculosa*, p. 233, *id.* Descr. New Hym., Costa Rica ; spp. nn.

Hoplismenus impar, sp. n., Provancher, Nat. Canad. xi. p. 3, Canada.

Amblyteles æquivocus, Eutin, p. 34, *rufo-niger*, Vienna, p. 35, *proximus*, Hungary, *alternator*, Vienna, *aterrimus*, Attica, p. 36, *impressus*, Hungary, p. 37, *subfasciatus*, Vienna, *interjectus*, Tinos, Vienna, and Athens, p. 38, and *filatus*, Carinthia, p. 39, Tischbein, S. E. Z. xl. : spp. nn.

Trogus provancheri, sp. n., F. X. Burque, Nat. Canad. xi. p. 128, Canada.

Platylabus massaiæ, Gribodo, Ann. Mus. Genov. xiv. p. 344, Shoa.

Cryptides.

KRIECHBAUMER, —. Beitrag zur Kenntniss der Schlupfwespen-Gattung *Ischnocerus*. CB. Ver. Regensb. xxxiii. pp. 163–167.

General remarks on the genus, with descriptions of two new species.

Phygadeuon digitatus, Grav., and *Stibeutus heinemanni*, Först., recorded as new to Britain, and redescribed ; E. Capron, Ent. xii. pp. 14 & 15.

Cryptus contained in a jumping cocoon, Paasch & Dewitz, SB. Nat. Fr. 1879, pp. 81, 82, & 143; *C. limatus*, Cress. (= *Ischnus lentus*, Prov., *olim*), figured, Provancher, Nat. Canad. xi. p. 135, fig. 2.

Pezomachus and allies discussed by Snellen van Vollenhoven, who figures *Agrothereutes hopii*, Grav., *batavus*, Voll., *abbreviator*, Grav., *destitutus*, Voll., *Theroscopus cingulatus*, Först., *pedestris*, Fabr., *esenbecki*, Grav., var., *Pezomachus peregrinator* and *indagator*, Först. ; Pinacographia, pp. 58 & 59, pl. xxxvii. figs. 1–9.

Cryptus insidiator, F. Smith, Second Yark. Miss. Hym. p. 21, Kashmir ; *C. ferrugineus* and *bicolor*, id. Descr. New Hym. p. 231, Costa Rica ; *C. sericeifrons* and *circumcinctus*, p. 132, *eburneifrons*, p. 133, *flavipectus*, p. 134, and *ruficornis*, p. 139, Provancher, Nat. Canad. xi., Canada : spp. nn.

Ischnocerus filicornis, Bavaria, and *seticornis*, Chur, spp. nn., Kriechbaumer, CB. Ver. Regensb. xxxiii. pp. 164 & 165.

Hemiteles orbicularis, sp. n., Provancher, *l. c.* p. 123, Cap Rouge, Canada.

Mesostenus collinus and *sagax*, id. *l. c.* pp. 111 & 112, Canada ; *M.*

nigerrimus and *intrudens*, F. Smith, Descr. New Hym. pp. 231 & 232, Costa Rica : spp. nn.

Ophionides.

Snellen von Vollenhoven figures *Ophion minutus*, *parvulus*, *curvinervis*, Kriechb., *inflexus*, Ratz., *pteridis*, Kriechb., and *repentinus*, Holmgr.; Pinacographia, pl. xxxix. figs. 1–6.

Ophion parasitic on *Attacus polyphemus* and *promethea* ; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. xcix.

Paniscus. On the oviposition of this genus ; Adler, Ent. Nachr. v. pp. 205 & 206. *P. perforator*, Smith, = *Ophion rufus*, Brullé ; F. Smith, Phil. Tr. clxviii. p. 537.

Xenodocon ruficornis, Först., = *Ospryngotus seductorius*, Fabr. ; it is parasitic on *Pelopœus spirifex* and *destillatorius*, which it resembles in coloration : A. Mocsáry, Ent. Nachr. v. p. 11.

New species :—

Ophion tournieri, Geneva (= *repentinus*, Voll., pl. xxviii. fig. 7, *nec* Holmgr.), p. 61, *unicallosus* and *monostigma* [Holland ?], p. 62, pl. xxxix. figs. 7 & 8 (details), Snellen van Vollenhoven, Pinacographia ; *O. pteridis* (bred from larvæ of *Eriopus pteridis*), p. 89, *parvulus*, Munich, p. 104, and *minutus*, Turin, p. 105, Kriechbaumer, Ent. Nachr. v. ; *O. dentatus*, Kashmir, and *albo-pictus*, Yarkand, F. Smith, Second Yark. Miss. Hym. p. 22.

Trachynotus canadensis, Provancher, Nat. Canad. xi. p. 119, Canada.

Anomalon nigrum, id. *l. c.* p. 142, Canada.

Paniscus unicolor, Murree, Punjab Hills, and *quadrilineatus*, Yarkand, F. Smith, *l. c.* pp. 21 & 22.

Campoplex longipes, id. *l. c.* p. 21, Kashmir ; *C. niger*, p. 148, *minor* and *carinatus*, p. 150, Provancher, *l. c.*, Canada.

Pyracmon annulatum, id. *l. c.* p. 182, Canada.

Porizon boreale and *rugosum*, id. *l. c.* p. 206, Canada.

Mesochorus flaviceps, id. *l. c.* p. 210, Canada.

Exetastes rufo-femoratus and *matricus*, id. *l. c.* pp. 212 & 213, Canada.

Banchus ferrugineus, id. *l. c.* p. 217, Canada.

Tryphonides.

Snellen van Vollenhoven animadverts on the too great multiplication of genera allied to *Exochus*, and figures *Tylecomnus scaber*, Grav., *Chorinæus tricarinatus*, Holmg., *cristator*, Grav., and var. or sp. n. (?) *Exochus holmgreni*, Boh., *congener*, Holmgr., *podagricus*, Grav., and *squalidus*, Holmgr. ; Pinacographia, pp. 59 & 60, pl. xxxviii. figs. 1–8.

Tryphon scabriculus, Grav. Varieties described ; J. B. Bridgman, Ent. xii. pp. 129 & 130.

New species :—

Mesoleptus albo-pleuralis, p. 224, *flavicornis*, p. 228, *rufulus* (= *Phygadeuon rufulus*, p. 76), p. 229, *lætus*, p. 231, Provancher, Nat. Canad. xi., Canada.

Exyston variatus, id. *l. c.* p. 249, Canada.

Mesolius fissus and *antennatus*, id. *l. c.* pp. 257 & 260, Canada.

Tryphon gaspesianus, p. 252, *dorsalis*, p. 253, *hervieuxi*, p. 254, and *dionnii*, p. 256, *id. l. c.*, Canada.

Cteniscus apicatus, id. *l. c.* p. 263, Canada.

Erromenus bedardi, id. *l. c.* p. 266, Canada.

Orthocentrus pilifrons, *lucens*, and *carinatus*, id. *l. c.* pp. 279–281, Canada.

Bassus saginatus, id. *l. c.* p. 277, Cap Rouge, Canada.

Metopius basalis, Florida, *robustus*, Maryland, *nevadensis*, p. xxvii., *bellus*, *concinnus*, Nevada, *comptus*, *montanus*, p. xxviii., *mirandus*, *laticinctus*, Colorado, and *scitulus*, Nevada, p. xxix., Cresson, Tr. Am. Ent. Soc. vii.

Pimplides.

VOLLENHOVEN, SNELLEN VAN. Einige neue Arten von Pimplarien aus Ost-Indien. S. E. Z. xl. pp. 133–150.

Smith's articles on Wallace's captures are criticized in the introductory portion of this paper. Several new species are subsequently described, and the following known species, &c., noticed:—*Ephialtes melanomerus*, Voll., redescribed; *Pimpla*, Fabr., remarks on the difficulty of subdividing it; *P. bipartita*, Brullé, may be a *Rhyssa*; *P. punctator*, Linn. (= *pedator*, Fabr.), discussed, and varieties described; *P. punctata*, Fabr., var. (?) from Timor described; *P. continua*, Brullé, and *insidiator*, Smith, noticed; the latter is a species of very wide distribution, occurring in Mysol, Ternate, Timor, Waigiou, Gebeh, Aru, and Tasmania.

Rhyssa antipodum, Smith, = *R. fractinervis*, Ritsema; Ritsema, Tijdschr. Ent. xxii. p. lxxxviii. *R. lunator*, Fabr.: malformation of ovipositor; O. S. Westcott, Canad. Ent. xi. p. 140.

Pimpla instigator, Fabr., noticed; S. D. Bairstow, Ent. M. M. xvi. p. 36.

Rhyssa fulva, Island of Obi, near Ternate, p. 136, *bernsteini*, Salawatty or Waigiou, p. 138, *flaviceps*, Aru, p. 139, and *mulleri*, Java, p. 140, spp. nn., S. Van Vollenhoven, S. E. Z. xl.

Pimpla transversalis, Sumatra, Borneo, Timor, Thibet (?), p. 146, *zebra* and *elegans*, Java, p. 147, *basalis*, Sumatra, p. 148, and *sagræ*, Java, p. 149, S. v. Vollenhoven, S. E. Z. xl.; *P. lævigata*, *coxata*, and *molesta*, p. 229, and *lineata*, p. 230, F. Smith, Descr. New Hym., Costa Rica; *P.* (?) *antinorii* and *P. mahalensis*, Gribodo, Ann. Mus. Genov. xiv. p. 345, Shoa: spp. nn.

Xylonomus clavicornis, Kriechbaumer, CB. Ver. Regensb. xxxiii. p. 168, Trieste (remarks on *X. securicornis*, Holmgr., are added).

BRACONIDÆ.

Microgaster. Notes on, and inquiries respecting, this genus; Kriechbaumer, Ent. Nachr. v. pp. 101–104. *Microgaster* sp. bred from *Pieris Cydæ* is distinct from *Apanteles glomeratus*, infesting *P. brassicæ*; E. A. Bullough, Ent. xii. p. 62. *M. dilutus*, Ratz., ♂ described; S. D. Bairstow, Ent. M. M. xvi. p. 116.

Thyreodon morosus and *principalis*, spp. nn., F. Smith, Descr. New Hym. p. 230, Costa Rica.

Bracon lævis, id. *l. c.* p. 234, Costa Rica ; *B. martini*, Gribodo, *id.* Ann. Mus. Genov. xiv. p. 346, Shoa : spp. nn.

Evaniidæ.

Trigonalys niger, Westm. Its structural characters and their variation discussed ; H. de Tournier, CR. Ent. Belg. xxii. pp. x.–xii.

Trigonalys mexicanus, *læviceps*, Mexico, and *nevadensis*, Nevada, spp. nn., Cresson, Tr. Am. Ent. Soc. vii. p. vii.

Aulacus pallipes, Massachusetts, p. xvii., *occidentalis*, Colorado, Nevada, *melleus*, *consors*, Nevada, p. 295, *montanus*, *firmus*, Colorado, and *pacificus*, Vancouver's Island, p. 256, *id.* l. c. ; *A. galitæ*, Gribodo, Ann. Mus. Genov. xiv. p. 339, Galita : spp. nn.

Megischus antinorii, sp. n., *id. l. c.* p. 346, Shoa.

Chalcididæ.

Notes on *Chalcididæ* parasitic on the eggs of various *Lepidoptera* ; Lichtenstein & Frey-Gessner, Le Nat. i. p. 50.

Megastigmus pictus, Först., and *Torymus azureus*, Boh., recorded as British, and the other British species of *Megastigmus* noticed ; P. Cameron, Tr. E. Soc. 1879, pp. 118 & 119.

Pachylarthrus smaragdinus, Curt., parasitic on *Tephritis*, the "Celery fly" ; E. A. Fitch, Ent. xii. pp. 231 & 232.

Eurytoma studiosa, Say, parasitic on larva of *Euura salicicola* ; transformations described : E. A. Smith, N. Am. Ent. i. pp. 42 & 43.

Eulophus, Geoff. General notes ; F. Karsch, JB. zool. Sect. westf. Ver. vii. pp. 31–35.

New species :—

Leucaspis parvicauda, Mocsáry, Term. füzetek, iii. p. 119, Hungary.

Coryna dubia, Buckton, Mon. Brit. Aph. ii. p. 86, note, pl. lxiv. (cocoons), parasitic on *Aphis rumicis*.

Aphelinus aspidioticola, W. H. Ashmead, Canad. Ent. xi. p. 159, Florida.

Trichogramma pretiosa, C. V. Riley, *op. cit.* p. 161, parasitic on the cotton worm (egg) ; *T.* (*Aprobosca*) *erosicornis*, Westwood, Tr. L. S. (2) i. p. 593, pl. lxxiii. figs. 24 & 25, Ceylon.

Oligosita subfasciata, figs. 14–19, *staniforthi*, figs. 20 & 21, p. 591, and *O.* (?) *nodicornis*, figs. 22 & 23, p. 592, *id. l. c.* pl. lxxiii., Ceylon.

Cirrospilus esurus, C. V. Riley, *l. c.* p. 162, parasitic on the Cotton-Worm (larva).

Proctotrypidæ.

Mayr, G. Ueber die Schlupfwespen-Gattung *Telenomus*. Verh. zool.-bot. Ges. Wien, xxix. p. 697–714.

Separate tables of the males and females are given, and the known species are described, as well as the new ones. The following synonyms occu-

T. ovulorum and *nigripes*, Thoms., = *semistriatus*, Nees, *Teleas linnæi*, pt., Nees, and *zetterstedti*, Ratz., = *T. truncatus*, Nees, *T. ovulorum*, Bouché, = *terebrans*, Ratz., *T. punctatulus*, Ratz., = *nitidulus*, Thoms.

Snellen van Vollenhoven figures *Loxotropa antennata*, Jur., fig. 1, *tripartita*, Marsh, *dispar*, Nees, *Spilomicrus nigripes* and *integer*, Thoms., figs. 3–6, and *Corynopria cincta*, Hal., fig. 8; Pinacographia, pl. xl.

Gonatopus (?) *alatus*, Cress., is a *Dryinus*; W. H. Patton, Canad. Ent. xi. p. 65.

Perisemus tri-areolatus, Först. (= *Bethylus fulvicornis*, Curt.), bred from gall of *Andricus terminalis*; E. A. Fitch, Ent. xii. p. 24.

Teleas. Notes on species parasitic on the eggs of *Lepidoptera*; Lichtenstein & Frey-Gessner, Le Nat. i. p. 50.

Antæon lateralis, Thoms., new to Britain, recorded from Dumfries; P. Cameron, Ent. M. M. xvi. p. 94.

Hadronotus musciformis, Nees, ♀ described; Mayr, Verh. z.-b. Wien xxix. p. 698, note.

Diapria coccophaga, sp. n., W. M. Maskell, Tr. N. Z. Inst. xi. p. 229, pl. ix.; parasitic on New Zealand *Coccidæ*.

Loxotropa sabuleti, sp. n., Vollenhoven, Pinacographia, p. 62, pl. xl. [Holland ?].

The *cicrus major*, sp. n., *id. l. c.* p. 63, pl. xl. fig. 7, Holland and Swit the exuvia

STRECKER, H. *ixianus*, id. Tijdschr. Ent. xxii. p. xiii., Holland, ?; *P.* ture and I (*?*, Canad. Ent. xi. p. 64, Connecticut: spp. nn.

Growers' *ortulus*, sp. n., *id. l. c.* p. 65, Connecticut.

iltratus, *tumidus*, p. 703, *simoni*, p. 705, *pentopheræ*, *hey-*

Contains ge*oullschlegeli*, *harpyiæ*, *bombycis*, p. 711, *umbripennis*, *hof-*

of North Amei*gracilis*, *kolbii*, *tabani*, p. 713, and *coccivorus*, p. 714, Mayr,

WADLY, A. №, xxix., Austria, spp. nn.

xxvii. pp. *astoni*, sp. n., Westwood, Tr. L. S. (2) i. p. 585, pl. lxxiii.

Relates to *c.* Helena.

cisus, id. *l. c.* p. 586, pl. lxxiii. figs. 10 & 11, Salisbury.

WARDLE, T

Arts, x

Includ*h*

CYNIPIDÆ.

special *ne*

li's observations on *Cynipidæ* reprinted from Canad. Ent. x.

WHIT*li*94; Scot. Nat. v. pp. 27–36.

*Rh**ne*an undetermined oak-gall; E. A. Ormerod, Ent. M. M. xv. pp. 197

T*S*3, woodcuts.

vari*ne**cophaga crassipes*, Westw., not used for caprification in Egypt;

*ni*stein's specimens of *Blastophaga* from Montpellier correspond

B. grossorum, Gr., from Tyrol, but are distinct from *Cynips prenes*,

L., from Smyrna; S. S. Saunders, Ent. M. M. xv. p. 190.

Spathogaster tricolor. Note on its galls; G. B. Rothera, Ent. xii. pp. 23 & 24.

Cynips, sp. Kidney-shaped galls from oak in California, H. Lucas, Bull Soc. Ent. Fr. (5) ix. p. xlvi. *C. hungarica* passing two years and a half in the gall; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) ix. p. xxv.

Dryophantus scutellaris. Note on gall; G. C. Bignell, Ent. xii. pp. 62 & 63.

Phænoglyphis, Först. (= *Auloxysta*, Thoms.), mentioned by P. Cameron, and a British specimen recorded, probably ♂ of *P. xanthocnema* Först. (= *A. rufa*, Thoms.), Tr. E. Soc. 1879, pp. 114 & 115.

Hexacola hexatoma, Hart., and *Allotria tscheki*, Giraud, recorded as British; *id. l. c.* pp. 114 & 116.

Onychia. P. Cameron, *l. c.* pp. 110 & 111, discusses the synonymy of this genus, and tabulates the allied genera as follows:—

A. Scutellum ending in a sharp spine, *Aspicera.*

B. Scutellum truncated.

Abdominal petiole short, *Homalaspis.*

„ „ long, *Onychia.*

New species:—

Ibalia rufipes, Nevada, and *montana*, Colorado, Cresson, Tr. Am. Ent. Soc. vii. p. xvii.

Cynips atriceps, Buckton, Mon. Brit. Aph. ii. p. 106, pl. lxxiii. fig. 6, parasitic on *Aphis amygdali.*

Allotria pleuralis, P. Cameron, Tr. E. Soc. 1879, p. 113, Clyde.

Psichacra dalii, id. *l. c.* p. 115, Glanville's Wootton (allied to, but distinct from *gracilis*, Dahlb. (? = *longicornis*, Hart., ♀), which ...rded as ...ticed; P. British, *l. c.* p. 116).

Onychia nigripes, id. *l. c.* p. 112, Norwich.

Homalaspis biusta (Westw., MS.), *id. l. c.* p. 112, Brit... *itis*, the "Celery

Charips microcera (Haliday, MS.), *id. l. c.* p. 117, Britai... *icicola*; trans-

... 43.

Urocerid.æ. ... Sect. westf.

Xiphydria attenuata, Nort., ♀, described, with notice ...

Rhyssa humida, Say; W. H. Patton, Canad. Ent. xi. pp. 14

Oryssus occidentalis, Colorado, Nevada, and *mexicanus*, Mexi... Hungary.

Cresson, Tr. Am. Ent. Soc. vii. pp. ix. & x. ..., pl. lxiv.

Tenthredinidæ. ... p. 159,

Vollenhoven, S. C. Snellen van. De inlandische Bladwespen ... on the gedaantewisseling en levenswijze beschreven. Twintigste ... S. (2) Tijdschr. Ent. xxii. pp. 1–20, pls. i.–iv.

Includes life-histories of *Selandria adumbrata*, Klug, p. 1, pl. i., *L...* and *toma pullata*, Zadd., p. 7, pl. ii., *H. vulgaris*, Klug, p. 12, pl. iii. u... figs., *H. ustulata*, Linn., p. 15, pl. iii. lower figs., and *Selandria sixi...* ton- p. 18, pl. iv.

J. W. May has continued his translations of Snellen Van Vollenhoven's Life-Histories of Saw-Flies; Ent. xii. pp. 4–8, 101–106, 149–151, 171–175, 264–267. The following species are noticed: *Lophyrus virens*, Klug, *Lyda clypeata*, Klug, *Selandria cereipes*, Voll., *Cimbex sylvarum*, Fabr., and *Phyllotoma tenella*, Zadd.

List of *Tenthredinidæ* described by Eversmann, in Bull. Mosc. xx.

(1847), and omitted by Kirchner from his "Catalogus Hymenopterorum Europæ"; P. Cameron, Ent. M. M. xvi. p. 64, note.

On rearing *Tenthredinidæ*, and notes on habits; R. v. Stein, Ent. Nachr. v. pp. 204–206, & 217.

Tenthredinidæ partially carnivorous; *Lophyrus* often remains two or three years in the cocoon: Brischke, *op. cit.* p. 244.

Hylotoma stephensi, Leach (*pagana*, Panz., var. ?), and the allied species discussed; P. Cameron, Tr. E. Soc. 1879, pp. 107 & 108.

Nematus nigro-lineatus, Cameron, redescribed, the larva lives in the rolled-down leaves of *Salix viminalis*, id. *l. c.* pp. 108–110; *N. ribis*, suggestions for its destruction, B. Cocke, Ent. M. M. xvi. p. 136. *N. vallator*, Vollenh.; Kriechbaumer translates Vollenhoven's account of the curious habits of the larva, adding observations of his own, Ent. Nachr. v. pp. 17–19.

Dineura rufa, Panz. Transformations described, with remarks on parthenogenesis in the *Tenthredinidæ*; R. v. Stein, *op. cit.* pp. 293–299.

Allantus basilaris, Say, and *dubius*, Nort. Distinctive characters pointed out; the former is carnivorous; W. H. Patton, Canad. Ent. xi. pp. 12–14.

Pœcilosoma longicorne, Thoms., recorded as probably new to Britain; S. D. Bairstow, Ent. M. M. xvi. p. 117.

The cocoon of *Strongylogaster subjectus*, Eversm., redescribed; P. Cameron, Ent. the exuviæ, pp. 63 & 64.

STRECKER, H. *trigosa*, Fabr. Larva attacking vine; A. Laboulbène, Bull. ture and I (5) ix. pp. cviii. & cix.

Growers' ies :—

Contains ge ens (Zadd. MS., = *aurulenta*, Zadd. olim, *nec* Sich.), André, of North Amer p. 30, S. Europe.

WADLY, A. *Nittata*, Mocsáry, Term. füzetek, iii. p. 115, Buda.

xxvii. pp. *Cyrenaica*, André, *l. c.* p. 48, Gavarnie, Pyrenees: *H. massaiæ*, Relates to th Mus. Genov. xiv. p. 347, Shoa; *H. fumipennis*, F. Smith, c. Miss. Hym. p. 18, Jhilam Valley, Punjab Hills.

WARDLE, T *alicicola*, E. A. Smith, N. Amer. Ent. i. pp. 41 & 42 (woodcuts Arts, na and forewing), Illinois (described in all stages).

Includ *hytus temesiensis*, Mocsáry, *l. c.* p. 115, S. Hungary.

special *alia rufo-scutellata*, p. 116, and *maculata*, Hungary, p. 117; *A.* WHI *li*, Brussa, p. 117, note, *id.* l. c.; *A. vollenhoveni*, p. 346, *scioensis* and *nosa*, p. 347, Gribodo, *l. c.*, Shoa.

R *Strongylogaster sharpi*, P. Cameron, Ent. M. M. xvi. p. 64, Thornhill.

T *Allantus frivaldszkii*, Mocsáry, *l. c.* p. 118, S. Hungary; *A. providus* var nd *multicolor*, p. 18, and *simillimus*, Murree, Punjab Hills, and *termi- lis*, Kashmir, p. 19, F. Smith, *l. c.*

Macrophya opposita, id. *l. c.* p. 19, Kashmir.

Tenthredo gracilenta, Mocsáry, *l. c.* p. 119, N. Hungary; *T. simulata*, p. 19, *fallax* [nom. bis lectum], and *nigro-maculatus*, p. 20, F. Smith, *l. c.*, Kashmir, &c.

Lyda provancheri and *chicoutimiensis*, V. A. Huart, Nat. Canad. xi. pp. 148 & 149, Canada.

LEPIDOPTERA.

BY

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

General Notes.

Bobretzky, N. Ueber die Bildung des Blastoderms und der Keimblätter bei den Insecten. Z. wiss. Zool. xxxi. pp. 195–214, pl. xiv.

Describes the gradual development of the egg in *Pieris crataegi* and *Porthesia chrysorrhœa*, with occasional references to the eggs of other insects and *Crustacea*.

Brandt, E. [Vide *Pieridæ*, and Insecta (General Subject

Breitenbach, W. Zur Systematik der Lepidopteren. Z pp. 427 & 428.

Contains remarks on the possible use of the structure of as an aid to classification.

Browne, M. Collecting Butterflies and Moths, being capturing, killing, and preserving *Lepidoptera* and Illustrated. Reprinted with additions from "Practical London; 1879, 8vo, p. 50.

Butler, A. G. Illustrations of Typical Specimens of *Le Heterocera* in the collection of the British Museum. London: 1879, 4to, pp. xviii.–82, pls. xli.–lx.

This part, like the last, is devoted entirely to Japanese and Chinese species.

Hopffer, C. Exotische Schmetterlinge. S. E. Z. xl. pp. 47–9, 413–454.

A series of posthumous notes. The supposed new species were al previously described in S. E. Z. 1874 (*cf.* G. Weymer, *op. cit.* xl. pp. & 210.

Kirby, W. F. Catalogue of the Collection of Diurnal *Lepidoptera* formed by the late William Chapman Hewitson, of Oatlands, Walton-on-Thames, and bequeathed by him to the British Museum. Published under the direction and by the authority of the executors of the will of Mr. Hewitson. London: 1879, 4to, pp. iv.–246.

[Kirby, W. F.] Introductory papers on *Lepidoptera*, Nos. xi.–xv. Ent. xii. pp. 11–14, 81–83, 92–96, 123–125, 145–149.

Extends from *Callima* to *Pyrrhogyra*.

Lewert, A. Wahrnehmungen über Insektenentwicklung. Ent. Nachr. v. pp. 45–48, 61–65, 73–80, plate.

Treats of the part played by enclosed air in the rupture of the pupa-case, the inflation and expansion of the wings, and the functions of the fluid contained in the nervures, and comprises many interesting and important physiological observations on the development of *Lepidoptera* on emerging from the pupa.

McAldowie, A. M. On the colours of animals, and the arrangement of pigment in *Lepidoptera*. Sci. Goss. xv. pp. 36–38, woodcuts.

The pigment is deposited between the membranous layers composing the scales, and is arranged in parallel lines corresponding to the situation of the ribs or striæ.

Riley, C. V. Philosophy of the Pupation of some Butterflies. Nature, xx. pp. 594 & 595.

The connecting link which sustains the newly-formed pupa consists of the exuviæ of the internal organs of the larva.

Strecker, H. Butterflies and Moths in their connection with Agriculture and Horticulture, a paper prepared for the Pennsylvania Fruit-Growers' Society, Jan. 1879. Harrisburg: 1879, 8vo, pp. 22.

Contains general information relating to *Lepidoptera*, especially those of North America.

Wadly, A. Notes on certain Silk-producing Bombyces. J. Soc. Arts, xxvii. pp. 632 & 633.

Relates to the various ordinary domesticated species.

Wardle, T. On the Wild Silks of India, principally Tusser. J. Soc. Arts, xxvii. pp. 499–513. Compare also pp. 60, 633, & 634.

Includes a list of known silk-producing *Bombyces* by F. Moore, and special remarks on the more important species and their silk.

White, F. B. On the Male Genital Armature in the European *Rhopalocera*. Tr. L. S. (2) i. pp. 357–369, pls. lv.–lvii.

The structure of these organs in a large number of species, belonging to various families, is elaborately described and illustrated.

Europe.

Hartmann, A. Die Kleinschmetterlinge des europäischen Faunengebietes. Erscheinungszeit der Raupen und Falter, Nahrung und biologische Notizen. MT. Münch. ent. Ver. iii. pp. 143–200.

Contains notices of times of appearance, food-plants, localities, &c. The portion published in 1879 extends to the genus *Incurvaria*.

Lunel, A. Iconographie des Papillons de l'Europe centrale, et particulièrement de la Suisse, et des Alpes. Genève: 1879.

[Not seen by the Recorder.] Appearing in parts with four coloured plates each.

Millière, P. Iconographie et description de Chenilles et Lépidoptères inédits. Ann. Soc. L. Lyon, xxv. pp. 1–12, pl. clv.

Möschler, H. B. Die Familien und Gattungen der europäischen Tagfalter. Abh. Ges. Görlitz, xvi. pp. 136–213, 2 pls.

[Not seen by the Recorder.]

Mosley, S. L. Illustrations of European Butterflies; a Series of Hand-painted Figures. Parts i.–xii. Huddersfield: 1879, 8vo.

Issued to subscribers only.

Parts 11–22 of W. F. Kirby's "European Butterflies and Moths" have appeared during the year.

British Isles:—

Moncreiffe, T. The *Lepidoptera* of Moncreiffe Hill. Scot. Nat. v. pp. 24–27, 69–77.

603 species have been captured in the space of a square mile. For further observations *cf.* Moncreiffe & Barrett, *l. c.* pp. 115–118.

White, F. B. The *Lepidoptera* of Scotland. Scot. Nat. v. pp. 39–44.

Additions to former papers.

——. The Mountain *Lepidoptera* of Britain; their distribution and its causes. Scot. Nat. v. pp. 97–105, 149–160.

The author regards the following British species as strictly alpine:—*Erebia epiphron*, *Zygæna exulans*, *Pachnobia hyperborea*, *Anarta melanopa* and *cordigera*, *Psodos coracina*, *Scopula uliginosalis*, *Scoparia alpina* and *gracilalis*, *Crambus furcatellus*, *Penthina staintoniana* and *grevillana*, *Swammerdamia nanivora*, *Zelleria saxifragæ*, and probably one or two species of *Nepticula*. He then discusses the geographical and climatic changes which have taken place in the British Islands during and subsequent to the glacial period, and the manner in which animals and plants spread thither from the Continent, with special reference to mountain species and their present distribution in Britain.

S. L. Mosley has continued his "Illustrations of Varieties of British *Lepidoptera*." Parts iii.–v. have appeared within the year, containing varieties of *Anthocharis cardamines*, *Colias edusa*, *Vanessa io*, *atalanta*, and *cardui*, *Zygæna trifolii*, *filipendulæ*, and *loniceræ*, *Abraxas grossulariata* and *ulmata*, *Papilio machaon*, *Argynnis paphia*, *adippe*, *euphrosyne*, and *selene*.

A. Wilson has published part v. of his "Larvæ of British *Lepidoptera*," concluding the work (pp. 177–367, ci., xvi. pls. xxv.–xl.). Indices, and tables of food-plants, and times of appearance in all stages are added.

Captures of *Lepidoptera* in various parts of Britain, Ent. xii. pp. 18, 19, 60, 75–78, 96–101, 120–123, 126–128, 151–153, 155–157, 162–167, 182–193, 209–214, 226–228, 233–237, 252–254, 293–295, 297, 259–263, Ent. M. M. xvi. pp. 98 & 99, Sci. Goss. xv. p. 281, Scot. Nat. v. pp. 116, 117, 160 & 19[illegible].

Captures in Yorkshire in 1877–78, Porritt & Prest, Tr. Yorksh. Nat. Union, i. Series D, pp. 2–16, iii. pp. 71–76.

Additions to the *Macro-Lepidoptera* of Guernsey; W. A. Luff, Ent. xii. p. 17.

Notes on Irish *Lepidoptera*, F. W. Sinclair, P. R. Dubl. Soc. (2) ii. pp. 237–242, includes additions and corrections to former lists of Irish species.

MAILLARD, P. N. Papillons des Deux-Sèvres, description des Rhopalocères, ou papillons diurnes, suivie de celle des Sphingides. Melle: 1878, pp. xviii. & 70.

France.

SAND, M. Catalogue raisonné des Lépidoptères du Berry et de l'Auvergne (France Centrale). Paris: 1879, 8vo, pp. vi. & 207.

Based upon the results of twenty-five years' collecting. The district appears to be extremely rich, as four-fifths of the French species occur within its limits.

De Lafitole continues his "Calendrier Lépidoptérologique (Chenilles)" from July to December. Pet. Nouv. ii. pp. 295, 299, 302, 303, 306, & 307; Le Nat. i. pp. 77 & 78, 86 & 87, 94 & 95, 100, 107, 117, & 133.

Notes on food-plants of various French *Lepidoptera*; E. L. Ragonot, Bull. Soc. Ent. Fr. (5) ix. p. lxxiv.

Notes on various French *Lepidoptera*; Pet. Nouv. ii. pp. 290, 310, & 311; Le Nat. i. (1) p. 4, (3) p. 4, & pp. 37, 38, 47, 59, 85, & 86; Feuill. Nat. ix. p. 119.

Captures of *Lepidoptera* at Budos, S. France; Brown, Actes Soc. L. Bord. xxxii. pp. cxi.–cxiii.

Holland.

DE GRAFF, H. W., & SNELLEN, P. C. T. Microlepidoptera, nieuw voor de Fauna van Nederland. Tijdschr. Ent. xxii. pp. 127–132 (*cf.* also pp. lxxxviii. & lxxxix.)

Germany & Austria.

FRITSCH, K. Jährliche Periode der Insectenfauna von Österreich-Ungarn. iv. Die Schmetterlinge. Denk. Ak. Wien, xxxix. pp. 79–142, pls. i.–iv., xli. pp. 83–150, pls. i.–iv.

Treated in the same manner as in the writer's former papers.

FUCHS, A. Lepidopterologische Mittheilungen aus dem nassauischen Rheinthale. S. E. Z. xl. pp. 40–46, 166–174.

Relates to various species, which will be noticed in their places.

Rehberg, H. Systematisches Verzeichniss der um Bremen gefangenen Gross-Schmetterlinge. Abh. Ver. Brem. vi. pp. 455–488.

663 species enumerated.

Catalogue of *Lepidoptera* of the neighbourhood of Berlin, to the end of the *Geometridæ* (747 species, out of 2287 occurring in Europe); see Pfützner, Deutsche E. Z. xxiii. pp. 33–47. A preliminary list of the remainder of the *Lepidoptera*, apparently by Tieffenbach, is appended (pp. 49–58).

List of *Lepidoptera* of Hanau; Limpert & Röttelberg, JB. wetter. Ges. 1879.

Catalogue of *Lepidoptera* which hibernate in the perfect state in N. Bohemia; R. v. Stein, Ent. Nachr. v. pp. 181–188.

Switzerland.

Captures of Butterflies in the Valais in 1878; Forbes & Sclater, Ent. M. M. xv. pp. 275–278. Butterflies of the Eastern Alps; H. J. Elwes, *op. cit.* xvi. pp. 2–7. Butterflies and Sphinges of Zermatt; R. C. R. Jordan, *op. cit.* pp. 86–90. Captures of *Lepidoptera* at Einsiedeln; M. Paul, MT. schw. ent. Ges. v. pp. 508–510.

Italy.

Curó, A. Saggio di un Catalogo dei Lepidotteri d' Italia (contin.). Bull. Ent. Ital. xi. pp. 49–67, 142–152.

Extends from *Ligia* to *Eupithecia*.

Failla-Tedaldi, L. Sopra alcuni Lepidotteri Siciliani. *Op. cit.* pp. 225–228.

Brief notes on 36 species of *Heterocera*.

Turati, E. Contribuzione alla Fauna Lepidotterologica Lombarda. *Op. cit.* pp. 153–208, pls. vii. & viii.

A few species are described as new. Plate vii. represents the neuration of various species of *Psychidæ*.

L. Tognoli enumerates 147 *Lepidoptera* (*Rhopalocera-Zygænidæ*) found in the neighbourhood of Modena; Ann. Soc. Mod. (2) xii. pp. 81–146. The families and genera are characterized throughout.

Notes on Italian Butterflies; A. H. Swinton, Ent. M. M. xvi. pp. 40 & 41.

Spain.

Seebold, T. Catalogo de los Lepidopteros observados en los alrededores de Bilbao. An. Soc. Esp. viii. pp. 97–131, pl. i.

A Spanish translation, with additions, and figures of the new species of the list published in S. E. Z. xxxviii. pp. 359–380 [*cf.* Zool. Rec. xiv. *Ins.* p. 112].

Turkey.

Captures of Butterflies at Port Baklar: J. J. Walker, Ent. M. M. xv. pp. 193–196 (74 species observed within five miles).

Russia.

STAUDINGER, O. Ueber Lepidopteren des südöstlichen europäischen Russlands. S. E. Z. xl. pp. 315–328.

Several new species described.

Additions to the list of Livonian *Lepidoptera* : F. Sintenis, &c., SB. Ges. Dorp. v. pp. 5–9, 32 & 33.

Additions to the Lepidopterous Fauna of St. Petersburg ; W. v. Hedemann, Hor. Ent. Ross. xv. p. 139.

S. Alpheraki continues his notes on the *Lepidoptera* of Taganrog ; Troudy Ent. Ross. xi. pp. 45–50. A new *Nephopteryx* is described.

Asia.

ASIATIC SOCIETY OF BENGAL. Descriptions of new Indian Lepidopterous Insects, from the Collection of the late W. S. Atkinson; *Rhopalocera* by W. C. Hewitson, and *Heterocera* by F. Moore. With introductory notice by A. Grote. Calcutta : 1879, 4to, part i. pp. xi. & 88, pls. i.–iii. (*Rhopalocera* to *Hepialidæ*).

The descriptions of new species already published from the collection are here reprinted; but the Recorder has not referred to these where no figures or fresh information is given.

BOHATSCH, O. Nachtrag zur Lepidopteren-Fauna Syriens. Verh. z.-b. Wien, xxix. pp. 405–410.

Supplementary to Lederer's papers. 14 moths are specially noticed, some new.

BUTLER, A. G. Descriptions of new species of *Lepidoptera* from Japan. Ann. N. H. (5) iv. pp. 349–374, 437–457.

In addition to new species and varieties, many known European and other species are here recorded from Japan for the first time.

——. On a Collection of *Lepidoptera* from Cachar, N.E. India. Tr. E. Soc. 1879, pp. 1–8.

84 species are enumerated, collected by W. Grant in the immediate vicinity of his bungalow, on the Burtell Tea Estate, Cachar. 8 new species are described, and the local variations of others remarked on.

——. The Butterflies of Malacca. Tr. L. S. (2) i. pp. 533–568, pls. lxviii. & lxix.

258 species are enumerated, many new. A table of their geographical distribution is appended, and a few Moths are also described.

MOORE, F. Scientific Results of the Second Yarkand Mission, based upon the Collections and Notes of the late F. Stolicza: *Lepidoptera*. Calcutta: 1879, roy. 4to, pp. 18, 1 col. pl.

Published by the Government of India.

OBERTHÜR, C. Diagnoses d'espèces nouvelles de Lépidoptères de l'île Askold. Rennes: 1879, 8vo, pp. 16.

Staudinger, O. Lepidopteren-Fauna Kleinasiens (Fortzetgung). Hor. Ent. Ross. xv. pp. 159–435.

The *Micro-Lepidoptera* of Asia Minor, from *Cledeobia* to *Alucita*, are treated in the same manner as in the writer's former paper on *Macro-Lepidoptera* [cf. Zool. Rec. xv. *Ins.* p. 165]. The portion published in 1879 breaks off in *Coleophora* at p. 368; and, therefore, the notice of the subsequent part of the paper will be deferred till next Record. Suggestions respecting probable varieties, &c., are too numerous to be fully noticed here.

Notes on the geographical affinities of the butterflies of Asia Minor; H. J. Elwes, P. E. Soc. 1879, pp. xi.–xiii.

Africa, &c.

Aurivillius, P. O. C. *Lepidoptera* Damarensia. Förteckning på fjärilar insamlade i Damara-landet af G. de Vylder åren 1873 och 1874, jemte beskrifning öfver förut okända arter. Œfv. Ak. Förh. xxxvi. No. 7, pp. 39–69.

53 species enumerated, several new.

Butler, A. G. On a Collection of *Lepidoptera* from the Island of Johanna. Ann. N. H. (5) iii. pp. 186–192.

24 butterflies and 3 moths, nearly all exhibiting a strongly-marked Mascarene character. 14 are common to Madagascar, and only 12 are known to occur in Tropical Africa.

——. Descriptions of New Species of *Lepidoptera* from Madagascar, with notes on some of the forms already described. *L. c.* iv. pp. 227–246.

Dewitz, H. Afrikanische Tagschmetterlinge. Verh. L.-C. Ak. xli. (2) No. 2, pp. 39, pls. xxv. & xxvi.

Includes the species taken by Falkenstein at Chinchoxo and by Pogge on the coast of Guinea.

——. Afrikanische Schmetterlinge. MT. Münch. ent. Ver. iii. pp. 23–35, pls. i. & ii.

Includes a list of the Sphinges and Bombyces collected by Falkenstein and Pogge during the German expedition to the West Coast of Africa in 1873–76. A few new species are described and figured.

Mabille, P. *Lepidoptera* Madagascariensis; species novæ. Bull. Soc. Philom. (7) iii. pp. 132–144.

28 new species described.

——. Recensement des Lépidoptères hétérocères observés jusqu'à ce jour à Madagascar. Ann. Soc. Ent. Fr. (5) ix. pp. 291–348, pl. vi.

Saalmüller, M. Bemerkungen und Nachträge an den "Mittheilungen über Madagaskar, und seine Lepidopteren-Fauna." Ber. senck. Ges. 1878–79, pp. 122–126.

Additions and corrections to his former paper (*l. c.* 1877–78, pp. 71–96).

Seriziat, —. Catalogue des Lépidoptères des environs de Collo (Algeria). Bellac: 1879, 8vo, col. pl. [Not seen by the Recorder.]

Trimen, R. On some hitherto undescribed Butterflies inhabiting Southern Africa. Tr. E. Soc. 1879, pp. 325–346.

Wollaston, E. Notes on the *Lepidoptera* of St. Helena, with descriptions of new species. Ann. N. H. (5) iii. pp. 219–233, 329–343, 415–441.

90 moths and 4 butterflies enumerated, with remarks on habits, localities, transformations, and distribution.

A. G. Butler enumerates 21 *Lepidoptera* from Rodriguez, the majority being wide-ranging species. He redescribes his *Caradrina expolita*, *Diomea bryophiloides*, *Homoptera turbida*, and *Laverna plumipes*. Phil. Tr. clxviii. pp. 541–544.

Captures of *Lepidoptera* in Madagascar, with descriptions of a few new species; *id.* Cist. Ent. ii. pp. 389–394.

Notes on a small collection of Mascarene *Lepidoptera*; P. Mabille, Le Nat. i. (1) pp. 3 & 4; (2) pp. 3 & 4; (3) pp. 3 & 4.

Australasia.

Butler, A. G. On a Small Collection of Heterocerous *Lepidoptera* from New Zealand. Cist. Ent. ii. pp. 487–511.

88 species mentioned, many new.

——. On Heterocerous *Lepidoptera* collected in the Hawaiian Islands by T. Blackburn. Ent. M. M. xv. pp. 269–273.

Several new species are described, and short notes on known ones added.

Semper, G. Beitrag zur Rhopaloceren-Fauna von Australien. J. Mus. Godeffr. xiv. pp. 138–194, pls. viii. & ix.

Several new species are described; the important notes on the synonymy, variation, &c., of known species are too numerous to be given in detail here. The paper concludes with a table of the distribution of Australian *Lepidoptera* in Australia and in the adjacent islands. (Abstract by Crüger, S. E. Z. xl. pp. 375–382.)

Snellen, P. C. T. *Lepidoptera* van Celebes, verzameld door M. C. Piepers, met aanteekeningen en beschrijving der nieuwe soorten. Tweede afdeeling: *Heterocera*. Tijdschr. Ent. xxii. pp. 61–126, pls. vi.–x.

103 species of Sphinges and Bombyces are noticed, many of which are described as new. The proposed corrections of synonymy will seldom require notice, as most of them are conjectural. The variation, neuration, &c., of various known species are also discussed.

Godman, Salvin, & Butler publish a list of the *Lepidoptera* collected by Rev. G. Brown in New Ireland and New Britain, with descriptions of a few new species; P. Z. S. 1879, pp. 155–166, pl. xv.

Notes on butterflies from Duke of York Island and New Ireland; Godman & Salvin, P. Z. S. 1879, pp. 652–655.

America.

Butler, A. G. On the *Lepidoptera* of the Amazons, collected by J. W. H. Traill during the years 1873 to 1875. Part iii. *Noctuites*. Tr. E. Soc. 1879, pp. 19–76.

145 species are enumerated, 55 of which are new.

Dewitz, H. Naturgeschichte cubanischer Schmetterlinge, nach Beobachtungen des Herrn Dr. Gundlach bearbeitet. Z. ges. Naturw. (3) iv. pp. 155–174, pl. ii.

Contains detailed notices, generally with figures, of the earlier stages of *Danais erippus*, Cram., *Heliconia charithonia*, Linn. (pupa, figs. 1 & 1 *a*), *Papilio polydamas*, Linn. (pupa, figs. 2 & 2 *a*), *P. asterias*, Cram., *Pamphila ethlius*, Cram. (larva and pupa, figs. 3 & 3 *a*, *b*), *Achlyodes flyas*, Cram. (pupa, figs. 4 & 4 *a*, *b*), *Ancerya rimosa*, Grote (larva, figs. 5 & 5 *a*), *Hyalurga vinosa*, Drury (pupa, figs. 6 & 6 *a*), *Gonodonta uxoria*, Cram., figs. 7 & 7 *a*, *Melanchræa geometroides*, Walk. (larva and pupa, figs. 8, 8 *a–c*), and *Conchylodes diphtheralis*, Hübn. (pupa and cocoon, figs. 9, 9 *a–c*). A list of Cuban *Lepidoptera* is added, with notes on food plants, and occasional short descriptions of the larvæ, or observations on their habits.

Mann, B. P. Descriptions of some Larvæ of *Lepidoptera*, respecting *Sphingidæ* especially. Psyche, ii. pp. 265–272.

Contains notes from Boisduval's "Species Général des Lépidoptères Hétérocères," vol. i., and descriptions of or remarks on the larvæ of the following species by W. V. Andrews:—*Arctia isabella*, *Euchætes egle*, *Parasa chloris*, *Limacodes cippus*, *Datana major*, *Anisota stigma*, and *Scolecocampa libatrix*.

Sprague, F. H. Notes on Butterflies of Massachusetts. Psyche, ii. pp. 257–260.

Times of appearance.

Part viii of the second series of W. H. Edwards' "Butterflies of North America" has appeared in 1879.

The portion of Godman & Salvin's "Biologia Centrali-Americana" published in 1879 includes 56 pp. of text and 4 pls. on *Lepidoptera Rhopalocera*, extending as far as the genus *Hymenitis*. They include *Ituna* and *Lycorea* in *Danaina*, placing the remaining genera under *Ithomiina*. (Several species referred to as figured on pl. v., not yet published, are mentioned here for the sake of convenience.) Two species (*Ithomia cadra*, pl. ii. fig. 5, and *Hymenitis furina*, pl. iv. figs. 15 & 16) are figured in advance of the text belonging to them.

The descriptions of *Lepidoptera* in Kirby's "Fauna Boreali-Americana" are reprinted by G. J. S. Bethune, Canad. Ent. xi. pp. 146–154.

H. A. Hagen criticizes Gerhard's Catalogue of N. American *Lepidoptera*, which seems to contain many S. American species included in error; S. E. Z. xl. pp. 475 & 476.

Scarcity of butterflies in Nova Scotia and New Brunswick in 1878; C. E. Heustis, Canad. Ent. xi. p. 39.

List of butterflies collected in Dayton, Ohio; G. R. Pilate, *op. cit.* pp. 139 & 140.

Captures near Chicago in 1878; C. E. Worthington, *op. cit.* pp. 68–72.

J. O. Westwood (Tr. E. Soc. 1879) notices and figures several monstrous *Lepidoptera*:—*Gonepteryx rhamni*, p. 220, pl. vi. fig. 1, with extra imperfectly developed hind-wing; *Vanessa urticæ*, p. 221, pl. vi. fig. 2, with additional hind-wing; *Hipparchia janira*, p. 221, pl. vi. fig. 3, with a portion of one under surface of hind-wing supplied by a portion of an additional fore-wing. The following perfect insects or pupæ with larval heads, &c., are noticed:—*Bombyx mori*, pp. 223, 226 & 227, pl. vii. fig. 5, *Vanessa atalanta*, p. 223, pl. vii. fig. 4, *Phalæna heteroclita suberistata*, Müll. (prob. = *Liparis monacha*), p. 224, *Nymphalis populi*, p. 224, *Morpho eurylochus*, p. 225, pl. vii. fig. 3, *V. antiopa*, p. 225, *Pieris rapæ*, p. 225, *Zygæna exulans* var. *vanadis*, *Smerinthus tiliæ*, p. 226, *Sphinx* sp., p. 226, *Zerene adusta* and *Botys fuscalis*, p. 227, and *Orgyia antiqua*, p. 228.

On the analogy between the *Phryganeidæ* and *Lepidoptera*; F. Müller, Kosmos, iv. pp. 388–390 (woodcuts of neuration).

Structure of the proboscis in various *Lepidoptera* discussed; H. Breitenbach, Ent. Nachr. v. pp. 237–243, plate.

Notes on season-dimorphism in various *Lepidoptera*; Schumann, Ent. Nachr. v. p. 91.

A conspectus of our present knowledge as to the hibernation of British butterflies is given by E. A. Fitch, Ent. xii. pp. 1–4. See also Harwood & Hodgkinson, *op. cit.* pp. 57–59.

The effect of the wet season of 1879 on *Lepidoptera* is discussed in Ent. xii. pp. 179 & 180, 182 & 183, 202–204, 228 & 229, 255 & 256, 269 & 270, 281–287, 295 & 296; Sci. Goss. xv. p. 185.

Notes on the influence of the weather and the soil on *Lepidoptera*, also on hibernation, and on cannibal larvæ; W. V. Reichenau, Ent. Nachr. v. pp. 137–139.

Hibernation of *Lepidoptera*; O. Wackerzapp, Ent. Nachr. v. pp. 142–144.

Food and localities of *Lepidoptera*; E. Lelièvre, Feuill. Nat. ix. pp. 153 & 154.

Garden insects; J. W. Douglas, Ent. M. M. xvi. pp. 115 & 116.

On some injurious *Lepidoptera*; W. J. Griffith, Bull. Soc. Polymath. de Morbihan, 1879.

Long duration of the pupa-state in *Dilephila euphorbiæ*, *Eriogaster pinicola* and *lanestris*, *Gastropacha quercus*, and *Acronycta aceris*; R. v. Stein, Ent. Nachr. v. pp. 218 & 258.

Larvæ feeding on flowers; W. Cole & others, P. E. Soc. 1879, pp. v. & vi.

General remarks on the coloration of Lepidopterous larvæ; A. Batelli, Bull. Ent. Ital. xi. pp. 139–141.

On rearing butterflies from the egg; W. H. Edwards, S. E. Z. xl. pp. 455 & 456.

The eggs of *Lepidoptera* retain their vitality even after being plunged

into the strongest acids, but caustic potash and naphtha destroy them; Weinmann, Ann. Ent. Belg. xxii. p. xciv.

Improved moth-traps; H. Bergmann, Ent. Nachr. v. pp. 116–118, pl.; O. S. Westcott, Canad. Ent. xi. pp. 131 & 132.

Magnesium light for capturing moths; P. Noel, Feuill. Nat. x. p. 28.

Sifting apparatus for collecting Lepidopterous larvæ described; Bergmann, Ent. Nachr. v. pp. 49–51.

On preserving *Lepidoptera*; C. Bureau, Le Nat. i. p. 34.

Apparatus for inflating larvæ described; F. A. Wachtl, MT. forstl. Versuchswesens für Oesterreich, Heft iii.; Ent. Nachr. v. pp. 7–10, woodcuts.

On preserving larvæ; Sci. Goss. xv. pp. 58, 59, 256, & 257; Feuill. Nat. ix. pp. 103 & 104.

On the mischief caused to Lepidopterists by earwigs and centipedes getting at their setting-boards and breeding-cages, &c., *cf.* A. Kuwert, S. E. Z. xl. pp. 508–511.

Black paper instead of white recommended for lining drawers of cabinets for *Lepidoptera*; J. H. Leech, Ent. xii. p. 256.

Papilionidæ.

Papilio ophidocephalus, Oberth., redescribed; R. Trimen, Tr. E. Soc. 1879, p. 345: it is a constant form. *P. thersander*, Fabr., is distinct from *P. phorcas*, Cram.; *P. cyprœafila*, Butl., var. *gallienus*, from Calabar, described; *P. zalmoxis*, Hew., small var. noticed; and *P. horribilis*, var. *calabaricus*, described; W. L. Distant, P. Z. S. 1879, pp. 647–649. *P. polytes*, var. *stichius*, Hübn., ♂ described, p. 552; *P. mestor*, Hübn., ♀, and *P. achates*, Cram., ♂ described, p. 553; A. G. Butler, Tr. L. S. (2) i. *P. bairdi*, Edw. (= *asterias*, var. *utahensis*, Streck.), and *asteroides*, Reak. (*nec* Streck.), discussed by W. H. Edwards, Canad. Ent. xi. pp. 83–86. *P. delalandi*, Godt., variation noticed; Saalmüller, Ber. senck. Ges. 1878–79, p. 125. *P. homerus*, Fabr., habits, localities, eggs, and newly emerged larva discussed; P. H. Gosse, P. E. Soc. 1879, pp. lv.-lviii. *P. hystaspes*, Feld., taken at sea during a calm, nine miles from the nearest land; W. L. Distant, P. E. Soc. 1879, p. xxx. *P. krusensternia*, Esch., varieties noticed; C. Oberthür, Tr. E. Soc. 1879, p. 229. *P. podalirius*, ab. *latteri*, from Algeria, described by Austaut, Pet. Nouv. ii. p. 293. *P. pylades*, Fabr., var. from Chinchoxo noticed; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, p. 15. *P. thoas*, probably double-brooded at Toronto; W. E. Saunders, Canad. Ent. ix. p. 120. *P. thoas* (*cresphontes*), unusually early appearance of imago; and food-plants of larvæ noticed; Canad. Ent. xi. pp. 239 & 240.

Parnassius charltonius, Gray, figured by F. Moore, Second Yark. Miss. Lep. pl. i. fig. 3. *P. smintheus*, var. *behri*, and *P. baldur*, eggs and young larvæ described; W. H. Edwards, Canad. Ent. xi. pp. 141 & 142.

Baltia shawii, Bates, redescribed and figured by F. Moore, *l. c.* p. 3, pl. i. fig. 5.

Ornithoptera ruficollis, sp. n., A. G. Butler, Tr. L. S. (2) i. p. 552, Malacca.

Papilio esperi, id. *l. c.* p. 553, pl. lxviii. fig. 7, Malacca, Penang; *P. walkeri*, S. India, and *butleri*, Malacca, O. E. Janson, Cist. Ent. ii. p. 433, pl. viii. figs. 2 & 3; *P. casyapa*, Calcutta, and *lankeswara*, Ceylon, F. Moore, P. Z. S. 1879, p. 143; *P. hornimani*, W. L. Distant, *op. cit.* p. 647, pl. xlvii. figs. 1-3, Magila, E. Africa; *P. cilix*, p. 653, *oritas* and *paron*, p. 654, and *browni*, p. 655, Godman & Salvin, P. Z. S. 1879, New Ireland; *P. sangira*, C. Oberthür, Tr. E. Soc. 1879, p. 229, pl. viii. fig. 1, Sanghir Islands: spp. nn.

Pieridæ.

Brandt, A. Commentare zur Keimbläschentheorie des Eies. i. Die Blastodermelemente und Dotterballen der Insecten. Arch. mikr. Anat. xvii. pp. 43–57, pl. iv.

The writer discusses the observations of Bobretzky on the eggs of *Pieris crataegi*, and comes to the conclusion that the yelk-balls are not merely germ-cells (Keimzellen), but bodies of a higher order, which arise from the investment of the intravitelline cells by a yelk-sphere. Thus the yelk-balls are not primary but secondary cells (Metacyta).

Enterpe charops, Boisd. C. Hopffer defines var. *peruviana*, from Chanchomayo, and *venezuelana*, from Colombia; S. E. Z. xl. p. 66.

Terias zoe, Hopff., = *rahel*, Fabr.; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, p. 10.

Nychitona sylvicola, Boisd., noticed; A. G. Butler, Ann. N. H. (5) iv. p. 232.

Pieris achamantis, Berg, = *vanvolxemi*, Capronn.; E. v. Harold, S. E. Z. xl. p. 237. *P. calypso*, Dru., hermaphrodite described; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, p. 10. *P. madetes*, figs. 3 & 4, and *eurygonia*, figs. 5 & 6, Godman & Salvin, figured by them, P. Z. S. 1879, pl. xv.; the latter = *P. bagoe*, Boisd., *iid. l. c.* p. 653. *P. mesentina*, Cram., and *eriphia*, Godt., variation noticed; *Pinacopteryx syrinx*, Wallengr., appears to be a var. of the former; Aurivillius, Œfv. Ak. Förh. xxxvi. No. 7, pp. 44 & 45. *P. rapæ*, its spread in N. America; C. V. Riley, Am. Nat. xiii. p. 393.

Tachyris rhodope, Fabr., and *poppea*, Cram., figured, and variation discussed; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, pp. 11–13. *T. berenice*, Hew., and *thysu*, Hopff., noticed; *id. l. c.* pp. 14 & 15.

Appias albina, Boisd. Swarms in India; M. B., Nature, xx. p. 581. *A. figulina*, A. G. Butler, ♂ described by him; Tr. L. S. (2) i. p. 551.

Eronia vohemara, Ward, = *lucasi*, Grand., ♂, Saalmüller, Ber. senck. Ges. 1878–79, p. 124 (both sexes redescribed).

Colias edusa, not observed in Ireland in 1878; W. W. Fleming, Ent. xii. p. 17. *C. stoliczkana*, F. Moore, redescribed and figured by him; Second Yark. Miss. *Lep.* p. 4, pl. i. fig. 1.

Gonepteryx cleopatra attracted by green nets, and scared by blue ones; G. H. Bryan, Sci. Goss. xv. p. 277.

Rhodocera: migrating swarms of various species; A. Ducommun, Nat. Mex. iv. (Rivista Cientifica), pp. 4 & 5.

Callosune evanthe, Boisd., variation noticed; Saalmüller, Ber. senck. Ges. 1878–79, p. 125.

Anthocharis cardamines with orange spot on right wing only; W. Dean, Ent. xii. p. 181. *A. thoosa*, Scudd., redescribed; W. H. Edwards, Canad. Ent. xi. p. 87.

New species:—

Terias anjuana and *decipiens*, p. 189, *bewsheri*, *chalcomixta*, and *dentilimbata*, p. 190; A. G. Butler, Ann. N. H. (5) xv., Island of Johanna. *T. xanthomelæna*, Godman & Salvin, P. Z. S. 1879, p. 159, New Ireland.

Pieris falkensteini, Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, p. 10, pl. i. fig. 4, Chinchoxo. *P. hæmus* (= *poppea*, Trim., pt.), R. Trimen, Tr. E. Soc. 1879, p. 342, S. & E. Africa. *P. smithi* and *affinis*, Mabille, Bull. Soc. Philom. (7) iii. p. 138, Madagascar.

Catophaga pseudolalage, Sikkim, and *lankapura*, Ceylon; F. Moore, P. Z. S. 1879, p. 142.

Belenois joannæ, iii. p. 191, Island of Johanna, *albipennis*, iv. p. 232, A. G. Butler, Ann. N. H. (5); *B. coniata*, id. Cist. Ent. ii. p. 391, Madagascar.

Appias taprobana, F. Moore, P. Z. S. 1879, p. 143, Ceylon. *A. plana*, A. G. Butler, Tr. L. S. (2) i. p. 551, Malacca, Borneo.

Tachyris lindneri, Dewitz, *l. c.* p. 14, pl. i. fig. 6, Chinchoxo.

Delias metarete, A. G. Butler, *l. c.* p. 550, Malacca, Penang, Borneo.

Nepheronia lutescens, id. Cist. Ent. ii. p. 431, Borneo and Tenasserim.

Ixias insignis, id. *l. c.* pl. viii. fig. 1, Formosa.

Idmais eucheria, P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. clxxiv., Madagascar.

Callosune deidamioides and *damarensis*, Aurivillius, Œfv. Ak. Förh. xxxvi. No. 7, pp. 45 & 46, Damara Land.

Anthocharis ena, Mabille, Bull. Soc. Philom. (7) iii. p. 134, Madagascar. *A. stella*, W. H. Edwards, Canad. Ent. xi. p. 87, Nevada, &c.

Danaidæ.

Müller, F. *Ituna* und *Thyridia*. Ein merkwürdiges Beispiel von Mimicry bei Schmetterlingen. Kosmos, v. pp. 100–108, woodcuts. (Translated by R. Meldola, P. E. Soc. 1879, pp. xx.–xxviii.)

The author discusses the mimicry existing between *Ituna ilione* and *Thyridia megisto*. The *Danaidæ* may be separated into two groups by the presence or absence of a basal cell, and by the position of the scent-brushes of the male. In *Danais*, *Ituna*, and *Lycorea*, a basal cell is present, the marginal cell between the submedian and the first branch of the median nervure is double, and the scent-tufts are placed at the extremity of the abdomen; but in *Ithomia* and all its allies, including *Thyridia*, the basal cell is absent, and the abdominal processes are replaced by an odoriferous tuft of hair on the upper side of the hind-wing on the subcostal nervure. In *Thyridia* the odour is very powerful, and it is the only species known in which this character has been transferred, though to a lesser extent, to the female. The odour of *Ituna* resembles that of snuff.

The paper concludes with a statement of some of the principal problems connected with mimicry among butterflies, as applicable to the case of *Thyridia* and *Ituna*; but these scarcely admit of abridgment, especially as the author does not seem to have reached a perfectly definite conclusion. In the discussion on this paper (P. E. Soc. 1879, pp. xxviii. & xxix.), J. J. Weir mentions that he has never seen distasteful larvæ eaten by birds, and concludes that their dislike to them is hereditary, and due to unconscious cerebration. H. W. Bates disputes the subdivision of the *Danaidæ*, contending that Müller's observations merely prove that *Ituna* and *Lycorea* are the connecting links between *Danais* and *Ithomia*; and he then briefly sums up what is known respecting mimicry in *Heliconiidæ*.

Danais chrysippus: transformations, &c., noticed; M. Korb, Ent. Nachr. v. pp. 81 & 82. *D. hamata*, Macleay: G. Semper regards this species as distinct from *limniace*, Cram. The following are probably local forms:—*melissa*, Cram., *microsticta* and *septentrionis*, Butl., *orientalis*, Semp. (var. n. from the Philippines), *leucoptera*, Butl., *hamata*, Macl., *obscurata* and *moderata*, Butl., *neptunia*, Feld., and *melittula*, Herr.-Schäff. He figures *hamata*, *mellitula*, *neptunia* var., *orientalis*, *limniace*, and *septentrionis*; J. Mus. Godeffr. xiv. pp. 139 & 140, pl. viii. figs. 1-7. *D. archippus*: large assemblage on a hickory tree; W. H. Edwards, Canad. Ent. xi. p. 239. (Sub *plexippus*): testaceous var. from Antigua; W. L. Distant, P. E. Soc. 1879, p. lii. (Sub *berenice*): occurrence in New Zealand; F. W. Sturm, Tr. N. Z. Inst. xi. p. 305. *D. plexippus*, *cleothera*, and *berenice* discussed by Godman & Salvin, Biol. Centr. Am. *Rhop.* pp. 1–4; to the last species they refer *D. strigosa* and *thersippus*, Bates, as varieties.

Euplœa crimas, Godman & Salvin, figured by them; P. Z. S. 1879, pl. xv. fig. 1.

The known Central American species and genera of *Danainæ*, from *Ituna* to *Hymenitis*, are redescribed and fully discussed by Godman & Salvin (Biol. Centr. Am. *Rhop.*). The following corrections of synonymy occur, or known species are figured:—*Ituna lamirus*, Latr. (= *Ituna albescens*, Dist.); *Olyras theon*, Bates, pl. i. fig. 2, *insignis*, Salv., pl. i. fig. 1; *Eutresis theope* (= *E. hyperia*, Staud., *nec* Doubl.), pl. i. fig. 3; *Tithorea duenna*, Bates, pl. ii. fig. 7, *pinthias* (= *tarricina*, Bates, *nec* Hew., = *duenna*, Butl. & Druce, *nec* Bates), pl. ii. fig. 8, *T. irene*, Dru. (= *T. umbratilis*, Bates), pl. ii. fig. 10; *Melinæa scylax*, Salv. (= *M. ribbii*, Weym.), pl. ii. fig. 12, *M. imitata*, Bates (= *tachypetis*, Feld., = *lilis*, Butl. & Druce), pl. ii. fig. 11; *Scada xanthina*, Bates, pl. iii. fig. 2; *Thyridia melantho*, Bates, pl. i. fig. 4; *Mechanitis lycidice*, Bates (= *doryssa*, Boisd., = *isthmia*, Butl. & Druce, = *ovata*, Dist.), pl. i. figs. 7 & 8, *M. isthmia*, Bates (*isthmicus*, pl. i. figs. 11 & 12), *M. doryssus*, Bates (= *utenaia*, Reak.), pl. i. figs. 9 & 10, pl iv. fig. 2, *M. labetas*, Dist. (= *doryssus*, Butl. & Druce, p.), pl. iv. fig. 1, and *M. macrinus*, Hew., pl. i. figs. 5 & 6; *Ceratinia megalopolis*, Feld. (*Ith. megalopolis*, pl. iii. fig. 8), *C. cleis*, Bates (*Ith. cleis*, pl. iii. fig. 5, = *mylassa*, Druce), *leucania*, Bates (= *Ith. leucania*, pl. iii. fig. 9), and *C. callispila*, Bates (= *Ith. callispila*, pl. iii. figs. 6 & 7); *Napeogenes hemimelæna*, G. & S., pl. iii. fig. 3, *N.*

tolosa, Hew., pl. ii. fig. 1, pl. iii. fig. 4, *N. pædaretus*, G. & S., pl. iv. figs. 4 & 5; *Dircenna relata*, Butl. & Druce (= *olyras*, B. & D.), and *D. euchytma*, Feld. (*Ith. euchytma*, pl. iii. figs. 16 & 17); *Callithomia panamensis*, G. & S., pl. ii. fig. 2; *Leucothyris vicina*, Salv. (*Ithomia vicina*, pl. iii. fig. 18), *L. æsion*, G. & S. (*Ith. æsion*, pl. ii. fig. 4), and *L. pagasa*, Druce (*Ith. pagasa*, pl. iii. fig. 15); *Pteronymia alcmena*, G. & S. (*Ith. alcmena*, pl. v. fig. 1), *P. parva*, Salv. (*Ith. parva*, pl. v. fig. 2), *P. simplex*, Salv. (*Ith. simplex*, pl. iii. fig. 20), *P. rufo-cincta*, Salv. (*Ith. rufo-cincta*, pl. iii. fig. 21), *P. notilla*, Butl. & Druce (= *olyrilla*, B. & D.); *Ithomia* (type fixed as *drymo*) *panamensis*, Bates (figured as *I. lycaste*, Fabr., pl. v. fig. 3, and = *Ceratinia boucardi*, Druce), *I. heraldica*, Bates, pl. v. fig. 4, *I. xenos*, Bates, pl. v. fig. 8, *I. patilla*, Hew. (figured as *I. cotytto*, pl. v. fig. 6, and = *I. psyche*, Bates), *I. leila*, Hew., pl. v. fig. 7, *I. hippocrenis*, Bates, pl. v. fig. 5, and *I. jucunda*, G. & S., pl. ii. fig. 3.

New genera and species:—

Epithomia, Godman & Salvin, Biol. Centr. Am. *Rhop.* p. 32. Allied to *Callithomia*; type, *Dircenna callipero*, Bates (= *balboa*, Bates, = *agrippina*, Hew.); redescribed, *l. c.* p. 33, and figured as *Ithomia callipero*, pl. iii. fig. 14.

Calloleria, iid. *l. c.* Allied to last; type, *Ithomia tutia*, Hew. (= *Pteronymia azara*, Butl. & Druce); add *I. azara*, Hew. (= *dorilla*, Bates).

Hyposcada, iid. *l. c.* p. 35. Type, *Ith. adelphina*, Bates (= *virginiana* ♀, Hew., f. 112): redescribed, p. 36, and figured as *Ith. adelphina*, pl. iii. fig. 13; add *I. virginia*, Hew. (= *virginiana*, Hew., f. 111, text, and Bates).

Episcada, iid. *l. c.* p. 40. Allied to *Leucothyris*; type, *Ithomia salvinia*, Bates; redescribed and figured, *l. c.* p. 41, pl. iii. fig. 19.

Hypoleria, iid. *l. c.* p. 52. Allied to *Hymenitis*; type, *H. libera*, sp. n., *l. c.* p. 53, pl. iv. figs. 12 & 13, Panama; add *H. fumosa*, sp. n., *l. c.* fig. 14, Panama; *H.* (*Ith.*) *cassotis*, Bates (figured, pl. v. fig. 10), and *rhene*, G. & S. (figured as *Ith. rhene*, pl. ii. fig. 6), & sect. ii., *H.* (*Ith.*) *polissena*, Hew.

Pseudoscada, iid. *l. c.* p. 55. Allied to *Hymenitis*; type, *Ithomia utilla*, Hew. (= *I. pusio*, G. & S., under which name it is figured at pl. v. figs. 13 & 14).

Idea godmani, C. Oberthür, Tr. E. Soc. 1879, p. 230, Sanghir Islands.

Hestia linteata, A. G. Butler, Tr. L. S. (2) i. p. 536, pl. lxix. fig. 6, Malacca.

Danaus persimilis, F. Moore, P. Z. S. 1879, p. 136, Siam.

Amauris dominicanus (= *Danais niavius*, var. Trim.; Tr. L. Soc. xxvi. pp. 511 & 521, pl. xliii. fig. 6), R. Trimen, Tr. E. Soc. 1879, p. 323, S.E. Africa.

Euplœa depuiseti, C. Oberthür, *l. c.* p. 230, pl. viii. fig. 2, Sanghir Islands; *E. pinwilli*, A. G. Butler, Tr. L. S. (2) i. p. 535, pl. lxix. fig. 9, Malacca.

Salpinx leucogonis, id. *l. c.* p. 536, pl. lxviii. fig. 5, Malacca; *S. granti*, id. Tr. E. Soc. 1879, p. 2, Cachar.

Tithorea helicaon (= *irene*, Butl. & Druce, *nec* Dru.), Costa Rica, *T. hypothous* (figured as *T. irene*, pl. ii. fig. 9), Guatemala, Godman & Salvin, Biol. Centr. Am. *Rhop.* pp. 10 & 11.

Aeria agna, Godman & Salvin (*Ithomia eurimedia*, pl. iii. fig. 12), Biol. Centr. Am. *Rhop.* p. 15, Central America, and *A. pacifica* (*I. eurimedia*, l. c. figs. 10 & 11), *iid. l. c.* p. 16, Guatemala.

Ceratinia decumana (= *Napeogenes excelsa*, Butl. & Druce, *nec* Feld., and *Cer. excelsa* var., Dew.), *iid. l. c.* p. 23, pl. iv. fig. 3, Costa Rica and Panama.

Callithomia hedila, iid. (= *C. hezia*, pl. iii. fig. 1) *l. c.* p. 32, Guatemala.

Pteronymia tigranes (= *artena*, Butl. & Druce, *nec* Hew.), p. 42, figs. 10 & 11, Guatemala, *alope*, p. 43, Panama, Venezuela, and ? Mexico, *fulvescens* (= *latilla*, B. & D., *nec* Hew.), p. 46, figs. 8 & 9, Costa Rica, *agalla*, p. 47, figs. 6 & 7, Costa Rica, Panama, and Chiriqui, *iid. l. c.* pl. iv.

Eutresis hyspa, iid. P. Z. S. 1879, p. 150, Ecuador.

Athesis demylus, iid. *ibid.*, Ecuador.

Melinæa hicetas, Upper Amazons, and *cydon*, Tabatinga and Pebas, *iid. l. c.* pp. 150 & 151.

Heliconiidæ.*

Heliconia, *Evides*, *Colænis*, *Agraulis*, and *Acræa*. Observations on larvæ; H. Burmeister, S. E. Z. xl. pp. 194 & 195.

Evides pavana mimics *Acræa thalia* more closely in the ♂ than in the ♀; F. Müller, P. E. Soc. 1879, p. ii.

Acræidæ.

Acræa pharsalus, Ward, redescribed, p. 5; *A. petræa*, Boisd., var. from Chinchoxo noticed, p. 6, also varieties of *A. anemosa*, Hew., p. 17, *aganice*, Hew., p. 18, and *peneleos*, Ward, p. 19, pl. i. fig. 7; *A. actiaca*, Hew., = *nohara*, Boisd., p. 18: Dewitz, Verh. L.-C. Ak. xli. (2) No. 2. *A. madagascariensis*, Guén., = *dejeani*, Boisd.; P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. 329. *A. neobule*, Doubl. & Hew., var. from Damara Land noticed; Aurivillius, Œfv. Ak. Förh. xxxvi. No. 7, p. 40. *A. piva*, Guén., = *ranavalona*, Boisd., ♀; Saalmüller, Ber. senck. Ges. 1878–79, p. 122. *A. rakeli*, Boisd., = *zitja*, Boisd, ♀; some Mascarene specimens approach var. *radiata*, Guén. (p. 3); *A. sganzini*, Boisd., is a very slight var. of *lycia*, Fabr.; *A. manjaca*, Boisd., is not even a var of *serena*, F., but *mahela*, Boisd., is perfectly distinct from *neobule*, Doubl. & Hew., which has never been met with in Madagascar; *A. neobule* perhaps = *horta*, L., var. (p. 4): P. Mabille, Le Nat. i.

Acræa poggii and *flava*, Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, pp. 18 & 19, pl. i. figs. 8 & 10, Guinea; *A. formax*, A. G. Butler, Ann. N. H. (5) iv. p. 230; *A. lia*, Mabille, Bull. Soc. Philom. (7) iii. p. 132; *A. smithi*, id. Ann. Soc. Ent. Fr. (5) ix. p. 341, all from Madagascar: spp. nn.

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* As this family is now restricted, by almost all authors, to *Heliconius* and its immediate allies, the Danaoid group formerly included in it will for the future be classed with the *Danaidæ* in the Zoological Record.—W. F. K.

Nymphalidæ.

On the pupation of the *Nymphalidæ*, J. A. Osborne, Ent. M. M. xv. pp. 257 & 258, xvi. pp. 55–58, 148–152, Nature, xix. p. 507; Riley, Psyche, ii. pp. 249–251; Edwards's paper (*cf.* Zool. Rec. xv. *Ins.* p. 176), partly reprinted from Canad. Ent. x., Ent. M. M. xv. pp. 220–226.

Cirrochroa malaya, Feld., probably = *bajadeta*, Moore; A. G. Butler, Tr. L. Soc. (2) i. p. 543.

Argynnis. Difference of colouring in the sexes: J. J. Weir, Ent. xii. pp. 153 & 154; *A. aglaia*, ab. *eridioides* described by C. F. Pflümer, S. E. Z. xl. p. 157; *A. nitocris*, Edw., ♀ described; *A. egleis*, Boisd., and *A. idalia*, Dru., transformations described, W. H. Edwards, Canad. Ent. xi. pp. 83, 177–179, & 217–219; he also (*l. c.* pp. 51–56) makes the following corrections in the synonymy of various species of *Argynnis*:—The reputed ♀ of *A. nevadensis*, Edw., is that of *coronis*, Behr.; Boisduval's *A. egleis*, var. *irene*, is a good species, and should be followed by *eurynome*, Edw.; *montivaga*, Behr. (= *astarte*, Edw., *nec* Doubl., = *argc*, Streck.) and *egleis*, Boisd. (= ♀ *mormonia*, Boisd., and *montivaga*, Edw., *nec* Behr.), *A. zerene*, Boisd., belongs to a different section; *A. hydaspe*, Boisd. (= *zerene*, Behr., = *purpurascens*, H. Edw.), and *monticola*, Behr., are varieties.

Melitæa baroni, H. Edwards, transformations described, and *minuta*, W. H. Edw., pupa described; W. H. Edwards, *l. c.* pp. 129–131 & 141.

Phyciodes nycteis, Doubl. & Hew., transformations, and *vesta*, W. H. Edw., pupa described; *id. l. c.* pp. 101–105 & 129.

Eresia texana, W. H. Edw., transformations described; *id. l. c.* pp. 127–129.

Grapta. W. H. Edwards (Butt. N. Amer. ii. *Grapta*, pl. iii.) figures and redescribes *G. rusticus*, Edw., figs. 1–4, larva and pupa, figs. *a*, *b*, & *b* 2, var. *marsyas*, figs. 5 & 6; and *G. zephyrus*, Edw., larva and pupa, figs. *c* & *d*; *G. silvius*, Edw., is perhaps a seasonal form of *rusticus*. He believes that many species (perhaps some identical with the various American species which have been proved to be distinct by breeding) are confounded by European Entomologists under the name *c-album*.

Vanessa, sp. Oviposition by a headless ♀, A. S. Wilson, Nature, xx. p. 267; *V. antiopa*, aberration described, Turati, Bull. Ent. Ital. xi. pp. 158 & 159; *V. urticæ*, 228 small ichneumons contained in a single pupa, E. L., Feuill. Nat. x. p. 15; *V. ladakensis*, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 2, pl. i. fig. 2.

Pyrameis cardui. Extraordinary abundance in 1879, often associated with *Plusia gamma*, and sometimes migrating in large swarms; Ent. xii. pp. 180, 222–225, 270 & 271; Nature, xx. pp. 183, 197, 208, 220, 243, 255, 266, 291, 426, 427, 431, 455 & 456; Ent. M. M. xvi. pp. 41, 44–51; C. R. lxxxviii. p. 1280; Feuill. Nat. ix. pp. 64, 65, 120, 124-126, 143, & 153; L. Nat. i. pp. 52–54, 59 & 60, 69, 70, 76, & 77; Bull. Soc. Ent. Fr. (5) ix. pp. lxxxvii.–lxxxix., xci., xcii., xcix.–ci.; SB. z.-b. Wien, xxix. pp. 40, 41, 43; Ent. Nachr. v. pp. 188–191, 195–198, 206, 211–215, 226, 227, 257, 287, 314–316; Atti Soc. Ital. xi., Adunanze, pp. 14 & 15; protective mimicry (resemblance to shingle when settled), C. Foran, Sci. Goss. xv.

p. 207; fertilizing *Erica canina*, H. Müller, Nature, xx. p. 146; injurious to peas and clover in Austria, Ent. Nachr. v. p. 231; pupa may lie dormant for several years, McLachlan, Ent. M. M. xvi. p. 51; it probably lives a month or six weeks in the perfect state, M. Girard, Bull. Soc. Zool. France (5) ix. p. cxxxiii.; larva in September and October, Ent. M. M. xvi. p. 130.

Vanessa cardui and *huntera* in Hawaii; T. Blackburn, Ent. M. M. xvi. p. 161.

Junonia cœnia. Its occurrence in New England; S. H. Scudder, Psyche, ii. pp. 276 and 277: *J. lavinia*, aberration; Blake, Tr. Am. Ent. Soc. vii. p. xiv.

Callima. F. Moore revises this genus and describes many new species, as well as those already known; *C. paralekta*, Doubl. & Hew. *nec* Horsf., is renamed *C. hewitsoni* (p. 9): Tr. E. Soc. 1879, pp. 9–15.

Crenis benguelæ, Chapm., noticed and figured; Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, p. 7, pl. i. figs. 1 & 2. *C. natalensis*, Boisd., variation noticed; *id. l. c.* p. 23.

Epicalia acontius. F. Müller figures and discusses the differences existing in colour, markings, and structure between the sexes; Kosmos, iv. pp. 284–292 (abstract by Meldola, Nature, xix. pp. 586–588). The difference appears to be due to sexual selection. The males of *Epicalia* with angulated wings possess scent-organs between the wings, which do not exist in those species in which the wings are more rounded. An analogous arrangement of scent-organs only exists in *Antirrhœa archœa*.

Diadema dinarba, Hew., varieties described; W. L. Distant, P. Z. S. 1879, p. 704. *D. lassinassa*, var. *gigas*, from the Sanghir Islands, described; C. Oberthür, Tr. Ent. Soc. 1879, p. 233.

Pantopea drucii, Butl., = *Diadema dubius*, Beauv., var.; P. Mabille, Le Nat. i. p. 4.

Pseudacræa drusilla, Saalm., = *apaturoides*, Feld.; Saalmüller, Ber. senck. Ges. 1878–79, p. 123.

Limenitis. R. M. Grey adduces reasons for believing that *ursula*, *proserpina*, *artemis*, and *disippus* are all one species, Canad. Ent. xi. pp. 16 & 17; discussion on the original form of the N. American species, *op. cit.* pp. 195 & 196; *L. artemis*, Dru., forms *lamina*, Fabr., and *proserpina*, Edw., described and figured in detail, in all stages, W. H. Edwards, Butt. N. Amer. ii. *Limenitis*, pl. i.; *L. artemis* and var. *proserpina* and *L. disippus*, habits of larvæ described, W. H. Edwards, Canad. Ent. xi. pp. 224–228.

Aconthea alankara, Horsf., probably = *martha*, Fabr., ♂; A. G. Butler, Tr. L. S. (2) i. p. 541.

Rhomaleosoma pratinas, D. & H., = *Nymphalis* (*Aterica*) *edwardsi*, Hoev.; *R. wardi*, Druce, = *losinga*, Hew., and the latter insect is, perhaps, one form of a Protean species including *lakuma*, Butl., *harpalyce*, Cram., *cupalus*, Fabr., and *spatiosum*, Mab., W. L. Distant, *l. c.* pp. 705 & 706; *R. inanum*, Butl., varieties noticed, *id. l. c.*

Aterica theophane, Hopff., = *cupavia*, Cram.; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, pp. 7 & 8.

Harma lucasi, Doum., ♂ described and figured, pl. liv. fig. 2, p. 706;

H. theodota, Hew., = *beckeri*, Herr.-Schäff, ♂ p. 707; *H. theobene*, D. & H., varieties noticed, p. 708: W. L. Distant, *l. c.*

Adolias satropaces, W. C. Hewitson, redescribed and figured by him; Desc. Ind. Lep. Atk. p. 1, pl. i. figs. 6–8.

Charaxes narcæus, Westw., recorded as new to Japan; [illegible] Riley M. M. xv. p. 257. *C. saturnus*, Butl., appears to be only a var. of [illegible] Cram., as intermediate varieties exist; Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 41.

Nymphalis lucretius, Cram., ♀ noticed; Dewitz, Verh. L.-C. Ak. xli. (2), No. 2, p. 8.

Mynes guerini, Wall. Variation discussed, and several varieties figured, by G. Semper, J. Mus. Godeffr. xiv. p. 153, pl. ix.

Paradiadema, g. n., W. L. Distant, P. Z. S. 1879, p. 704. Allied to *Diadema*; hind margin of fore-wings scarcely excavated, and apical angle only faintly prominent; lower subcostal nervules emitted nearer apical margin; costa of hind wings more arched; precostal nervure curved outwardly. Type, *P. hora*, sp. n., *l. c.* pl. liv. fig. 1, Cameroons.

New species:—

Cethosia methypsea, A. G. Butler, Tr. L. S. (2) i. p. 543, Penang, Assam.

Cirrochroa rotundata, id. *ibid.*, Malacca.

Cynthia erotella, id. *l. c.* p. 544, Malacca.

Lachnoptera ayresi, R. Trimen, Tr. E. Soc. 1879, p. 326, Natal.

Argynnis laura, Nevada, p. 49, *hippolyta*, Oregon and California, p. 81, and *chitone*, Utah and Arizona, p. 82; W. H. Edwards, Canad. Ent. xi.

Melitæa fulvia, id. *l. c.* p. 117, Texas and Colorado.

Eresia laias, Godman & Salvin, P. Z. S. 1879, p. 151, pl. xiv. fig. 1, Colombia.

Eurema schæneia, R. Trimen (= *Pyrameis hippomene*, Trim., *nec* Boisd.), *l. c.* p. 329, S. Africa.

Vanessa haronica, F. Moore, P. Z. S. 1879, p. 137, Ceylon.

Junonia boopis, R. Trimen (= *orithyia*, Wallengr. & Trim., *nec* Linn.), *l. c.* p. 331, S. Africa.

Precis tugela, id. *l. c.* p. 334, Natal, Transvaal. *P. petersi*, p. 20, fig. 14, *staudingeri*, fig. 15, *cœlestina*, fig. 13, p. 21, and *nachtigali*, p. 22, fig. 16; Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, pl. i., Guinea.

Salamis definita, A. G. Butler, Ann. N. H. (5) iv. p. 230, Madagascar.

Callima buxtoni, Sumatra, *atkinsoni*, Darjiling, p. 10, *buckleyi*, N.W. Himalaya, p. 11, *ramsayi*, Nepal, *huttoni*, Mussuree, and *boisduvali*, Kussowlee, p. 12, *mackwoodi*, Ceylon, *doubledayi*, Scind Hills, *alompra*, Burma, and *wardi*, Calicut and Coonoor, p. 14; F. Moore, Tr. E. Soc. 1879.

Crenis pechueli and *ribbii*, Dewitz, *l. c.* pp. 23 & 24, pl. ii. figs. 1 & 3, Guinea.

Cyrestis adæmon, Godman & Salvin, P. Z. S. 1879, p. 158, pl. xv. fig. 2, New Ireland. *C. eximia*, C. Oberthür, Tr. E. Soc. 1879, p. 232, pl. viii. fig. 4, Sanghir Islands.

Diadema antevorta, W. L. Distant, P. Z. S. 1879, p. 703, Magila, E. Africa.

Hypolimnas charybdis, Bombay, and *labuana*, Labuan, Borneo; A. G. Butler, Cist. Ent. ii. p. 433. *H. incommoda*, id. Tr. L. S. (2) i. p. 543, Malacca. *H. poggii*, Dewitz, *l. c.* p. 25, pl. ii. fig. 2, Guinea.

Panopea bewsheri, A. G. Butler, Ann. N. H. (5) xv. p. 187, Island of Johanna.

Pseudacræa kuenowi, Dewitz, *l. c.* p. 26, pl. ii. fig. 6, Guinea.

Limenitis bruijni, C. Oberthür, *l. c.* p. 231, pl. viii. fig. 3, Sanghir Islands.

Parthenos lilacinus, A. G. Butler (= *gambrisius*, Doubl. & Hew., *nec* Fabr.), Tr. L. S. (2) i. p. 544, Malacca, Penang.

Adelpha hypsenor, Godman & Salvin, P. Z. S. 1879, p. 151, pl. xiv. fig. 2, Colombia.

Neptis leuconata, *gononata*, and *mamaja*, p. 541, pl. lxix. figs. 1–3, *paraka*, *dorella* (= *helidore*, Fabr., *nec* Cram., *nec* Moore), and *dindinga*, p. 542, pl. lxviii. figs. 2, 3, & 6; A. G. Butler, Tr. L. S. (2) i. *N. cacharica*, id. Tr. E. Soc. 1879, p. 3, Cachar. *N. goochi*, R. Trimen, *l. c.* p. 336, Natal. *N. camboja*, Cambodia, and *sinuata*, Ceylon; F. Moore, P. Z. S. 1879, p. 136.

Athyma nivifera and *clerica*, A. G. Butler, Tr. L. S. (2) i. p. 540, pl. lxix. figs. 4 & 5, Malacca.

Euphædra zaddachi, Dewitz, *l. c.* p. 27, pl. ii. fig. 9, Guinea.

Harma frederica, W. L. Distant, *l. c.* p. 707, pl. liv. fig. 3, Calabar.

Adolius annamita, F. Moore, *l. c.* p. 137, Cochin China.

Nymphalis hildebrandti and *guderiana*, Dewitz, *l. c.* p. 28, pl. ii. figs. 16 & 18.

Charaxes agabo, W. L. Distant, *l. c.* p. 708, pl. liv. fig. 4, Calabar. *C. viridicostatus*, Aurivillius, Œfv. Ak. Förh. xxxvi. (7), p. 41, Damara Land.

Mynes eucosmetus, Godman & Salvin, P. Z. S. 1879, p. 653, Duke of York Island and New Ireland.

Morphidæ.

Amathusia phidippus, Linn.: variation noticed; A. G. Butler, Tr. L. S. (2) i. p. 538.

Thaumantis pseudaliris, Butler, redescribed and figured by him, *l. c.* p. 538, pl. lxviii. fig. 1.

Morpho cypris and *sulkowskii*: ball and socket insertion of scales; those of *Hipparchia semele* are much less distinctly so; Blake, Tr. Am. Ent. Soc. vii. p. xiv. woodcuts.

Satyridæ.

Zophoessa atkinsonia (figs. 2 & 3) and *Debis scrbonis* (figs. 4 & 5), W. C. Hewitson, redescribed and figured by him; Desc. Ind. Lep. Atk. p. 2, pl. i.

Pseudonympha ibitina, Ward, redescribed; A. G. Butler, Cist. Ent. ii. p. 389.

Œneis julta: on its variation in Esthonia; Hoyningen-Huene, S. E. Z. xl. pp. 276–279.

Chionobas ivallda, Mead, transformations figured and described; W. H. Edwards, Butt. N. Amer. ii. *Chionobas*, pl. iii.; *cf.* also Canad. Ent. xi. pp. 142 & 143 (with notice of egg of *C. iduna*, Edw.).

Melanargia galathea, slight aberration from Sicily, noticed and figured; Feuill. Nat. ix. p. 152.

Satyrus statilinus, Hübn.; transformations described; A. Brants, Tijdschr. Ent. xxii. pp. xxiii. lxxxiii. & lxxxiv. & 200–205.

Hipparchia lehana, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 1, pl. i. fig. 4.

Mycalesis eusirus, Hopff., = *safitza*, Doubl. & Hew.; Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, p. 4. *M. fraterna*, Butl.: dimorphism; A. G. Butler, Ann. N. H. (5) xv. pp. 186 & 187.

Hyphthima arctous, Fabr.: aberration described and figured; *arctoides*, Hew., is not truly distinct; G. Semper, J. Mus. Godeffr. xiv. p. 145, pl. viii. figs. 8 & 9. *H. vinsoni*, Guén., ? = *Erebia rakoto*, Ward; A. G. Butler, Ann. N. H. (5) iv. p. 229.

Cœnonympha gemma, Hübn.: transformations described and figured; the larva is remarkable for only moulting three times; W. H. Edwards, Canad. Ent. xi. pp. 31–35.

New genera and species :—

Smithia, P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. clxxiii. Affinities not stated; type, *S. paradoxa*, sp. n., *l. c.*, Madagascar.

Erebiola, R. W. Fereday, Ent. M. M. xvi. p. 128. Allied to *Erebia* and *Percnodaimon*; type, *E. butleri*, sp. n., *l. c.* p. 129, pl. i., New Zealand.

Henotesia, A. G. Butler, Ann. N. H. (5) iv. p. 228. Allied to *Pedaliodes*; type, *H. angavano*, Ward ?, or sp. n. ?, *wardi* (p. 329), Madagascar.

Debis indosa (= *D. dendrophilus*, var., Trim., Tr. E. Soc. 1868, p. 285), R. Trimen, Tr. E. Soc. 1879, p. 324, Natal and Transvaal.

Pseudonympha subsimilis and *angulifascia*, A. G. Butler, Ann. N. H. (5) iv. p. 228; *P. wardi*, id. Cist. Ent ii. p. 391, all from Madagascar.

Satyrus hansi, J. L. Austaut, Le Nat. i. p. 138, Algeria; *S. albivittula*, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 344, Madagascar. *S. paulus*, W. H. Edwards, Canad. Ent. xi. p. 50, Nevada.

Mycalesis lurida, A. G. Butler, Tr. E. Soc. 1879, p. 3, Cachar; *M. anynana*, id. Ann. N. H. (5) iv. p. 187, Island of Johanna; *M. saussurii*, Dewitz, Verh. L. C. Ak. xli. (2) No. 2, p. 17, pl. i. fig. 9, Guinea.

Mycalesis parvidens, p. 342, *exocellata*, *irrorata*, and *butleri*, p. 343, Mabille, Ann. Soc. Ent. Fr. (5) ix., Madagascar.

Daphnæura smithi, id. Bull. Soc. Ent. Fr. (5) ix. p. clxxiv., Madagascar.

Strabena mabillii, A. G. Butler, Ann. N. H. (5) iv. p. 227, Madagascar.

Culapa parva, id. *ibid.*, Madagascar.

Hyphthima niveata, id. *l. c.* p. 229, Madagascar; *H. corticaria*, id. Tr. L. S. (2) i. p. 537, Malacca.

Libytheidæ.

Libythea laius, sp. n., R. Trimen, Tr. E. Soc. 1879, p. 337, S. & E. Africa.

Erycinidæ.

Zemeros albipunctata, A. G. Butler, figured by him; Tr. L. S. (2) i. pl. lxix. fig. 10.

Dodona deodata, W. C. Hewitson, redescribed and figured by him; Desc. Ind. Lep. Atk. p. 3, pl. i. fig. 1.

Laxita, g. n., A. G. Butler, Tr. L. S. (2) i. p. 546. Subgenus of *Abisara*, with rounded wings; type, *Taxila tanita*, Hew.

Abisara prunosa, sp. n., F. Moore, P. Z. S. 1879, p. 137, Ceylon.

Lycænidæ.

Zeritis discifer, Herr.-Schäff., ♀ noticed; G. Semper, J. Mus. Godeffr. xiv. p. 154; this species is quite distinct from *aurifer*, Blanch. *Z. lucanus*, Don., = *discifer*, but is distinct from *lucanus*, Fabr.

Polyommatus kashgharensis, fig. 7, p. 5, and *lehanus* and *yarkandensis*, figs. 6 & 8, p. 6, all of F. Moore, redescribed and figured by him, Second Yark. Miss. Lep. pl. i.

Thestor callimachus, Eversm. Transformations described and figured; Millière, Ann. Soc. L. Lyon, xxv. pp. 8 & 9, pl. cxxv. figs. 6–8.

Lycænopsis ananga, Feld., = *haroldus*, Fabr.; A. G. Butler, Tr. L. S. (2) i. p. 546.

Danis alenas and *alcas*, Feld., are sexes; G. Semper, *l. c.* p. 155.

Castalius ethion, Doubl. & Hew., ♀ described; A. G. Butler, Tr. L. S. (2) i. p. 547.

Cupido romanzo, Saalm., = *philippus*, Fabr., ♂, and *Ialmenus batikeli*, Boisd., = *gambinus*, Boisd., ♀; Saalmüller, Ber. senck. Ges. 1878-79, p. 123. *C. jobates*, Hopff.: structure and variation noticed; Aurivillius, Œfv. Ak. Förh. xxxvi. No. 7, p. 43.

Lycæna agestis: varieties figured; W. P. Weston, Ent. xii. p. 185. *L. alexis*: protective mimicry in settling on flowers, J. W. Slater, Ent. xii. p. 84; hermaphrodite, right side ♂, left ♀, W. P. Weston, Ent. xii. p. 58. *L. bætica* noticed; Snell & Weir, Ent. xii. pp. 83 & 84. *L. corydon*: varieties; H. Vaughan, P. E. Soc. 1879, p. lii. *L. medon*, Hufn.: transformations described, proving the identity of the various forms of the species; W. Buckler, Ent. M. M. xv. pp. 241–244.

Plebeius lucretilis and *lusones*, Hew., redescribed and figured; Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, pp. 8 & 30, pl. ii. figs. 4 & 8.

Lycænesthes bengalensis, Moore, = *balliston*, Hübn.; G. Semper, *l. c.* p. 165.

New genera and species :—

Spalgis, F. Moore, P. Z. S. 1879, p. 137. Allied to *Gerydus*; type, *Lucia epius*, Westw.

Catapœcilma, A. G. Butler, Tr. L. S. (2) i. p. 547. Allied to *Lampides*, but hind-wings with 3 tails; type, *Hypochrysops elegans*, Druce.

Surendra, F. Moore, *l. c.* p. 142. Type, *Amplypodia quercetorum*, Moore; to contain also *S. latimargo*, Andamans, and *discalis*, Ceylon, spp. nn., *l. c.*

Pentila tachyroides, Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, p. 29, pl. ii. fig. 5, Guinea.

Liptena soyauxi, id. *ibid.* pl. ii. fig. 10, Guinea.

Polyommatus pseuderos, Kashmir, p. 138, *limbatus* and *transpectus*, Bengal, *albo-cæruleus* and *dilectus*, Nepal, &c., p. 139, F. Moore, P. Z. S. 1879.

Plebeius (*Danis*) *macleayi*, Cape York, p. 155, *P.* (*Lampides*) *dubiosa*, Cooktown, Cape York, p. 159, G. Semper, J. Mus. Godeffr. xiv.; *P. reichenowi*, p. 31, fig. 14, *sorhageni*, fig. 11, pl. ii., *falkensteini*, pl. i. fig. 5, p. 32, *poggii*, fig. 7, *punctatus*, fig. 15, p. 33, *gussfeldti*, fig. 12, *homeyeri*, fig. 13, p. 34, pl. ii., Dewitz, *l. c.*, Guinea.

Lampides pseudelpis, A. G. Butler, Tr. L. S. (2) i. p. 547, pl. lxviii. figs. 7 & 8, Malacca.

Castalius azureus, id. Ann. N. H. (5) iv. p. 230, Madagascar.

Lycæna squalida, id. Tr. E. Soc. 1879, p. 4, Cachar; *L. celona*, Austaut, Pet. Nouv. ii. p. 293, Algeria; *L. leucon*, Mabille, *op. cit.* p. 289, and *L. sanguigutta*, id. Bull. Soc. Philom. (7) iii. p. 132, both from Madagascar.

Holochila margarita, Gayndah, Cape York, p. 161, *helenita*, Cape York, *hyacinthina* (Scott, MS.; = *erinus*, Herr.-Schäff., *nec* Fabr.), Sydney, Rockhampton, p. 162, and *anita*, Sydney, Cape York, p. 163, G. Semper, *l. c.*

Lycænesthes godeffroyi, id. *l. c.* p. 165, Bowen and Cooktown.

Thecla (*Zephyrus*) *diamantina* (Staud., MS.), C. Oberthür, Diagn. Lep. Ask. p. 3, Island of Askold.

Aphnæus lunulifera, F. Moore, P. Z. S. 1879, p. 140, Darjiling.

Ialmenus dæmeli, G. Semper, *l. c.* p. 166, Rockhampton, &c.

Hypolycæna vittigera, Mabille, Pet. Nouv. ii. p. 289, Madagascar.

Iolaus argentarius, A. G. Butler, Ann. N. H. (5) iv. p. 231, Madagascar.

Myrina ficedula (= *alcides*, Boisd. & Trim., p.), R. Trimen, Tr. E. Soc. 1879, p. 340, S. Africa.

Dendorix lazulina, Ceylon, *schistacea*, Calcutta, and *grisea*, Deyra Dhoon, p. 140, *rectivitta*, N. Cachar, and *lankana*, Ceylon, p. 141, F. Moore, P. Z. S. 1879.

Curetis dentata and *discalis*, id. *l. c.* pp. 137 & 138, N. India.

Anops stigmata, id. *l. c.* p. 138, Moulmein, Burma.

Amblypodia naradoides and *darana*, id. *l. c.* p. 141, Ceylon.

Epitola falkensteini, Dewitz, *l. c.* p. 9, pl. i. fig. 3, Chinchoxo.

Hewitsonia kirbii, id. *l. c.* p. 35, pl. ii. fig. 17, Guinea.

Hesperiidæ.

Plötz, C. Verzeichniss der vom verstorbenen R. Buchholz in West-Africa—beim Meerbusen von Guinea—gesammelten Hesperiden. S. E. Z. xl. pp. 353-364.

Speyer, A. Neue Hesperiden des paläarctischen Faunengebiets. S. E. Z. xl. pp. 342–352.

——. Die Hesperiden-Gattungen des europäischen Faunengebiets. ii. Nachträge. Das Flügelgeäder. *L. c.* pp. 477–500.

The European genera are discussed in great detail, with special reference to their neuration.

C. Plötz gives a table of the genera of the *Hesperiidæ*. He admits 56 genera (a few new) to which he assigns types; 7 others he mentions as unknown to him. S. E. Z. xl. pp. 175–180.

On the position of the wings of the *Hesperiidæ*; A. Speyer, S. E. Z. xl. pp. 154 & 155.

Evening-flying species in Brazil frequent certain species of verbenas (*Franciscea*, &c.) with long, narrow, scentless, violet flowers; F. & H. Müller, Kosmos, iv. pp. 481 & 482.

Eudamus proteus, Linn. Notes on transformations; W. H. Edwards, Canad. Ent. xi. p. 193.

Pyrrhopyga, Hübn. C. Plötz discusses this genus, tabulating 97 species, including several new ones; 11 other described species are unknown to him; *P. pardalina*, Feld., ? = *santhilarius*, Latr.; *epigona*, Herr.-Schäff., ? = *amystis*, Hew.; and *galgula*, Hew., ? = *strigifera*, Feld.: S. E. Z. xl. pp. 520–538.

Erycides, Hübn. C. Plötz discusses the species; he tabulates 21, including 3 new ones; 14 other described species are unknown to him: *l. c.* pp. 406–411, & 474.

Ismene iphis, Dru. Variation noticed; Dewitz, Verh. L.-C. Ak. xli. (2) No. 2, pp. 15 & 16.

Pamphila phyleus, *brettus*, *accius*, *maculata*, *arpa*, *palatka*, and *delaware*. Notes on earlier stages; W. H. Edwards, Canad. Ent. xi. pp. 190–192.

Astictopterus xanites, A. G. Butler, noticed and figured by him; Tr. L. S. (2) i. p. 555, pl. lxix. fig. 7.

Plesioneura hyalinata, Saalm., = *andrachne*, Boisd.; Saalmüller, Ber. senck. Ges. 1878-79, p. 123.

Pyrgus melotis, Dup. (*hypoleuca*, Led.), discussed; P. C. Zeller, S. E. Z. xl. p. 452 & 453.

New genera and species :—

Sophista, C. Plötz, S. E. Z. xl. p. 176. Allied to *Lychnuchus*, Hübn.; type, *Thracides aristoteles*, Westw. (the name is spelt *Sopleista* on p. 179).

Sapœa, id. *l. c.* p. 177. Allied to *Leucochitonea*; type, *L. bicolor*, Trim.

Gomalia, F. Moore, P. Z. S. 1879, p. 144. Affinities not stated; type, *G. albo-fasciata*, sp. n., *l. c.*, Ceylon.

Pyrrhopyga rufinucha, Bolivia, p. 151, *ærata*, fig. 5, Santa Marta, *rufipectus* and *minthe*, fig. 4, Ecuador, *variegaticeps*, Costa Rica, and *eupheme*, fig. 5, Peru and Bolivia, p. 152, *malis*, fig. 6, Antioquia, and *erythrosticta*, Chontales and Veragua, p. 153, Godman & Salvin, P. Z. S. 1879, pl. xiv.; *P. ulixes*, Surinam, *dysoni* (= *licinus*, Möschl.), Chiriqui, and

hephæstos, Surinam, p. 521, *patroclus*, Peru, *dorylas*, Porto Cabello, and *othello*, Brazil, p. 522, *porus* (Weym., MS.), Colombia, p. 523, *martii* and *spixi*, Brazil, p. 525, *pertii*, Brazil, p. 526, *cyrillus*, Oaxaca, p. 529, *staudingeri* (Hew., MS.), locality unknown, p. 530, *dulcinea*, Panama, p. 532, *josepha*, Brazil, p. 534, *pelota*, Brazil, p. 535, C. Plötz, S. E. Z. xl.

Myscelus belti, Godman & Salvin, *l. c.* p. 153, Chontales and Guatemala.

Erycides tophana, Brazil, and *imbreus*, Central America, p. 406, and *crebus*, Bahia, p. 407, C. Plötz, l. c., *E. pyres*, Haiti, Porto Rico, and *scython*, Paraguay, Godman & Salvin, *l. c.* p. 154.

Ismene harmo and *I.* (?) *orma*, p. 363, and *I. juno* (Maass, MS.) p. 364, C. Plötz, *l. c.*, Gulf of Guinea; *I. aquilina*, A. Speyer, S. E. Z. xl. p. 346, Vladivostok and Island of Askold; *I. jankowskii*, C. Oberthür, Diagn. Lep. Ask. p. 4, Askold.

Entheus matho, Godman & Salvin, *l. c.* p. 154, Nicaragua and Chontales.

Hesperia polites and *sacrator*, Antioquia, pl. xiv. figs. 7 & 8, p. 154, *aurifer*, *saptine*, and *syrna*, Irazu, Costa Rica, p. 155, *iid.* l. c.; *H. pulvina*, *capronnieri*, and *nydia*, p. 353, *calpis* and *buchholtzi*, p. 354, *leonora*, *ilias*, and *lodra*, p. 355, and *camerona* and *pyrosa*, p. 356, C. Plötz, S. E. Z. xl. Gulf of Guinea; *H. marginata*, A. G. Butler, Cist. Ent. ii. p. 392, Madagascar.

Cobalus ciliatus, A. G. Butler, Tr. L. S. (2) i. p. 554, Malacca.

Pamphila mæsoides, id. *ibid.*, Malacca; *P. umbrata*, id. Ann. N. H. (5) xv. p. 191, Island of Johanna; *P. ariel*, P. Mabille, Le Nat. i. (3) p. 5, Madagascar; *P. amalia*, G. Semper, J. Mus. Godeffr. xiv. p. 183, Rockhampton; *P. dukolum*, Blake, Tr. Am. Ent. Soc. vii. p. ix., Costa Rica; *P. dion*, W. H. Edwards, Canad. Ent. xi. p. 238, Canada to Nebraska.

Astictopterus gemmifer and *stellifer*, A. G. Butler, Tr. L. S. (2) i. p. 555, Malacca.

Plesioneura asmara (Moore, MS.) and *pinwilli*, id. *l. c.* p. 556, Malacca.

Hesperilla rietmanni, G. Semper, *l. c.* p. 187, Sydney.

Trapezites (?) *kingdoni*, A. G. Butler, Ann. N. H. (5) iv. p. 232, Madagascar.

Cyclopides pardalina, id. *l. c.* p. 233, Madagascar; *C. malchus*, Mabille, Bull. Soc. Philom. (7) iii. p. 134, Madagascar.

Pholisora nicus, W. H. Edwards, Canad. Ent. xi. p. 51, Nevada.

Apaustus anomæus, *argyrosticta*, and *dolus*, p. 358, *aburæ* and *batea*, p. 359, *leander*, *leucopygus*, *placidus*, and *debilis*, p. 360; C. Plötz, *l. c.*, Gulf of Guinea.

Pyrgus antonia (Staud., MS.) and *staudingeri*, A. Speyer, S. E. Z. xl. pp. 342 & 344, S.W. Siberia.

Plastingia charita, p. 356, *luehderi* and *reichenowi*, p. 357, C. Plötz, *l. c.*, Gulf of Guinea.

Antigonus denuba, *brigida*, *philotimus*, and *thecla*, p. 361, and *plistonicus*, p. 362; *id. l. c.*, Gulf of Guinea.

Tagiades calligana and *lavata*, A. G. Butler, Tr. L. S. (2) i. pp. 556 & 557, pl. lxix. figs. 11 & 8, Malacca; *T. nymphalis*, A. Speyer, *l. c.* p. 348, Wladiwostok and China; *T. elmina* and *woermanni*, C. Plötz, *l. c.* p. 362, Gulf of Guinea.

SPHINGIDÆ.

CIACCIO, G. V. Sul interna tessitura dell' occhio delle Sfingi. Rend. R. Acc. Bologn. 1877–78, pp. 170–172.

[Not seen by the Recorder.]

A. G. Butler redescribes and figures *Chærocampa suffusa* and *pallicosta*, Walk., p. 1, *Triptogon roseipennis*, Butl., and *complacens*, Walk., p. 2, *Acherontia medusa*, Butl., and *Diludia discistriga*, Walk., p. 3, and *D. increta*, Butl., p. 4, Ill. Lep. Het. iii. pl. xli. figs. 1–7. The transformations of *D. increta* are erroneously noticed and figured as those of *D. vates* in Tr. L. S. ix. p. 616, pl. xci. figs. 18 & 19.

Thyreus abboti. Green variety of larva; Hagen, P. Bost. Soc. xx. p. 136.

Dilephila nerii discussed, and larva and imago figured; J. Faivre, Mém. Soc. Sâone-et-Loire, ii. pp. 43–47, figs. 4 & 5.

Dilephila insidiosa, Ersch., = *bienerti*, Staud., ? = *hippophaes*, var.; O. Staudinger, S. E. Z. xl. p. 316.

Smerinthus austauti, Staud., distinguishing characters pointed out, and larva, and var. *staudingeri* described; L. Austaut, Le Nat. i. (2) p. 3, & pp. 68, 69, & 85. *S. ocellatus*, dimorphism in larva; E. Boscher, P. E. S. 1879, p. xliv. *S. tiliæ* with aborted hind wings; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. xcviii. ab. *pechmani* from Nymphenburg, described and figured, A. Hartmann, MT. Münch. ent. Ver. iii. pp. 35–37, pl. iii. figs. 1–3.

Sphinx eremitus, Hübn. Transformations noticed; T. W. Fyles, Canad. Ent. xi. p. 59.

Acherontia atropos. In the ♂ the skin connecting the ventral and dorsal plates forms an f-shaped longitudinal fold; L. Arnhart, SB. z.-b. Wien, xxix. pp. 54 & 55.

Brachyglossa (?) *stigmatica*, P. Mabille, redescribed and figured by him; Ann. Soc. Ent. Fr. (5) ix. p. 293, note, pl. vi. fig. 1.

Zonilia. P. Mabille [incorrectly] places together *Z. densoi*, Kef., *malgassica*, Feld., and *rhadama*, Boisd.; Ann. Soc. Ent. Fr. (5) ix. p. 296. *Z. rosæ*, Butl., and *œnopion*, Hübn., are perhaps forms of one species; Dewitz, MT. Münch. ent. Ver. iii. pp. 25 & 26.

New species:—

Macroglossa taxicolor, F. Moore, P. Z. S. 1879, p. 387, Ceylon; *M. falkensteini*, Dewitz, MT. Münch. ent. Ver. iii. p. 23, pl. i. fig. 1, Chinchoxo; *M. œsalon* and *bombus*, Mabille, Ann. Soc. Ent. Fr. (5) ix. pp. 299 & 347, Madagascar.

Pterogon obscurus, id. *l. c.* p. 346, Madagascar.

Angonyx borneensis, Borneo, and *vigens*, Philippines; A. G. Butler, Tr. E. Soc. 1879, pp. 261 & 262.

Acosmeryx metanaga, id. Ann. N. H. (5) iv. p. 350, Japan.

Gnathostypsis laticornis, id. *l. c.* p. 233, Madagascar.

Diodosida grandidieri, id. *l. c.* p. 234, Madagascar.

Chærocampa humilis, id. ibid.; *C. argyropeza*, Mabille, Bull. Soc. Philom. (7) iii. p. 135 (= *Ocyton tyrrhus*, Boisd., see Mabille, Ann. Soc.

Ent. Fr. (5) ix. p. 299); *C. bifasciata*, id. Ann. Soc. Ent. Fr. (5) ix. p. 345: all from Madagascar.

Ambulyx auripennis, F. Moore, P. Z. S. 1879, p. 388, Ceylon; *A. guessfeldti*, Dewitz, MT. Münch. ent. Ver. iii. p. 27, pl. ii. figs. 1 & 1*a*, Chinchoxo; *A. grandidieri*, Mabille, Bull. Soc. Philom. (7) iii. p. 135, & Ann. Soc. Ent. Fr. (5) ix. p. 297, Madagascar.

Triptogon rectilinea, F. Moore, P. Z. S. 1879, p. 388, N. India.

Smerinthus hamatus, pl. ii. fig. 2, and *pechuelii*, pl. i. fig. 4, Dewitz, *l. c.* p. 28, Chinchoxo; *S. askoldensis*, C. Oberthür, Diagn. Lep. Ask. p. 5, Island of Askold.

Basiana conspersa, H. Dewitz, *l. c.* p. 29, pl. i. figs. 2 & 2*a*, Chinchoxo.

Clanis undulosa, F. Moore, *l. c.* p. 387, N. China.

ÆGERIIDÆ.

Sesia culiciformis. Extraordinary abundance; C. Schmidt, Ent. Nachr. v. pp. 287 & 288.

Grotea longipes, Möschl., = *Ægeria syringæ*, Harr.; *Grotea* being preoccupied, the name *Podosesia* is substituted; H. B. Möschler, S. E. Z. xl. p. 246.

Ægeria pictipes, G. & R. Natural history; J. S. Bailey, N. Amer. Ent. i. pp. 17–21, pl. iii.

New genera and species:—

Pramila, F. Moore, Desc. Ind. Lep. Atk. p. 9. Allied to *Sphecia*; type, *P. atkinsoni*, sp. n., *l. c.* pl. ii. fig. 6.

Trilochana, id. *ibid.* Affinities not stated; type, *T. scolioides*, sp. n., *l. c.* pl. ii. fig. 2, Darjiling.

Melittia nepcha and *newara*, id. *l. c.* p. 10, Darjiling; *M. gigantea*, id. P. Z. S. 1879, p. 413, Masuri.

Pseudosesia grotei, id. *l. c.* p. 414, N. India.

Pansa aurociliata, Aurivillius, Œfv. Ak. Förh. xxxvi. (7), p. 47, Damara Land.

Ægeria flava and *tricincta*, F. Moore, Desc. Ind. Lep. Atk. p. 8, Darjiling.

Sciapteron sikkima, id. *l. c.* p. 9, Darjiling.

THYRIDIDÆ.

Thyris usetata, sp. n., A. G. Butler, Ann. N. H. (5) iv. p. 367, Japan.

URANIIDÆ.

WESTWOOD, J. O. Observations on the *Uraniidæ*, a family of Lepidopterous Insects, with a Synopsis of the family, and a Monograph of *Coronidia*, one of the genera into which it is divided. Tr. Z. S. x. pp. 507–542, pls. lxxxv. & lxxxvi. (details), & lxxxvii. & lxxxviii. (perfect insects).

The author discusses the position of this family, and inclines to refer

them to the *Bombyces*. The nomenclature of the genera being very confused, and the greater part of the names being objectionable, he gives the following list, all except the second being old names with new terminations (the number of species is added after each genus) : *Uranidia* (8), *Chrysiridia* (3), *Alcidia* (9), *Lyssidia* (5), *Manidia* (8), *Coronidia* (21). He figures the following known species : *Alcidia metaurus*, Hopff., fig. 2 ; *Coronidia orithea*, Cram., fig. 3 ; *C. egina*, Boisd., var. *paulina*, from San Paulo, p. 533, figs. 6 & 7, *rosina*, Feld., p. 535, figs. 8 & 9, pl. lxxxvii., *echenais*, Hopff., var. ? *granadina*, from New Granada, p. 536, fig. 5, *japet*, Boisd., fig. 6, *interlineata*, Walk., p. 538, fig. 9, and *leachi*, fig. 11, pl. lxxxviii. The larva and pupa of a species allied to *C. orithea* are described and figured, p. 520, pl. lxxxv. figs. 1 & 2.

Urania rhipheus discussed : the *Uraniidæ* appear to be nearest related to the *Noctuidæ* ; Mabille, Ann. Soc. Ent. Fr. (5) ix. pp. 318 & 319. P. Maassen considers that *U. crœsus*, Gerst., = *drurii*, Boisd. is identical with Drury's *ripheus*, and renames *ripheus*, Cram. (= *orientalis*, Swains. [= *madagascariensis*, Lesson]), *U. crameri* (p. 115) ; S. E. Z. xl. pp. 113–115.

Nyctalemon docile, sp. n., A. G. Butler, Tr. L. S. (2) i. p. 562, Malacca.

Alcidia boops, sp. n., Westwood, *l. c.* p. 525, pl. lxxvii. fig. 1, Aru.

Coronidia erecthea and *boreada*, Brazil, pp. 530 & 531, pl. lxxxvii. figs. 4 & 5, *nicaraguana*, Nicaragua, and *columbiana*, Colombia, p. 534, figs. 3 & 4, *œola*, West Indies, Guatemala, and Brazil, p. 535, figs. 1 & 2, *biblina*, Nicaragua and Venezuela, p. 537, fig. 7, *briseis*, p. 538, fig. 9, locality unknown, and *genevana*, p. 539, fig. 10, Mexico, pl. lxxxviii., spp. nn., Westwood, *l. c.*

Agaristidæ.

Nikæa, g. n., F. Moore, Desc. Ind. Lep. Atk. p. 11. Allied to *Eusemia* ; type, *Hypercompa longipennis*, Walk.

Agarista caudata, Dewitz, MT. Münch. ent. Ver. iii. p. 30, pl. i. figs. 3 & 3 *a*, Guinea ; *A. tyrianthina*, A. G. Butler, P. Z. S. 1879, p. 160, New Ireland : spp. nn.

Eusemia poggii, Dewitz, *l. c.* p. 31, pl. ii. fig. 3, Guinea ; *E. austeni*, F. Moore, Desc. Ind. Lep. p. 11, Khasia Hills ; *E. virguncula*, Mabille, Bull. Soc. Philom. (7) iii. p. 136, Madagascar : spp. nn.

Rothia micropales and *westwoodi*, spp. nn., A. G. Butler, Ann. N. H. (5) iv. p. 235, Madagascar.

Phægorista helcitoides, sp. n. [= *similis*, Walk.], Dewitz, *l. c.* p. 32, pl. ii. fig. 4, Guinea.

Seydyra venosa, sp. n., F. Moore, P. Z. S. 1879, p. 389, Darjiling.

Pais gordoni, A. G. Butler, Ent. M. M. xvi. p. 10, Tugela River, S. Africa.

Chalcosiidæ.

Chalcosia coliadoides, Walk., var. *latifasciata*, from Malacca, noticed ; A. G. Butler, Tr. L. S. (2) i. p. 559.

Amesia pexifascia, A. G. Butler, redescribed by him, Tr. L. S. (2) i. p. 559.

Retina costata, Walk., redescribed and figured; A. G. Butler, Ill. Lep. Het. iii. p. 9, pl. xliii. fig. 7.

New genera and species :—

Boradia, F. Moore, P. Z. S. 1879, p. 391. Allied to *Agalope*; type, *B. carneola*, sp. n., *l. c.* p. 392, N.W. Himalaya.

Ratarda, id. *l. c.* p. 392. Allied to *Canerkes*; type, *R. marmorata*, sp. n., *l. c.* p. 393, pl. xxxii. fig. 1, Darjiling.

Klaboana, id. *l. c.* p. 393. Type, *Gynautocera macularia*, Guér.

Codane, id. Desc. Ind. Lep. Atk. p. 17. Type, *Pidorus zenotea*, Walk.

Arachotia, id. *l. c.* p. 14. Type, *A. flaviplaga*, sp. n., *l. c.*, Darjiling; add *A. vespoides*, sp. n., *id.* P. Z. S. 1879, p. 390, N. India.

Chalcosia appendiculata, Snellen, Tijdschr. Ent. xxii. p. 75, pl. vi. figs. 7, 7 *a–f*, Celebes; *C. albata*, N. India, and *bicolor*, Sumatra and Malacca, F. Moore, P. Z. S. 1879, p. 390; *C. argentata*, id. Desc. Ind. Lep. Atk. p. 17, Hazara district.

Cyclosia cardinalis, id. *l. c.* p. 18, Darjiling; *C. subflava*, id. P. Z. S. 1879, p. 392, Malacca.

Amesia juvenis, A. G. Butler, Tr. L. S. (2) i. p. 559, Malacca.

Campylotes atkinsoni, F. Moore, Desc. Ind. Lep. Atk. p. 17, Darjiling.

Trypanophora atkinsoni, id. *l. c.* p. 15, Darjiling.

Eterusia lativitta, Darjiling, and *alompra*, Assam, *id. l. c.* pp. 15 & 16; *E. magnifica*, A. G. Butler, Tr. E. Soc. 1879, p. 5, Cachar.

Chelura basiflava, F. Moore, P. Z. S. 1879, p. 391, Darjiling; *C. eronioides*, id. Desc. Ind. Lep. Atk. p. 15, Darjiling.

Soritia fuscescens, Darjiling, and *olivascens*, Khasia Hills, *id. l. c.* p. 16.

Agalope livida, id. P. Z. S. 1879, p. 391, China.

Herpa subhyalina, id. Desc. Ind. Lep. Atk. p. 18, Sikkim.

Histia nilgira, id. *ibid.*, Nilgiri Hills.

Milleria albifascia, id. *l. c.* p. 19, Cherra Punji, Assam.

Laurion corculum, A. G. Butler, Tr. L. S. (2) i. p. 559, Malacca.

Thymaridæ.

Thymara caudata, sp. n., F. Moore, P. Z. S. 1879, p. 394, pl. xxxii. fig. 3, British Burma and Assam.

Zygænidæ.

Zygæna filipendulæ. Males attracted by a ♀ pupa; Oberlander, Bull. Soc. Rouen, xiv. (noticed, Bull. Ent. Ital. xi. p. 221).

A. G. Butler redescribes and figures *Syntomis annetta*, Butl., and *Balotæa æyeroides*, p. 4, and *Bintha gracilis*, Walk., p. 5; Ill. Lep. Het. iii. pl. xliii. figs. 1–3.

Procris ampelophaga noticed; Targioni, Atti Soc. Ital. xi. Adunanze, p. 16.

Syntomis tenuis, Walk., noticed and figured; Snellen, Tijdschr. Ent. xxii. p. 70, pl. vi. fig. 3.

Pseudonaclia sylvicolens, Butl., = *quadrimacula*, Mab.; Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 301.

Horama panthalon, Fabr., noticed; Marshall & Kirby, Ent. M. M. xvi. p. 19.

Zygæna asoka, F. Moore, P. Z. S. 1879, p. 389, N.W. India.

Procris funeralis, A. G. Butler, Ann. N. H. (5) iv. p. 351, Japan.

Aglaope (?) *perpusilla*, Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 348, Madagascar.

Xenares dimidiata, Snellen, Tijdschr. Ent. xxii. p. 69, pl. vi. fig. 2, Amparang, Celebes.

Northia khasiana, F. Moore, Desc. Ind. Lep. Atk. p. 12, Khasia Hills.

Artona postvitta and *fuliginosa*, id. *l. c.* pp. 13 & 14, Darjiling; *A. quadrimaculata*, id. P. Z. S. 1879, p. 390, Masuri.

Syntomis austeni, id. *l. c.* p. 389, N.E. Bengal; *S. newara* and *lepcha*, Darjiling, *cherra*, Cherra Punji, Assam, p. 12, *hyalina*, Darjiling, and *disjuncta*, Khasia Hills, p. 13, *id.* Desc. Ind. Lep. Atk.; *S. sargania*, A. G. Butler, Tr. E. Soc. 1879, p. 4, Cachar.

Pseudonaclia simplex, id. Ann. N. H. (5) iv. p. 236, Madagascar.

Dysauxes indica, F. Moore, P. Z. S. 1879, p. 390, Bombay.

Cœnochromia lutulenta, Snellen, Tijdschr. Ent. xxii. p. 71, pl. vi. fig. 4, Celebes.

Arctiidæ.

A. G. Butler redescribes and figures *Phissama vacillans* and *Spilosoma sangaicum*, Walk., p. 5, *Spilarctia ione* and *mollicula*, Butl., and *S. subcarnea*, Walk., p. 6, *Thanatarctia infernalis* and *Euprepia phœosoma*, Butl., p. 7; Ill. Lep. Het. iii. pl. xlii. figs. 4–10.

Hyalurga vinosa, Dru. On a pupa in which the prolegs of the larva were retained; Dewitz, SB. Nat. Fr. 1879, pp. 9 & 10, and Ent. Nachr. v. pp. 119 & 120.

Euprepia caia. Broods of larvæ were reared under red, blue, and violet glass respectively; no important varieties were obtained, but the brood under the violet glass ate ravenously, fed up rapidly, and the moths appeared a fortnight before the others. G. Schoch, MT. schw. ent. Ges. xi. p. 540.

Chelonia caia. Larva destroyed apparently by a parasitic fungus; E. Lelièvre, Feuill. Nat. ix. p. 106.

Arctia pudica, Esp.: notes on larvæ, and on the sound produced by the moth; V. Gaiger, Ent. Nachr. v. p. 142. *A. villica*: rearing and variation; A. Fuchs, S. E. Z. xl. pp. 167–171. *A. orientalis*, F. Moore, redescribed by him; Second Yark. Miss. Lep. p. 7.

Euchætes collaris, Fitch. Transformations described; W. H. Patton, Psyche, ii. pp. 251–253.

Callimorpha dominula, L.: white var. *hamelensis*, from Hameln, de-

scribed by C. F. Pflümer, S. E. Z. xl. p. 158. *C. interrupto-marginata*: anal appendages of ♂ described, and supposed to be accessory organs of flight; C. G. Siewers, Canad. Ent. xi. pp. 47 & 48, and Ent. M. M. xvi. p. 19.

Nemeophila. Remarks on various American species; A. R. Grote, *op. cit.* pp. 209 & 210.

Macronyx debilis, Feld. (? = *Aloa rhodophœa*, Walk.) described; Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 54.

Spilosoma sanguinale, Moore ?, noticed and figured; Snellen, Tijdschr. Ent. xxii. p. 100, pl. viii. fig. 3. *S. striato-punctatum*, Motsch., redescribed as new by C. Oberthür, Diagn. Lep. Ask. p. 6.

Anaphela luctifera, Walk., = *Œnophila stella*, Guér.; Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 309.

New genera and species :—

Lælapia, A. G. Butler, Ann. N. H. (5) iv. p. 238. Allied to *Lopera*, Walk. (*Cataphractes*, Feld.); type, *L. notata*, sp. n., *l. c.*, Madagascar.

Numenoides, id. *l. c.* Allied to *Numenes*; type, *N. grandis*, sp. n., *l. c.*, Madagascar.

Gonerda, F. Moore, P. Z. S. 1879, p. 395. Allied to *Alope*; type, *G. perornata*, sp. n., *l. c.* pl. xxxii. fig. 2, Cashmere.

Carbisa, id., Desc. Ind. Lep. Atk. p. 41. Allied to *Icambosida*; type, *C. venosa*, sp. n., *l. c.* pl. ii. fig. 10, Darjiling.

Pimprana, id. *l. c.* Allied to last ?; type, *P. atkinsoni*, sp. n., *l. c.* p. 42, pl. ii. fig. 11, Darjiling.

Pangora, id. *l. c.* Allied to *Creatonotus*; type, *P. distorta*, sp. n., *l. c.* pl. ii. fig. 14, N. India, add *P. matherana*, sp. n., *id.* P. Z. S. 1879, p. 396, Bombay.

Nayaca, id. Desc. Ind. Lep. Atk. p. 43. Allied to *Alphea*; type, *Arctia imbuta*, Walk.; add *N. florescens*, sp. n., *l. c.* pl. ii. fig. 13, Darjiling.

Rajendra, id. *l. c.* p. 43; P. Z. S. 1879, p. 396. Allied to *Creatonotus*; type, *R. lativitta*, sp. n., *ll. c.*; but will also include *Aloa integra*, *dentata*, and *biguttata*, Walk., *A. sipahi* and *nigricans*, Moore, and *R. vittata*, British Burma, and *pannosa*, N.W. Himalaya, spp. nn., P. Z. S. 1879, pp. 396 & 397, pl. xxxii. figs. 12 & 8.

Challa, id., P. Z. S. 1879, p. 398. Allied to *Alpenus*; types, *C. bimaculata*, l. c., and *discalis*, l. c. p. 399, pl. xxxii. fig. 7, N. W. Himalaya, spp. nn.

Rhypopteryx, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 57 (affinities not stated). Type, *R. sordida*, sp. n., *l. c.* p. 58, Damara Land.

Halesidota trigona, A. R. Grote, N. Amer. Ent. i. p. 46, Colorado.

Amerila piepersi, Snellen, Tijdschr. Ent. xxii. p. 102, pl. viii. fig. 4, Celebes.

Amblythyris radama, Mabille, Bull. Soc. Philom. (7) iii. p. 137, Madagascar.

Arctia suttadra, F. Moore, P. Z. S. 1879, p. 395, Cashmere; *A. bicolor*, Mabille, Bull. Soc. Philom. (7) iii. p. 137, Madagascar; *A. rectilinea*, G. H. French, Canad. Ent. xi. p. 45, Illinois.

Glanycus tricolor, F. Moore, Desc. Ind. Lep. Atk. p. 38, Darjiling.

Hypercompa flavicolor and *similis*, id. P. Z. S. 1879, p. 397, N. W. Himalaya; *P. nyc[h]t[h]emerata*, id. Desc. Ind. Lep. Atk. p. 38, Darjiling.

Euchætes sikkimensis, id. *l. c.* p. 39, Darjiling.

Alpenus flavens, id. *ibid.*, Cherra Punji, Assam.

Trichosoma huguenini, Millière, Ann. Soc. L. Lyon, xxv. p. 10, pl. cxxv. fig. 10, Algiers.

Spilosoma dornesi (Staud., MS.), C. Oberthür, Diagn. Lep. Ask. p. 6, Island of Askold.

Spilarctia uniformis, p. 39, and *howra*, Calcutta, *S. obliquivitta*, pl. ii. fig. 26, Darjiling, p. 40, F. Moore, l. c., *S. inæqualis* and *rosacea*, A. G. Butler, Ann. N. H. (5) iv. pp. 351 & 352, Japan.

Icambosida punctilinea, F. Moore, *l. c.* p. 40, Darjiling.

Caligula (*Mœnas*, Hübn. ?) *wallengreni*, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 56, Damara Land (? = *scapulosa*, Walleng., ♀).

Rhyparia tigrina, F. Moore, P. Z. S. 1879, p. 398, pl. xxxii. fig. 4, S. India.

Phaos huttoni, A. G. Butler, Cist. Ent. ii. p. 487, New Zealand.

Hypsidæ.

Aganais membliaria, Cram. ?, from Celebes, described, p. 77, *A. egens*, Walk., noticed and figured, p. 80, pl. vii. fig. 4; Snellen, Tijdschr. Ent. xxii.

Hypsa concinula, P. Mabille, redescribed and figured by him, Ann. Soc. Ent. Fr. (5) ix. p. 294, note, pl. vi. fig. 2; *H. antiqua* and *stipata*, Walk., = *Aganais insularis*, Boisd., = *borbonica*, Boisd., *id. l. c.* p. 307.

Aganais mecynoides, id. *l. c.* p. 295, note, pl. vi. fig. 3, Congo; *A. vitessoides*, Snellen, Tijdschr. Ent. xxii. p. 78, pl. vii. fig. 1, Maros, Celebes, spp. nn.

Hypsa leuconeura, sp. n., A. G. Butler, P. Z. S. 1879, p. 161, New Ireland.

Agape leonina, sp. n., id. *ibid.*, New Ireland.

Callidulidæ.

Cleosiris catamita, Geyer. Details and neuration discussed and figured; Snellen, Tijdschr. Ent. xxii. p. 67, pl. vi. fig. 1, 1 *a* & *b*.

Herimba, g. n., F. Moore, Desc. Ind. Lep. Atk. p. 20. Type, *H. atkinsoni*, sp. n., *l. c.* p. 21, pl. ii. fig. 3, Darjiling.

Datanga, g. n., *id. l. c.* Allied to *Callidula*, Hübn.; types, *D. minor*, Moulmein, Burma, and *attenuata*, Darjiling, spp. nn., *l. c.*

Callidula abisara, A. G. Butler, Tr. L. S. (2) i. p. 558, Malacca.

Cleis lunigera, id. P. Z. S. 1879, p. 162, New Ireland.

Lithosiidæ.

A. G. Butler redescribes and figures *Miltochrista inscripta*, Walk. (the insect described by Walker as the ♂ is probably *Sesapa erubescens*), p. 4, *M. rhodophila*, Walk., *Collita ægrota* and *Tatargyra formosa*, Butl., p. 5, Ill. Lep. Het. iii. pl. xlii. figs. 11–13, pl. xliii. fig. 1.

Deiopeia occultans, Poll., = *laymerisa*, Grandid.; P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 306.

Bizone hova, Guén., = *amatura*, Walk., A. G. Butler, Cist. Ent. ii. p. 393; *cf.* also P. Mabille, *l. c.* p. 303.

Nola. *N. chlamitulalis* feeds when nearly full-grown on *Myrica gale*, and constructs a cocoon resembling that of *Halias*; *N. albula* feeds on *Adenocarpus parvifolius*, Lafaury, Le Nat. i. p. 30; *N. impura*, Mann, discussed, O. Bohatsch, Verh. z.-b. Wien, xxix. pp. 405 & 406.

Calligenia miniata. A yellow var. from Lyndhurst recorded; H. Neale, Ent. M. M. xvi. p. 110.

Cyme princeps, Feld. & Rog., noticed, and neuration figured; Snellen, Tijdschr. Ent. xxii. p. 90, pl. x. fig. 5.

Lithosia quadra. Small pale sterile ♀ and a dipterous parasite emerging from a pupa; J. Fallou, Bull. Soc. Ent. Fr. (5) ix. p. cxvi. *L. lutarella*, var. *pallifrons*, occurs on the Rhine on the hottest slopes, whereas the type occurs in cooler grassy woods; A. Fuchs, S. E. Z. xl. pp. 166 & 167.

Halicomitra pulchra, Butl., = *Caloschemia monilifera*, Mab.; P. Mabille, *l. c.* p. 303.

Adrepsa, g. n., F. Moore, Desc. Ind. Lep. Atk. p. 37. Allied to *Digama*?; type, *A. stilboides*, sp. n., *l. c.* p. 38, pl. ii. fig. 20, Assam.

New species:—

Cossa nubecula, F. Moore, P. Z. S. 1879, p. 394, Andamans.

Barsine pretiosa, id. *ibid.*, N.W. Himalaya.

Bizone grandis, P. Mabille, Bull. Soc. Philom. (7) iii. p. 136, Madagascar.

Cyana decipiens, A. G. Butler, Ann. N. H. (5) iv. p. 352, Japan.

Miltochrista torrens, id. *l. c.* p. 353, Japan.

Systropha nivosa, id. *ibid.*, Japan.

Digama piepersiana, Snellen, Tijdschr. Ent. xxii. p. 80, pl. vii. fig. 2, Celebes.

Emydia soricina, id. *l. c.* p. 82, pl. vii. figs. 3 & 3 *a*, Celebes.

Lithosia gigantea (Staud., MS.), C. Oberthür, Diagn. Lep. Ask. p. 6, Island of Askold; *L. erythropleura*, P. Mabille, *l. c.* p. 302, Madagascar; *L. chryseola*, p. 83, *xantholoma* and *lurida*, p. 84, Snellen, *l. c.* pl. vii. figs. 5–7, Celebes.

Paidia creatina, id. *l. c.* p. 85, pl. vii. fig. 8, Celebes.

Setina nigro-cincta and *calligenioides*, id. *l. c.* pp. 86 & 87, pl. vii. figs. 9 & 10, Celebes; *S. dharma*, F. Moore, *l. c.* p. 394, N.W. Himalaya.

Hypocrita meander and *flavicollis*, Snellen, *l. c.* pp. 88 & 89, pl. vii. figs. 11 & 12, Celebes; *H. calochroma*, id. Bol. Ac. Cordoba, iii. p. 22, Cordova.

Deiopia serrata, P. Mabille, Le Nat. i. (3) p. 5 (= *Argina serrata*, id. Ann. Soc. Ent. Fr., 5, ix. p. 387), and *D. diva*, id. Ann. &c. p. 305, both from Madagascar.

Euchelia ragonoti, id. *l. c.* p. 348, Madagascar.

Nola fumosa and *candida*, A. G. Butler, Ill. Lep. Het. iii. p. 9, pl. xliii. figs. 2 & 3, Yokohama.

Pitane rotundata, *rectilinea*, and *flavicostata*, Snellen, Tijdschr. Ent. xxii. pp. 90–92, pl. x. figs. 6 *a–d*, 7 & 8, Celebes.

Cycnia transversa, F. Moore, *l. c.* p. 398, N.W. India.

Eudule weyenberghi, Snellen, Bol. Ac. Cordoba, iii. p. 19, Cordova.

Nycteolidæ.

Halias prasinana and sp. n. (?), V. Batault, Mém. Soc. Sâone-et-Loire, ii. p. 41, figs. 1–3.

Sarrothripa curvilinea and *caradrinoides*, spp. nn., Snellen, Tijdschr. Ent. xxii. pp. 93 & 94, pl. x. figs. 9 *a* & *b*, 10 *a–d*, Celebes.

Earias anthophilana and *limbana*, spp. nn., id. *l. c.* pp. 96 & 97, pl. viii. figs. 1 & 2, Celebes.

Hylophila sylpha, sp. n., A. G. Butler, Ill. Lep. Het. iii. p. 10, pl. xliii. fig. 10, Yokohama.

Nychthemeridæ.

Nychthemera insularis, Boisd., P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 304; *N. latistriga*, Walk. ?, redescribed and figured, pl. vi. fig. 5.

Leptosoma consobrinum, Hopff., = *inconstans*, Voll.; Snellen, Tijdschr. Ent. xxii. p. 72.

Arbudas, g. n., F. Moore, Desc. Ind. Lep. Atk. p. 19. Type, *A. bicolor*, sp. n., *l. c.* p. 20, pl. ii. fig. 19, Darjiling.

Nychthemera abraxata, Snellen, Tijdschr. Ent. xxii. p. 73, pl. vi. fig. 6, Celebes; *N. nigro-venosa*, F. Moore, P. Z. S. 1879, p. 394, Ceylon; *N. rasana*, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 304, Madagascar: spp. nn.

Leptosoma consors, sp. n., A. G. Butler, Ann. N. H. (5) xv. p. 192, Island of Johanna.

Hylemera puella and *fragilis*, spp. nn., *id. l. c.* p. 236, Madagascar.

Liparidæ.

Lælia sinensis, Walk. (= *Leucoma brevicornis*, W.) and *Pantana ampla*, W., redescribed and figured; A. G. Butler, Ill. Lep. Het. iii. pp. 9 & 10, pl. xliii. figs. 8 & 9.

Oxicesta marmorea, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 8, pl. i. fig. 17.

Orgyia antiqua (?) stated to have emerged from the larva without passing through the pupa state; Weir & Gates, P. E. Soc. 1879, p. xlix. *O. cænosa* noticed, with remarks on other fen insects; F. D. Wheeler, Ent. xii. pp. 78–80. *O. ericæ*, Germ.: life history; P. C. Zeller, S. E. Z. xl. pp. 453–466. *O. leucostigma*: parthenogenesis noticed; Leidy, P. Ac. Philad. 1879, pp. 195 & 196, and Ann. N. H. (5) iv. p. 473.

Euproctis karghalica (pl. i. fig. 18) and *lactea*, F. Moore, redescribed by him; Second Yark. Miss. Lep. p. 7.

Lælia subrufa, Snellen: varieties from Celebes noticed, and one figured by him; Tijdschr. Ent. xxii. p. 105, pl. viii. fig. 6.

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Bizone grandis, P. Mabille, Bull. Soc. Philom. (7) iii. p. 136, Madagascar.

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Miltochrista torrens, id. *l. c.* p. 353, Japan.

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Digama piepersiana, Snellen, Tijdschr. Ent. xxii. p. 80, pl. vii. fig. 2, Celebes.

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Paidia creatina, id. *l. c.* p. 85, pl. vii. fig. 8, Celebes.

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Hypocrita meander and *flavicollis*, Snellen, *l. c.* pp. 88 & 89, pl. vii. figs. 11 & 12, Celebes; *H. calochroma*, id. Bol. Ac. Cordoba, iii. p. 22, Cordova.

Deiopia serrata, P. Mabille, Le Nat. i. (3) p. 5 (= *Argina serrata*, id. Ann. Soc. Ent. Fr., 5, ix. p. 387), and *D. diva*, id. Ann. &c. p. 305, both from Madagascar.

Euchelia ragonoti, id. *l. c.* p. 348, Madagascar.

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Pitane rotundata, *rectilinea*, and *flavicostata*, Snellen, Tijdschr. Ent. xxii. pp. 90–92, pl. x. figs. 6 *a–d*, 7 & 8, Celebes.

Cycnia transversa, F. Moore, *l. c.* p. 398, N.W. India.

Eudule weyenberghi, Snellen, Bol. Ac. Cordoba, iii. p. 19, Cordova.

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Sarrothripa curvilinea and *caradrinoides*, spp. nn., Snellen, Tijdschr. Ent. xxii. pp. 93 & 94, pl. x. figs. 9 *a* & *b*, 10 *a–d*, Celebes.

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Leptosoma consobrinum, Hopff., = *inconstans*, Voll.; Snellen, Tijdschr. Ent. xxii. p. 72.

Arbudas, g. n., F. Moore, Desc. Ind. Lep. Atk. p. 19. Type, *A. bicolor*, sp. n., *l. c.* p. 20, pl. ii. fig. 19, Darjiling.

Nychthemera abraxata, Snellen, Tijdschr. Ent. xxii. p. 73, pl. vi. fig. 6, Celebes; *N. nigro-venosa*, F. Moore, P. Z. S. 1879, p. 394, Ceylon; *N. rasana*, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 304, Madagascar: spp. nn.

Leptosoma consors, sp. n., A. G. Butler, Ann. N. H. (5) xv. p. 192, Island of Johanna.

Hylemera puella and *fragilis*, spp. nn., *id. l. c.* p. 236, Madagascar.

Liparidæ.

Lælia sinensis, Walk. (= *Leucoma brevicornis*, W.) and *Pantana ampla*, W., redescribed and figured; A. G. Butler, Ill. Lep. Het. iii. pp. 9 & 10, pl. xliii. figs. 8 & 9.

Oxicesta marmorea, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 8, pl. i. fig. 17.

Orgyia antiqua (?) stated to have emerged from the larva without passing through the pupa state; Weir & Gates, P. E. Soc. 1879, p. xlix. *O. canosa* noticed, with remarks on other fen insects; F. D. Wheeler, Ent. xii. pp. 78–80. *O. ericæ*, Germ.: life history; P. C. Zeller, S. E. Z. xl. pp. 453–466. *O. leucostigma*: parthenogenesis noticed; Leidy, P. Ac. Philad. 1879, pp. 195 & 196, and Ann. N. H. (5) iv. p. 473.

Euproctis karghalica (pl. i. fig. 18) and *lactea*, F. Moore, redescribed by him; Second Yark. Miss. Lep. p. 7.

Lælia subrufa, Snellen: varieties from Celebes noticed, and one figured by him; Tijdschr. Ent. xxii. p. 105, pl. viii. fig. 6.

Laria v-nigrum. Premature development of antennæ and front legs in the pupa; Steudel, JH. Ver. Württ. xxv. pp. 61–63.

Liparis auriflua and *chrysorrhœa*: urticating properties of imago; J. Anderson, Sci. Goss. xv. p. 257. Urticating apparatus of the larvæ described; A. H. Swinton, P. E. Soc. 1879, pp. xxxi. & xxxii. *L. dispar*: parthenogenesis; W. G. Pearce, Ent. xii. pp. 229 & 230.

Psilura monacha. Tenacity of life, and power to develop itself after quitting the pupa under the most unfavourable circumstances; J. Schilder, Ent. Nachr. v. pp. 299 & 300.

Lymantria limata, Cram. Redescribed, with notice of transformations; Snellen & Piepers, Tijdschr. Ent. xxii. pp. 111 & 112.

Dasychira pudibunda: variation in larva; Gauchler & Boecker, Ent. Nachr. v. pp. 147, 215 & 216. *D. misana*, Moore, redescribed and figured; Snellen, *l. c.* p. 110, pl. ix. figs. 4 & 5.

Phiala xanthosoma, Wallengr., = *Heteromorpha costipuncta*, Herr.-Schäff., = *Dasychira atomaria*, Walk.; Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 54.

Olene mendosa, Hübn. Transformations noticed; Snellen & Piepers, *l. c.* p. 112.

Family *Phialidæ*, Wallengr., recharacterized; Aurivillius, *l. c.* p. 52.

Asthenia, Westwood (preoccupied in *Diptera*), is renamed by him *Asthenidia*. He considers *Strophidia*, Hübn. (= *Micronia*, group 1, Guén.), to belong to the *Bombyces*, and to be allied to the *Uraniidæ*; Tr. Z. S. x. pp. 514 & 515.

New genera and species:—

Baryaza, F. Moore, Desc. Ind. Lep. Atk. p. 45. Type, *B. cervina*, sp. n., *l. c.* pl. iii. fig. 1, Darjiling.

Caragola, id. *l. c.* p. 46. Allied to *Caviria* and *Redoa*; type, *C. costalis*, sp. n., *l. c.* pl. ii. fig. 21, Darjiling.

Haraspa, id. *l. c.* p. 47. Type, *H. testacea*, sp. n., *l. c.* pl. ii. fig. 15, Darjiling.

Daplasa, id. *l. c.* p. 51. Type, *D. irrorata*, sp. n., *l. c.* p. 52, pl. ii. fig. 17, Darjiling.

Mahora, id. *l. c.* p. 52. Allied to *Lymantria*; types, *Cyclidia plagiodotata*, Walk. (redescribed and figured, *l. c.* pl. iii. fig. 6), and *M. irrorata*, sp. n., *l. c.*, Darjiling.

Nagunda, id. *l. c.* p. 53. Type, *Alope semicincta*, Walk.

Locharna, id. *ibid.* Type, *L. strigipennis*, sp. n., *l. c.* pl. iii. fig. 11, Khasia Hills.

Cadrusia, id. *l. c.* p. 54. Allied to *Lymantria*; type, *C. virescens*, sp. n., *l. c.* pl. iii. fig. 16, Darjiling.

Imaus, id. *ibid.* Type, *Lymantria munda*, Walk.

Barhona, id. *l. c.* p. 55. Allied to *Lymantria*; type, *B. carneola*, id. *l. c.* p. 56, Darjiling.

Dura, id. *ibid.* Type, *D. alba*, sp. n., *l. c.* Darjiling. (Allied to *Dasychira albicans*, Walk.)

Himala, id. *l. c.* p. 57. Type, *Redoa argentea*, Walk., redescribed, *l. c.* (= *Dasychira ilita*, Moore, olim).

Cultura, F. Moore, P. Z. S. 1879, p. 401. Allied to *Redoa*?; type, *C. alba*, sp. n., *l. c.*, Ceylon.

Birnara, A. G. Butler, Tr. L. S. (2) i. p. 560. Allied to *Pantana*; type, *B. nubila*, sp. n., Malacca; add *P. bicolor*, *Eloria marginalis*, and *Genusa discifera*.

Kettelia, id. *l. c.* p. 560. Allied to *Penora*; type, *K. lowii*, sp. n., *l. c.*, Malacca, Borneo.

Trichophiala, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 53. Allied to *Phiala*; type, *T. devylderi*, sp. n., *l. c.* p. 54, Damara Land.

Orygia ocularis, F. Moore, Desc. Ind. Lep. Atk. p. 44, Calcutta; *O. limbata*, A. G. Butler, Tr. L. S. (2) i. p. 560, Malacca, Moulmein; *O. ludekingi*, Snellen, Tijdschr. Ent. xxii. p. 104, pl. viii. fig. 5, Celebes, Java; *O. aurantia*, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 345, Madagascar.

Aroa ochripicta, F. Moore, P. Z. S. 1879, p. 399, Hong Kong.

Artaxa unimacula, Khasia Hills, and *leithiana*, fig. 9, Bombay, N. Canara, p. 399, *erecta*, fig. 6, Canara, and *brevivitta*, fig. 10, Bengal, p. 400, *l. c.* pl. xxxii.; *A. dispersa*, fig. 6, and *venosa*, fig. 5, p. 50, Darjiling, J v. ppiata, Cherra Punji, Assam, *basalis*, fig. 16, Darjiling, and *howra*, *Ptiza*, p. 51, *id.* Desc. Ind. Lep. Atk. pl. ii.

Secornidas *ochracea*, Calcutta, and *cinnamomea*, Upper Kunawur, *id. l. c.* p. 44.

Redoa lactea and *diaphana*, id. *l. c.* p. 46, Darjiling.

Gazalina transversa, id. *l. c.* p. 47, pl. ii. fig. 22, Darjiling.

Lælia amabilis, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 58, Damara Land; *L. saturnioides*, Snellen, Tijdschr. Ent. xxii. p. 105, pl. viii. figs. 7, 7 *a–c*, Takalar, Celebes.

Leucoma pruinosa, A. G. Butler, Ann. N. H. (5) iv. p. 236, Madagascar.

Gegane turbata, id. *l. c.* p. 237, Madagascar.

Euproctis titania, id. *ibid.*, Madagascar; *E. moorii* (? = *Artaxa similis*, Moore), pl. viii. figs. 8–10, p. 106, *flavipennis*, fig. 1, p. 107, *discophora*, fig. 2, and *pallipes*, fig. 3, p. 108, pl. ix., Snellen, *l. c.*, Celebes; *E. subdita*, Ceylon, *flavo-nigra*, Nepal, fig. 11, and *post-incisa*, N.E. Bengal, fig. 5, F. Moore, P. Z. S. 1879, p. 400, pl. xxxii.; *E. subnigra*, Cherra Punji, *pygmæa*, Calcutta, *semivitta*, fig. 25, Khasia Hills, and *variegata*, fig. 24, Darjiling, *id.* Desc. Ind. Lep. Atk. p. 48, pl. ii.

Pida lativitta, id. *l. c.* p. 49, Darjiling; *P. albo-dentata*, id. P. Z. S. 1879, p. 401, N.W. Himalaya.

Chærotricha bipartita, fig. 4, *marginata* and *uniformis*, p. 49, Darjiling, and *quadrangularis*, p. 50, fig. 23, Munipur, E. Bengal, *id.* Desc. Ind. Lep. Atk. pl. ii.

Stilpnotia sericea, Masuri, Darjiling, and *ochripes*, Darjiling, *id. l. c.* p. 45.

Asthenia (?) *flavicapilla*, P. Mabille, *l. c.* p. 345, Madagascar.

Strophidia vollenhovii [*-veni*], Westwood, Tr. Z. S. x. p. 515, note, Malay Islands; *S. urapterina* and *bifasciata*, p. 165, and *clarissima*, p. 166, A. G. Butler, P. Z. S. 1879, New Ireland.

Dasychira virginea, C. Oberthür, Diagn. Lep. Ask. p. 7, Island of Askold; *D. brunnescens*, p. 57, *perdix*, pl. iii. fig. 3, and *fasciata*, Darjiling, *strigata*, Gurhwal, Simla, p. 58, and *cinctata* and *albescens*, Darjiling, p. 59, F.

Moore, l. c.; *D. kansalia* (? = *strigata*, ♂), *id.* P. Z. S. 1879, p. 401, Kussowlie; *D. vibicipennis* and *gentilis*, A. G. Butler, Ann. N. H. (5) iv. p. 239, Madagascar.

Mardara viola and *peculiaris*, id. *l. c.* p. 240, Madagascar.

Liparis rhodophora, Mabille, Bull. Soc. Philom. (7) iii. p. 137, Madagascar.

Porthetria lepcha, p. 54, and *umbrina*, pl. iii. fig. 4, p. 55, F. Moore, Desc. Ind. Lep. Atk., Darjiling.

Lymantria grisea, id. *ibid.* pl. iii. fig. 5, Darjiling; *L. sobrina*, fig. 5, Dharmsala, N.W. Himalaya, *todara*, fig. 6, Nilgiris, *similis*, Calcutta district, and *vinacea*, Canara, p. 402, *sinica*, Shanghai and Formosa, and *albolunulata*, Simla and Dharmsala, p. 403, *id.* P. Z. S. 1879, pl. xxxiii.; *L. rosea*, A. G. Butler, *l. c.* p. 239, Madagascar.

Pegella bivittata (= *Lymantria lineata*, Walk.), F. Moore, Desc. Ind. Lep. Atk. p. 57, Darjiling.

Dreata bimaculata, Dewitz, MT. Münch. ent. Ver. iii. p. 33, pl. ii. fig. 5 Guinea.

iepers,

Psychidæ.

p. 52.

Standfuss, M. Beobachtungen an den schlesischen Arten des by Hi- *Psyche* (Schrank), und Versuch einer Systematik sämmtlicher der europ. Fauna angehörenden Vertreter dieses Genus (Inaugural Dissertation). Namslau: 1879, 8vo, pp. 46, pls. 2 (also Z. e. Ver. Schles. n. s. vii.).

General observations on the genus. The structure and transformations of 8 species are specially treated, and the following classification is proposed:—*Pupicolæ* (*Empedopsyche*, g. n.; ♀ never quitting pupa-case), and *Pupifugæ* (*Oreopsyche*, Spey., and *Psyche*, Schr.). *P. unicolor* is thus made the type of *Psyche*, for all the other species included by Standfuss in the genus are of later date than Schrank.

Heterogynis. This genus should follow the *Psychidæ*. The discoidal cell is always divided, contrary to the characters given by Herrich-Schäffer. Heylaerts, CR. Ent. Belg. xxii. pp. clvii. & clviii.

Psyche quadrangularis, Christoph, noticed; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. xciv. & xcv. *P. turatii*, Staudinger, redescribed and figured; Turati, Bull. Ent. Ital. xi. pp. 166–170, pl. vii. figs. 4 & 4 *a*, pl. viii. figs. 1–10.

Œceticus cannot be separated from the typical *Psychidæ*; Snellen, Tijdschr. Ent. xxii. pp. 113 & 114.

New genera and species:—

Empedopsyche, Standfuss, *l. c.* p. 39. ♀ never quitting case; type, *Psyche hirsutella*.

Diabasis, Heylaerts, CR. Ent. Belg. xxii. p. cxxxviii. Intermediate between *Psyche* and *Apterona*; type, *D. helicinoides*, sp. n., *l. c.*, Mount Parnassus.

Bijugis, id. *l. c.* p. cxxxix. Male as in *Epichnopteryx*; female never quitting the case, but provided with compound eyes, antennæ, jointed

legs, and a prominent ovipositor. Types, *Psyche bombycella*, Schiff., and *pectinella*, Fabr.

Pseudopysche, C. Oberthür, Diagn. Lep. Ask. p. 7. Made the type of a new tribe (*Pseudopsychidæ*) [but is a species of *Parisa*, teste A. G. Butler]; *P. dembowskii*, sp. n., *l. c.*, Island of Askold.

Epichnopteryx hofmanni, Palermo, *millierii*, South Ural, and *staudingeri*, Sarepta, Heylaerts, Le Nat. (2) p. 3, and CR. Ent. Belg. xxii. p. cxxxix.; *E. flavescens*, id. *l. c.* p. cxxxviii., Ala Tau.

Fumea rouasti, id. *l. c.* p. cxl., Ala Tau.

Œceticus variegatus and *fuscescens*, Snellen, Tijdschr. Ent. xxii. pp. 114 & 116, pl. ix. figs. 6, 6 *a–d*, & 7, 7 *a*, *b*, Celebes.

NOTODONTIDÆ.

Cerura lanigera, A. G. Butler, redescribed and figured by him, Ill. Lep. Het. iii. p. 10, pl. xliii. fig. 11.

Cnethocampa pityocampa, W. V. Habits, &c.; V. Gaiger, Ent. Nachr. v. pp. 106–108.

Ptilophora kashghara, F. Moore, redescribed and figured by him, Second Yark. Miss. Lep. p. 8, pl. i. fig. 19.

New genera and species :—

Niganda, F. Moore, Desc. Ind. Lep. Atk. p. 63. Placed next to *Celeia*; to contain *N. strigifascia*, l. c. p. 63, pl. iii. fig. 15, *sikkima*, *aurata*, and *albistriga*, p. 64, and *divisa*, p. 65, Darjiling, spp. nn.

Rachia, id. *l. c.* p. 70. Placed next to *Pheosia*; type, *R. plumosa*, sp. n., *l. c.*, Darjiling.

Danaka, id. *l. c.* p. 71. Placed next to *Paravetta*; type, *D. pyraliformis*, sp. n., *l. c.* pl. iii. fig. 10, Darjiling.

Kophene, id. *l. c.* p. 72. Types, *K. cuprea*, l. c., and *minor*, p. 73, spp. nn., both from Calcutta.

Chrysotypus, A. G. Butler, Ann. N. H. (5) iv. p. 240. Allied to *Pygæra*; type, *C. dives*, sp. n., *l. c.* p. 241, Madagascar.

Argyrotypus, id. *l. c.* Allied to last; type, *A. locuples*, sp. n., *l. c.* Madagascar.

Paleca, id. *l. c.* p. 354. Allied to *Cleapa*; type, *P. rufescens*, sp. n., *l. c.*, Japan.

Inguridia, id. *l. c.* Allied to *Ingura*; type, *I.* [*h*] *abrostolina*, sp. n., *l. c.*, Japan.

Harpyia taczanovskii, C. Oberthür, Diagn. Lep. Ask. p. 11, Island of Askold.

Moma champa, F. Moore, P. Z. S. 1879, p. 403, pl. xxxiii. fig. 2, Dharmsala, N.W. Himalaya.

Stauropus albescens, S. India, *indicus*, N.E. Bengal, *virescens*, Darjiling, and *vinaceus*, pl. xxxiii. fig. 1, India, *id. l. c.* p. 404; *S. apicalis*, id. Desc. Ind. Lep. Atk. p. 59, Darjiling; *S. persimilis*, A. G. Butler, Ann. N. H. (5) iv. p. 353, Japan.

Heterocampa irrorata, *brunnea*, and *maculata*, p. 60, *plagiviridis*, *obli-*

quiplaga, *variegata*, and *basalis*, p. 61, F. Moore, l. c.; *H. belfragii*, A. R. Grote, Canad. Ent. xi. p. 209, Texas.

Nioda lignea, A. G. Butler, *l. c.* p. 241, Madagascar.

Rosama plusioides, F. Moore, Desc. Ind. Lep. Atk. p. 62, Darjiling.

Gluphisia sinuata, id. P. Z. S. 1879, p. 405, N.E. Bengal.

Sphetta apicalis, pl. xxxiii. fig. 7, Darjiling, and *bi-ocellata*, Bomb[illegible] *l. c.* p. 405.

Spatalia gemmifera, id. Desc. Ind. Lep. Atk. p. 62, pl. iii. fig. 14, Darjiling.

Celeia disrupta and *sikkima*, id. *l. c.* pp. 62 & 63, Darjiling.

Ceira ochracea, *junctura*, and *basistriga*, p. 65, *postica*, Darjiling, and *decurrens*, p. 66, Cherra Punji, Assam, *id. l. c.*

Pydna fasciata, Darjiling, and *indica*, Calcutta, *id. l. c.* pp. 66 & 67.

Lophopteryx argentata, *flavistigma*, and *ferruginosa*, id. *l. c.* p. 67, Darjiling.

Ramesa apicalis, id. *l. c.* p. 68, pl. iii. fig. 12, Darjiling.

Hoplitis strigata, id. *ibid.* fig. 13, Canara.

Notodonta sikkima, id. *l. c.* p. 68, Darjiling; *N. jankowskii*, p. 11, *dembowskii* and *monetaria*, p. 12, C. Oberthür, Diagn. Lep. Ask., Island of Askold.

Peridea cinerea, A. G. Butler, *l. c.* p. 353, Japan.

Pheosia costalis, *albifascia*, and *sikkima*, F. Moore, *l. c.* p. 69, Darjiling.

Lophopteryx pryeri, A. G. Butler, *l. c.* p. 355, Japan; *L. ladislai*, C. Oberthür, *l. c.* p. 13, Island of Askold.

Paravetta sikkima, F. Moore, *l. c.* p. 70, Darjiling.

Rachia plumosa, id. *ibid.*, and P. Z. S. 1879, pl. xxxii. fig. 1, Darjiling.

Beara castanea, id. Desc. Ind. Lep. Atk. p. 71, pl. iii. fig. 9, Darjiling.

LIMACODIDÆ.

Limacodes loesa, Moore. Structure, variation, and larva noticed; Snellen & Piepers, Tijdschr. Ent. xxii. pp. 120 & 121.

New species:—

Scopelodes vulpina, F. Moore, Desc. Ind. Lep. Atk. p. 73, pl. iii. fig. 22, Darjiling.

Parasa valida, A. G. Butler, Ann. N. H. (5) iv. p. 242, Madagascar.

Limacodes castaneus and *dentatus* (both Staud., MS.), C. Oberthür, Diagn. Lep. Ask. pp. 7 & 8, Island of Askold; *L. chlorostigma*, p. 117, pl. ix. fig. 8, *albiguttatus*, p. 118, fig. 1, *circinatus*, p. 119, fig. 2, and *catenatus*, p. 121, fig. 3, pl. x., Snellen, Tijdschr. Ent. xxii., Celebes; *L. strigatus*, Mabille, Bull. Soc. Philom. (7) iii. p. 139, Madagascar.

Narosa rufotessellata, F. Moore, *l. c.* p. 73, pl. iii. fig. 24, Darjiling; *N. culta*, A. G. Butler, *l. c.* p. 356, Japan.

Contheyla thoracica, F. Moore, *l. c.* p. 74, pl. iii. fig. 7, Darjiling.

Monema ocellata, id. *l. c.* p. 74, Darjiling.

Miresa cuprea, id. *ibid.* pl. iii. fig. 8, Darjiling.

Setora divergens, id. *l. c.* p. 75, pl. iii. fig. 23, Darjiling.

Siculodidæ.

Siculodes plagula, Guén., = *Pyralis werneburgalis*, Kef.; P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 333.

Siculodes opalinula, sp. n., *id. l. c.* p. 347, Madagascar.

Drepanulidæ.

Drepana albo-notata, Mount Parisnath, Behar, p. 83, *flava*, fig. 7, *pallida*, *bi-ocularis*, fig. 9, and *postica*, fig. 8, p. 84, pl. ii. and *vinacea*, p. 85, Darjiling, F. Moore, Desc. Ind. Lep. Atk.; *D. specularis*, id., P. Z. S. 1879, p. 407, Ceylon: spp. nn.

Oreta sanguinea, id., Desc. Ind. Lep. Atk. p. 85, Darjiling; *O. auripes*, A. G. Butler, Ann. N. H. (5) iv. p. 355, Japan: spp. nn.

Saturniidæ.

Lelièvre, E. Notes sur quelques *Bombyx* séricigènes exotiques. iii. *Bombyx pernyi*. Feuill. Nat. ix. pp. 112 & 113.

Wailly, A. Notes on certain Silk-producing Bombyces. Ent. xi. pp. 8–11, 169–171.

Relates to the food, reproduction, &c., of various species.

Breyeria borinensis. De Borre reviews the controversy respecting the affinities of this fossil, which he is still inclined to regard as allied to the existing *Saturniidæ*; Ann. Ent. Belg. xxii. pp. lxxvii.–lxxxiii. It is also regarded as Lepidopterous by A. R. Wallace, Nature, xix. p. 582.

Attacus atlas. Life-history, with coloured figures of transformations, P. H. Gosse, Ent. xii. pp. 25–41, 67–75 (also reprinted separately); *A. cynthia*, silk (from the "Times"), J. Soc. Arts, xxvii. pp. 909 & 910; rearing, V. Batault, Mém. Soc. Sâone-et-Loire, ii. pp. 39 & 40; Naturalization in France, probable value, winding of silk, &c., M. Girard, Le Nat. i. (3) p. 4, Bull. Soc. Ent. Fr. (5) ix. p. lx. *A. pryeri*, A. G. Butler, redescribed and figured by him, Ill. Lep. Het. iii. p. 11, pl. xliii. fig. 5. *A. vacuna*, Westw., of which *perspicuus*, Butl., is probably a var. [?], noticed, Künckel d'Herculais, Le Nature, Sept. 1878, pp. 248 & 249, H. Lucas, Bull. Soc. Ent. Fr. (5) ix. pp. xviii. & xix.

Hyalophora cecropia taken at Clapham, J. Ives, Sci. Goss. xv. pp. 46 & 66; rearing in France, A. L. Clement, Bull. Soc. Ent. Fr. (5) ix. p. cxxi.

Antheræa yama-mai. On rearing; Capronnier, CR. Ent. Belg. xxii. pp. clix. & clx.

Attacus [*Antheræa*] *pernii*. Transformations described and figured; Millière, Ann. Soc. L. Lyon, xxv. pp. 1–7, pl. clv. figs. 1–5.

Actias luna. Aberrations, Blake, Tr. Am. Ent. Soc. vii. pp. xiii. & xiv.; rearing, J. Wullschlegel, MT. Ges. Aargau, i. pp. 100–103; *A. selene*, note on transformations, A. L. Clement, Bull. Soc. Ent. Fr. (5) ix. p. cxliii.

Heniocha, Hübn., recharacterized; Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 49.

Phalæna pavonia major and *minor*, Linn., are regarded by A. Speyer as the sexes of the common Emperor Moth; consequently this must take the name of *Saturnia pavonia*, and the large European species must retain that of *S. pyri*: S. E. Z. xl. pp. 151 & 152.

Aglia tau. Late appearance in 1879; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. lxxx.

Saturnia io. Food-plants; L. W. Goodell, Canad. Ent. xi. p. 78.

Coscinocera, g. n., A. G. Butler, P. Z. S. 1879, p. 163. Allied to *Argeina* and *Attacus*; type, *Att. hercules*, Misk., add *C. omphale*, sp. n., *l. c.* p. 164, New Ireland.

New species:—

Attacus obscurus, id., Tr. E. Soc. 1879, p. 5, Cachar.

Saturnia (*Bunæa*) *fusicolor*, and *S.* (*B.*) *auricolor*, Mabille, Bull. Soc. Philom. (7) iii. p. 139, Madagascar.

Tropæa aliena, A. G. Butler, Ann. N. H. (5) iv. p. 355, Japan.

Saturnia diospyri, Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 316, Madagascar; *S. zaddachi*, Dewitz, MT. Münch. ent. Ver. iii. p. 34, pl. ii. fig. 6, Guinea.

Perisomena cincta, Mabille, *l. c.* p. 317, Madagascar.

Heniocha bi-oculata, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 50, Damara Land.

Bombycidæ.

Blakely, E. T. The Silk Industry of Northern Italy. J. Soc. Arts, xxvii. pp. 96–100.

Entirely statistical.

Congrès International Séricole, tenu à Paris du 5 au 10 Sept. 1878, xxiii. Paris: 1879, 8vo, pp. 154.

Chiefly of economic interest.

Riley, C. V. The Silkworm; being a brief Manual of Instructions for the Production of Silk. Washington: 1879, 8vo, pp. 31, 2 pls.

Extracted from the Rep. Ent.; Ann. Rep. Dept. Agric. 1878, pp. 10–32.

Tichomiroff, A. Ueber die Entwicklungsgeschichte des Seidenwurms. Zool. Anz. ii. pp. 64–67.

Deals with the development of the embryo in the egg.

Bombyx mori. Prospects of sericiculture in England and elsewhere; A. Wallace, P. E. Soc. 1879, pp. xiv. & xv. Notes on the casting of the tracheæ at the last moult, and on two pupæ in one cocoon; Potts & Riley, Am. Nat. xiii. pp. 454, 455, & 652. Westwood quotes some old observations of Majoli, according to which the larvæ are sometimes transformed after the fourth moult without forming any cocoon, the result being an insect presenting a mixture of the characters of the larva and

the imago (Tr. E. Soc. 1879, pp. 227 & 228). If the true legs of the larvæ are amputated, the legs of the moth will be proportionately defective; Mélise, Ann. Ent. Belg. xxii. pp. xcii.–xciv., *cf.* R. McLachlan, P. E. Soc. 1879, pp. xxxii. Discussion on diseases; Assoc. Fr. vii. pp. 769 & 770.

Hanisa, g. n., F. Moore, P. Z. S. 1879, p. 406. Allied to *Bombyx*, &c.; type, *B. subnotata*, Walk.

Aristhala sikkima, sp. n., *id. l. c.* p. 406, pl. xxxiii. fig. 3, Darjiling.

Ocinara diaphana, id. *l. c.* Desc. Ind. Lep. Atk. p. 83, Khasia Hills.

LASIOCAMPIDÆ.

Gastropacha, sp., *Opsirrhina fervens*, Walk., and *Anapæa oxleyi*, Newm. Notes on the transformations of these Australian species: the latter presents sexual differences of colour and marking in the larva state; Meldola & Francis, P. E. Soc. 1879, pp. xv. & xvi.

Datanoides fasciata and *Phrixolepia sericea*, A. G. Butler, redescribed and figured by him; Ill. Lep. Het. iii. p. 11, pl. xliii. figs. 4 & 6.

Gastropacha quercus two or three years in cocoon, Ent. Nachr. v. pp. 218, 257, 258, & 285; *G. vishnu*, Lef., affinities and transformations discussed, Snellen & Piepers, Tijdschr. Ent. xxii. pp. 122–124.

Estigena pardale, Moore. Structure and transformations discussed; *iid. l. c.* pp. 124 & 125.

Bombyx castrensis: O. Staudinger describes var. *khirghisica* from S. E. Russia, S. E. Z. xl. p. 318. *B. quercus*, notes on breeding, G. R. Dawson & W. C. Dale, Ent. xii. pp. 59 & 106; specimen with malformed antennæ, F. O. Morris, P. Z. S. 1879, p. 145; dwarf and sterile ♀ bred, J. Fallou, Bull. Soc. Ent. Fr. (5) ix. pp. lxxxix. & xc. *B. rubi*, rearing, R. R. Fans, Sci. Goss. xv. p. 19; Hymenopterous parasite on eggs, Le Nat. i. pp. 29 & 30.

Lebeda cervicolora, Saalm., = *Borocera cajani*, Guén., = *B. madagascariensis*, Boisd., var., and *L. badia*, Saalm., is another var.; P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. 313, *cf.* also A. G. Butler, Cist. Ent. ii. p. 393.

Borocera stali, Wallengr., = *Pachypasa effusa*, Walk., = *Gonometa postica*, Walk.; Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 51.

New genera and species:—

Kosala, F. Moore, P. Z. S. 1879, p. 407. Allied to *Eutricha*; type, *K. sanguinea*, sp. n., *l. c.* pl. xxxiii. fig. 8, Khasia Hills.

Mahanta, id. Desc. Ind. Lep. Atk. p. 78. Placed next to *Eutricha*; type, *M. quadrilinea*, sp. n., *l. c.* pl. iii. fig. 20, Darjiling.

Arguda, id. *l. c.* p. 79. Allied to *Metanastria*; type, *A. decurtata*, sp. n., *l. c.*, Darjiling.

Radhica, id. *l. c.* Allied to last; *R. flavo-vittata*, sp. n., *l. c.*, N.W. Himalaya.

Chatra, id. *l. c.* p. 80. Allied to *Œona*; type, *C. grisea*, sp. n., *l. c.*, Cherra Punji and Khasia Hills.

Rhinobombyx, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 51. Allied to

Hammatocampa, Wallengr.; type, *R. cuneata*, sp. n., *l. c.* p. 52, Damara Land.

Belippa apicata, F. Moore, Desc. Ind. Lep. Atk. p. 75, Darjiling.

Gastropacha sikkima, p. 75, *sinuata* and *torrida*, pl. iii. fig. 19, p. 76, *id. l. c.*, Darjiling.

Odonestis signata, id. *l. c.* p. 76, Darjiling; *O. pyriformis*, pl. xxxiv. fig. 7, Masuri, and *divisa*, Ceylon, *id.* P. Z. S. 1879, p. 408.

Messata æneseens, *quadrifasciata*, and *vialis*, Ceylon, and *fraterna*, pl. xxxiv. fig. 6, Bombay; *id. l. c.* p. 409.

Eupterote ochripicta, Ceylon, and *canaraica*, Canara, *id. l. c.* p. 410; *E. nilgirica*, id. Desc. Ind. Lep. Atk. p. 77, Nilgiri Hills.

Sphingognatha khasiana, id. *ibid.*, Khasia Hills.

Eutricha flavo-signata, id. *ibid.*, Darjiling; *E. cheela*, id. P. Z. S. 1879, p. 408, Dharmsala, N.W. Himalaya.

Metanastria minor, id. Desc. Ind. Lep. Atk. p. 78, Darjiling.

Bombyx henkii, Staudinger, S. E. Z. xl. p. 318, S.E. Russia; *B. sordida*, Mabille, Bull. Soc. Philom. (7) iii. p. 138, Madagascar.

Lasiocampa gueneana and *plagiogramma*, id. Ann. Soc. Ent. Fr. (5) ix. p. 314, Madagascar; *L. bhira*, F. Moore, P. Z. S. 1879, p. 410, pl. xxxiv. fig. 2, Dharmsala, N.W. Himalaya.

Anchirithra punctuligera, Mabille, *l. c.* p. 315, Madagascar.

Suana cervina, F. Moore, *l. c.* p. 410, Ceylon.

Brachylia acronyctoides, id. *l. c.* p. 411, pl. xxxiv. fig. 4, Bombay.

Lebeda placida, p. 80, *vulpina*, *lineata*, and *fulgens*, p. 81; id. Desc. Ind. Lep. Atk., Darjiling.

Borocera pelias, Mabille, Bull. Soc. Philom. (7) iii. p. 138, Madagascar.

Trichiura khasiana, F. Moore, *l. c.* p. 82, Khasia Hills.

Mustilia castanea and *hepatica*, pl. iii. fig. 18, *id. ibid.*, Darjiling; *M. sphingiformis*, id. P. Z. S. 1879, p. 407, pl. xxxiii. fig. 4, Masuri.

Anisota bisecta, J. A. Lintner, Canad. Ent. xi. p. 10, Wisconsin.

Zeuzeridæ.

Cossus centerensis, natural history, J. S. Bailey, Canad. Ent. xi. pp. 1-5, plate; *C. ligniperda* coming to sugar, Sci. Goss. xv. pp. 143 & 214.

Endagria pantherina noticed; V. Batault, Mém. Soc. Sâone-et-Loire, ii. pp. 40 & 41.

Arbela, g. n., F. Moore, P. Z. S. 1879, p. 411. Allied to *Cossus*; to contain *A. tetraonis*, sp. n., *l. c.* pl. xxxiv. fig. 3, Bombay, *Cossus tessellatus*, Moore (*infrà*), and *C. quadrinotatus*, Walk.

New species :—

Cossus arenicola, O. Staudinger, S. E. Z. xl. p. 317, S.E. Russia; *C. tessellatus*, p. 85, Calcutta, and *cashmirensis*, p. 86, Kashmir, F. Moore, Desc. Ind. Lep. Atk.; *C. maculatus*, Snellen, Tijdschr. Ent. xxii. p. 125, pl. x. fig. 4, Celebes; *C. breviculus*, Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 344, Madagascar.

Endagria locuples, id. Bull. Soc. Philom. (7) iii. p. 134, Madagascar.

Zeuzera pardicolor and *stigmatica*, p. 86, and *albo-fasciata*, p. 87, F.

Moore, *l. c.*, Darjiling; *Z. liturata*, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 48, Damara Land.

Phragmatœcia saccharum, Darjiling, and *minor*, Silhet; F. Moore, *l. c.* 87.

Hepialidæ.

Simulation of death in *Hepialidæ*; J. Anderson, Sci. Goss. xv. p. 207.

Hepialus hectus. The male has two scent-pouches at the base of abdomen, and the hind tibiæ, which are generally inserted in the pouches, are provided with a tuft of hair on the inside, and serve to diffuse the odour. P. Bertkau, SB. Ver. Rheinl. xxxvi. pp. 288 & 289; Ent. Nachr. v. pp. 223 & 224.

Charagia virescens. Notes on habits and transformations; C. H. Gossett, Tr. N. Z. Inst. xi. pp. 347 & 348.

Hepialus sexnotatus, Darjiling, and *murinus*, Dharmsala, F. Moore, P. Z. S. 1879, p. 413; *H. umbrinus*, id. Desc. Ind. Lep. Atk. p. 88, Darjiling: spp. nn.

Gorgopis niphonica, sp. n., A. G. Butler, Ann. N. H. (5) iv. p. 357, Japan.

Phassus salsettensis, fig. 5, Bombay, *malabaricus*, Canara and Nilgiris, *chalybeatus*, Darjiling, p. 412, and *albo-fasciatus*, fig. 8, p. 413, Nilgiris; F. Moore, P. Z. S. 1879, pl. xxxiv.: spp. nn.

Porina fuliginea, sp. n., A. G. Butler, Cist. Ent. ii. p. 488, New Zealand.

Noctuidæ.

Butler, A. G. On the natural affinities of the *Lepidoptera* hitherto referred to the genus *Acronycta* of authors. Tr. E. Soc. 1879, pp. 313–317, pl. xi.

The writer discusses the larval characters and neuration chiefly of the British species, and distributes them as follows:—Arctiidæ: *Pharetra rumicis* and *P. auricoma*, &c.; Liparidæ: *Acronicta* [sic] *leporina* and *simplex*, *Artomyasis aceris* and *hastulifera*, &c.; Notodontidæ: Genus ——? *megacephala*, *Triæna psi*, *tridens*, &c., *Hyboma strigosa*; Noctuidæ: *Jocheœra alni* and *Mamestra ligustri*. Tr. E. Soc. 1879, pp. 313–317, pl. xi.

——. On the *Lepidoptera* of the Amazons, collected by J. W. H. Trail during the years 1873 to 1875. Part iii. Noctuites. Tr. E. Soc. 1879, pp. 19–76.

143 species are noticed, of which 55 are described as new. Many observations and corrections in synonymy occur, of which the following are the most important:—*Prodenia strigifera*, Walk., = *Xylina inquieta*, Walk.; *Perigea otiosa*, *paupera*, and *imbella*, Walk., are probably all varieties of one species; *Condica palpalis*, Walk., = *Phalœna cupentia*, Cram.; *Nystalea*, *Cucullia*, &c., are probably *Notodontidæ*; *Agrophila*, all the New World species placed in this genus by Walker belong to *Aphusia*; *Palindia fumata*, Feld., = *mabis*, Guén.; *P. egala*, Walk., = *julianata*, Stoll; *P. spectabilis*, Walk., = ? *perlata*, Guén.; *P. testacei-*

ceps, Feld., = *alabastraria*, Hübn.; *P. crocoptera*, Feld., = *corinna*, Cram.; *Ceroctena pictipennis*, Feld., = *Giscala quadricolor*, Walk.; *Bugisara bombycoides*, Walk., = *Phal. licormas*, Cram.; *Ecregma*, Walk., and *Hemiceras*, Guén., are probably *Notodontidæ*, allied to *Apela*, *Lophopteryx*, &c.; *Hemiceras metastigma*, Walk., amended description; *Barydia japeta*, Cram., is noticed; *Homoptera involuta*, Walk., is an *Ypsia*, and *H. ustipennis*, Walk., a *Xylis*; *Phal. sulima*, Stoll, = *Hypogramma damonia*, Cram.; *Stictoptera phryganoides* and *Nagara steirialis*, Walk., = *Stictoptera subaurata*, Walk.; *Hypocala filicornis*, Guén., = *H. andremona*, Cram., var.; *Azeta* (?) *pertinax*, Feld., = *Vogia amplivitta*, Walk.; *Brotis* (?) *stenogaster*, Feld., = *Gigia obliqua*, Walk.; *Brujas despecta*, Walk., is a *Blosyris*, and perhaps = *scolopacea*, Cram.; *Phal. helima*, Cram., is a *Brujas*, and comes from South America, not Sierra Leone; *Brujas rengus*, Walk., = *Letis intracta*, Walk.; *Letis*, Hübn.: *Phal. corisandra*, Cram., = *P. occidua*, Linn.; *L. incipiens*, Walk., = *Xylis ustipennis*, Walk.; *P. marmorides*, Cram., is allied to *Brujas maculicollis*, Walk., and may be an extreme var of *occidua*, ♀; *Letis integra*, Walk., = *Syrnia letiformis*, Guén.; *Crinoides*, Butl., and *Bardaxima*, Walk., are *Notodontidæ*, the latter scarcely differs from *Etobesa*; *Phurys biangulata*, Walk., is a *Heteropygas*; *P. contenta*, Walk., = *Poaphila scita*, Walk., and is a *Hemiceras*, allied to *H. linea*, Guén.; *P. garnoti*, Guén., appears to be a true *Phurys*; *P. inficita* is probably a *Poaphila*; *Epidromia* (*Obroates*) *negata*, Walk., amended description; *Massava scissa*, Walk., = *Isogona continua*, Guén.; *Zethes*: all Amazonian or New World forms referred by Walker to this genus belong to *Ephyrodes*; *Mazacyla fusifera*, Walk., = *Focilla relata*, Walk.; *Amphigonia* (?) *erythropus*, Feld., = *euspila*, Walk.; *A.* (?) *rudis*, Walk., is a species of *Nedusia* (*Geometrites*); *Focilla guerini*, Guén., *Amphigonia costalis*, Walk., and *F. ghilianii*, Guén., probably belong to *Azatha*; *Homoptera pacifica*, Walk., belongs to *Lacera*; *Rhescipha* is allied to *Teratocera*, and not to the *Limacodidæ*; *Liviana pullescens*, *Leida pallida*, and *Ephyrodes scitilinea*, all of Walker, = *Thermesia sigillata*, ♂; *Argidia subrubra*, Feld., = *Azirista intracta*, Walk., = *Phal. tarchon*, Cram.; *Arg. aganippe*, Feld., = *Hypernaria subvelata*, Walk.; *Orthogramma coppryi*, Walk., = *Archana certa* and *Azeta apicifera*, Walk.; *Epitausa lætubilis*, Walk., = *O. coppryi*, Guén.; *O. vacillans*, Walk., = *Plaxia ingenua*, Walk., and is allied to *Thermesia scalena*, Feld.; *Thermesia*: the species referred to this genus by Walker are distributed as follows—*T. sigillata* and *alacris* belong to *Liviana*; *T. prospera*, *moniliaris* (= *Phurys arenosa*), *subrutilans*, and *finipalpis* belong to *Capnodes*; *T. torrida* = *Gerisa discerpta*; *T. ignilinea* belongs to *Orthogramma*; *T. bipunctata* belongs to *Ephyrodes*; *T. guttularis* belongs to *Orthogramma* (= *Epitausa*); *T. croceiceps* belongs to *Dagassa*; *T. generatrix* belongs to *Orsa*; *T. arenacea* = *consocia* = *retrahens*, but is not a true *Thermesia*; *T. vagans* belongs to *Egnasia*; *T. despecta* belongs to *Bithiasa*; *T. transducta* = *Azuzia rubricans*; *T. simplex* = *Iluza decisa*; *T. reticulata* = *T. scitaria*; *Remigia subsignata*, Walk., = *Thermesia gemmatalis*, Hübn., var.; *Hypernaria continuens*, Walk., = *Azeta uncas*, Guén.; *Azeta vampoa*, *rhodogaster*, and *mirzah*, Guén., and *Chabora undulifera*, Walk., = *Pangrapta repugnalis*, Hübn.;

A. quassa, Walk., = *Massala dimidiata*, Walk.; *A. hypopyrina* and *leucoma*, Feld., belong to *Pangrapta*, and *A. obvertens*, Walk., = *Capnodes turtur*, Feld.; *Homoptera* (?) *albirena*, Walk., = *Helia calligramma*, Hübn.; *H. dotata*, *quadrisignata*, *zonata*, and *scitior* (= *perpusilla*) belong to *Metalectra*; *H.* (?) *extranea*, Walk., = his *Mulelocha frontalis* and (var.) *Blanona dives* (? = *Selenis compacta*, Feld.), and may be referred to *Mulelocha*, to which *H. ocellata*, Walk., is also allied; *H. diminutiva*, Walk., is a *Dagassa*; *Cyclopteryx* (?) *macrops*, Feld., = *Dialithis dioptica*, Walk.; *Bleptina pithesalis*, Walk., = *Megatomis spurcatalis*, Walk.; *Menecina bifacies*, Walk., = *Blanona selenisoides*, Walk.; *Hypenaria*, Guén.: of the species referred to this genus by Walker—*H. ortilia*, *orphna*, *tarchon*, and *subvelata* belong to *Argidia*; *H. patula* = *Latebraria contacta*; *H. sublineata* is an *Amphigonia*; *H. continuens* = *Azeta uncas*; *H. punctulosa* is a small *Lacera*; *H. interponens* probably = *H. roseispila*; *Capnodes obliterata*, Walk., = *sterope*, Cram.; *C. exhilarans*, Walk., and ? *uncinata*, Feld., = *imitans*, Walk.; *Phalæna striataria*, Cram., belongs to *Capnodes*; *C. mundicola*, Walk., redescribed, *C. rufinans*, Walk. (♂ = *Gerisa. discerpta*, Walk., ♀ = *Thermesia torrida*, Walk.), = *Capnodes onyx*, Guén.; this species, and also *C. subguttata*, Feld., and *rotundifera*, Walk., belong to *Gerisa*; *C. melanea*, Walk., probably belongs to *Pangrapta*; *C. sexplagiata*, Walk., = *pueritia*, Cram.; *Apistis*, Hübn., the type is *A. fellearia* Hübn. (= *Hypernaria metastigma*, Walk.), and *Thermesia* (?) *infumata*, Feld. (= *Hypernaria anisospila*, Walk.), and *Plaxia subducta* and *spiloleuca*, Walk., may also be placed in the same genus; *Empelathra*, Walk. (type, *amplificans*, Walk.): *Orthogramma vacillans* (= *Plaxia ingenua*), and *Thermesia scalena*, Feld., may be provisionally referred to this genus.

Grote, A. R. On *Lithophane* and new *Noctuidæ*. Bull. U. S. Geol. Surv. v. pp. 201–208.

Walker's American *Xylinæ* are identified by Fernald as follows:—*antennata* = *cinerea*, Riley, *infructuosa* ? = *petulca*; *spoliata* and *clanfacta* are not *Xylinæ*.

——. The Species of *Erotyla*, *Spragueia*, *Fruva*, *Xanthoptera*, *Exyra*, and *Prothymia*. Canad. Ent. xi. pp. 231–238.

These are discussed with special reference to their neuration, and a list of N. American species is added. The following synonyms occur:—*Spragueia leo*, Guén., = *onagrus*, Herr.-Schäff. (*nec* Guén.); *S. truncatula*, Zell., = *apicella*, Grote; *Exyra nigrocaput*[!], Morr., = *ridingsi*, Riley; and *Prothymia sub-olivacea*, Harv., = *orgiæ*, Grote.

A. G. Butler (Ill. Lep. Het. iii.) figures and redescribes the following known *Noctuæ* (his own, unless otherwise stated):—*Gonophora derasoides*, p. 12, fig. 1, *Acronycta leucocuspis* and *increta*, p. 13, figs. 2 & 3, *Leucania grata*, *Alysia grisea*, and *Dandaca senex*, p. 13, figs. 4–6, *Agrotis illoba* and *odiosa* and *Hermonassa cecilia*, p. 14, figs. 7–9, *Graphiphora caliginea* and *Dasycampa fornax*, p. 15, figs. 10 & 11, *Phlogophora beatrix*, fig. 12, pl. xliv., and *Aplectoides nitida*, pl. xlv. fig. 1, p. 16, *Eurois virens*, *Hadena lucia*, and *Xylina arctipennis*, p. 17, figs. 5, 2 & 3, *Lithophane saga* and *Cucullia fraterna*, p. 18, figs. 9 & 10, *Heliothis adanita* and *Acontia bi-*

plagiata (Walk.), p. 19, figs. 4 & 7, *A. bimacula* (Walk.), fig. 8, pl. lxv., *A. maculosa* (Walk.) and *Erastria stygia*, pl. xlvi., figs. 1 & 2, p. 20, *Callopistria obscura* and *æthiops*, p. 21, figs. 3 & 4, *Scedopla regalis*, *Plusia jessica* and *mikadina*, p. 22, figs. 5–7, *Deva splendida* and *Amphipyra erebina*, p. 23, figs. 8 & 12, *Nænia muscosa*, p. 24, fig. 9, *Catocala bella*, *pragnax* (Walk.), figs. 10 & 11, pl. xlvi., *zalmunna*, pl. xlvii. fig. 3, p. 25, *Sypna achatina* and *fuliginosa* and *Nyctipao lætitia*, p. 26, figs. 7–9, and *Hypopyra extricans* (Walk.), p. 27, fig. 12, pl. xlvii.

F. Moore (Second Yark. Miss. Lep. pl. i.) redescribes and figures the following *Noctuæ* (all his own species):—*Acronycta karghalica*, fig. 9, p. 8, *Hydræcia tibetana*, fig. 21, *Mamestra canescens*, fig. 13, p. 9, *Agrotis tibetana*, fig. 16, *Spælotis undularis*, fig. 10, p. 10, *Tæniocampa chiklika*, fig. 11, *Hadena stoliczkana*, fig. 12, p. 11, and *Heliothis hyblæoides*, fig. 20, p. 12.

Dicopis vitis, French, = *Mamestra distincta*, Hübn., *Heliothis illinoiensis*, Fr., = *Pyrrhia illiterata*, and *Orthosia signata*, Fr., = *Glæa anchocelioides*, Guén., which curiously resembles *Agrotis alternata*, but may be distinguished by the unarmed tibiæ; Grote, N. Am. Ent. i. p. 11.

Grote also publishes some conjectural corrections of the synonymy of various North American *Noctuæ*; Canad. Ent. xi. p. 29.

Noctuæ attracted by decaying animal matter; Bailey, Canad. Ent. xi. p. 204.

Captures of *Noctuidæ* at Clyde, Wayne Co., N. Y.; W. L. Devereaux, Canad. Ent. xi. pp. 105–109.

Panthea cœnobita, Esp. Habits noticed; W. Schmidt, S. E. Z. xl. p. 109.

Acronycta walkeri, Andr., = *albo-rufa*, Grote; A. R. Grote, Bull. Brooklyn Ent. Soc. 1879, p. 93.

Sesamia cyrnæa, Mab., probably = *S. cretica*, Led.; Mabille, Bull. Soc. Ent. Fr. (5) ix. pp. 319 & 320.

Nonagria fulva: larva noticed; J. Sang, Ent. M. M. xvi. p. 110. *N. sparganii*, Esp., new to Britain, S. Webb, *op. cit.* xv. p. 236; natural history, W. Buckler, *op. cit.* xvi. pp. 99–101.

Gortyna flavaga var. *xanthenes*, Germ., recorded from Algeria; Goossens, Bull. Soc. Ent. Fr. (5) ix. p. clvii.

Hydræcia micacea. Habits of larvæ; F. Schmidt, Ent. Nachr. v. pp. 30–32.

Dipterygia caliginosa, Walk., redescribed; A. G. Butler, Ann. N. H. (5) iv. p. 359, Japan.

Prodenia phylolaceæ, Abb. & Smith, noticed; A. R. Grote, Canad. Ent. x. pp. 205 & 206.

Crymodes exulis and *Hadena assimilis*. Notes on these species, and their supposed identity; T. G. Smart and others, Ent. xii. pp. 84–86, 107, 157 & 158.

Mamestra abjecta: larva described; W. Buckler, *l. c.* xvi. pp. 19–21, 93. *M. griseipennis*, Feld., = *Agrotis* (?) *moderata*, Walk., and probably belongs to *Hapalia*; *M. angusta*, Feld., = *Xylina spurcata*, Walk., = *Hadena mutans*, Walk.; and *M. acceptrix*, Feld., = *Euplexia insignis*, p. Walk.: A. G. Butler, Cist. Ent. ii. pp. 489–491.

Pyralis secalis, Linn. M. W. Schöyen reviews the controversy relating to this species, and determines it to be *Hadena didyma*; the latter name therefore falls. S. E. Z. xl. pp. 389–396.

Luceria loculata, Mor., = *Mamestra pastor*, Guén.; A. R. Grote, *l. c.* p. 39.

Agrotis segetum noticed; F. Sintenis, SB. Ges. Dorp. v. pp. 98 & 99.

Graphiphora. A. R. Grote now refers to this genus his *Mamestra puerilis*, *Dianthœcia rufula*, *Himella furfurata* and *fidelis*, *Acerra normalis* and *muricina*, and Morrison's *Dianthœcia modesta*; l. c. pp. 26–28.

Pachnobia hyperborea. Varieties; T. G. Smart, Ent. xii. p. 86.

Anchocelis lunosa hibernates as a larva; E. A. Fitch, Ent. xii. pp. 19 & 20.

Orrhodia rubiginea. Larvæ in ants' nests; Schumann, Ent. Nachr. v. p. 80.

Xanthia gilvago, Dup., noticed; "N. R.," Le Nat. i. p. 66.

Dianthœcia barretti. Natural history; W. Buckler, *l. c.* pp. 52–55.

Polia nigro-cincta. Variety figured; Ent. xii. p. 162.

Miselia oxyacanthæ, L., var. *capucina*, Mill., recorded as new to Germany; Von Wacquant & Pflümer, S. E. Z. xl. p. 160.

Iaspidea celsia, Linn. Transformations described; F. Thurau, S. E. Z. xl. pp. 511 & 512, and Ent. Nachr. v. pp. 252 & 253.

Brotolomia meticulosa. Hibernation; H. Wittenmann, Ent. Nachr. v. pp. 190 & 191.

Hadena funerea, Hein., noticed as occurring in Italy; Turati, Bull. Ent. Ital. xi. p. 176.

Erana vigens, Walk., = his *E. graminosa*; A. G. Butler, *l. c.* p. 492.

Cloantha hyperici double-brooded on the Rhine; A. Fuchs, S. E. Z. xl. p. 172.

Cucullia fraudatrix 4 years in pupa; Kramer, Ent. Nachr. v. p. 287.

Rhodophora florida, Guén. Habits of moth and larva; the larva feeds on the buds and seeds of the Evening Primrose (*Œnothera biennis*), and the moth conceals itself by day among the withering flowers. In both cases, the colouring is completely protective. D. S. Kellicott, N. Am. Ent. i. pp. 30 & 31.

Heliothis sulmala, Streck., = *Euleucyptera comatilis*, Grote; A. R. Grote, *l. c.* p. 247.

Acontia. Table of the African species, pp. 66–68; *A. guttifera*, Feld. & Rog., described, p. 64. Aurivillius, Œfv. Ak. Förh. xxxvi. (7).

Thalpochares acclivis, Feld. & Rog. Structure noticed; *id. l. c.* p. 68.

Palindia dominicata, Guén., redescribed; A. R. Grote, N. Am. Ent. i. p. 13.

Aletia argillacea (Cotton Worm). Remarks; C. V. Riley, Rep. Ent., Ann. Rep. Dept. Agric. 1878, pp. 5–10. Parasites; *id.* Canad. Ent. xi. pp. 161 & 162. Hibernation of moth; *id.* Am. Nat. xiii. p. 726.

Plusia gamma. Abundance in 1879, migrations, &c. [*cf.* also under *Pyrameis cardui* (*Nymphalidæ*)]; Ent. Nachr. v. pp. 256, 257 & 319; Ent. M. M. xvi. pp. 110 & 111; Bull. Soc. Ent. Fr. (5) ix. pp. lxxxvii.–lxxxix.; CR. Ent. Belg. xxii. pp. cxxxi. & cxxxii. Destructive to flax; Dragendorff & Sintenis, SB. Ges. Dorp. v. pp. 100–105.

Gonitis fructifera is common to the West Indies and Japan; A. G. Butler, Ann. N. H. (5) iv. p. 350.

Catocala editha, Edw., = *amatrix*; Blake, Tr. Am. Ent. Soc. vii. p. iv. *C. elocata* var. *oberthuri*, from Algeria, described by L. Austaut, Le Nat. i. p. 85.

Ophideres cajeta, Walk., = *pomona*, Cram., = *fullonia*, Clerck; *O. bilineosa*, Walk., = *cajeta*, Cram.: A. G. Butler, Tr. L. S. (2) i. p. 561.

Dasypodia selenophora. Transformations described; W. Colenso, Tr. N. Z. Inst. xi. pp. 300-304.

Cyligramma importans, Kef., = *magus*, Guér.; *C. raboudou*, Luc., = *disturbans*, Walk.: P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 327. Butler, however (Cist. Ent. ii. p. 393) refers *C. raboudou* to *conturbans*, Walk.

Ophisma radama, Feld., = *præstans*, Guén.; *O. infinita*, Guén., = *finita*, Guén.: P. Mabille, *l. c.* p. 328.

New genera and species:—

Belosticta, A. G. Butler, Ann. N. H. (5) iv. p. 357. Allied to *Acronycta*; type, *B. extensa*, sp. n., Japan.

Epipsammia, O. Staudinger, S. E. Z. xl. p. 320. Allied to *Tapinostola*; type, *E. deserticola*, sp. n., *l. c.*, S.E. Russia.

Hebdomochondra, id. *l. c.* p. 321. Allied to *Tapinostola*; type, *H. syrticola*, sp. n., *l. c.*, S.E. Russia.

Palpangula, id. *l. c.* p. 324. Allied to *Leucanitis*; types, *L. cestis*, Mén. (= *punctata*, Mén., ♀), *densistrigata*, Staud., and *spilota*, Ersch. (= *henkii*, Staud.).

Metecia, Snellen, Bol. Ac. Arg. iii. p. 94. Allied to *Mycteroplus*; thorax clothed with long depressed hair; tibiæ strongly spined. Type, *M. cornifrons*, sp. n., *l. c.* p. 96, pl. i. figs. *a–d*, Cordova.

Plusidia, A. G. Butler, Ill. Lep. Het. iii. p. 27. Allied to *Euclidia*, but less hairy; palpi erect and very long; second segment of the abdomen with a prominent dorsal pencil. Type, *P.* [*h*]*abrostoloides*, sp. n., *l. c.* p. 28, pl. xlvii. fig. 5, Hakodadi.

Paranympha [erroneously attributed to Cramer], *id.* Tr. E. Soc. 1879, p. 73. Allied to *Capnodes*; type, *Phalæna toxea*, Cram.; add *P. albocostata*, sp. n., *l. c.*, Rio Jutahi.

Cymatophora argenteo-picta, C. Oberthür, Diagn. Lep. Ask. p. 13, Island of Askold; *C. plumbea*, A. G. Butler, Ann. N. H. (5) iv. p. 357, Japan.

Dicopis vitis, G. H. French, Canad. Ent. xi. p. 76, Illinois (?); *D. damalis*, A. R. Grote, Bull. U. S. Geol. Surv. v. p. 208, California.

Microcælia distincta, A. G. Butler, Tr. E. Soc. 1879, p. 19, Rio Trombetas.

Diphthera æquatoria, P. Mabille, Guide du Naturaliste, Feb. 1879, p. 26, Congo.

Acronycta consanguis, A. G. Butler, Ann. N. H. (5) iv. p. 358, Japan.

Apatela distans, Montreal, and *parallela*, Colorado, A. R. Grote, Canad. Ent. xi. p. 58; *A. tota*, id. N. Am. Ent. i. p. 12, Texas; *A. felina*, id. Bull. U. S. Geol. Surv. v. p. 208, California.

Mithimna deparca, A. G. Butler, *l. c.* p. 358, Japan.

Leucania photophila, id. Ent. M. M. xv. p. 269, Honolulu.

Nonagria turpis, id. Ann. N. H. (5) iv. p. 359, Japan.

Lithophane cinerosa and *hemina*, A. R. Grote, *l. c.* p. 202, New York.

Xylophasia rubescens, A. G. Butler, Cist. Ent. ii. p. 489, New Zealand; *X. scitula*, id. Ann. N. H. (5) iv. p. 359, Japan.

Dargida singularis, id. Tr. E. Soc. 1879, p. 23, Parentins (? = *Phal. phytolucea*, Sepp).

Mamestra zachi, Bohatsch, Verh. z.-b. Wien, xxix. p. 406, Syria; *M. arietis*, A. R. Grote, *l. c.* p. 207, California.

Apamea limbata (? = *Caradrina variolosa*, Motsch.), A. G. Butler, Ann. N. H. (5) iv. p. 360, Japan.

Celæna fasciata and *dentilineata*, id. Tr. E. Soc. 1879, pp. 23 & 24, Amazons.

Caradrina jurassica (Riggenbach), Millière, Ann. Soc. L. Lyon, xxv. p. 7, pl. clv. fig. 9, Canton Soleure; *C. albisignata* (Staud., MS.) and var. *cæca*, C. Oberthür, *l. c.* p. 14, Island of Askold; *C. spælotidis*, A. G. Butler, *l. c.* p. 243, Madagascar.

Agrotis depravata, id. *l. c.* p. 360, Japan; *A. arenivolans*, id. Ent. M. M. xv. p. 269, Maui; *A. vocalis* and *vernilis* (sic), A. R. Grote, Canad. Ent. xi. p. 56 & 57; *A. basalis*, *munis*, p. 38, and *mirabilis*, p. 39, all from Colorado, *conchis* and *olivalis*, p. 43, *parentalis*, *cænis*, and *catenula*, p. 44, *decipiens* and *minimalis*, p. 45, *id.* N. Am. Ent. i., Western States; *A. niveivenosa*, Colorado, and *biclavis*, Arizona, *id.* Bull. U. S. Geol. Surv. v. p. 206; *A. pseudoplectra*, Snellen, Bol. Ac. Arg. vi. p. 96, Cordova.

Chera virescens, A. G. Butler, Cist. Ent. ii. p. 489, New Zealand.

Chersotis sericea, id. *l. c.* p. 490, New Zealand.

Epilecta decorata, id. Ann. N. H. (5) iv. p. 361, Japan.

Triphænopsis efflorescens, id. *ibid.*, Japan.

Graphiphora lepida and *lubentia*, id. *l. c.* p. 362, Japan; *G. purpurea*, id. Cist. Ent. ii. p. 490, New Zealand; *G. garmani*, Illinois, *perbrunnea*, p. 28, and *erythrolita*, p. 208, California, A. R. Grote, Canad. Ent. xi.

Panolis notabilis, A. G. Butler, Ann. N. H. (5) iv. p. 243, Madagascar.

Perigrapha præses, A. R. Grote, Bull. U. S. Geol. Surv. v. p. 202, Sanzalito.

Tæniocampa evanida, A. G. Butler, *l. c.* p. 362, Japan.

Orthosia signata, G. H. French, *l. c.* p. 76, Illinois (?); *O. conradi*, A. R. Grote, *l. c.* p. 203, Colorado.

Eupsilia strigifera, A. G. Butler, *l. c.* p. 363, Japan.

Dasycampa evelina and *ardescens*, id. *l. c.* pp. 363 & 364, Japan.

Mesogona dilatata and *divergens*, id. *l. c.* p. 364, Japan.

Cosmia achatina, id. *l. c.* p. 365, Japan.

Eremobia virescens, id. *l. c.* p. 243, Madagascar.

Oncocnemis aterrima, A. R. Grote, Canad. Ent. xi. p. 199, California; *O. mirificatus*, id. Bull. U. S. Geol. Surv. v. p. 207, Nevada.

Polia illepida, id. Canad. Ent. xi. p. 95, Nevada and Colorado.

Phlogophora pallens (Staud., MS.), C. Oberthür, *l. c.* p. 14, Island of Askold.

Euplexia debilis, A. G. Butler, *l. c.* p. 244, Madagascar.

Hadena jankowskii, C. Oberthür, *l. c.* p. 14, Island of Askold; *H. longula*, Nevada, *modiola*, Wisconsin, p. 204, *fumosa*, *H.* (*Pseudanarta*) *flavidens*, Colorado, and *H.* (*P.*) *aurea*, Texas, p. 205, A. R. Grote, *l. c.*

Xylina mirabilis, A. G. Butler, *l. c.* p. 365, Japan.

Morrisonia infidelis, A. R. Grote, Canad. Ent. xi. p. 206, Michigan.

Nystalea squamosa, A. G. Butler, Tr. E. Soc. 1879, p. 26, Rio Sapó.

Cucullia sabulosa and *naruenensis*, O. Staudinger, S. E. Z. xl. p. 322, S.E. Russia; *C. africana*, Aurivillius, Œfv. Ak. Förh. xxxvi. (7) p. 59, Damara Land.

Heliophila dia, A. R. Grote, *l. c.* p. 29, San Francisco.

Tamila velaris, California, and *vanella*, Nevada; *id. l. c.* p. 197.

Pyrrhia stilla, id. N. Amer. Ent. i. p. 45, Western States.

Heliothis illinoiensis, G. H. French, *l. c.* p. 77, Illinois.

Ariola pulchra, A. G. Butler, Ill. Lep. Het. iii. p. 19, pl. xlv. fig. 6, Yokohama.

Aphusia marmorea, id. Tr. E. Soc. 1879, p. 27, Rio Jutahi.

Lygranthœcia separata, A. R. Grote, Canad. Ent. xi. p. 198, Nevada.

Acontia variegata and *flavo-maculata*, C. Oberthür, *l. c.* pp. 15 & 16, Island of Askold; *A. noloides* and *arefacta*, A. G. Butler, Ann. N. H. (5) iv. p. 366, Japan; *A trimaculata*, p. 60, *wallengreni*, p. 61, *spangbergi*, p. 62, *rectangularis*, p. 64, *conifrons*, p. 65, Aurivillius, *l. c.*, Damara Land; *A. microptera*, Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 321, Madagascar.

Tarache lanceolata, A. R. Grote, *l. c.* p. 198, Texas.

Eustrotia retis, Pennsylvania, and *secta*, Massachusetts, *id. l. c.* pp. 198 & 199; *E. dividua*, id. N. Amer. Ent. i. p. 46, Texas.

Thalpochares cinerea, Aurivillius, *l. c.* p. 68, Damara Land; *T. œtheria*, A. R. Grote, *l. c.* p. 47, Florida.

Anthophila hebescens, A. G. Butler, *l. c.* p. 366, Japan.

Phyllophila cretacea, id. Ill. Lep. Het. iii. p. 28, pl. xlvii. fig. 11, Yokohama.

Microphysa fumosa, id. Tr. E. Soc. 1879, p. 28, Rio Jutahi.

Phrygionis dives, p. 30, *regalis* (Para), p. 31, note, *setosa*, p. 31, and *metalligera*, p. 32, *id. l. c.*, Amazons.

Eulepidotis argyritis, id. *l. c.* p. 29, Rio Jutahi.

Penicillaria costalis, id. Ann. H. H. (5) iv. p. 367, Japan.

Ingura declinata, California, and *flabella*, Kansas; A. R. Grote, Canad. Ent. xi. pp. 207 & 208.

Habrostola commidendri, E. Wollaston, Ann. N. H. (5) iv. p. 230, St. Helena.

Plusia dalii, id. *l. c.* p. 232, St. Helena; *P. pyropia* and *serena*, A. G. Butler, *l. c.* pp. 367 & 368, Japan.

Ecregma modesta, id. Tr. E. Soc. 1879, p. 34, Amazons.

Hemiceras plana, Fonteboa, and *striolata*, Rio Negro; *id. l. c.* pp. 35 & 36.

Tiauspa argyra, id. *l. c.* p. 36, Rio Jutahi.

Amphipyra purpurascens, id. *l. c.* p. 37, Manaos.

Homoptera (?) *gyrochila*, Rio Javary, and *traili*, Rio Purus; *id. l. c* p. 40.

Metalectra (?) [*h*]*ypsilon*, id. *l. c.* p. 64, Tunantins.

Tyrissa (?) *laminata*, Manaos, and *T. notiaphila*, Rio Negro; *id. l. c.* p. 65.

Phosphila tatosoma, id. *l. c.* p. 42, Maues River.

Cænipeta lilacina (= *lobuligera*, p., Walk., *nec* Guén.), Rio Negro, and *dimidiata*, Amazons; *id. l. c.* p. 44.

Gerbatha [*h*]*ypsilon* and *angusta*, id. Ill. Lep. Het. iii. p. 24, pl. xlvii. figs. 1 & 2, Yokohama.

Prometopus assuetus and *ordinarius*, id. Tr. E. Soc. 1879, p. 21, Amazons.

Bolina agrotidea, P. Mabille, *l. c.* p. 346, Madagascar.

Hypocala violacea, A. G. Butler, *l. c.* p. 6, Cachar; *H. florens*, Mabille, *l. c.* p. 324, Madagascar.

Catocala pudica, F. Moore, Second Yark. Miss. Lep. p. 12, Ladák; *C. sinuosa*, A. R. Grote, *l. c.* p. 15, Florida; *C. grotiana*, J. S. Bailey, N. Amer. Ent. i. p. 21, Colorado.

Letis traili, A. G. Butler, *l. c.* p. 49, Rio Jutahi.

Hypopyra megalesia, P. Mabille, *l. c.* p. 346, Madagascar.

Ophiodes ponderosa, id. ibid.; *O. orthogramma*, id. Bull. Soc. Philom. (7) iii. p. 140, both from Madagascar.

Ophisma saalmuelleri, id. Ann. Soc. Ent. Fr. (5) ix. p. 328; *O. mabillii*, Saalmüller, Ber. senck. Ges. 1878–79, p. 126, both from Madagascar.

Achæa œdipodina, P. Mabille, Bull. Soc. Philom. (7) iii. p. 140, Madagascar.

Serrodes leucocelis, id. Ann. Soc. Ent. Fr. (5) ix. p. 330, Madagascar.

Psimada cineracea, A. G. Butler, Ill. Lep. Het. iii. p. 27, pl. xlvii. fig. 4, Yokohama.

Athyrma misera, id. Tr. E. Soc. 1879, p. 38, Amazons.

Ophiusa nigrimacula, P. Mabille. *l. c.* p. 347; *O. digona*, id. Bull. Soc. Philom. (7) iii. p. 141, both from Madagascar; *O. mabillii*, M. Saalmüller, Pet. Nouv. ii. p. 297, Nossi-Bé.

Grammodes rogenhoferi, Bohatsch, Verh. z.-b. Wien, xxix. p. 407, Syria; *G. rhodotænia*, Mabille, *l. c.* p. 141, Madagascar.

Poaphila mollis, A. G. Butler, Ill. Lep. Het. iii. p. 28, pl. xlvii. fig. 10, Yokohama.

Pæsula (sic) *nigricollis*, id. Tr. E. Soc. 1879, p. 39, Manaos.

Epidromia signata and *rivularis*, p. 52, *columba* and *distincta*, p. 53, and *ocellata*, p. 54; *id. l. c.*, Amazons.

Ceromacra fuliginea, id. *l. c.* p. 55, Amazons.

Lacera procellosa, id. Ann. N. H. (5) iv. p. 368, Japan; *L. amazonica*, id. Tr. E. Soc. 1879, p. 57, Amazons.

Amphigonia placida, id. *l. c.* p. 58, Rio Purus.

Argidia rosacea, id. *l. c.* p. 60, Rio Purus.

Orthogramma pavescens, Rio Jutahi, and *lurida*, Amazons; *id. l. c.* pp. 60 & 61.

Thermesia anceps, P. Mabille, *l. c.* p. 142, Madagascar.

Azeta turbida, A. G. Butler, *l. c.* p. 62, Rio Purus.

Selenis mira, id. Ill. Lep. Het. iii. p. 29, pl. xlvii. fig. 6, Hakodadi.

Dagassa vulgaris and *juruana*; id. Tr. E. Soc. 1879, p. 66, Amazons.

Renodes (?) *modesta*, id. *l. c.* p. 67, Amazons.

Bithiasa notigera, Butler, Ann. N. H. (5) iv. p. 369, Japan.

Capnodes curvipalpis, id. *ibid.*, Japan; *C. pallida*, p. 68, *senilis*, and *indigna*, p. 69, *bistriata* and *lacteigera*, p. 70, and *turbata*, p. 71, id. Tr. E. Soc. 1879, Amazons.

Hypenaria pyrochila, Rio Jurua, and *triocellata*, Rio Jutahi and Santarem; *id. l. c.* p. 74.

Plaxia maculigera, id. *l. c.* p. 75, Serpa.

Baniana projiciens, id. *l. c.* p. 39, Amazons.

Singara hypsoides, id. Ann. N. H. (5) iv. p. 245, Madagascar.

Deltoididæ.

Herminia lilacina, Butl., = *Rhapsa sentinalis*, Walk., var.; A. G. Butler, Cist. Ent. ii. p. 492.

Helia calvaria. Transformations; O. Raacke, Zeitschr. f. Ent. (n.s.) vii. pp. 80–87.

New genera and species:—

Mesoplectra, A. G. Butler, Ill. Lep. Het. iii. p. 65. Allied to *Bocana*, antennæ pectinated on both sides, each pectination terminating in two curved hairs; centre slightly swollen, and armed with two short incurved spurs; palpi long, and curved backwards; anterior tibiæ very broad and flattened, but with no pencil of bristles. Type, *M. lilacina*, sp. n., *l. c.* pl. lvii. fig. 3, Yokohama.

Celeopsyche, id. *l. c.* p. 68. Allied to *Marimatha*; palpi porrect, compressed, cuneiform, with very short terminal joint; antennæ very thick, simple; primaries with angulated outer margin, slightly excavated below apex; secondaries subangulated; legs rather short, compressed. Type, *C. nitens*, sp. n., *l. c.* pl. lvii. fig. 10, Yokohama.

Trotosema, id. Ann. N. H. (5) iv. p. 448. Allied to *Echana*; type, *T. sordidum*, sp. n., *l. c.* p. 449, Japan.

Cidariplura, id. *ibid.* Allied to *Edessena*; type, *C. gladiata*, sp. n., Japan.

Hypena minna, p. 59, fig. 12, *tator*[*r*]*hina*, fig. 13, pl. lv., *zilla* and *squalida*, figs. 1 & 2, p. 60, and *belinda*, fig. 3, p. 61, pl. lvi., *id.* Ill. Lep. Het. iii., Yokohama and Hakodadi; *H. ophiusinalis*, P. Mabille, Bull. Soc. Philom. (7) iii. p. 142, Madagascar.

Hypenodes balneorum, S. Alpheraki, Hor. Ent. Ross. xv. p. 137, N. Caucasus.

Gisira signata, A. G. Butler, *l. c.* p. 61, pl. lvi. fig. 4, Yokohama.

Hormisa plusioides and *cramboides*, id. *l. c.* pp. 61 & 62, pl. lvi. figs. 5 & 6, Yokohama; *H. morosa* and *calamina*, id. Ann. N. H. (5) iii. p. 446, Japan.

Herminia dolosa and *helva*, id. *l. c.* p. 447, Japan; *H. sicca* and *fumosa*, p. 62, *griselda*, *innocens*, *pryeri*, and *fentoni*, p. 63, *id.* Ill. Lep. Het. iii. pl. lvi. figs. 7–12, Yokohama.

Bleptima petrina, *lignea*, and *morosa*, p. 64, pl. lvi. figs. 13–15, and *ægrota*, p. 65, pl. lvii. fig. 1, *id. l. c.*, Yokohama; *B. onerata*, id. Ann. N. H. (5) iv. p. 447, Japan.

Bocana incongruens, id. *l. c.* p. 448, Japan; *B. tristis*, id. Ill. Lep. Het. iii. p. 65, pl. lvii. fig. 2, Yokohama.

Locastra marginata, id. *l. c.* p. 66, pl. lvii. fig. 4, Yokohama; *L. amica* and *inimica*, id. Ann. N. H. (5) iv. pp. 447 & 448, Japan.

Egnasia argillacea, *fallax*, and *erebina*, p. 450, and *opalina*, p. 451, *id. l. c.*, Japan; *E. simplex*, *porphyrea*, and *polybapta*, p. 66, *pulcherrima* and *pusilla*, p. 67, *id.* Ill. Lep. Het. iii. pl. lvii. figs. 5–9, Yokohama.

Marmorinia obscurata, Hakodadi, and *amphidecta*, Yokohama; *id. l. c.* pp. 68 & 69, pl. lvii. figs. 11 & 12.

Amblygoes (new name for *Apphadana*, Walk., preocc.) *cinerea*, id. *l. c.* p. 69, pl. lviii. fig. 1, Yokohama; *A. albinotata*, id. Ann. N. H. (5) iv. p. 449, Japan.

Marimatha straminea, id. Ill. Lep. Het. iii. p. 70, pl. lviii. fig. 2, Yokohama.

Geometridæ.

A. G. Butler (Ill. D. Lep. iii.) redescribes and figures the following *Geometridæ* (his own, unless otherwise stated):—*Urapteryx veneris* and *Thiopsyche pryeri*, p. 29, figs. 1 & 2, *Endropia mactans* and *Descoreba simplex*, p. 30, figs. 3 & 4, *Bizia œxaria* (Walk., = *Endrobia mibuaria*, Feld.), *Corypha incongruaria* (Walk.) and *Niphonissa arida*, p. 31, figs. 5–7, *Boarmia conferenda*, *lunifera*, and *displicens*, p. 32, figs. 8, 10, & 11, *leucophæa* and *agitata*, figs. 12 & 9, pl. xlviii., *angulifera* and *grisea*, pl. xlix. figs. 1 & 2, p. 33, *senex*, *insolita*, and *repulsaria* (Walk.), p. 34, figs. 3, 5, & 7, *Tephrosia charon* and *ignobilis*, *Bylazora virescens* and *Hypochroma pryeri*, p. 35, figs. 4, 6, 8, & 9, *H. superans*, *Elphos latiferaria* (Walk.), and *Jodis claripennis*, p. 36, figs. 12, 11, & 10, pl. xlix., *Thalassodes marina*, *Thalera crenulata* and *Comibæna diffecta*, p. 37, figs. 1–3, *Anisodes hadassa*, p. 38, fig. 5, *Asthena nupta*, *confusa*, *corculina*, and *superior*, p. 39, figs. 6–9, *Acidalia jakima*, *hanna*, and *absconditaria* (Walk.), p. 40, figs. 10–12, pl. l., *Timandra extremaria* (Walk.), p. 40, pl. li. fig. 1, *T. comptaria* (Walk.), *Hyria senicata* (Walk.), *Michroschus aurens*, p. 41, figs. 2–4, *Erosia rapha*, *azela*, and *moza*, p. 42, figs. 5–7, *Argyris indicataria* (Walk.) and *Caberà eliela*, p. 43, figs. 8 & 9, *Corycia virgo* and *sacra*, and *Thysanochilus purus*, p. 44, figs. 10–12, pl. li., *Macaria hebesata* (Walk.), p. 44, pl. lii. fig. 1, *M. zachera* and *maligna* and *Bithia amasa*, p. 45, figs. 2–4, *Lozogramma bela* and *amelia* and *Selidosema sordida*, p. 46, figs. 5–7, *Aspilates irradiata* (Walk.), *discriminaria* (Walk.), and *Euchera agnes*, p. 47, figs. 8–10, *Abraxas conspurcata* and *miranda*, p. 48, figs. 11 & 12, pl. lii., *A. placida*, p. 48, pl. liii. fig. 1, *A. plurilineata* (Walk.), *Deroca phasma* and *Lomaspilis opis*, p. 49, figs. 2, 4, & 3, *Pachyligia dolosa* and *modesta*, and *Hybernia dira*, p. 50, figs. 5–7, *Larentia hemana*, *Eupithecia sophia* and *invisa*, p. 51, figs. 8–10, *E. excisa* and *rufescens*, p. 50, figs. 11 & 12, pl. liii., *E. proterva* and *caliginea*, and *Collix vashti*, p. 52, pl. liv. figs. 1–3, *Lobophora julia*, *volitans*, and *terranea*, p. 53, figs. 4–6, *Lygranoa fusca*, *Melanthia casta* and *Melanippe inquinata*, p. 54, figs. 7–9, *M. bella*, *supergressa*, and *hecate*, p. 55, fig. 10–12, pl. liv., *Anticlea consanguinea*, *livida*, and *frigida*, p. 56, figs. 1–3,

Cidaria obscura, p. 57, fig. 5, *melancholica*, *arosa*, *cineraria*, and *jamesa*, p. 58, figs. 6–9, *C. tetrica* and *Eubolia niphonica*, p. 59, figs. 10 & 11, pl. lv.

L. W. Goodell publishes notes on the early stages of *Tetracis crocallata*, *Therina endropiaria*, and *Acidalia enucleata*; Canad. Ent. xi. pp. 193 & 194.

A. Rössler redescribes and figures his *Iodis norbertaria*, p. 107, fig. 4, *Acidalia seeboldiata*, p. 108, fig. 5, and *subherbariata*, p. 109, fig. 3; Ann. Soc. Esp. viii. pl. v.

Rumia cratægaria. Variety of larva; Lafaury, Le Nat. i. p. 37.

Pericallia syringaria partially double-brooded; F. D. Wheeler, Ent. xii. p. 109.

Biston lapponarius, Boisd., ♀ described; Wocke, Zeitschr. f. Ent. (n.s.) vii.

Gnophos stoliczkaria, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 14, pl. i. fig. 22.

Abraxas grossulariata. Autumnal pupation; Douglas & Silcock, Ent. M. M. xv. p. 205, and Ent. xii. p. 20. Variety of larva; J. E. Robson, Ent. xii. pp. 205 & 206.

Euschema militaris. Larva noticed and figured by O. E. Janson & J. Wood-Mason, proving the *Euschematidæ* to belong to the *Geometridæ*; Cist. Ent. ii. p. 540, pl. x.

Melanchræa cephise, Cram., and *geometroides*, Walk. The larvæ are true loopers, and the genus must be removed to the *Geometridæ*; Dewitz, SB. Nat. Fr. 1879, p. 31, and Ent. Nachr. v. p. 157.

Acidalia contiguaria. The pale and dark varieties discussed and figured; H. F. Fryer, Ent. xii. pp. 65–67. *A. separata* and *atlantica*, Walk., are probably varr.; E. Wollaston, Ann. N. H. (5) iii. pp. 329 & 330.

Macaria obstataria, Walk., = *Hemerophila* (?) *exclusa*, Walk., ? = *Philobia cinerearia*, Brem., and belongs to *Acidalia*; A. G. Butler, Tr. L. S. (2) i. p. 562.

Bupala piniaria, Linn., hermaphrodite (left side ♂, right side ♀); Kaltenbach, Tijdschr. Ent. xxii. p. xxii.

Pellonia calabraria, larva and variation noticed; A. Fuchs, S. E. Z. xl. pp. 40–43.

Chimatobia brumata, power of resisting cold; McLachlan & Hutchinson, Ent. M. M. xv. pp. 205 & 237. The number of ova contained in each ♀ averages about 250, and the larva emerges in about two months; G. C. Bignell, Ent. xii. pp. 107 & 108.

Anisopteryx æscularia. Ravages of larva in Hungary; G. Csellei, SB. z.-b. Wien, xxix. p. 40.

Emmelesia affinitata, natural history, W. Buckler, Ent. M. M. xvi. pp. 102 & 103; *E. alchemillata*, larva described, G. T. Porritt, Ent. xii. p. 128.

Eupithecia incertata, Mill., and *E. pumilata*, Hübn., noticed; Lafaury, Le Nat. i. p. 37. *E. innotata*, recorded from Lancashire, G. T. Porritt, Ent. M. M. xvi. p. 111.

Thera kashghara, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 15, pl. i. fig. 23.

Sestra fusiplagiata, Walk., = *Cidaria flexata*, Walk.; *C. obtruncata*, Walk., = *Lozogramma obtusaria*, Walk., and *Macaria* (?) *humeraria*, Walk., and possibly = *C. flexata*, var.; A. G. Butler, Cist. Ent. ii. p. 494.

Pseudocoremia. A. G. Butler describes *Cidaria lupinata*, Feld., ♀, and *Larentia productata*, Walk., ♂, both of which belong to this genus; Cist. Ent. ii. pp. 496 & 497.

Cidaria assata, Feld., = *Larentia megaspilata*, Walk.; *L. inoperata*, Walk., = *invexata*, Walk., pp. 502 & 503; *C. inquieta*, Feld., = *C. aggregata*, Walk.; *C. timarata*, Feld., = *similata*, Walk., and *C. sphæriata*, Feld., ? = *Eupithecia muscosata*, Walk., p. 508, A. G. Butler, Cist. Ent. ii.; *C. blomeri*, Curt., new to Germany, discussed, C. F. Pflümer, S. E. Z. xl. pp. 158–160; *C. cyanata*, larva described, C. F. Von Gumppenberg, MT. Münch. ent. Ver. pp. 37 & 38, pl. iii. figs. 4 *a* & *b*; *C. miata*, L. (*coraciata*, Hübn.), natural history, A. Fuchs, S. E. Z. xl. pp. 172–174; *C. testata* without hind wings, W. V. Boyd, P. E. Soc. 1879, p. xlvii.

Ortholitha bipunctaria, var. *maritima*, from Bilbao; T. Seebold, An. Soc. Esp. viii. p. 112, pl. i. fig. 6.

Collix sparsata. Transformations described; G. T. Porritt, Ent. xii. pp. 58 & 59.

New genera and species :—

Kalabana, F. Moore, P. Z. S. 1879, p. 415 (*Urapterygidæ* ?). Type, *Lagyra picaria*, Walk.; add *Celerena leucomela*, Walk., and *K. albifera*, sp. n., *l. c.*, Kulu, N.W. Himalaya.

Mniocera, A. G. Butler, P. Z. S. 1879, p. 162. Allied to *Bursada*; type, *Celerena cincta*, Walk.; add *C. funebris*, Feld., and *M. cinerescens*, sp. n., *l. c.*, New Ireland.

Crocinis, id. Ann. N. H. (5) iv. p. 244. Allied to *Pyrinea*; type, *C. fenestrata*, sp. n., *l. c.*; add *C. ochracea*, l. c., and *plana*, l. c. p. 245, all from Madagascar.

Lycauges, id. *l. c.* p. 373. Allied to *Hemerophila*; type, *L. lactea*, sp. n., Japan.

Synclysmus, id. *l. c.* p. 242. Allied to *Hypochroma*; type, *S. niveus*, sp. n., *l. c.* p. 242, Madagascar.

Zylobara, id. Cist. Ent. ii. p. 498. Allied to *Pseudocoremia* and *Bylazora*; type, *Rhyparia fenerata*, Feld.

Tanaor[*r*]*hinus*, id. Ill. Lep. Het. iii. p. 38. Allied to *Geometra*; palpi extremely long; fore-wings falcate, with straight outer margin; hind-wings rounded and entire. Type, *G. confuciaria*, Walk.; redescribed and figured, *l. c.* pl. l. fig. 4; add *T. prasinus*, sp. n., *id.* Ann. N. H. (5) iv. p. 438, Japan.

Orthocabera, id. Ann. N. H. (5) iv. p. 439. Allied to *Cabera*; type, *O. sericea*, sp. n., *l. c.* p. 440, Japan.

Cusuma, F. Moore, *l. c.* p. 415. Allied to *Euschema*; to contain *C. limbata*, sp. n., *l. c.*, Ceylon, and *Eusch. vilis*, Walk..

Inurois, A. G. Butler, *l. c.* p. 445. Allied to *Chimatobia*: type, *I. tenuis*, sp. n., Japan.

Urapteryx marginipennis, A. G. Butler, Tr. L. S. (2) i. p. 562, Malacca.

Epione grata, id. Ann. N. H. (5) iv. p. 369, Japan.

Hyperythra stulta, id. *l. c.* p. 370, Japan; *H. desiccata* and *arenacea*, id. Cist. Ent. ii. p. 495, New Zealand.

Lyrcea varians, id. *l. c.* p. 496, New Zealand.

Angerona nigrisparsa, id. Ann. N. H. (5) iv. p. 370, Japan.

Nematocampa straminea, id. *ibid.*, Japan.

Endropia gracilis and *abjecta*, id. *l. c.* p. 371, Japan.

Biston robustum, id. *ibid.*, Japan.

Tephrosia petrosa, id. *l. c.* p. 372, Japan.

Hypochroma eugrapharia, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 347; *H. grandidieri*, A. G. Butler, Cist. Ent. ii. p. 394: both from Madagascar.

Buzura strigaria, F. Moore, P. Z. S. 1879, p. 416, Ceylon.

Agathia magnifica, id. *ibid.*, Ceylon.

Boarmia arguta and *rimosa*, A. G. Butler, Ann. N. H. (5) iv. p. 372, Japan.

Pseudocoremia paludicola, id. Ent. M. M. xv. p. 272, Hawaiian Islands; *P. suavis*, id. Cist. Ent. ii. p. 497, New Zealand.

Argidava maculata, id. Ann. N. H. (5) iv. p. 373, Japan.

Ophthalmodes cretacea, id. *ibid.*, Japan.

Nemoria amphitritaria, C. Oberthür, Diagn. Lep. Ask. p. 8, Island of Askold; *N. pallidularia*, P. Mabille, *l. c.* p. 333, Madagascar.

Eucrostis nudilimbaria, Corsica, and *albicornaria*, Nossi-Bé, *id.* Bull. Soc. Ent. Fr. (5) ix. p. clv.

Phorodesma jankowskiaria, P. Millière, in C. Oberthür's Diagn. Lep. Ask. p. 1, Island of Askold.

Comibæna stibolepida, A. G. Butler, Cist. Ent. ii. p. 394, Madagascar.

Thalera veneta, id. Ann. N. H. (5) iv. p. 437, Japan.

Ephyra grata, id. *l. c.* p. 438, Japan.

Asthena auricruda, id. *ibid.*, Japan.

Acidalia arenosaria, O. Staudinger, S. E. Z. xl. p. 325, S. E. Russia; *A. esterelata*, P. Millière, Le Nat. i. p. 138, Alpes Maritimes; *A. purpureo-marginata*, Bohatsch, Verh. z.-b. Wien, xxix. p. 409, Syria; *A. impura*, p. 438, *macescens*, *fœdata*, and *invalida*, p. 439, A. G. Butler, *l. c.*, Japan.

Micronia semifasciata, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. p. 335, Madagascar.

Macaria pryeri and *irrorata*, A. G. Butler, *l. c.* p. 440, Japan.

Phasiane griseo-limbata, C. Oberthür, *l. c.* p. 9, Island of Askold.

Lozogramma capulata, A. G. Butler, *l. c.* p. 441, Japan.

Ozola terranea, id. *ibid.*, Japan.

Selidosema ægrota, id. Cist. Ent. ii. p. 499, New Zealand.

Euschema bellissima[*-mum*] and *prunicolor*, F. Moore, P. Z. S. 1879, p. 414; *E. nigrescens*, id. Desc. Ind. Lep. Atk. p. 20, Darjiling.

Tigridoptera interrupta, A. G. Butler, P. Z. S. 1879, p. 163, New Ireland.

Pachycnemia usitata, id. Cist. Ent. ii. p. 501, New Zealand.

Declana nigro-sparsa and *niveata*, id. *l. c.* p. 500, New Zealand.

Larentia comis and *inamœna*, id. Ann. N. H. (5) iv. pp. 443 & 444, Japan; *L. insularis*, id. Ent. M. M. xv. p. 272, Maui; *L.* (?) *falcata* and *L.* (?) *rufescens*, id. Cist. Ent. ii. pp. 503 & 504, New Zealand.

Emmelesia phasma, id. Ann. N. H. (5) iv. p. 441, Japan.

Eupithecia signigera, consueta, and *lucinda*, id. *l. c.* p. 442, Japan.

Helastia charybdis and *calida*, id. Cist. Ent. ii. pp. 503 & 504, New Zealand.

Lobophora misera, id. Ann. N. H. (5) iv. p. 443, Japan.

Melanthia arida, id. Cist. Ent. ii. p. 505, New Zealand.

Melanippe abraxina, id. Ann. N. H. (5) iv. p. 443, Japan; *M. luctuosaria*, C. Oberthür, *l. c.* p. 10, Island of Askold.

Anticlea umbrifera, A. G. Butler, *l. c.* p. 444, Japan.

Coremia squalida, id. Cist. Ent. ii. p. 505, New Zealand.

Phibalapteryx simulans and *undulifera*, p. 506, *anguligera* and *rivularis*, p. 507; *id. l. c.*, New Zealand.

Scotosia sericata, id. Ann. N. H. (5) v. p. 444, Japan; *S. rara*, id. Ent. M. M. xv. p. 273, Maui.

Cidaria soldaria, Turati, Bull. Ent. Ital. xi. p. 186, pl. viii. figs. 11 & 12, Brianza and Piedmont; *C. ludovicaria*, C. Oberthür, *l. c.* p. 10, Island of Askold; *C. complicata*, A. G. Butler, Ill. Lep. Het. iii. p. 57, pl. lv. fig. 4, Yokohama; *C. mendica*, id. Ann. N. H. (5) iv. p. 446, Japan; *C. callichlora*, id. Cist. Ent. ii. p. 509, New Zealand.

Eubolia dulcis, id. Ann. N. H. (5) iv. p. 245, Madagascar.

PYRALIDÆ.

GROTE, A. R. On the Neuration in certain genera of *Pyralidæ*. N. Amer. Ent. i. pp. 9–12, pl. ii.

The neuration of the following genera is described and figured:—EPIPASCHIÆ: *Epipaschia*, Clem., *Mochlocera*, Zell., *Cacozelia* and *Toripalpus*, Grote, and *Tetralopha*, Zell.; PHYCIDÆ: *Acrobasis* and *Salebria*, Zell., *Pempelia*, Hübn., *Nephopteryx*, Zell., *Pinipestis*, *Honora*, and *Dakruma*, Grote, *Homœosoma*, Curt., and *Anerastia*, Hübn.

RAGONOT, E. L. Notes on unknown or little-known larvæ of *Micro-Lepidoptera* (Pyrales). Ent. M. M. xvi. pp. 152–155.

Odontia dentalis, W. V., var. *gigantea*, Wocke. Larva, &c., noticed; Staudinger, Hor. Ent. Ross. xv. pp. 165 & 166.

Pyralis saccharalis, Fabr. The pupa has the power of working itself up and down its tunnel in the stem of the sugar-cane; W. S. M. D'Urban, Ent. M. M. xvi. pp. 166 & 167.

Threnodes multiguttalis, Staud., and *cacuminalis*, Ev., are probably forms of the same species; Staudinger, Hor. Ent. Ross. xv. pp. 164 & 165.

Aporodes floralis, Hübn., and var. *stygialis*, Tr., discussed; Staudinger, Hor. Ent. Ross. xv. p. 163.

Pyrausta cuprealis, F. Moore, redescribed and figured by him; Second Yark. Miss. Lep. p. 13, pl. i. fig. 26.

Geometra octomaculata, Linn. (1771). W. M. Schöyen discusses the synonymy of this species, which must take the name of *funebris*, Ström (1768), S. E. Z. xl. pp. 396–399.

Conchylodes diphtheralis, Hübn. The cocoon lies loosely on the ground,

and the enclosed pupa possesses the power of leaping with it; Dewitz & Gundlach, SB. Ges. Nat. Fr. 1879, pp. 31 & 32.

Glyphodes sylpharis, Butl., = *pyloalis*, Walk.; A. G. Butler, Ann. N. H. (5) iv. p. 453.

Botys perpendiculalis, Dup., is probably not a European species; P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. 339.

Botys purpuralis and *sanguinalis*. Varieties discussed; Staudinger, Hor. Ent. Ross. xv. p. 168.

Botys trinalis, W. V., varr. *pontica* and *andalusica*, from Amasia, and Granada, and *B. prunalis*, W. V., var. *prunoidalis*, from S. Europe and W. Asia, described; Staudinger, Hor. Ent. Ross. xv. pp. 170 & 171, 177.

Botys fuscalis. Transformations described; W. Buckler, Ent. M. M. xvi. pp. 161 & 162.

Botys œdipodalis, Melliss, *nec* Guén., = *B. ruficostalis*, Led.; E. Wollaston, Ann. N. H. (5) iii. pp. 338 & 339.

Botys lupulina destructive to maize in the department of the Ain; *B. zealis* is probably only a var.: Laboulbène & Fallou, Bull. Soc. Ent. Fr. (5) ix. pp. viii. & ix.

Botys trinalis, W. V. *B. auralis*, Peyerimhoff (= *trinalis*, var. *bornicensis*, Fuchs) and *biternalis*, Mann, are probably varieties; A. Fuchs, S. E. Z. xl. pp. 43–45. He also (*l. c.* p. 46) describes var. *marcidalis* from Astrabad.

Salbia continualis, Wallengr., redescribed and referred to *Botys*; A. G. Butler, Ent. M. M. xv. pp. 270 & 271.

Orobena saxicolalis, Mann, = *cæsialis*, Herr.-Schäff., and *O. helenalis*, Staud., = *infirmalis*, Staud.; Staudinger, Hor. Ent. Ross. xv. p. 179.

Spilodes palealis. Larva described; G. T. Porritt, Ent. xii. pp. 17 & 18.

Adena xanthialis, Walk., = his *Scopula* (?) *hybreasalis*; A. G. Butler, Cist. Ent. ii. p. 492.

Mecyna polygonalis, Hübn. Larva described; E. Wollaston, Ann. N. H. (5) iii. p. 339.

Microsca, A. G. Butler, Ill. Lep. Het. iii. p. 71. Allied to *Osca*; palpi less porrect, and with shorter terminal joint; spines of hind tibiæ longer; primaries with the outer margin more or less convex. Type, *Pyralis hedilalis*, Walk.; add *M. pallida*, *exusta*, and *ardens*, spp. nn., *l. c.* pl. lviii. figs. 7–9, Yokohama.

Circobotys, A. G. Butler, Ill. Lep. Het. iii. p. 77. Allied to *Cænostula*; fore-wings very narrow, much produced, and subfalcate, rendering the outer margin very oblique; hind-wings small, triangular; abdomen slender, extending much beyond them. Type, *C. nycterina*, sp. n., *l. c.* p. 77, pl. lix. fig. 14, Yokohama.

Deana sericea, A. G. Butler, Ann. N. H. (5) iv. p. 451, Japan.

Pyralis valida, p. 451, *yokohamæ* and *regina*, p. 452, *id. l. c.*, Japan; *P. elachia* and *fraterna*, p. 70, and *nannodes*, p. 71, *id.* Ill. Lep. Het. iii. pl. lviii. figs. 3 & 4, Yokohama; *P. helenensis*, E. Wollaston, Ann. N. H. (5) iii. p. 331, St. Helena; *P. cyanealis*, P. Mabille, Bull. Soc. Philom. (7) iii. p. 143, Madagascar.

Alyta calligrammalis, id. *ibid.*, Madagascar.

Doththa consocia, A. G. Butler, Ann. N. H. (5) iv. p. 452, Japan.

Aglossa achatina, id. Ill. Lep. Het. iii. p. 72, pl. lviii. fig. 6, Yokohama.

Rhodaria placens and *amata*, p. 72, *limbata* and *astrifera*, Yokohama, and *assimilis*, Hakodadi, p. 73, *id.* Ill. Lep. Het. iii. pl. lviii. figs. 10, 11, 13, 14, & 12.

Desmia stellaris, id. *l. c.* p. 73, pl. lviii. fig. 15, Yokohama.

Samea butyrosa, p. 73, *usitata* and *gracilis*, Yokohama, and *magna*, Hakodadi, p. 74, *id. l. c.* pl. lix. figs. 1, 3, 4, & 2; *S. commixta* and *exigua*, id. Ann. N. H. (5) iv. p. 453, Japan.

Asopia misera, id. Ill. Lep. Het. iii. p. 74, pl. lix. fig. 5, Yokohama.

Hymenia tricolor, id. *l. c.* p. 75, pl. lix. fig. 6, Yokohama.

Stenia sibirialis, P. Millière, Le Nat. i. p. 139, Island of Askold; *S. uniflexalis* and *pulchellalis*, P. Mabille, Ann. Soc. Ent. Fr. (5) ix. pp. 336 & 337, Madagascar.

Metasia ossealis and *M.* (?) *mendicalis*, Staudinger, Hor. Ent. Ross. xv. pp. 182 & 183, Asia Minor.

Oligostigma corculina, A. G. Butler, *l. c.* p. 75, pl. lix. fig. 7, Yokohama; *O. curta*, id. Ent. M. M. xv. p. 270, Hawaiian Islands.

Hydrocampa cretacea, id. Ill. Lep. Het. iii. p. 75, pl. lix. fig. 8, Yokohama.

Zebronia argyria, id. *l. c.* p. 76, pl. lix. fig. 9, Hakodadi.

Glyphodes pryeri, id. Ann. N. H. (5) iv. p. 453, Japan; *G. amethysta*, id. Tr. L. S. (2) i. p. 563, Malacca.

Margaronia inusitata, id. Ann. N. H. (5) iv. p. 454, Japan.

Astura striata, id. Ill. Lep. Het. iii. p. 76, pl. lix. fig. 10, Yokohama.

Botys dissolutalis (? = *limbo-punctalis*, Herr.-Schäff., var.), p. 169, *amasialis*, Amasia, p. 171, *pauperalis*, Asia Minor, p. 173, and *gutturalis*, Magnesia, p. 175, Staudinger, l. c.; *B. inornata* and *aurea*, p. 76, and *arbiter*, p. 77, A. G. Butler, *l. c.* pl. lix. figs. 11–13, Yokohama; *B. kingdoni*, id. Ann. N. H. (5) iv. p. 246, Madagascar; *B. localis*, id. Ent. M. M. xv. p. 271, Oahu; *B. minutalis* and *monotretalis*, P. Mabille, *l. c.* p. 339; *B. acosmialis*, id. Bull. Soc. Philom. (7) iii. p. 144, both from Madagascar.

Pionea terminalis, id. Ann. Soc. Ent. Fr. (5) ix. p. 338, Madagascar.

Scopula testacea, A. G. Butler, Ill. Lep. Het. iii. p. 77, pl. lix. fig. 15, Yokohama; *S. notata*, id. Cist. Ent. ii. p. 493, New Zealand.

Mecyna prunipennis, id. Ann. N. H. (5) iv. p. 454, Japan; *M. exigua*, id. Ent. M. M. xv. p. 271, Maui.

Crambidæ.

Meyrick, E. Descriptions of Australian *Micro-Lepidoptera*: i. Crambites. J. L. Soc. N. S. W. iii. pp. 175–216.

The paper includes *Phycidæ* and *Galleriidæ*. The known genera and species are redescribed, except the following, which are common European insects, and doubtless introduced:—*Ephestia elutella*, *E. interpunctella*, *Galleria mellonnella*, and *Achræa grisella*.

Eudorea granitalis (pl. i. fig. 25) and *transversalis*, F. Moore, are redescribed by him; Second Yark. Miss. Lep. pp. 13 & 14.

Scoparia ambigualis, Tr., var. from Brussa described ; Staudinger, Hor. Ent. Ross. xv. p. 162.

Melissoblaptes œconomellus, Mann, redescribed ; *id. l. c.* p. 231.

Melliphora alvearia. Larva described ; G. T. Porritt, Ent. M. M. xvi. p. 21.

Wrens supposed to keep down the numbers of the Bee Moth ; Am. Nat. xiii. p. 262.

C. G. Barrett describes the larvæ of *Homœosoma sinuella* and *binævella*, *Rhodophœa advenella* and *consociella*, and *Ephestia cinerosella*, Zell. (= *artemisiella*, Staint.) ; Ent. M. M. xv. pp. 180–183.

Ephestia xanthotricha, Staud., redescribed in full ; *E. elutella*, Hübn., var. (?) *unicolorella*, from Asia Minor described, Staudinger, *l. c.* p. 227 & 228.

Homœosoma, Curt., recharacterized, and *H. vagella*, Zell., redescribed, E. Meyrick, J. Linn. Soc. N. S. W. iii. p. 214 ; *H. venosella*, F. Moore, redescribed and figured by him, *l. c.* p. 15, pl. i. fig. 24.

Acrobasis porphyrella, Dup., larva noticed, and *A. fallouella*, Rag., redescribed ; Seebold & Rössler, An. Soc. Esp. viii. p. 116.

Euzophera oblitella, Zell., recorded as new to Britain, J. B. Blackburn, Ent. xii. p. 16, and Ent. M. M. xv. pp. 187 & 188, with additional notes by H. T. Stainton ; *E. rhenanella*, Fuchs, = *tephrinella*, Led., A. Fuchs, S. E. Z. xl. p. 46.

Myelois cribrum. Transformations described, G. T. Porritt, *l. c.* xv. pp. 258 & 259 ; *M. undulosella* and *griseella*, F. Moore, redescribed and figured by him, *l. c.* p. 16, pl. i. figs. 27 & 15.

Hypochalcia chalybeella, Ev., var. (?) or sp. n. (?), *acraspedella* from Armenia described ; Staudinger, *l. c.* p. 203.

Eucarphia illignella, Zell., var. (?) *incredibilis*, from Asia Minor described ; *id. l. c.* p. 203.

Nephopteryx. Several species from Asia Minor (including the larva of *N. meliella*, Mann), noticed at some length, *id. l. c.* pp. 188–194 ; *N. angustella*, larva described, G. T. Porritt, *l. c.* xvi. pp. 65 & 66 ; *N. zimmermani*, Grote, observations, D. S. Kellicott & A. R. Grote, Canad. Ent. xi. pp. 114–116 & 195.

Etiella, Zell., recharacterized, and *E. behri*, Zell., redescribed ; E. Meyrick, *l. c.* pp. 203 & 205.

Rhodophœa formosella. Larva described ; G. T. Porritt, Ent. xii. p. 206.

Pempelia carnella. Natural history ; W. Buckler, Ent. M. M. xvi. pp. 167–172.

Pempelia hispanella, Staud., = *subornatella*, Dup., var. ; *P.* (?) *leucochrella*, Herr.-Schäff. ; characters discussed, Staudinger, *l. c.* pp. 199 & 201.

Phycis subornatella. Larva described ; G. T. Porritt, Ent. M. M. xvi. pp. 162 & 163.

Eromene, Hübn., recharacterized, and *E. bifractella*, Walk., redescribed ; E. Meyrick, *l. c.* pp. 195 & 197.

Crambus. E. Meyrick (*l. c.*) redescribes *C. concinnellus*, Walk., p. 182, *lativitalis*, Walk. (= *halterellus*, Zell.), p. 183, *trivittatus*, Zell. (= *bivit-*

tellus, Walk., *nec* Don.), p. 185, *bivittellus*, Don. (= *recurvellus*, Walk.), p. 186, *pleniferellus*, Walk., p. 187, *cuneiferellus*, Walk., p. 189, *relatalis*, Walk., p. 191, and *opulentellus*, Zell., p. 192; *C. hortuellus*, larva described, G. T. Porritt, Ent. M. M. xvi. p. 162; *C. geniculeus* and *selasellus*, larvæ described, W. Buckler, *op. cit.* xv. pp. 206 & 207, xvi. pp. 41 & 42.

New genera and species :—

Paralipsa, A. G. Butler, Ann. N. H. (5) iv. p. 454, (neuration figured). Allied to *Alipsa*; type, *P. modesta*, sp. n., *l. c.* p. 455, Japan.

Maxillaria, Staudinger, Hor. Ent. Ross. xv. p. 209. Intermediate between *Acrobasis* and *Trachonitis*; type, *M. meretrix*, sp. n., *l. c.*, Brussa.

Metœcis, P. Mabille, Bull. Soc. Ent. Fr. (5) ix. p. 340. *Phycidæ* ? Wings very coarsely scaled; abdomen stout and very long; larva lives in the nests of gregarious *Bombycidæ*. Type, *M. lepidocerella*, sp. n., *l. c.* p. 341, Madagascar.

Lasiocera, E. Meyrick, J. Linn. Soc. N. S. W. iii. p. 209. Placed between *Eucarphia* and *Ceroprepes*; antennæ thickened in ♂, basal half densely clothed with thick scales. Type, *L. canilinea*, sp. n., *l. c.*, Goulburn and Paramatta.

Prionophora, id. *l. c.* p. 179. Maxillary palpi absent; apex of fore wings acute, hind wings clothed with long hair-scales towards base. Type, *Crambus ruptellus*, Walk. (redescribed, *l. c.*).

Scoparia obsoleta, Staudinger, Hor. Ent. Ross. xv. p. 163, Asia Minor; *S. similis*, *helenensis*, *scintillulalis*, and *transversalis*, E. Wollaston, Ann. N. H. (5) iii. pp. 333–336, St. Helena; *S. conifera*, A. G. Butler, Cist. Ent. ii. p. 493, New Zealand.

Melissoblaptes tenebrosus, A. G. Butler, Ill. Lep. Het. iii. p. 78, pl. lx. fig. 1, Yokohama.

Etiella sincerella, Sydney, and *chrysoporella*, Melbourne and Adelaide; E. Meyrick, *l. c.* pp. 204 & 206.

Eucarphia seniella, Staudinger, *l. c.* p. 205, Taurus; *E. vulgatella* and *ensiferella*, E. Meyrick, *l. c.* pp. 208 & 209, Melbourne, &c.

Ceroprepes almella, id. *l. c.* p. 210, Paramatta.

Anerastia strigosa, Staudinger, Hor. Ent. Ross. xv. p. 225, Asia Minor; *A. mirabilella*, E. Meyrick, *l. c.* p. 213, Sydney.

Ephestia kuehniella, P. C. Zeller, S. E. Z. xl. p. 166, Halle (probably introduced from N. America); *E. inductella* and *E. vapidella* (Mann, MS.), Staudinger, *l. c.* p. 229, Asia Minor.

Homœosoma distichella, E. Meyrick, *l. c.* p. 215, New South Wales.

Dakruma coccidivora, H. Comstock, N. Amer. Ent. i. pp. 25–29, pl. iv., Washington, parasitic on the "cottony maple scale" (*Pulvinaria innumerabilis*, Rathven).

Acrobasis celticola, Staudinger, *l. c.* p. 207, Asia Minor.

Ancylosis morbosella and *A.* (?) *mimeticella*, id. *l. c.* pp. 218 & 220, Asia Minor.

Euzophera lafauryella, E. L. Ragonot, Bull. Soc. Ent. Fr. (5) ix. p. clv., Cape Breton.

Myelois leucocephala, *nigripunctella*, and *sabulosella*, O. Staudinger,

S. E. Z. xl. pp. 326–328, S.E. Russia; *M. cinerea*, p. 210, *albunculella*, Asia Minor, p. 213, *umbrosella*, Cyprus, p. 215, and *M.* (?) *exasperata*, Taurus, &c., p. 217, *id.* Hor. Ent. Ross. xv.; *M. subarcuella*, Blue Mountains, and *cosmiella*, Melbourne, E. Meyrick, *l. c.* pp. 211 & 212.

Nephopteryx tristis, S. Alpheraki, Troudy Ent. Ross. xi. p. 47, Taganrog; *N. strigata*, Asia Minor, and *brephiella*, Macedonia, Staudinger, *l. c.* pp. 190 & 194; *N. stenopterella*, Sydney, and *opimella*, Paramatta, E. Meyrick, *l. c.* pp. 200 & 201.

Pempelia brucella (Mann, MS.), p. 195, *sordida*, p. 196, *noctivaga*, p. 197, and *epischniella*, p. 200, Staudinger, *l. c.*, Asia Minor; *P. strigiferella*, Sydney, and *rufitinctella*, Paramatta, E. Meyrick, *l. c.* pp. 202 & 203.

Asarta ciliciella, Staudinger, *l. c.* p. 201, Taurus.

Prionapteryx whiteheadi, E. Wollaston, *l. c.* p. 340, St. Helena.

Schœnobius imparellus, E. Meyrick, *l. c.* p. 176, Paramatta.

Chilo paramattellus, id. *l. c.* p. 178, Paramatta.

Crambus whitelyi, A. G. Butler, Ill. Lep. Het. iii. p. 78, pl. lx. fig. 2, Hakodadi; *C. sabulinus*, p. 455, *yokohamæ* and *vigens*, p. 456, *id.* Ann. N. H. (5) iv., Japan; *C. milvellus*, Sydney, p. 181, *torrentellus*, Queensland, and *aurantiacus*, Newcastle (Australia), p. 184, *hoplitellus*, Sydney, p. 188, *dimidiellus*, Sydney, Rockhampton, &c., p. 190, *invalidellus*, Tasmania, p. 193, and *enneagrammos* [*-us*], Sydney, Melbourne, &c., p. 194, E. Meyrick, *l. c.*

Eromene longipalpella, Melbourne, p. 196, *præmaturella*, Sydney, p. 197, and *dilatella*, Paramatta, p. 198, *id. l. c.*

Apurima lineata, A. G. Butler, *l. c.* p. 457, Japan.

Tortricidæ.

Fernald, C. H. Notes on Walker's Types of *Tortricidæ* of North America. N. Amer. Ent. i. pp. 36–38.

Consists entirely of synonymic notes, which do not admit of abridgment.

Notes on the Tortrices of Surrey, Kent, and Sussex; W. P. Weston, Ent. xii. pp. 186–188, 216–220, 239–242.

Tortrix nigridia injurious to pines in Maine; C. H. Fernald, Canad. Ent. xi. p. 195. *T. seeboldiana*, Rössler, redescribed and figured by him, An. Soc. Esp. viii. p. 118, pl. i. fig. 2.

Spilonota rosicolana, Doubl. Transformations of this species and allies described; C. G. Barrett, Ent. M. M. xv. pp. 247–249.

Catoptria æmulana. Two species probably confounded under this name; W. Machin, Ent. xii. pp. 109 & 110. The second was regarded by Doubleday as *decolorana*, Freyer; E. G. Meek, *op. cit.* p. 130.

Phoxopteris nubeculana, Clem. Noticed and figured; C. V. Riley, Rep. Ent., Ann. Rep. Dept. Agric. 1878, pp. 34 & 35, pl. ii. figs. 3 *a–c*.

Semasia gallicolana, Zell., noticed as probably distinct from *obscurana*, Steph. The *S. obscurana* of Wilkinson & Stainton's Manual is *gallicolana*. H. T. Stainton, Ent. M. M. xv. p. 238.

Ephippiphora obscurana and *gallicolana*. Additional notes on their identity; W. P. Weston, Ent. xii. p. 20.

Retinia. Larva destructive to pines in North America; S. H. Scudder, and others, Canad. Ent. xi. pp. 176 & 177, & 194.

Carpocapsa pomonella. Remarks; C. V. Riley, *l. c.* pp. 33 & 34, Am. Nat. xiii. pp. 523 & 524; *cf.* also N. Amer. Ent. i. pp. 5–7.

Grapholitha seeboldi, Rössl., and *modestana*, Herr.-Schäff., redescribed, and the former figured, Seebold & Rössler, An. Soc. Esp. viii. pp. 120 & 122, pl. i. fig. 1; *G. zebeana*, Ratz., transformations, Torge, S. E. Z. xl. pp. 382–386, Ent. Nachr. v. pp. 267 & 268; *G. dorsana*, Fabr., var. *gigantana*, from Asia Minor, described, Staudinger, Hor. Ent. Ross. xv. p. 260.

Cochylis posterana, Zell., var. *collaterana*, Mann, noticed, from Brussa and Bilbao, Seebold & Rössler, *l. c.* p. 119; *C. claviculana*, Mann, and *moribundana*, Staud., redescribed, Staudinger, Hor. Ent. Ross. xv. pp. 242 & 244; *C. stoliczkana*, F. Moore, redescribed and figured, Second Yark. Miss. Lep. p. 16, pl. i. fig. 14.

Dapsilia rutilana, Hübn., redescribed and figured; C. V. Riley, Rep. Ent., Ann. Rep. Dept. Agric. pp. 42 & 43, pl. v. fig. 1.

Eupœcilia gilvicomana, Zell., recorded as new to Britain; E. G. Meek, Ent. xii. pp. 263 & 264.

New species :—

Penthina delitana, Staudinger, Hor. Ent. Ross. xv. p. 250, Balkan, Caucasus, &c.; *P. cuphostra* and *acharis*, A. G. Butler, Ill. Lep. Het. iii. p. 80, pl. lx. figs. 8 & 9, Yokohama; *P. osmundana*, C. H. Fernald, Canad. Ent. xi. p. 156, Maine.

Tortrix striolana, E. L. Ragonot, Bull. Soc. Ent. Fr. (5) ix. p. cxxxii., France; *T. ignoratana*, Staudinger, *l. c.* p. 234, Amasia; *T.* (*Lozotœnia*) *clemensiana* and *T.* (*Lophoderus*) *juglandana*, C. H. Fernald, *l. c.* p. 155, United States; *T.* (*Ptycholoma*) *dissitana*, Grote, N. Amer. Ent. i. p. 29, Buffalo.

Pandemis sinapina, A. G. Butler, *l. c.* p. 78, pl. lx. fig. 3, Yokohama.

Cacœcia similis, id. *l. c.* p. 79, pl. lx. fig. 4, Yokohama.

Steganoptycha simulatana, Staudinger, *l. c.* p. 261, Amasia; *S. obscura*, E. Wollaston, Ann. N. H. (5) iii. p. 341, St. Helena.

Phoxopteryx pulchra, A. G. Butler, *l. c.* p. 79, pl. lx. fig. 7, Yokohama.

Retinia (?) *comstockiana*, C. H. Fernald, *l. c.* p. 157, Ithaca, N. Y.

Grapholitha prunivorana, E. L. Ragonot, *l. c.* p. cxxxii., Dax; *G. umbratana*, p. 253, *medullana*, p. 254, *desertana*, p. 256, *tetragrammana*, p. 259, Staudinger, *l. c.*, Asia Minor; *G. albimaculana*, C. H. Fernald, *l. c.* p. 157, Maine.

Sciaphila fumida and *cupreifera*, A. G. Butler, *l. c.* p. 79, pl. lx. figs. 5 & 6, Yokohama.

Cochylis dictyodana (and ab. *insignatana*), p. 238, *sparsana*, Asia Minor, p. 239, *clathratana*, S. Ural, p. 240, *respirantana*, p. 246, and *centaureana* Asia Minor, p. 247, Staudinger, *l. c.*

Eudemis helichrysana, E. L. Ragonot, *l. c.* p. cxxxii., Dax.

Tineidæ.

Guénée, A. Essai sur les *Yponomeutides*. Ann. Soc. Ent. Fr. (5) ix. pp. 281–290.

Guénée remarks on various known species of *Hyponomeuta*, *Psecadia*, *Cydosia*, *Eggina* (? = last), *Atteva*, and *Corinea* (? = last), and describes 2 new genera and several new species.

Tinea taken and bred in 1878; J. H. Threlfall, Ent. M. M. xv. p. 237; Ent. xii. pp. 86 & 87; *cf.* also G. Elisha, Ent. xii. pp. 60 & 61.

Rössler figures and redescribes his *Tinea mæniella*, *Lita vasconiella*, *Nothris bilbainella*, and *Butalis biventrella*; An. Soc. Esp. viii. pp. 125–127 & 130, pl. i. figs. 9, 7, 10, & 8.

Lithocolletis, *Leucanthiza*, *Bucculatrix*, and *Nepticula*. Notes on various N. American species; V. T. Chambers, Canad. Ent. xi. pp. 89–93. *Lith. fitchella*, Clem., and *quercitorum*, Frey & Bell., are distinct; *L. juglandiella*, Clem., = *caryifoliella*, Clem.; *L. mariæella*, Chamb., = *L. trifasciella*, Haw.; *L. virginiella*, Chamb., = *obscuriostella*, Clem.; *Leuc. saundersella*, Chamb., = *amphicarpeæ-foliella*, Clem.

Lithocolletis and *Nepticula*. On breeding; G. Elisha, Ent. xii. pp. 238 & 239.

Talæporia improvisella, Staudinger, var. from Asia Minor described by him, Hor. Ent. Ross. xv. p. 267.

Melasina lugubris, *ciliaris*, and *melana* are all one species, but *punctata*, Herr.-Schäff., is distinct; *id. l. c.* p. 269.

Euplocamus ursella, *anticella*, and *sanctæ-helenæ* (of which last *ligniferellus* is a synonym), all of Walker, are redescribed by E. Wollaston, Ann. N. H. (5) iii. pp. 415–417.

Tinea. A. Fuchs notices several species occurring near Bornich, and describes two new ones; S. E. Z. xl. pp. 337–342. *T. fenestratella*, v. Heyd., recorded as new to Britain, and von Heyden's description translated; H. Ruston, Ent. M. M. xv. pp. 238 & 239. *T. paradoxella*, Staudinger, var. from Asia Minor, described by him, *l. c.* p. 273. *T.* (*Ornix*) *caricella*, Hübn.: time of appearance; F. Thomas, Ent. Nachr. v. pp. 217 & 218. *T. auristrigella*, Chamb., = *Incurvaria medio-striatella*, Clem.; V. T. Chambers, Canad. Ent. xi. p. 146.

Adela biviella, Zell., redescribed; *A. bella*, Chamb., amended description; *A. schlægeri*, Zell., = *Dicte* (*A.*) *corruscifasciella*, Chamb.: *id. l. c.* p. 125.

Nemotois schiffermuelleriella. Habits of larva; G. Elisha, Ent. xii. pp. 183 & 184.

Acrolepia perlepidella. Transformations described; Barrett & Grigg, Ent. M. M. xvi. pp. 34–36.

Ræsslerstammia erxlebella. Note on larva; H. T. Stainton, Ent. M. M. xvi. p. 84; P. E. Soc. 1879, p. xxxi.

Hyponomeutidæ. This family should probably be transferred to the *Bombyces*, after the *Lithosiidæ*; A. G. Butler, Ill. Lep. Het. iii. p. 81, note.

Hyponomeuta irrorella, Hübn. Larva described; A. Guénée, *l. c.* p. 281

Simaethis nerdamia cæsiella. Two British species have hitherto been confused under this name, viz., *oxyacanthella*, Dup. & Zell., and *spiniella*, Zell., pp. 207 & 208 ; *S. nanivora* has been taken in Esthonia, Ross. xv. I. T. Stainton, Ent. M. M. xv. On larvæ feeding on mountain ash, Talæporg & Stainton, *op. cit.* xvi. pp. 163 & 164. Synonymic notes; E. L. Ragonot, *op. cit.* xv. pp. 229–231.

Atemelia torquatella (a Scotch species) found at Castle Eden Dene ; J. Sang, *op. cit.* xvi. p. 165.

Zelleria. T. Moncreiffe regards *heparіella*, *insignipennella*, and *fusca* as all distinct ; Scot. Nat. v. p. 72.

Cerostoma instabilella and *trichonella*, Mann, redescribed ; Staudinger, *l. c.* pp. 284–287.

Psecadia chrysopyga, Herr.-Schäff. (*nec* Zell.), var. *andalusica* described ; *id. l. c.* p. 296.

Depressaria. The larvæ of several species feed on carrot ; E. L. Ragonot, *l. c.* xvi. p. 116. *D. atomella* recorded as new to Britain, J. B. Hodgkinson, Ent. xii. pp. 55 & 56, and Ent. M. M. xv. pp. 208 & 209 ; differentiated from *D. scopariella*, H. T. Stainton, *l. c.* xv. pp. 188 & 189. *D. rotundella*, Dougl. : larva noticed ; *id. l. c.* xvi. pp. 112 & 113. *D. stigmella*, F. Moore, redescribed by him, Second Yark. Miss. Lep. p. 17.

Gelechia acuminatella bred from *Carduus heterophyllus* ; F. B. White, Scot. Nat. v. p. 118. *G. lathyri*, a fen insect, recorded from Perthshire ; H. T. Stainton, *l. c.* xvi. p. 11. *G. gerronella*, Zell., noticed ; *id. l. c.* pp. 111 & 112. *G. suavella*, Hübn. : habits ; J. W. Douglas, *op. cit.* xv. p. 207. *G. luculella* : larva and habits described ; J. H. Wood, *op. cit.* xvi. pp. 164 & 165. *G. cerealella* feeding on maize in Corsica, M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. xcix. ; a *Pteromalus* is parasitic on it, *id. l. c.* p. xxxiv. *G. diffinis*, Haw., var. ? *tristis*, from Russia, and *G. terebinthinella*, Herr.-Schäff., described ; Staudinger, *l. c.* pp. 306 & 307.

Gelechia. V. T. Chambers publishes the following notes on some of his own species :—*G. 5-notella* = *G. fasciella*, *G. inornatella* = worn specimens of *G. packardella* and *superbifrontella* ; *G. purpurella* may = the European *G. stigmatella*. Canad. Ent. xi. pp. 118 & 119.

Lita solanella, Boisd., an Algerian species, occurs in Australia ; E. Meyrick, Ent. M. M. xvi. p. 66.

Pronuba yuccasella. On the fertilization of *Yucca* ; N. Am. Ent. i. pp. 33–36.

Ithome onomaculella is congeneric with *Perimede erransella*, and *Chrysopelia purpuriella* is congeneric with *Æœa ostryœella* ; V. T. Chambers, *l. c.* pp. 9 & 10.

Embryonopis halticella, Eaton, figured, and redescribed at length ; Phil. Tr. clxviii. pp. 235–237, pl. xiv. fig. 8.

Ptochenusa inopella and *paupella*, Zell., are distinct ; Staudinger, *l. c.* p. 319.

Nothris limbipunctella, Staud., noticed ; T. Seebold, An. Soc. Esp. viii. p. 128.

Pleurota. The various species from Asia Minor discussed at great length : *P. schlægeriella*, var. *syriaca* from Beyrut described, p. 339 ; Staudinger, *l. c.* pp. 332–346.

Notes on the *Œcophoridæ* of Australia; E. Meyrick, *l. c.* xv.

Symmoca cedestiella, Zell. Variation noticed; Staudinger, *l*

Œcophora lambdella. Habits; C. G. Barrett, Ent. M. M. x

Gracilaria mirabilis, Frey, = *robiniella*, Clem.; V. T. Cha[illegible]. Fr. (5) c. p. 145.

Coleophora ahenella, Wocke, noticed as new to Britain, H. T. Stainton, Ent. M. M. xvi. p. 265; larva noticed, W. H. B. Fletcher, *op. cit.* l. c.; *C. deauratella*, supposed larva, W. Warren, *op. cit.* xvi. p. 113.

Laverna murtfeldtella, *cephalanthiella*, *obscurusella*, and *L.* (?) *ignobilisella*, Chamb. Amended descriptions, notes on larvæ, &c.; Murtfeldt & Chambers, Canad. Ent. xi. pp. 5–8.

Butalis scipionella, Staud., noticed; T. Seebold, *l. c.* p. 130.

Chrysocorys festaliella, cocoon; C. G. Barrett, Ent. M. M. xvi. p. 37.

Batrachedra clemensella, Chamb., = *striolata*, Zell.; V. T. Chambers, *l. c.* p. 144.

Antispila rivillii noticed, Turati, Bull. Ent. Ital. xi. pp. 205 & 206; *A. hydrangeella*, V. T. Chambers, imago described by him, *l. c.* p. 126.

Argyresthia quercicolella, Chamb., = *abdominalis*, Zell.; *id. l. c.* p. 144.

Gracilaria purpuriella, Chamb., may = *G. stigmatella*; id. *l. c.* p. 74.

Elachista kilmunella, Staint. H. T. Stainton discusses the synonymy of this and the allied species, *monticola*, Wocke (= *monticolella*, cf. J. B. Hodgkinson, Ent. xii. p. 16, and Ent. M. M. xv. p. 209, = ? *alpinella*, Staint.), and *stagnalis*, Frey, the last not yet authenticated as British, Ent. M. M. xv. pp. 175–179; *E. perplexella* double-brooded, J. Sang, *op. cit.* pp. 259 & 260.

Lithocolletis scopariella, note on economy, Sang & Stainton, *l. c.* xv. p. 239; *L. scudderella*, Frey, is distinct from *salicifoliella*, Chamb., pp. 72 & 73; the mine figured by Packard, as that of *L. geminatella*, is probably that of a *Nepticula*, p. 75; *L. necopinusella*, Chamb., = *hageni*, Frey, *L. gemmea*, Frey, is distinct from *Parectopa robiniella*, Clem., V. T. Chambers, *l. c.* p. 144.

Lyonetia speculella, Clem., *apicistrigella* and *gracilella*, Chamb., and (*Lithocolletis*) *nidificausella*, Pack., are only doubtfully distinct; *id. l. c.* pp. 74 & 75.

Nepticula basiguttella noticed, W. Warren, Ent. M. M. xvi. p. 37; *N. lapponica*, Wocke, recorded as new to Britain, J. H. Threlfall, *op. cit.* xv. p. 239, Ent. xii. p. 80.

New genera and species :—

Scintilla, A. Guénée, Ann. Soc. Ent. Fr. (5) ix. p. 287. Intermediate between *Chalybe* and *Cydosia*; type, *Phal. punctella*, Cram.

Syblis, id. *l. c.* p. 288. Allied to last; type, *S. glaucopodella*, sp. n., *l. c.* p. 289, Jamaica.

Pogochætia, Staudinger, Hor. Ent. Ross. xv. p. 310. Placed between *Bryotrocha* and *Lita*; type, *P. solitaria*, sp. n., *l. c.*, Asia Minor.

Apatetris, id. *l. c.* p. 316. Allied to *Nannodia*; type, *A. mirabella*, sp. n., *l. c.* p. 317, Asia Minor.

Holcopogon, id. *l. c.* p. 330. Allied to *Nothris*; type, *H. helveolellus*, sp. n., *l. c.*, Asia Minor.

Simaethis hyligenes, A. G. Butler, Ill. Lep. Het. iii. p. 80, pl. lx. fig. 10, Yokohama.

Atychia compar (? = *dispar*, var.) and *tristis*, Staudinger, Hor. Ent. Ross. xv. pp. 265 & 266, Asia Minor.

Talæporia pallida, id. *l. c.* p. 268, Asia Minor.

Scardia lignivora, A. G. Butler, Ent. M. M. xv. p. 273, Oahu.

Tinea fasciella, Staudinger, *l. c.* p. 271, Asia Minor; *T. muricolella* and *subtilella*, A. Fuchs, S. E. Z. xl. pp. 340 & 341, Bornich; *T. flavo-fimbriata*, p. 417, *bicolor*, p. 418, *pulveripennis*, p. 419, *aureo-marmorata* and *piperata*, p. 420, *pulverulenta*, p. 421, *compositarum*, p. 423, *congenera* and *brunneo-marmorata*, p. 424, *vilis* and *fasciculata*, p. 425, *scalaris* and *helenæ*, p. 427, *helenæides* and *apicalis*, p. 428, *irrorata*, p. 429, *atlantica* and *fasciolata*, p. 430, *minutissima* and *divisa*, p. 431, *flavo-tincta* and *actæon*, p. 432, and *niveo-picta*, p. 433, E. Wollaston, Ann. N. H. (5) iii., St. Helena; *T. terranea*, A. G. Butler, Cist. Ent. ii. p. 510, New Zealand; *T.* (*Blabophanes*) *liberiella*, P. C. Zeller, S. E. Z. xl. p. 471, Africa.

Safra lignea, A. G. Butler, Ill. Lep. Het. iii. p. 82, pl. lx. fig. 15, Yokohama.

Adela trifasciella, Staudinger, *l. c.* p. 275, Asia Minor; *A. askoldella*, P. Millière, Le Nat. i. p. 139, Island of Askold.

Nemotois splendidus, Staudinger, *l. c.* p. 277, Asia Minor.

Hyponomeuta assamensis, A. G. Butler, Tr. E. Soc. 1879, p. 6, Cachar; *H. polysticta*, id. Ill. Lep. Het. iii. p. 81, pl. lx. fig. 11, Yokohama; *H. grandipunctella*, A. Guénée, Ann. Soc. Ent. Fr. ix. p. 282, Australia.

Zelleria (?) *impura*, Staudinger, *l. c.* p. 280, Asia Minor.

Argyresthia pretiosa, id. *l. c.* p. 281, Asia Minor.

Idophasia tauricella, id. *l. c.* p. 282, Taurus.

Cerostoma strigosa, A. G. Butler, Ill. Lep. Het. iii. p. 81, pl. lx. fig. 12, Yokohama; *C. albidorsella*, Persia, and *manniella*, Asia Minor, *id. l. c.* pp. 287 & 288.

Psecadia amasina, p. 291, *tripunctella*, p. 292, *treitschkiella*, Asia Minor, p. 294, *lugubris*, Balkan, and *vidua*, Saisan (Siberia), p. 296, *id.* l. c.: *P. bicolorella*, A. Guénée, *l. c.* p. 283, locality unknown.

Depressaria oinochroa [*œno-*], Turati, Bull. Ent. Ital. xi. p. 200, pl. viii. figs. 13 & 14, Alzate; *D. zelleri* and *radiata*, Staudinger, *l. c.* pp. 300 & 302, Asia Minor. *D. nomia*, A. G. Butler, Ill. Lep. Het. iii. p. 82, pl. lx. fig. 13, Yokohama.

Gelechia astragali, Staudinger, Hor. Ent. Ross. xv. p. 304, Asia Minor; *G. imogena*, A. G. Butler, Ann. N. H. (5) iv. p. 457, Japan; *G.* (*Lita*) *tabacella*, E. L. Ragonot, Bull. Soc. Ent. Fr. (5) ix. pp. cxlvi. & cxlvii., on tobacco, and perhaps potato, in Algeria.

Bryotropha indignella, Staudinger, *l. c.* p. 308, Amasia.

Teleia comedonella, p. 312, *mersinella*, p. 313, and *maculata*, p. 314, Staudinger, *l. c.*, Asia Minor.

Parasia litigiosella, P. Millière, Le Nat. i. p. 139, Cannes.

Ergatis decoratella (Zell., MS.), Staudinger, *l. c.* p. 320, S. Europe, Asia.

Doryphora punctatella and *parvula*, id. *l. c.* pp. 321 & 323, Asia Minor.

Nothris sulcella, Staudinger, *l. c.* p. 328, Amasia.

Pleurota subpyropella, Amasia, p. 336, *proteella*, Beyrut, p. 340, *galaticella*, Amasia, p. 341, *issicella*, Mersina, p. 344, *simplex*, Lebanon and Beyrut, p. 345, *id. l. c.*

Lecithocera briantiella, Turati, *l. c.* p. 202, pl. viii. fig. 15, Alzate, &c.

Symmoca griseo-sericeella, E. L. Ragonot, *l. c.* p. cxl., Coimbra, Portugal.

Cydosia chalybella, Guadeloupe, p. 284, *cervinella*, locality unknown, *chrysorrhœella*, Haiti, and *cyanella* (= *nobilitella*, Westw. & Walk., *nec* Cram.), Brazil, p. 285, *garnotella*, Martinique, *brasiliella*, Brazil, p. 286, and *gracilella*, Haiti, p. 287; A. Guénée, *l. c.*

Œcophora fusco-maculella, E. L. Ragonot, *l. c.* p. cxli., Coimbra, Portugal; *Œ. sordida* and *irroratella*, Staudinger, *l. c.* pp. 350 & 351, Asia Minor; *Œ. enopisema*, A. G. Butler, Ill. Lep. Het. iii. p. 82, pl. lx. fig. 14, Yokohama; *Œ. huttoni*, id. Cist. Ent. ii. p. 511, New Zealand; *Œ. splendidula* and *pictipennis*, E. Wollaston, *l. c.* pp. 434 & 435, St. Helena.

Glyphipteryx semilunaris, ead. *l. c.* p. 436, St. Helena.

Gracilaria mutilata and *pallescens*, Staudinger, *l. c.* pp. 353 & 355, Asia Minor.

Coleophora albipennella, p. 359, *setipalpella*, p. 360, *diffinis*, p. 361, *tristella*, p. 362, *bivittella*, p. 363, *echinella*, p. 364, *similis*, p. 366, *univittella*, Asia Minor, p. 368, and *simillima*, Dalmatia, p. 367, Staudinger, l. c.; *C. malivorella*, C. V. Riley, Rep. Ent., Ann. Rep. Dep. Agric. 1878, p. 48, pl. vii. fig. 1, Pennsylvania.

Stegmatophora bifasciata, E. Wollaston, *l. c.* p. 437, St. Helena.

Butalis alseriella, Turati, *l. c.* p. 204, pl. viii. figs. 16 & 17, Lago d'Alserio.

Cosmopteryx flavo-fasciata, E. Wollaston, *l. c.* p. 438, St. Helena.

Elachista densicornella, J. B. Hodgkinson, Ent. xii. p. 56, Grange-over-Sands; *E. recurva*, E. Wollaston, *l. c.* p. 438, St. Helena.

Lithocolletis deceptusella and *quercivorella*, V. T. Chambers, Canad. Ent. xi. pp. 73 & 145, Kentucky (?).

Bucculatrix myricæ, E. L. Ragonot, *l. c.* p. cxlii., Dax.

Pterophoridæ.

Pterophoridæ taken in the Valais, June and July, 1878; R. C. R. Jordan, Ent. M. M. xvi. pp. 21 & 22.

Adactyla sanctæ-helenæ, sp. n., E. Wollaston, Ann. N. H. (5) iii. p. 440, St. Helena.

DIPTERA.

BY

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

THE GENERAL SUBJECT.

BIGOT, J. M. F. Diptères nouveaux ou peu connus. 11e partie. Ann. Soc. Ent. Fr. (5) ix. pp. 183–234.

Chiefly relates to *Xylophagidæ* and *Stratiomyiidæ*. After notices of the position and characters of various genera, the following notes occur:—*Xenomorpha*, Macq, = *Chyromyza*, Wied., = *Hylorus*, Phil.; *Hexacantha* Lioy, = *Beris*; *B. tibialis, chalybæata, morrisi, vallata, nigra, sexdentata, mexicana, incisuralis*, and *albitarsis* belong to *Hoplacantha*; *B. lucifera, B. spiniger, alias*, and *servillii* belong to *Exæreta*; *B. clavipes, maculipennis, flavispinosa*, and *guerini* belong to *Octacantha*; *Heterostomus*, Bigot (preoccupied), is renamed *Heterostomyia*; and the species *H. flexipalpis* should be called *H. inflexipalpis* [!]; *Stratiomys riparia* and *furcata* belong to *Thyreodontha*; *S. solennis, lutatius, garatus, ialemus*, and *paron* belong to *Odontomyia*; *Od. argentata, interrupta, heydeni*, and *dispar* belong to *Hoplodonta*; *O. tigrina* and *nigrita* belong to *Psellidotus*; *Clitellaria pacifica* and *Cyclogaster rubriceps* belong to *Lasiopa*; *Chrysomyia flavicornis* and *Sargus politus, bicolor*, and *viridis* belong to *Microchrysa*; *S. nigrifemoratus* belongs to *Merosargus*; *S. longipennis, insignis, flavipennis, posticus*, and *testaceus* belong to *Plecticus*; *S. hovas* probably belongs to *Chrysonotus*; *S. tenebrifer, natalensis, aureus*?, *staminens* (sic), and *lunus*?, belong to *Pedicella*, Big., which is renamed *Macrosargus*. The author then redescribes known genera and species (chiefly his own) as follows:—*Macroceromys, Euceromys* and *E. nexura* (Walk. ?), *Chalcochætis, Trichochæta*, and *Enoplomyia*. The paper concludes with remarks on the structural characters of the *Asilidæ*, with special reference to the genera *Laphyctis* and *Laphystia*.

GIARD, A. Deux espèces d'Entomophthora nouvelles pour la Flore française, et présence de la forme *Tarichium* sur une muscide. Bull. Sci. Nord. ii. pp. 353–363.

Relates to fungoid parasites on *Calliphora vomitoria*, var. n., *dunensis*, and on *Chironomus riparius*.

GRABER, V. Ueber neue, otocystenartige Sinnesorgane der Insecten. Arch. mikr. Anat. xvi. pp. 56–97, pls. iii. & iv.

The writer describes the internal structure of the antennæ (which he regards as auditory organs) in *Diptera*, and also describes an organ resembling a long pear-shaped bladder which he has discovered in a Dipterous larva, behind the dorsal vessel, and between the 9th and 10th segments; and suggests that this also may be an auditory organ.

KÜNCKEL D'HERCULAIS, J. Recherches morphologiques et zoologiques sur le système nerveux des Insectes diptères. C. R. lxxxix. pp. 491–494.

In the *Stratiomyiidæ*, *Tabanidæ*, *Syrphidæ*, *Conopidæ*, and part of the *Muscidæ*, *Acalypteræ* (*Sepsinæ*, *Platystominæ*, &c.), the nervous chain of the larva becomes elongated during the pupa state, by the separation of some of the ganglia which were previously united, and the transfer of others to the abdomen of the imago. The *Diptera* may thus be divided into three groups, according to the evolution of the nervous system:—(1) those in which the ganglia become reduced in number in the pupa state, as in the majority of other insects (*Tipulidæ*, *Mycetophilidæ*, *Culicidæ*, *Chironomidæ*, *Bibionidæ*, *Asilidæ*, *Leptidæ*, &c., forming the bulk of the old group *Nemocera*; (2) those in which the ganglia become more separated during the pupa state (*Stratiomyiidæ*, &c., as above mentioned); and (3) those in which the thoracic and abdominal ganglia remain connected, as in the larva (*Œstridæ*, *Hippoboscidæ*, *Nycteribiidæ*). A further classification is suggested as follows:—Thoracic and abdominal ganglia united in a single mass (*Hippoboscidæ*, *Nycteribiidæ*, *Œstridæ*, and *Muscidæ Calypteræ*); (2) two nervous centres, one thoracic and the other abdominal (*Conopidæ* and the majority of the *Muscidæ Acalypteræ*); (3) one thoracic and two abdominal centres (*Syrphidæ*); (4) one thoracic and five abdominal centres (*Tabanidæ*, *Stratiomyiidæ*); (5) two thoracic and five abdominal centres (*Therevidæ*); (6) three thoracic and five abdominal centres (*Scenopinidæ*); (7) two or three thoracic centres more or less united, and always six abdominal centres (*Xylophagidæ*, *Empidæ*, *Asilidæ*, *Bombyliidæ*, *Bibionidæ*, *Culicidæ*, *Chironomidæ*, *Tipulidæ*, *Rhyphidæ*, *Mycetophilidæ*); (8) two thoracic and no abdominal centres (*Dolichopidæ*, which thus show an affinity to the *Muscidæ*).

——. Terminaisons nerveuses tactiles et gustatives de la trompe des Diptères. Assoc. Fr. vii. pp. 771–773.

After a brief review of the observations of Leydig, Landois, and Jobert, the proboscis in *Diptera* is described as terminating in two valves which correspond to the labial palpi. Below the integument is a large branching tube, called the false tracheæ, the function of which is to strengthen the palpi. There are true tracheæ in the thickness of the palpi, but parallel to the stem of the false tracheæ runs the large labial nerve, which immediately dichotomises, sending a large number of ramifications to both the inner and outer surfaces of the terminal valves of the proboscis (or the palpi). The nervous filaments on the outer surface are connected with the long and well-developed hairs which border the proboscis; those on the inner side are connected with the rudimentary

hairs placed there, which form a very slender cylinder corresponding to the base of the developed hairs. These filaments cease in the centre of the developed hairs, but traverse the rudimentary ones, appearing beyond them as a very delicate rounded point. The former are probably organs of touch, the latter of taste.

MAYER, P. Sopra certi organi di senso nelle antenne dei Ditteri. Atti Ac. Rom. Mem. sci. fis. (3) iii. pp. 211–229, plate (*cf.* pp. 184 & 185, and Zool. Anz. ii. pp. 182 & 183).

The writer criticizes the observations of Graber, in Arch. mikr. Anat. xvi. (1878), on *Diptera*, and of Bertè on *Pulex*. The structure of the basal joint of the antennæ appears to be very similar in all *Diptera*.

MEADE, R. H. Parasitic *Diptera*. Ent. M. M. xvi. pp. 121 & 122.

Contains notes on *Tachina larvarum*, L., *Exorista vulgaris*, Fall., *E. grandis*, Zett., and *Masicera atropivora*, Desv.

OSTEN-SACKEN, C. R. Catalogue of the described *Diptera* of North America. 2nd Edition. Sm. Misc. Coll. xvi. No. 270 [dated 1878 on separate title, and 1880 on title of the whole volume, in which state only it reached this country, in Sept., 1880], pp. xlviii. & 276.

Entirely rewritten, the first edition having been published in 1858. A general introduction and bibliography is prefixed, and a great number of observations are appended, among which it is only possible here to notice new genera and species. The following new names are proposed for preoccupied genera:—*Neoempheria* (*Empheria*, Winn.), p. 9, *Neoglaphyroptera* (*Glaph.*, Winn.), p. 10, *Idioplasta* (*Protoplasa* and *-plasta*, O.-S.), p. 36, *Neoexaireta* (*Ex.* Schin.), p. 44, *Neorondania* (*Rond.*, Jaen.), p. 50, *Neocristicus* (*Er.*, Loew), p. 81, *Neomochtherus* (*Mochth.*, Loew), *Neoitamus* (*Itam.*, Loew), p. 82, *Neoidiotypa* (*Idiot.*, Loew), p. 187, *Neaspilota* (*Aspil.*, Loew), p. 192.

RONDANI, C. Hippoboscita Italica in familias et genera distributa. Bull. Ent. Ital. xi. pp. 3–28.

The *Diptera* are divided into *Hippoboscita*, *Muscita*, and *Pulicita*, and the first is subdivided into the families *Braulidæ* (new characters of the genus *Braula* added), *Nycteribiidæ*, *Hippoboscidæ*, and *Streblidæ*.

VERRALL, G. H. Zoology of Kerguelen's Island—*Diptera*. Phil. Trans. clxviii. pp. 238–248, pl. xiv. figs. 1–6.

Several species have rudimentary wings, and their hair and bristles are proportionately undeveloped likewise. The following species described by Eaton in Ent. M. M. xii., are redescribed and figured:—*Calycopteryx moseleyi*, p. 239, *Amalopteryx maritima*, p. 241, *Apetenus litoralis*, *Anatalanta aptera*, *Limnophyes pusillus*, and *Halirytus amphibius*.

Captures in Yorkshire in 1877; S. L. Mosley, Tr. Yorksh. Nat. Un. i. Series D, pp. 19–22.

List of *Diptera Brachycera* of Zwickau; Schlechtendal, JB. Ver. Zwickau, 1879.

G. Gercke describes the metamorphoses of *Ceratopogon* (naked-winged species), *Tanypus nigro-punctatus*, Stæg., *Hydrellia mutata*, Meig., and *Hydromyza livens*, Fall.; Verh. Ver. Hamb. iv. pp. 222–234, pl. & figs.

Contributions to a knowledge of the *Diptera* of Charkow and the neighbourhood, with remarks on their distribution in European Russia; W. Jaroschevsky, Troudy Ges. Charkow, xi. pp. 317–454 [1877]). A list of 506 species, of which 207 are noticed in detail, 1 doubtfully as new.

Notes on Arctic *Diptera*; Osten-Sacken, J. L. S. xiv. pp. 116–118.

Notes on the collection of *Diptera* in the Museum at Cambridge, U.S.; Hagen, Canad. Ent. xi. pp. 132 & 133.

Notes on the nervous system of the *Diptera*; E. Brandt, Hor. Ent. Ross. xiv. pp. vii. & viii.

Aquatic Dipterous larvæ appear to render stagnant water more corrupt; J. W. Slater, Ent. p. 87.

Extraordinary structure of the larva and pupa of a Dipterous insect, combined with dimorphism in the ♀ imago; F. Müller, P. E. Soc. 1879, p. l. (preliminary notice only).

Cecidomyidæ.

Circular relating to the Wheat Midge and the Hessian Fly; A. S. Packard, Canad. Ent. xi. pp. 137–139.

Cecidomyia trifolii, sp. n., J. A. Lintner, Am. Nat. xiii. p. 190, & Canad. Ent. xi. p. 44, New York State (destructive to clover seed). Subsequently renamed by him *C. leguminicola*, the former name being preoccupied in the genus; Canad. Ent. xi. p. 121.

Oligotrophus tanaceticolus, sp. n., Karsch, JB. Westf. Ver. 1878-79, p. 27, pl. i. figs. 1 *a* & *b*, Westphalia.

Mycetophilidæ.

Beling, —. Nachrichten über den Heerwurm in den Jahren 1871–77. Zool. Gart. 1879, pp. 74–83, 112–115.

Sciara militaris ("Heerwurm"). Great trains of larvæ; Dragendorff, SB. ges. Dorpat, v. p. 31.

Bibionidæ.

Arribálzaga, F. L. Notas dipterológicas sobre los Bibiónites del Baradero. Nat. Arg. i. pp. 295–299.

The following known genera and species are redescribed: *Dilophus*, Meig., *D. similis*, Rond., *Bibio*, Geoffr., *B. subæqualis*, Rond., *Plesia*, Wiedem., *P. funebris*, Fabr., *Scatopse*, Geoffr., *S. fulvitarsis*, Macq., and *S. atrata*, Say ?.

Bibio, sp. from Jamaica. Two males in copulâ with one ♀; P. H. Gosse, Ent. M. M. xvi. p. 160.

Bibio vicinus, sp. n., Arribálzaga, Nat. Arg. i. p. 297, Baradero.

Scatopse pallidipes, sp. n., *id. l. c.* p. 298, Baradero.

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Bibio, sp. from Jamaica. Two males in copulâ with one ♀; P. H. Gosse, Ent. M. M. xvi. p. 160.

Bibio vicinus, sp. n., Arribálzaga, Nat. Arg. i. p. 297, Baradero.

Scatopse pallidipes, sp. n., *id. l. c.* p. 298, Baradero.

BLEPHAROCERIDÆ.

Blepharocera ancilla, sp. n., Osten-Sacken, Sm. misc. Coll. (270), p. 266, California.

CULICIDÆ.

Attitude of gnats at rest; J. W. Slater, Ent. xii. p. 274.

Culex mosquito as the nurse of *Filaria sanguinis-hominis*; Manson & Cobbold, J. L. S. xiv. pp. 304–311.

Anopheles annulipalpis and *albitarsis*, spp. nn., Arribálzaga, Nat. Arg. i. pp. 149 & 150, Buenos Aires.

Ædes squamipennis, sp. n., *l. c.* p. 151, Buenos Aires.

TIPULIDÆ.

LOEW, H., & OSTEN-SACKEN, C. R. Analytische Tabelle zum Bestimmen der nordamerikanischen Arten der Tipuliden-Gattung *Pachyrrhina*. Verh. z.-b. Wien, xxix. pp. 513–516.

The nature of this paper (which is in English) is sufficiently explained by the title.

OSTEN-SACKEN, C. R. Die *Tanyderina*, eine merkwürdige Gruppe der Tipuliden. Verh. z.-b. Wien, xxix. pp. 517–522.

Contains general observations, and the description of a new species.

Diotrepha, g. n., Osten-Sacken, Sm. misc. Coll. (270), p. 219. Allied to *Orimarga*, but with the posterior branch of the fourth vein not forked, so that there are only three posterior cells; type, *D. mirabilis*, sp. n., *l. c.* p. 220, Georgia, Texas.

Tanyderus forcipatus, sp. n., Osten-Sacken, Verh. z.-b. Wien, xxix. p. 520, woodcuts, New Zealand.

STRATIOMYIIDÆ.

Stratiomyia. Larvæ living in hot water in Eubœa, and very tenacious of life; H. Lucas, Bull. Soc. Ent. Fr. (5) ix. p. cxlii.

New genera and species:—

Negritomyia, Bigot, Ann. Soc. Ent. Fr. (5) ix. p. 190. Allied to *Ephippium*; type, *E. maculipennis*, Macq.

Gobertina, id. Bull. & Ann. Soc. Ent. Fr. (5) ix. pp. lxviii. & 192. Allied to *Nemotelus*, chætum a little longer, and obtuse at the tip, face perpendicular, not conical or swollen; types, *G. picticornis* and *argentata*, spp. nn., described, Ann. Soc. Ent. Fr. (5) ix. pp. 192 & 193 (where the latter is called *G. argentea*), Sierra Leone.

Chalcochætis bicolor, id. *l. c.* p. 189, Manilla.

Trichochæta nemoteloides, id. *l. c.* p. 191, Ternate.

Enoplomyia cothurnata, id. *ibid.*, Batchian.

Hermetia nigrifacies, p. 200, *flavo-scutata*, p. 201, Mexico, *varipennis*, Brazil, and *melanesia*, Moluccas, p. 202, *id. l. c.*

Euparyphus aureo-vittatus, locality unknown, p. 203, *kabylinus*, Oran, and *niger*, California, p. 204, *id. l. c.*

Histiodroma flaveola, id. *l. c.* p. 205, Mexico.

Biastes pallipes and *vicinus*, id. *l. c.* p. 206, Sierra Leone.

Acanthina aurata, id. *l. c.* p. 207, Colombia.

Ephippium albitarsis, Australia, New Guinea, and *consobrinum*, New Guinea, *id. l. c.* pp. 207 & 208.

Chrysochlora pluricolor, id. *l. c.* p. 209, Brazil.

Stratiomyia dentata, p. 210, *lacerata*, p. 211, California, *lambessiana*, Algeria, p. 212, *armeniaca*, Armenia, and *velutina*, Chili, p. 213, *id. l. c.*

Odontomyia atro-virens, New Zealand, p. 214, *pachyceps*, Para, and *clypeata*, Amazon, p. 215, *anchorata*, Chili, p. 216, and *punctifer*, locality unknown, p. 217, *id. l. c.*

Exochostoma caloceps, id. *l. c.* p. 217, Colorado.

Evasa flavipes, India, *argyroceps*, p. 219, and *fulviventris*, Moluccas, *pallipes*, Batchian, pp. 220, and *pictipes*, New Guinea, p. 221, *id. l. c.*

Sargus niphonensis, Niphon, p. 221, *pallipes*, Ceylon, *S.* (?) *magnificus*, Assam, p. 222, *S.* (?) *papuanus*, New Guinea, p. 223, *S. splendens*, Mexico, and *nigribarbis*, California, p. 224, *id. l. c.*

Macrosargus tenuiventris, Amazon, *rufibasis*, S. America, p. 225, and *smaragdiferus*, Mexico, p. 226, *id. l. c.*

Chrysonotus calopus, Natal, *flavo-pilosus*, Mexico, p. 227, *fulvithorax*, Amazon, p. 228, *id. l. c.*

Merosargus fraternus and *calceolatus*, id. *l. c.* pp. 228 & 229, Mexico.

Plecticus flaviceps, Mexico, and *doleschali*, Mysol, *id. l. c.* pp. 230 & 231.

Microchryza (?) *gemma*, id. *l. c.* p. 231, Ceylon.

Nemotelus cothurnatus, Spain, p. 232, *hirtulus*, Natal, *niger*, p. 233, and *ruficornis*, Chili, p. 234, *id. l. c.*

Rhaphiocera picta, Van der Wulp, CR. Ent. Belg. xxii. p. clxi., Brazil.

Xylophagidæ.

Glutops, Burg., appears to belong to the *Xylophagidæ*, near *Arthropeas*; J. Bigot, Bull. Soc. Ent. Fr. (5) pp. cxxii. & cxxiii.

New species :—

Macroceromyia fulviventre[*-tris*], Bigot, Ann. Soc. Ent. Fr. (5) ix. p. 187, Mexico.

Cænomyia cinereibarbis, id. *l. c.* p. 194, Baltimore.

Subula rufiventris, Natal, p. 194, *caffra*, Sierra Leone, and *calopodata*, Ternate, p. 195, *id. l. c.*

Hoplacantha limbata, id. *l. c.* p. 196, Mexico.

Dialysis dispar, id. *l. c.* p. 197, California.

Exæreta eupodata, p. 198, *hyacinthina* and *philippii*, p. 199, *id. l. c.*, Chili.

Chyromyza vicina, id. *l. c.* p. 200, Australia ?.

Arthropeas leptis, Osten-Sacken, Sm. misc. Coll. (270), p. 223, White Mountains.

Tabanidæ.

Pangonia neocaledonica. Amended description; Mégnin, Bull. Soc. Ent. Fr. (5) ix. pp. lx. & lxi.

Tabanus autumnalis. Notes on the anatomy of the larva, and on the presence of an organ of doubtful significance; H. Krauss, Zool. Anz. ii. pp. 229 & 230.

Sackenimyia, g. n., J. Bigot, Bull. Soc. Ent. Fr. (5) ix. p. l. Allied to *Pangonia*; types, *P. fulvithorax*, Wied., *analis*, F., &c.

Tabanus canus, Karsch, Z. ges. Naturw. (3) iv. p. 376, pl. iv. fig. 1 (wing), Chinchoxo; *T. dodgii*, Nebraska, *superjumentarius*, p. 37, and *sparus*, Milford, N. H., p. 38, C. P. Whitney, Canad. Ent. xi.: spp. nn.

Chrysops cuclux [!], p. 35, *nigrilimbo* [!!] and *cursim* [!!!], p. 36, spp. nn., *id. l. c.*, Milford.

Leptidæ.

Atherix ibis. Swarms of females observed on the banks of the Rhone, near Geneva; De Borre, CR. Ent. Belg. xxii. p. cxx. Oviposition; Perez, Act. Soc. L. Bord. xxxii. p. xliii.

Vermileo degeeri, Macq. Structure described; J. Bigot, Bull. Soc. Ent. Fr. (5) ix. pp. xx. & xxi.

Bombyliidæ.

Arribálzaga, F. L. Notas dipterológicas sobre los Antrácidos y Bombiliarios del Partido del Baradero (Provincia de Buenos Aires). Parte primera. Antrácidos. Nat. Arg. i. pp. 225–231, 263–275.

Contains general observations on the group, and descriptions of the following known species:—*Exoprosopa erythrocephala*, Fabr., and *proserpina*, Wiedem., *Anthrax minerva*, *ditacula*, and *melaleuca*?, Wiedem., *Argyramœba imitans*, Schin., and *œdipus*, Fabr., and *Hirmoneura exotica*, Wiedem.

Anthrax. Description of a new species (not named) from Colorado, with remarks on the variation in neuration of two specimens; S. W. Williston, Canad. Ent. xi. pp. 215 & 216.

Anthrax subæqualis, *ambigua*, and *crepuscularis*, spp. nn., Arribálzaga, *l. c.* pp. 267, 268 & 271, Baradero.

Mulio (?) *cinereus*, sp. n., *id. l. c.* p. 273, Baradero.

Nemestrinidæ.

Parasymmictus, g. n., J. Bigot, Bull. Soc. Ent. Fr. (5) ix. p. lxvii. Allied to *Symmictus*; type, *Hirmoneura clausa*, Ost.-Sack.

Asilidæ.

Arribálzaga, F. L. Asilides argentinos. An. Soc. Arg. viii. pp. 145–153.

Not seen by the Recorder; stated to include 5 species.

Asilus not injurious to domestic animals [as supposed by the Ancients]; J. R. Mégnin, Bull. Soc. Ent. Fr. (5) ix. pp. cxxxiv. & cxxxv.

Dasypogon bilimbatum, Big., = *Callinicus castaneus*, Loew; *Triclis notata*, Big., = *D. sexfasciatus*, Wied.: J. Bigot, Bull. Soc. Ent. Fr. (5) ix. p. lxviii.

Trypanea (*Promachus*) *apivora*, Fitch, *nec* Walk., renamed *fitchi*; Osten-Sacken, Sm. misc. Coll. (270) p. 235, note 121.

Planetolestes, g. n., Arribálzaga, *l. c.* Type, *Laphria coarctata*, Perty.

Cyrtopogon lyratus, sp. n., Osten-Sacken, Sm. misc. Coll. (270), p. 202, Catskills, White Mountains.

Microstylum miles, sp. n., Karsch, Z. ges. Naturw. (3) iv. p. 379, pl. iv. fig. 3 (wing), Chinchoxo.

Xiphocerus susurrus, sp. n., *id. l. c.* p. 380, pl. iv. fig. 4, Chinchoxo.

Empidæ.

Empis 4-*vittata*, *uruguayensis*, and *vicina*, spp. nn., Arribálzaga, Nat. Arg. i. pp. 292–294, Baradero, &c.

Tachydromia sanguinea, sp. n., *id. l. c.* p. 294, Baradero.

Hemerodromia vittata, sp. n., id. *ibid.*, Baradero.

Dolichopodidæ.

Porphyrops signifer, sp. n., Osten-Sacken, Sm. misc. Coll. (270), p. 242, New York.

Syrphidæ.

Batelli, A. Contribuzione all' Anatomia ed alla Fisiologia della Larva dell' *Eristalis tenax*. Bull. Ent. Ital. xi. pp. 77–120, pls. i.–v.; Ann. N. H. (5) iii. pp. 94 & 95.

Remarks on various *Syrphidæ*; Van der Wulp, Tijdschr. Ent. xxii. pp. xci. & xcii.

Syrphus mellinus destroyed by a parasitic fungus of the genus *Entomophthora*, and resting in numbers on a grass (*Molinia cærulea*), dead or dying; Corun & Brogniart, CR. Ent. Belg. xxii. pp. xxxvi.-xxxviii., and Assoc. Fr. vii. pp. 690–693.

Eristalis tenax, Linn., recorded from Illinois; T. E. Bean, Psyche, ii. p. 260.

Sphecomyia vespiformis, Gorski, from Europe, = *S. vittata*, Wied., from N. America; V. v. Röder, Ent. Nachr. v. pp. 96–98.

Merapioides, g. n., J. Bigot, Bull. Soc. Ent. Fr. (5) ix. p. l. Allied to *Milesia*; type, *M. villosus*, sp. n., *l. c.*, Georgia (America).

Crioprora, g. n., Osten-Sacken, Sm. misc. Coll. (270) p. 251. Allied to *Pocota*; the face forms a short snout, prolonged anteriorly rather than downward, with no tubercle in the middle, and with an emargination at the tip. To contain *Brachypalpus cyanogaster*, Loew, and *Pocota cyanella* and *alopex*, O.-S.

Xylota nitida, sp. n., J. Portschinsky, Hor. Ent. Ross. xv. p. 157, Dnieper.

Spilomyia cimbiciformis, sp. n., *id. ibid.*, Siberia.

Muscidæ.

Fitch, E. A. *Trypeta reticulata.* Ent. xii. pp. 257–259, woodcut.

General notes on the British gall-making *Trypetidæ* are added.

Künckel d'Herculais, J. Observations sur les mœurs et métamorphoses du *Gymnosoma rotundatum*, Linn. Ann. Soc. Ent. Fr. (5) ix. pp. 349–362, pl. x. figs. 1–6.

Chiefly relates to the anatomy of the larva and pupa. The former is parasitic on various *Pentatomidæ*.

Lesbini, C., Weyenbergh, H., & Conil, P. A. Études sur la Mycosis. Act. Ac. B. Aires, iii. pt. 2, pp. 41–98, figs.

Robson, M. H. On the Development of the House-Fly and its Parasite. Sci. Goss. xv. pp. 7–9 (woodcuts of transformations). *Cf.* on parasites (*Chelifer*, &c.), pp. 21, 39, 46, 47, 88, & 94.

Schnetzler, B. Quelques observations sur le rôle des insectes pendant la floraison de l'*Arum crinitum*. C. R. lxxxix. pp. 508–510; Ann. N. H. (5) iv. pp. 399 & 400.

Musca cæsar often oviposits on this plant, and is frequently drowned in the flower in large numbers.

Pollenia basalis, Macq., *Sarcophaga mutata* and *Sapromyza squalida*, F. Smith, redescribed by the latter; Phil. Tr. clxviii. pp. 538 & 539.

Exorista hortulana, Meig., recorded as new to Britain; Meade & Porritt, Ent. M. M. xvi. pp. 44 & 95.

Hydrotæa curvipes, Fall. Amended description of ♂; J. Portchinsky, Hor. Ent. Ross. xv. p. 158.

Musca domestica (?) in the Philippines; S. Kneeland, P. Bost. Soc. xx. p. 121.

Calliphora infesta, Phil., and *Compsomyia* (*Calliphora*) *fulvipes*, Macq., noticed; E. L. Arribálzaga, An. Soc. Arg. vii. pp. 252–258.

Case of myiasis; Marchi, Atti Soc. Ital. xi. Adunanze, pp. 16 & 17.

Anthomyia conformis, Nördl. (Fall.?). Transformations described; F. Farsky, Verh. z.-b. Wien, xxix. pp. 107–114, pl. iii. figs. 8–11.

Lonchæa chorea, Meig. Transformations described; *id. l. c.* pp. 101–107, pl. iii. figs. 1–7.

Ephydra, sp. n. Swarms about a petroleum lake in California, and probably breeds upon the water-plants; Dean & Hagen, P. Bost. Soc. xx. pp. 134 & 135.

New species :—

Echinomyia versicolor, Karsch, Z. ges. Naturw. (3) iv, p. 380, pl. iv. fig. 5, Chinchoxo.

Tachina aletiæ, C. V. Riley, Canad. Ent. xi. p. 162, parasite on the Cotton Worm (pupa).

Loxoneura auribata, Karsch, *l. c.* p. 378, pl. iv. fig. 2 (wing), Chinchoxo.

Phorocera atripalpis (Rond., MS.), C. G. Bertolini, Mem. Ac. Bologn. (3) ix. p. 197. Injurious to *Coniferæ* round Bologna.

Phorostoma nigro-fasciata, J. Portchinsky, Hor. Ent. Ross. xv. p. 158, Dnieper.

Platystoma falkensteini, Karsch, *l. c.* p. 382, pl. iv. fig. 7 (wing), Chinchoxo.

Calliphora anthropophaga, P. A. Conil, Act. Ac. B. Aires, iii. pt. 2, pp. 41–98, figs. [= *Compsomyia* (*Calliphora*) *rubrifrons*, Macq., and *Somomyia montividensis*, Big. ; E. L. Arribálzaga, An. Soc. Arg. vii. pp. 252–258].

Hydrotæa pellucens, J. Portschinsky, *l. c.* p. 158, Dnieper.

Aricia arguta, Karsch, *l. c.* p. 381, pl. iv. fig. 6 (wing), Chinchoxo.

Borborus venalicius, Osten-Sacken, Sm. misc. Coll. (270), p. 263, Cuba (introduced from Africa ?).

Œstridæ.

Œstrus equi, oviposition ; G. A. Poujade, Bull. Soc. Ent. Fr. (5) ix. p. cxxviii.

Gastrophilus porcorum, Brauer, introduced into France with horses from Russia ; Mégnin, *op. cit.* pp. cxvii. & cxviii.

Phoridæ.

Leptophora perpusilla, Six, = *oligoneura*, Mik. ; Van der Wulp, Tijdschr. Ent. xxii. pp. xc. & xci.

Hippoboscidæ.

Hippobosca ægyptiaca, Macq., and *bactriana*, Rond. Neuration figured ; Rondani, Bull. Ent. Ital. xi. p. 26.

Hippobosca canina, Italy, Persia, and *taurina*, Italy, spp. nn. ; *id. l. c.* p. 25.

Nycteribiidæ.

Chelidomyia, g. n., Rondani, Bull. Ent. Ital. xi. pp. 10 & 15 (= *Stenopterum* and *Oxypterum*, Leach, *Craterina*, Curt., and *Anapera*, Meig. ; the first 3 preoccupied, and the fourth rejected because a synonym of the second). Wings long and narrow, more or less pointed at the tips ; type, *Hippobosca hirundinis*, Linn. ; add *pallida*, Leach (of which *kirbiana*, Leach, is a var.), and *cypseli*, Italy, parasitic on swallows and *Cypselus* ; and *melbæ*, Piedmont, &c., on *Cypselus*, spp. nn., *l. c.* pp. 16 & 17.

Ornithophila, id. *l. c.* pp. 11 & 20. Allied to *Olfersia* ; antennæ laminiform, edged with long hairs ; scutellum with the middle of the hind margin hairy. Type, *O. vagans*, sp. n., *l. c.* p. 21, Parma, host unknown.

Ornithomyia gestroi, sp. n., *id. l. c.* p. 18, Italy, parasitic on *Falco eleanora*.

botauri, Italy, on *Ardea purpurata*, p. 22; *garzettæ*, Insubria, ...own, *falcinelli*, Malta, host unknown, p. 23: *id. l. c.*, spp. nn. ...*ia ercolanii*, sp. n., *id. l. c.* p. 7, parasitic on *Myotus murinus*.

Polyctenidæ.

...USE, C. O. On the affinity of the genus *Polyctenes*, Giglioli, ...n description of a new species. Tr. E. Soc. 1879, pp. 309–312, ...x. & x.

...thor considers this abnormal form to be the type of a new ...llied to the *Hippoboscidæ* rather than to the *Hemiptera*. One ...es and 3 new species are described. A. E. Eaton suggests its ...ith the *Anoplura*; P. E. Soc. 1879, p. xlv. Rejoinder by J. O. ...d; *op. cit.* p. xlix.

...odes, g. n., C. O. Waterhouse, Tr. E. Soc. 1879, p. 311. Allied ...*a*, with which it agrees most nearly in neuration. Eyeless; head ...ith a series of long spines arranged like a comb along the pos... margin. Abdomen not divided into segments. Wings well deve... Type, *E. mirabilis*, sp. n., *l. c.* pl. x., Colombia ?.

...cenes lyræ, figs. 1 & 2, taken from a bat (*Megaderma lyra*) re... from Secunderabad, Madras Presidency, and *spasmæ*, figs. 3, 3 *a*, ...m a bat (*M. spasma*) from Java, spp. nn., C. O. Waterhouse, *l. c.* ...312, pl. ix.

(APHANIPTERA.)

(Pulicidæ.)

on moles (very large); W. Locock, Sci. Goss. xv. p. 282.

...x erinacei, J. Fedarb, Sci. Goss. xv. p. 258, on hedgehog; *P.* (?) *...ntris*, Weijenbergh, Bol. Ac. Arg. iii. p. 188, on *Dasypus minutus* ...y a *Sarcopsylla*): spp. nn.

...opsylla gallinacea, Westw., is probably distinct from *Hectopsylla* ..., Frauenf.; Ritsema, Tijdschr. Ent. xxii. p. lxxxvii.

NEUROPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

PARFITT, E. The Fauna of Devon, *Neuroptera*. Tr. Devon Ass. xi. pp. 386–421.

A list of about 195 species of all families, with localities, &c., preceded by general notes on the order. About 19 *Psocidæ*, 13 *Perlidæ*, 19 *Ephemeridæ*, 22 *Odonata*, 31 *Planipennia*, and 90 *Trichoptera* are enumerated for the county.

ROSTOCK, M. Die Netzflügler Sachsens. SB. Ges. Isis, 1879, pp. 70–91.

Commences with a sketch of the characters and habits of the various groups, notes on special forms, lists of genera according to authors, &c., followed by a catalogue of 342 Saxon species in 124 genera. The species are distributed as follows: 151 *Trichoptera*, 61 *Planipennia*, 45 *Odonata*, 35 *Ephemeridæ*, 24 *Perlidæ*, and 26 *Psocidæ*.

Crude notes on 5 species of *Neuroptera* collected during the Transit of Venus Expedition in Rodriguez Island; F. Smith, Phil. Tr. clxviii. pp. 539 & 540.

A list of a few species taken at Schelling, in Holland; H. J. Veth, in Tijdschr. Ent. xxii. Verslag, p. xciii.

An imperfect sketch of the order (excluding *Pseudo-Neuroptera*) is given by E. L. Taschenberg, in his "Praktische Insekten Kunde," part i. pp. 184–190.

A list of species in all groups taken by Cuni y Martorell, in the vicinity of Barcelona; An. Soc. Esp. vii. pp. 61–62. Notes on species from other localities in Spain; Bolivar, *l. c.* pp. 62–64.

TRICHOPTERA.

MCLACHLAN, ROBERT. A Monographic Revision and Synopsis of the *Trichoptera* of the European Fauna. Part viii. pp. 429–500, pls. xlv.–li. (May, 1879). London & Berlin: 8vo.

Occupied by the *Rhyacophilidæ*, which are divided into four sections,

viz., *Chimarrha*, *Rhyacophila*, *Agapetus*, and allies, and *Beræa* and allies; but the author expresses an opinion that the last should probably be transferred to the *Leptoceridæ*. The changes in nomenclature, and the synonymy, cannot be fully detailed here. Details for each species are figured as usual.

Müller, Fritz. Ueber Phryganiden. Zool. Anz. ii. pp. 38–40, 180–182, 283 & 284, & 405–407.

Of these four notices on Brazilian species, the first (pp. 38–40) concerns the habits, and especially the cases and structure, of the larvæ of 30 species, observed by the author at Blumenau, Santa Catharina; some new genera are indicated; the families *Phryganeidæ* and *Limnophilidæ* do not occur in Brazil. The second (pp. 180–182) explains the structure and habits of certain larvæ, &c., of *Helicopsyche*, and their cases [*cf.* also P. E. Soc. 1879, pp. vi. & vii.]. The third (pp. 283 & 284) notices the occurrence of branchiæ in the imago of a species of *Leptoceridæ* [cf. also P. E. Soc. 1879, pp. xiii. & xiv., with remarks by McLachlan on the European genera of *Trichoptera* in which such a structure is known to occur]; and the author divides the *Trichoptera* into two groups, according to the condition of the pupæ: in the first group, comprising *Rhyacophilidæ* and *Hydroptilidæ*, the pupa is enclosed in a cocoon, lying within the case or attached to its inner walls; in the second, which includes all the other families, the case has an opening at each end, allowing a stream of water to flow round the strongly active pupa. The fourth notice (pp. 405–407) enlarges on the same subject, with a scheme of classification according to the habits of the larvæ in correlation with the structure of the palpi of the imago. [*Cf.* also Kosmos, ii. pp. 386–396.]

——. Notes on the cases of some South Brazilian *Trichoptera*. Tr. E. Soc. 1879, pp. 131–144.

Embodies much of the matter appearing in the above-mentioned notes, with additional new genera, and fuller descriptions of those previously proposed. (All these observations are anticipatory of a more extended paper that will appear, with plates, in the Arch. Mus. R. Jan.)

Rostock, M. Einige Bermerkungen über die Arbeit von Wallengren, die Linnéischen Arten der Gattung *Phryganea* betreffend. SB. Ges. Isis, 1879, pp. 68–70.

A sketch of Wallengren's views, and McLachlan's objections thereto [*vide infrà*].

Wallengren, H. D. J. An Analysis of the Species of Caddis-Flies (*Phryganea*) described by Linnæus in his "Fauna Suecica." J. L. S. xiv. pp. 726–733. Followed by Notes by R. McLachlan, pp. 733–736.

The following changes are suggested by Wallengren:—*Ph. striata* = *Neuronia ruficrus*, Scop.; *Ph. grisea* = *Limnophilus stigma*, Curt.; *Ph. bimaculata* = *Limnophilus griseus*, auctt.; *Ph. flavilatera* = *Hydropsyche instabilis*, Curt.?; *Ph. saltatrix* = *Stenopsocus immaculatus*, Steph. He also thinks that *Tinea robertella*, L., = *Leptocerus dissimilis*, Steph.; the Linnean names having priority in all cases. The Recorder, *l. c.*, has

examined the evidence in support of these changes, and is not disposed to consider Wallengren's identifications as proved.

Small *Trichoptera* (and insects of some other Orders) may be preserved in a condition most suitable for study by blowing open the wings when freshly pinned, so as to separate these from each other, and from the abdomen, allowing them to dry in that position. McLachlan, Ent. M. M. xvi. p. 45, Ent. Nachr. v. pp. 199 & 200.

McLachlan calls attention to a habit certain species of this group have of depositing their eggs, enveloped in the usual gelatinous medium, on the leaves of trees far from water, in autumn. The young larvæ produced from these eggs appeared to belong to the *Limnophilidæ*, and probably to the genus *Halesus*. Ent. M. M. xvi. p. 135.

The larvæ to which F. A. Forel attributes the cause (in part) of the sculptures on limestone pebbles on the shores of Lake Leman [*cf.* Zool. Rec. xv. *Ins.* p. 247], proved to pertain to *Tinodes wæneri*, L. (= *lurida*, Curt.). Similar sculptures are very abundant on the pebbles of the shores of Lake Neuchâtel, and are probably due to a variety of causes. McLachlan, P. E. Soc. 1879, pp. xviii. xxx. xliii. & xlvii. (embodying also notes by Meldola & Forel).

Limnophilidæ.

A species, given as "*Anabolia pilosa*, Brauer," found in the Falkenstein Caves; S. Fries, Zool. Anz. ii. p. 154.

Limnophilus instillatus, *scalenus*, *hyalinatus*, and *rhanidophorus*, spp. nn., Wallengren, Ent. M. M. xv. p. 274, Norway.

Stenophylax thedeni, sp. n., *id. l. c.* p. 275, Scandinavia.

Sericostomatidæ.

Helicopsyche sperata, McLach. A full account of the habits and structure of this species is given by Ph. de Rougemont in Bull. Soc. Neuch. xi. pp. 405–426, with plate. A previously read note by him appears in Verh. schw. Ges. 1878 (1879), p. 138, in which he proposes the name *H. fanni*, subsequently dropped. Notes on De Rougemont's discovery, by McLachlan, are published in Ent. M. M. xv. pp. 239 & 257, and his paper is reprinted almost *in extenso*, with notes, by Von Siebold in Bull. Ent. Ital. xi. pp. 134–138, under the title, "L'*Helicopsyche* in Italia: Lettera terza agli entomologi Italiani." Targioni-Tozzetti, Resoconti Ent. Ital. 1878, pp. 28–31, announces the discovery of the female insect by Tassinari at Imola, and gives a woodcut of it, with detailed description, &c. In the same Resoconti for 1879, pp. 18 & 19, he states, on McLachlan's authority, that the insect referred to was *Tinodes aureola*, and not *Helicopsyche*; notes on the structure of the male are there given.

Fritz Müller states that about half-a-dozen species of *Helicopsyche* are known to him as occurring in South Brazil. One species is very remarkable for the first-built portion of the case being straight, so that it remains like a small chimney on the top of the more adult cases. One species inhabits rocks wetted by the spray of waterfalls, and is more

active than those that frequent deeper water. A comparison of the structure of the larvæ and pupæ of Brazilian species is made with that given by Brauer for *H. ceylanica*. Tr. E. Soc. 1879, pp. 132 & 133; P. E. Soc. 1879, pp. vi. & vii.; Zool. Anz. ii. pp. 180 & 181.

In a note on Swainson's genus *Thelidomus*, B. R. Dyer refers to *Helicopsyche* as having been discovered in Tasmania, thinking the genus had only hitherto been known from India and Brazil; P. R. Soc. Tasm. 1878 (1879), p. 17.

Leptoceridæ.

Fritz Müller, Tr. E. Soc. 1879, has notes on South Brazilian species as observed by him (*cf.* also P. E. Soc. 1879, Zool. Anz. ii., and Kosmos, ii., as cited at p. 203).

Of McLachlan's Section ii., two genera are known to him. One (p. 133, not named) is near *Odontocerum*, but has the antennæ not dentate, and the eyes of the ♂ very large and contiguous; the case, a cylindrical, slightly-curved sand-tube; two species known [the Recorder is of opinion that *Mystacides albicornis*, Burm., will fall into this genus]. For the other, the name *Grumicha* (St. Hilaire; practically a new genus) is reserved, p. 134; the insect is noticed as having 2.2.2 spurs, a closed discoidal cell, the radius and first apical section connected by a transverse nervule, apical forks Nos. 1, 2, 3, and 5 in the anterior, and 1, 2, and 5 in the posterior wings. The cases are the well-known black *Dentalium*-like tubes [the Recorder thinks this genus probably belongs to the *Sericostomatidæ*].

Of Section iii., there is a species of *Tetracentron*, which uses hollow sticks for its case (sometimes also appropriating the case of *Grumicha*), and the imago of which is remarkable for the existence of branchiæ. Also several species placed provisionally in *Setodes* (for one of these the generic name *Nectopsyche* is proposed in Zool. Anz. ii. p. 40); and a new genus termed *Grumichella* (p. 135; given previously as *Grumichinha* in Zool. Anz. ii. p. 40), near *Leptocerus*, the case much resembling that of *Grumicha*.

Of Section iv. (pp. 137 & 138), Müller is acquainted with three species (genera not named), forming their cases of leaves; one of them inhabits the water that collects at the base of the leaves of *Bromeliæ*.

Hydropsychidæ.

Fritz Müller, Tr. E. Soc. 1879, notices the habits, &c., of S. Brazilian species as follows:—

Macronema (p. 139). The larvæ of one species is extremely common, and is found under large stones. The case is a rudely-constructed accumulation of small stones; that of the pupa more solid.

Tinodes? (ibid.). Cases similar to those described for this genus are very common.

An unnamed genus (*ibid.*), with cases similar to those of *Peltopsyche* (vide *Hydroptilidæ*).

Rhyacophylax, g. n. (p. 140). Nearly allied to *Smicridea*, but 1.4.4 spurs in the ♀ and 1.4.2 in the ♂, with very extraordinary cases.

Rhyacophilidæ.

McLachlan, "Revision and Synopsis," pt. viii., describes 66 species as pertaining to the European fauna, 40 of which are included in the genus *Rhyacophila*.

The habits of the larvæ of two forms of this family occurring in South Brazil are noticed by Fritz Müller, Tr. E. Soc. 1879, pp. 140 & 141. One of these lives, almost without any case, between the tangled stems of water-plants; the anterior legs of the larvæ are armed with curious, powerful forceps; the cocoon of the pupa is not protected by a regular case. Smaller species of another genus build portable cases agreeing with those of most of the *Hydroptilidæ* in not showing any difference between the two extremities; in one of them the water gains access by a small upright cylindrical chimney in the middle of the case, in another by small openings along the dorsal side.

New genera and species :—

The following are described by McLachlan, *l. c.*:—

Synagapetus, g. n., p. 484. Characters as in *Agapetus*, but differing in the neuration of the posterior wings. Includes *S. iridipennis*, McLach. (= *Rhyacophila azurea*, Pict., *nec* L.), and *dubitans*, McLach. (= *Rh. ciliatus*, Pict. ?, *nec* Gmélin).

Pseudagapetus, g. n., p. 485. Allied to *Agapetus*, but the intermediate legs of the ♀ not dilated; neuration as in *Synagapetus*. Includes *Agapetus punctatus*, Hag., and *Ps. armatus*, p. 486, pl. li., Austria, and *insons*, p. 487, pl. li., Pyrenees, spp. nn.

Rhyacophila albardana, p. 437, pl. xlvi., France and Switzerland, *occidentalis*, p. 438, pl. xlvi., Pyrenees, *evoluta*, ibid., pl. xlvi., Auvergne, *palmeni*, p. 440, pl. xlvi., Carniola, *acutidens*, p. 441, pl. xlvi., Italy, *relicta*, p. 442, pl. xlvi., Pyrenees, *denticulata*, p. 443, pl. xlvii., Pyrenees, *polonica*, p. 446, pl. xlvii., Poland, *hageni*, p. 447, pl. xlvii., Silesia, *præmorsa*, ibid., pl. xlvii., Saxony, Belgium, and France, *contracta*, p. 449, pl. xlvii., Pyrenees, *fraudulenta*, p. 450, pl. xlvii., Auvergne, *rupta*, ibid., pl. xlvii., Pyrenees, *pascoei*, p. 451, pl. xlviii., France, *simulatrix*, p. 453, pl. xlviii., Venetia, *aquitanica*, p. 457, pl. xlviii., Auvergne and Tyrol, *producta*, p. 460, pl. xlix., Carinthia, *meyeri*, p. 461, pl. xlix., Switzerland, *eatoni*, p. 463, pl. xlix., Pyrenees, *philopotamoides*, p. 463, pl. xlix., Pyrenees, *hirticornis* (Hagen), p. 464, pl. xlix., Switzerland, Carinthia, and Carniola, *sibirica*, p. 465, pl. xlix., Siberia, spp. nn.

Glossosoma spoliatum, p. 473, pl. l., Pyrenees, *nylanderi*, p. 474, pl. l., Finland, spp. nn.

Agapetus nimbulus, p. 479, pl. l., France and Switzerland, *pactus*, p. 481, pl. l., Holland, Belgium, France, &c., spp. nn.

Beræa vicina, sp. n., p. 499, pl. lii., Bavaria, Carinthia, and Carniola.

Hydroptilidæ.

A. E. Eaton notices the habits of the larvæ of a species of this family (belonging to the genus *Hydroptila* as restricted by him) in Savoy and the Canton Valais; P. E. Soc. 1879, p. xliv.

Fritz Müller, Tr. Ent. Soc. 1879, pp. 141–144, enters into details on

the structure and habits of (principally) the larvæ and cases of this family. He observes that it is probably one of the richest in species in S. Brazil, although no S. American member of it had hitherto been noticed. He groups the local forms roughly into six genera, as follows:

1. Cases resembling those of the European species, either naked or covered with fine sand, Diatoms, &c., more or less compressed, and with a slit at each end.
2. Very minute, nearly cylindrical, coriaceous, brown tubes, covered with fine sand, fixed by either end to the underside of stones, and generally showing two adhesive disks at the anterior, and one on the posterior, end.
3. *Diaulus*, g. n., p. 145 (first noticed by name only as *Dicaminus* in Zool. Anz. ii. p. 39; changed to *Diaulus* at p. 40). Strongly compressed oval cases, elegantly covered by Diatoms, with a narrow slit at each end, and with two (or sometimes three) cylindrical chimneys for access of water. Type, *D. ladislavi*, sp. n., *ibid.*
4. *Lagenopsyche*, g. n., *ibid.* (Zool. Anz. ii. p. 40). Cases resembling a bottle with the bottom cut away, and the lower part compressed until only a slit is visible, the neck representing the mouth-end by which it is held in an upright position; before transformation to pupa, the case is fastened by disks of silk, and the larva then turns itself in the case, so as to keep the head of the pupa uppermost. Two forms are noticed, termed *L. hyalina* and *L. spirogyræ* respectively.
5. *Rhyacopsyche*, g. n., *ibid.* (Zool. Anz. *loc. cit.*). Cases of younger larvæ are brown, coriaceous, nearly cylindrical, widening in the middle. From one end proceeds a silken thread, sometimes more than twice the length of the case, by which it is fastened to stones so as to prevent its being swept away by the rivulets in which it lives. Before transformation to pupa, the thread is much shortened, so as to sustain the case in an upright position. Type, *R. hageni*, sp. n., *ibid.*
6. *Peltopsyche*, g. n., p. 144 (Zool. Anz. *loc. cit.*). Cases resembling the egg-cases of *Nephelis*, fixed in large numbers to the upper side of stones; brown, tough, and coriaceous in texture; the basal wall very thin. The perfect insects differing from all other known forms in the antennæ of the ♂; the basal joints exhibit processes of a complicated structure, differing according to the species. Two species, viz., *P. maclachlani* and *P. sieboldi*, are noticed by name (*ibid.*).

Neuroptera-Planipennia.

Sialidæ.

Riley, C. V. On the larval characteristics of *Corydalus* and *Chauliodes*, and on the development of *Corydalus cornutus*. P. Am. Ass. 1878 (1879), pp. 285–287 (abstract in Canad. Ent. xi. pp. 96–98).

The larva of *Corydalus* has in its later stages three sets of breathing organs, viz., ordinary spiracles, long lateral branchial filaments, and

ventral spongy branchiæ ; the eggs number about 3,000, in masses on trees overhanging water, &c. ; the larvæ undergo about six moults, their motion is backward. In *Chauliodes*, the eggs have a longer peduncle and are not enveloped in gelatinous matter ; the skin of the larvæ is smooth (rough in *Corydalus*), the last pair of spiracles is on the tips of a pair of contractile filaments.

Myrmeleonidæ.

Brischke, C. Ueber das Eierlagen von *Myrmeleon*. Ent. Nachr. v. pp. 29 & 30.

Myrmeleon formicalynx, auctt. (*formicarius*, L.), after having been pinned for some time, deposited five small white eggs, of an oval shape, and agglutinated together ; after several days the larvæ escaped through a round hole. In a second instance also, only five eggs were laid.

Taschenberg, E. Die Arten der Gattung *Myrmecoleon*, Br., and *Ascalaphus*, der zoolog. Museums der Universität Halle. Z. ges. Naturw. (3) iv. pp. 174–231 (pp. 216–231 concern *Ascalaphidæ*).

Consists of somewhat detailed descriptions of such of Burmeister's types as exist in the Museum (including species named in MS. by Klug), and of a certain number of other species, mostly described without specific names. The author does not show that he is acquainted with the literature of the subject outside the few works cited. The only supposed new species to which a name is given is *Acanthaclisis puntifera* (sic), p. 191, Eliva Jononga (W. Africa).

Ascalaphidæ.

Taschenberg, E. [Vide *Myrmeleonidæ*, suprà.]

Commences with a table of genera according to Brauer in 1868 [the author does not appear to have been aware of the Recorder's Memoir of 1871, *cf.* Zool. Rec. viii. pp. 401–403]. 2 species are described and named as new, viz. :—*Haploglenius maculipennis*, p. 218, and *Bubo argyropterus*, p. 225, both from Eliva Jonango (W. Africa).

Osmylidæ.

Psectra diptera at Strasburg ; McLachlan, Ent. M. M. xvi. p. 94.

Pseudo-Neuroptera.

Thysanura.

Parona, C. Saggio di un Catalogo delle Poduridi Italiani. Atti Soc. Ital. xxi. pp. 559–611.

A descriptive catalogue worthy of being styled a monograph, commencing with generalities, a discussion of affinities, classification according to the views of various authors, and especially of Lubbock (whose system is mainly adopted), and an extensive bibliography. No new species are described, but details for 40 Italian species are given, with full synonymy. Following Lubbock's system, these are distributed

as follows:—2 *Smynthuridæ*, 2 *Papiriidæ*, 28 *Degeeriidæ*, 5 *Poduridæ*, 2 *Lipuridæ*, and 1 *Anuridæ*. A variety of *Degeeria nivalis*, L., is figured on p. 595.

The anatomy of *Machilis*, *Lepisma*, *Iapyx*, &c., in connection with its bearing on the origin of insects, is discussed by J. Wood-Mason in Tr. E. Soc. 1879, pp. 145–167, woodcuts. The author considers the Cockroaches are direct descendants of *Lepisma* and allies.

Notes on *Beckia argentea*, Lubbock ?, a *Campodea* and a *Lipura* from the Falkenstein Caves. S. Fries, Zool. Anz. ii. p. 154.

Orchesella rufescens, L., taken in England; Lubbock, P. E. Soc. 1879, p. xliv.

Tullbergia, g. n., Lubbock, Ann. N. H. (4) xviii. p. 324. Body elongate; antennæ not clavate, 4-jointed; post-antennal organs transverse; lower claws absent; anal spines large. *T. antarctica*, sp. n., *ibid.*, Kerguelen Island. Omitted from Zool. Rec. xiii. [1876]; more fully described and figured, with notes on other species from this island, in Phil. Tr. clxviii. p. 249, pl. xiii. figs. 1 *a–c*.

Mallophaga.

Giebel, C. Neue von A. B. Meyer gesammelte Federlinge. Z. Ges. Naturw. (3) iv. pp. 474 & 475.

Notes on species collected on birds in the South Sea Islands; the known species are as follows, with their hosts:—*Nirmus satelles*, Nitzsch, on *Epimachus magnificus*, *Lipurus ferox*, Gieb., on *Diomedea melanophrys*, *L. versicolor*, Nitzsch, on the black stork, *L. caudatus*, Rudow, on *Procellaria capensis*. Other species are diagnosed as new.

The same author, Phil. Tr. clxviii. pp. 250 & 257, describes more fully and figures the species found by Eaton in Kerguelen Island as follows:—*Docophorus dentatus*, Giebel, p. 250, pl. xiv. fig. 16, *Nirmus angulicollis*, id. p. 252, fig. 17, *N. setosus*, id. p. 253, fig. 18, *Goniodes brevipes*, id. p. 254, fig. 19, *Lipurus clypeatus*, id. p. 255, fig. 20; he also indicates (p. 257) a probably new species of *Lipurus* (on *Diomedea fuliginosa*) from the same island.

Goniocotes hologaster, Denny, *nec* Nitzsch, redescribed and named *G. gigas* by O. Taschenberg, who found one example on a Cochin China fowl; Z. ges. Naturw. (3) iv. pp. 104–107, pl. i. figs. 10 & 11.

Goniodes longipilosus, sp. n., Giebel, *l. c.* p. 475, on *Seleucides alba* from the South Seas.

Nirmus nudus, sp. n., *id. ibid.*, on *Seleucides alba*, from the South Seas.

Docophorus papuanus, sp. n., *id. ibid.*, on *Paradisea papuana*, from New Guinea.

Menopon ferale, sp. n., Leidy, P. Ac. Philad. 1878, p. 100, on *Pelecanus trachyrrhynchus* from Florida.

Thysanoptera.

Reuter, O. M. Diagnoser öfver nya *Thysanoptera* från Finland. Öfv. Fin. Soc. xxi. pp. 207–223.

Twenty-three species enumerated, of which several are new.

Szaniszló, A. von. Beiträge zur Lebensweise von *Thrips frumentarius*, Beling. SB. z.-b. Wien, xxix. pp. 33–36.

A full account of the life-history of the insect, with details of the damage occasioned by it in Transylvania in 1876.

Aptinothrips fasciatus, Butler, redescribed and figured; Phil. Tr. clxviii. p. 553, pl. liv. fig. 7.

New species :—

Phlœothrips longispina, Reuter, *l. c.* p. 214, *tibialis*, p. 215, *pallicornis*, p. 216, Finland.

Thrips (*Limothrips*) *bidens*, id. *l. c.* p. 218, *Th.* (*T.*) *basalis* and *flavicornis*, p. 219, *salicis*, p. 220, *Th.* (*Belothrips*) *bicolor*, p. 221, Finland.

Termitidæ.

Termes flavipes preyed upon by *Formica exsectoides*; McCook, P. Ac. Philad. 1879, p. 155. An immense swarm appeared at Cambridge, Massachusetts, on the morning of May 22nd, 1878, forming a dark cloud; they were accompanied by fifteen different species of birds, some of which so gorged themselves that they could not close their beaks. H. A. Hagen, P. Bost. Soc. xx. p. 118.

V. L. Seoane supplements his notes on the destruction of a Spanish man-of-war in the port of Ferrol by *Termites* (cf. Zool. Rec. xv. *Ins.* p. 250), by giving the scientific, as well as the vernacular, names of the timber-producing trees in the Philippines used for ship-building. CR. Ent. Belg. xxii. pp. xiv. & xv.

Embidæ.

McLachlan notices the finding by Wood-Mason, at Jubbulpore, of larvæ of a species of this family both in the open and under loose bricks; they probably pertained to *Oligotoma saundersi*, Westwood: P. E. Soc. 1879, p. xliii.

Psocidæ.

Selys-Longchamps, E. de. La sous-famille des Psocines en Angleterre, en Belgique, et en Scandinavie. CR. Ent. Belg. xxii. pp. clxiv.–clxvii.

Comparative faunistic notes, with a table, according to the works of McLachlan, the author, and Spångberg.

Psocus flavo-nimbatus, Rostock, Ent. Nachr. v. p. 129, Russia (Peipus Lake); *P. citricola*, W. H. Ashmead, Canad. Ent. xi. p. 228, Florida: spp. nn.

PERLIDÆ.

BRANDT, A. Ueber den rudimentären Hermaphroditismus bei Perliden. Zool. Anz. i. pp. 391–393 [1878].

Having previously noticed rudimentary ovaries, &c., in a ♂ larva of *Perla bipunctata*, Brandt was astonished to observe the same structures in a ♂ imago of the same species from another locality; he asks, can he only have observed a monstrous individual in each case, or can this rudimentary hermaphroditism be the rule in this species?

Isopteryx tubulosa, sp. n., Stein, MT. Münch. ent. Ver. iii. p. 139, woodcut, Thuringia.

EPHEMERIDÆ.

MÜLLER, ALBERT. Entdeckung der Nymphe von *Oligoneuria rhenana*, Imh. MT. schw. ent. Ges. v. (1878) pp. 384–386.

Concerns the discovery of larva and nymph, in July and October, in the Rhine at Basle, with description of the nymph, and notes on the distribution of the genus.

Prosopistoma punctifrons. É. Joly has the following additional notices on this creature. In Feuill. Nat. viii. pp. 99 & 100, he mentions having found more than 200 examples in the Garonne at Toulouse. In the same journal, ix. pp. 24 & 25, the notice of its discovery in the Rhone [*cf.* Zool. Rec. xv. *Ins.* p. 251] is reprinted. In Bull. Soc. Nimes, vii. January, 1879 (only separate copy, pp. 1–7, seen by the Recorder), under the title "Récentes captures de Prosopistomes dans la Garonne," he extends the subject, and concludes with an examination of an opinion supposed to have been advanced by McLachlan [the Recorder is not aware of having held such an opinion] to the effect that *Prosopistoma* may be fitted for a continuous aquatic life, with which he is disposed to agree.

É. Joly & A. Vayssière have also a note on the subject in C. R. lxxxvii. pp. 263–265, giving a succinct account of the anatomy and physiology of the creature, with a suggestion as to the possible absence of aerial forms.

Breyeria borinensis, De Borre. In Nature, xix. p. 501, A. R. Wallace advances this fossil as a proof of the existence of *Lepidoptera* in the carboniferous epoch. McLachlan, *l. c.* p. 554, calls attention to the fact that he had examined the fossil, and had published an opinion (CR. Ent. Belg. xx. p. 36) that it was an Ephemerid. Wallace, p. 582, defends his statement; McLachlan, xx. p. 5, replies. A. P. de Borre, CR. Ent. Belg. xxii. pp. lxxvii.-lxxxiii., enters into a lengthy examination of the question, admitting the existence of the transverse nervules, which, according to McLachlan, should render Lepidopterous affinities impossible, but is still inclined to the idea that it may represent some primitive Lepidopterous condition. A. E. Eaton, Nature, xx. p. 315 (Kosmos, iii. pp. 218 & 219), states that he had recently examined the fossil, and is disposed to place it in the vicinity of *Palingenia*, in the *Ephemeridæ*.

Isonychia ferruginea, Albarda, = *ignota*, Wlk. ; Eaton, Ent. M. M. xvi. p. 36.

Cœnis kungu and *cibaria*, spp. nn., Eaton, Ent. M. M. xv. p. 268, Lake Nyassa. (These form part of the materials from which the natives of the shores of the Lake manufacture an article of diet termed "Kungu cake." *Cf.* also appendix by Eaton to Elton's Journals, London, 1879, 8vo.)

Palingenia papuana, sp. n., *id.* Ann. Mus. Genov. xiv. pp. 398–400, woodcuts, New Guinea.

Odonata.

Machenhauer, F. Präparation der Libellen für Sammlungen. S. E. Z. xl. p. 539.

Ninni, A. Contribuzione per lo studio degli Ortotteri Veneti ; Catalogo degli Odonati. Venice : 1879.

Enumerates 47 species, of which 17 are *Libellulina*, 3 *Corduliina*, 5 *Gomphina*, 9 *Æschnina*, 2 *Calopterygina*, and 11 *Agrionina*. [Not seen by the Recorder ; *cf.* Bull. Ent. Ital. xi. p. 230.]

Pirotta, R. Libellulidi dei dintorni di Pavia. Atti Soc. Ital. xxi. pp. 87–100.

37 species enumerated, with minute general and particular geographical notes. They include 15 *Libellulina*, 4 *Corduliina*, 5 *Æschnina*, 3 *Gomphina*, 2 *Calopterygina*, and 8 *Agrionina*.

——. Sugli Ortotteri (e Miriapodi) del Varesotto. Atti Soc. Ital. xxi. pp. 637–641.

Enumerates 21 species of *Odonata* collected by Pavesi.

——. Libellulidi Italiani. Ann. Mus. Genov. xix. pp. 401–489.

This memoir (presented at the seventh meeting of the Italian Natural History Society, at Varese, in September, 1878) forms the most important and valuable local list that has probably ever been published on this group of insects. Commencing with general remarks (pp. 400–403), the author proceeds to a seemingly exhaustive bibliography, so far as regards the Italian species, from Aldrovandus, in 1638 (pp. 404–420). Then follows an elaborate essay on the geographical distribution of Italian species (pp. 420–431), explaining the limits of the Italian fauna, giving two comparative tables (one of which compares Italy with other European countries, and the other analyses the special sub-districts, divided into northern and southern), ending with a sketch of the principal features. Taking the number of European species at 105, the Italian number 85 (the author remarks that De Selys credited Italy with 63 in 1850). The remainder of the paper is occupied (pp. 432–489) by the systematic portion, the synonymy and special localities given in detail, with notes on general distribution and local variation. The 85 species are apportioned as follows : *Libellulina*, 25 ; *Corduliina*, 7 ; *Æschnina*, 13; *Gomphina*, 11 ; *Calopterygina*, 3 ; *Agrionina*, 26. (Reviewed in Bull. Ent. Ital. xi. pp. 209–211.)

Poletajeff, Olga. Petersburgskija Odonati. Troudy Ent. Ross. xi.; separate copy, 23 pp. & 1 pl.

An apparently elaborate local list (in the Russian language) of 27 species, with copious notes on habits and transformations. [Not seen by the Recorder, and date of publication at present uncertain.]

Selys-Longchamps, E. de. Nouvelles Observations sur les Odonates de la Région de la Nouvelle Guinée. Ann. Mus. Genov. xiv. pp. 287-324.

Supplementary to the memoir in MT. Mus. Dresd., noticed in Zool. Rec. xv. *Ins.* p. 252. Includes a list of species communicated by the Museum of Genoa, synopsis of the genera *Neurothemis* and *Agrionoptera*, a list of species collected in Ternate and New Guinea by Laglaize, full descriptions of some known species diagnosed in the former memoir, and additions and corrections thereto.

Spagnolini, A., & Ragazzi, V. Nota delle Libellule raccolte nelle campagne Livornesi e Pisane. Bull. Ent. Ital. xi. pp. 68–72.

Enumerates 33 species, of which 11 are *Libellulina*, 1 *Corduliina*, 5 *Æschnina*, 3 *Calopterygina*, and 13 *Agrionina*.

Stefanelli, Pietro. Seconda memoria intorno alla conservazione delle Libellule a colori fugaci. Bull. Ent. Ital. xi. pp. 29–35, pl. vi.

Advises rapid dessication in the receiver of an air-pump, and, in certain cases, injection of concentrated sulphuric acid.

Abundance of Dragon-flies at Zanzibar; J. Thomson, Ent. M. M. xvi. p. 280.

The Cuckoo stated to feed upon Dragon-flies, by Gilbert White, according to a previously unpublished letter in Bell's edition of the "Natural History of Selborne," vol. ii. p. 113. McLachlan, Ent. M. M. xvi. p. 22.

Libellulina.

Neurothemis. De Selys-Longchamps, Ann. Mus. Genov. xiv., ranges the species in three groups, as follows: (1) *gigantea*, Brauer; (2) that of *fluctuans*, including *Sophronia*, Drury (= *fulvia*, Drury, ♀), *oculata*, F. (= *stigmatizans*, F., ♀, *manadensis* and *elegans*, Rbr., *pseudopsophronia*, Brauer, and *unicolor*, Selys), *fluctuans*, F. (= *palliata* and *apicalis*, Rbr., *nicobarica* and *ramburi*, Brauer); (3) *equestris*, F., including *degener*, sp. n., p. 296, Bengal, *oligoneuria*, Brauer, *equestris*, F. (= *lineata*, Rbr.), and *feralis*, Burm. (= *communimacula*, Rbr.).

Agrionoptera. De Selys-Longchamps (*l. c.*) gives modified characters, and includes in the genus the following species, placed in two divisions. The first division is divided into two groups: (1) *pectoralis*, Brauer, *festa*, sp. n., p. 300, Queensland, and *simulans*, sp. n., *ibid.*, Malacca and Ceylon; (2) *difficilis*, sp. n., p. 301, Malaysia. The second division also forms two groups: (1) *mysis*, Selys; (2) *interrogata*, Selys, *lineata*, Brauer, *nicobarica*, Brauer, *insignis*, Rbr. (= *similis* and *papuensis*, Selys, as varr.), *longitudinalis*, Selys, and *sex-lineata*, Selys (= *insignis*, Brauer).

Calothemis, Selys, = *Orchithemis* (*Orchistemis*, in error), Brauer, and *C. exsudans*, Selys, = *O. pulcherrima*, Brauer; *id. l. c.* p. 323.

Trithemis infernalis, Brauer, was founded on very old examples of *festiva*, Rbr.; *id. l. c.* p. 324.

Corduliina.

Phyllomacromia contumax, sp. n., Selys, Ent. M. M. xvi. p. 103, West Africa.

Æschnina.

Æschna alpina, Selys, = *Æ. mixta*, Latr.; *id.* MT. schw. ent. Ges. v. (1878) p. 381.

Gomphina.

SELYS-LONGCHAMPS, E. DE. Révision des *Ophiogomphus*, et descriptions de quatre nouvelles Gomphines Américaines. CR. Ent. Belg. xxii. p. lxii.

Herpetogomphus and *Ophiogomphus*. The characters of these subgenera modified, chiefly after the anal parts of both sexes; *id. l. c.* pp. lxiii.–lxv.

Ophiogomphus morrisoni, sp. n., *id. l. c.* p. lxv., Nevada.

Gomphus consanguis, sp. n., *id. l. c.* p. lxvi., North Carolina.

Progomphus polygonus, sp. n., *id. l. c.* p. lxviii., Merida.

Tachopteryx hageni, sp. n., *id. ibid.*, Nevada.

Calopterygina.

SELYS-LONGCHAMPS, E. DE. Quatrièmes Additions au Synopsis des Caloptérygines. Bruxelles: 1879, 8vo, pp. 63: published also in Bull. Ac. Belg. (2) xlvii. pp. 349–409.

The number of known species is raised to about 183. The following are suppressed as synonyms, viz.:—*Sylphis elegans* (= *angustipennis*, ♀), *Rhinocypha ustulata* (= *petiolata*), and *R. albistigma* (= *colorata*). Previously unknown sexes are described as follows:—*Echo margarita*, ♂, *Vestalis apicalis*, ♀, *Hetærina majuscula*, ♀, *Euphæa refulgens*, ♀, *Dysphæa dimidiata*, ♀, *Anisoneura montana*, ♂, *Rhinocypha angusta*, ♀, *petiolata*, ♂, *tincta*, ♀, *colorata*, ♀, and *Euthore plagiata*, ♂. And there are additional notes on many other species.

New species:—

Matrona nigripectus, Selys, *l. c.* p. 9, Khasia Hills.

Echo (?) *uniformis*, id. *l. c.* p. 11, Sumatra.

Cleis mesostigma, id. *l. c.* p. 12, Cameroons.

Vestalis lugens (Albarda), p. 15, Sumatra, *smaragdina*, p. 16; Khasia Hills, *id. l. c.*

Lais fulgida, p. 19, Ecuador, *marginata*, p. 20, Peru, *id. l. c.*

Hetærina miniata, id. *l. c.* p. 24, Chiriqui; *H. maxima*, McLachlan, Ent. M. M. xv. p. 244, Costa Rica.

Epallage alma, Selys, *l. c.* p. 26, Persia.

Bayadera hyalina, id. *l. c.* p. 27, Khasia Hills.

Euphæa brunnea, p. 28, Khasia Hills, *semperi*, p. 30, Manila, *masoni*, p. 31, Tenasserim, *id. l. c.*

Libellago glauca, p. 34, Cameroons ("Old Calabar" in error), *cancellata*, p. 37, Cameroons, *asiatica* (Brauer), p. 38, Luzon, *id. l. c.*

Rhinocypha immaculata, p. 39, Khasia Hills, *bifasciata*, p. 40, Darjiling, *spuria*, p. 42, Khasia Hills, *ignipennis*, p. 43, Khasia Hills, *anisoptera*, p. 48, Sumatra, *id. l. c.*

Micromerus sumatranus (Albarda), p. 51, and *snellemanni*, p. 52, Sumatra, *id. l. c.*

Thore ornata, p. 54, Peru, *aurora*, p. 55, Ecuador, *id. l. c.*

Euthore meridana, id. *l. c.* p. 58, Merida.

ORTHOPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

CHATIN, JOANNES. Origine et valeur morphologique des différentes pièces du labium chez les Orthoptères. C. R. lxxxix. pp. 652 & 653.

An attempt to homologize the parts of the labium with those of the maxillæ.

DUBRONY, A. Notes sur quelques Orthoptères de Sardaigne. Ann. Mus. Genov. xiv. pp. 148–152.

A list of known species collected in the South-east of the island by J. B. Traverso, distributed amongst the families as follows:—3 *Mantidæ*, 1 *Phasmatidæ*, 7 *Acrydiidæ*, and 7 *Locustidæ*.

——. Enumération des Orthoptères rapportés par MM. J. Doria, O. Beccari, & L. M. D'Albertis des régions Indienne et Austro-Malaise. 1. Dermaptères. Ann. Mus. Genov. xiv. pp. 348–383.

——. [*Vide* FORFICULIDÆ, *posteà*, p. 216.]

KRAUSS, HERMANN. Synonymische Bemerkungen mit Bezug auf Bolivar's Catalogus Orthopterorum Europæ. Verh. z.-b. Wien, xxix. pp. 57–64.

Points out errors and omissions in Bolivar's Catalogue, errors in generic position, the synonymy of certain obscure or little-known species, differences in locality, &c.

Pirotta, R. Degli Ortotteri genuini Insubrici. Atti Soc. Ital. xxi. pp. 59–86.

A catalogue of the species known to the author from Lombardy, preceded by a bibliography, and each indication accompanied by full synonymy and local information, giving the distribution in general, that in Italy particularly, and that in Lombardy especially. 77 known species are enumerated, viz., 7 *Forficulidæ*, 5 *Blattidæ*, 2 *Mantidæ*, 1 *Phasmatidæ*, 8 *Gryllidæ* (including *Gryllotalpa*), 21 *Locustidæ*, and 33 *Acrydiidæ*.

——. Intorno agli Ortotteri (e Miriapodi) del Varesotto. Atti Soc. Ital. xxi. pp. 631–637.

Enumerates 31 species collected by Pavesi, viz.:—4 *Forficulidæ*, 1 *Mantidæ*, 3 *Gryllidæ*, 11 *Locustidæ*, and 11 *Acrydiidæ*.

Scudder, S. H. A Century of *Orthoptera*. Decade viii., *Acridii* (*Melanoplus*); P. Bost. Soc. xx. pp. 63–75. Decade ix., *Acridii* (*Pezotettix*); l. c. pp. 75–86. Decade x., *Locustariæ* (*Conocephalus*); l. c. pp. 87–95.

The whole series of Decades published also collectively under the above title, pp. 1–84, Boston: 1879.

W. M. Schøyen, in his "Supplement til H. Siebke's Enumeratio insectorum Norvegicorum," fasc. i., gives notes on, and additions to, the Norwegian Fauna. Förh. Selsk. Chr. 1879. No. 3, p. 10.

The species obtained in the Island of Rodriguez during the British Transit of Venus Expedition are enumerated by A. G. Butler in Phil. Tr. clxviii. pp. 545–549, with fuller descriptions of those considered to be new. The following are figured, viz.:—*Nemobius luteolus*, Butler, pl. liv. fig. 2, *Phisis spinifera*, id., fig. 1, *Epachromia rodericensis*, fig. 3, and *Bacillus incommodus*, fig. 4.

A slight, and very imperfect, sketch of the Order, including *Pseudo-Neuroptera*, is given by E. L. Taschenberg in his "Praktische Insektenkunde," pt. i. pp. 192–208.

A list of species found at Navacerrada and La Granja in Spain is given by Ruiz Madrid in An. Soc. Esp. vii. p. 59.

An enormous swarm of 'Locusts' appeared at Meerut, India, in March, 1879, and occasioned much damage; remedial means frustrated by the fatalistic ideas of the native planters. W. J. Wilson, P. E. Soc. 1879, p. xvi.

Forficulidæ.

Dubrony, A. D. Étude sur quelques Forficulides exotiques. An. Soc. Esp. viii. pp. 91–96.

An indication of 8 species existing in the Madrid Museum, 3 of which are described as new.

Dubrony, Ann. Mus. Genov. xiv. pp. 348–383, has a very important memoir on the species of New Guinea, other islands of the Eastern

Archipelago, and the neighbouring parts of Australia, enumerating 44 species (of which many are new, and illustrated by woodcuts), with synonymy, and many fresh indications of locality.

Forficula auricularia inimical to collectors of *Lepidoptera* by attacking moths on 'sugar' and on the setting-boards ; A. Kuwert, S. E. Z. xl. p. 508.

Labidura femoralis, Dohrn, var. figured and described by Dubrony, Ann. Mus. Genov. p. 353, who suggests that it approaches the genera *Forcinella* and *Brachylabis*.

Lobophora latior, Dohrn, figured and redescribed ; *id. l. c.* p. 374.

Forcinella wallacii, Dohrn, figured and redescribed ; *id. l. c.* p. 377.

Forficula decipiens, Géné, var. *hellmanni*, Kittary, = *tomis*, Kol.; Krauss, Verh. z.-b. Wien, xxix. p. 59.

New genus and species :—

Labidurodes, Dubrony, Ann. Mus. Genov. xiv. p. 355. Very near *Labidura*, but differs by the presence of distinct tuberculiform folds on the 2nd and 3rd abdominal segments. Type, *L. robustus*, id. *l. c.* p. 356, woodcut, Fly River, New Guinea.

Apachys beccarii, Dubrony, *l. c.* p. 349, woodcut, New Guinea (*A. chartacea*, De Haan, also figured for comparison).

Brachylabis punctata, id. *l. c.* p. 357, woodcut, Java.

Psalidophora angusticollis, p. 359, woodcut, Borneo, *australica*, p. 361, woodcut, N. Australia, *id. l. c.*

Labia pygidiata, p. 364, woodcuts, Java, *grandis*, p. 366, woodcuts, North Australia, New Guinea, Aru, *fœ*, p. 368, woodcuts, New Guinea and Ké Island, *nigrella*, p. 370, Java, *id.* l. c. ; *L. bicolor*, id. An. Soc. Esp. viii. p. 95, Abyssinia.

Platylabia gestroi, id. Ann. Mus. Genov. xiv. p. 372, woodcuts, New Guinea.

Forficula albertisi, p. 378, woodcuts, Borneo, Yule Island, *doriæ*, p. 379, woodcuts, Borneo, *borneensis*, p. 381, woodcuts, Borneo, *id. l. c.*

Diplatys raffrayi, id. An. Soc. Esp. vii. p. 91, Zanzibar.

Labidura livida, id. *l. c.* p. 93, Brazil.

Blattidæ.

Duchamp, G. Observations sur la structure et le développement de la Capsule Ovigère de la *Blatta orientalis*. Rev. Montp. vii. pp. 423–427.

Concerns the structure of the egg-capsule and of the glands producing the secretion of which it is formed. The usual number of eggs is 16. It is probable that the capsule is perfected simultaneously with the arrival of the eggs in the lower part of the genital organs. The capsule is composed of regular crystals, glued together by an amorphous substance. Woodcuts of the crystals, &c., are given.

KADAYI, HEINRICH. Beitrag zur Kenntniss der Vorgänge beim Eierlegen der *Blatta orientalis*. Zool. Anz. ii. pp. 632–636.

Observations on the formation of the egg-capsule within the vulva of the ♀, the deposition of the eggs therein (the contents of the right ovary are arranged on the left side of the capsule, and *vice-versâ*), and the mechanism by which the capsule is expelled.

NEWTON, E. T. On the Brain of the Cockroach, *Blatta orientalis*. Q. J. Micr. Soc. xix. pp. 340–356, pls. xv. & xvi.

SCUDDER, S. H. Palæozoic Cockroaches: a Complete Revision of the Species of Both Worlds, with an Essay toward their Classification. Mem. Bost. Soc. iii. pt. i. No. iii. pp. 1–134, pls. ii.–vi.

An important memoir, comprising an examination, with original descriptions (and figures) of all that has been discovered, with historical notice and bibliography. About sixty species are described, almost without exception known from single specimens, and mostly from one wing only. These insects appear to have been very plentiful in the palæozoic age, and their remains gradually become less frequent in ascending the geological scale. (Arguing on this evidence, as compared with the number of now-existing species, the author indulges in an illusory estimate of the number of palæozoic species.) The old genus *Blattina*, in which most fossil species have been placed, is abandoned for palæozoic forms, because Germar originally used it for a species found in amber, and having no connection with those of primitive formations. All the species differ in certain neural characters from recent forms. The author, therefore, proposes a special division for these, which he terms *Palæoblattariæ*, divided into two tribes, viz., *Mylacridæ* (containing a few species, all of which are from America) and *Blattinariæ* (common both to Europe and America), according to neural characters. The *Mylacridæ* were geologically the oldest, and therefore the oldest Cockroaches were American. A table of species, according to presumed antiquity, is given. An entirely new generic arrangement is adopted, as under:—MYLACRIDÆ include 3 genera, viz., *Mylacris*, Scudder (1868), in which are placed *Blattina bretonensis*, Sc., pl. v. fig. 1, *B. heeri*, Sc., pl. v. fig. 11, *M. pennsylvanicum*[*-cus*], sp. n., p. 44, pl. v. figs. 13 & 14, lower coal-measures of Pennsylvania, *M. anthracophilum*[*-lus*], Sc., pl. v. figs. 6–8, and *M. mansfieldi*, sp. n., p. 47, pl. v. fig. 15, lower coal-measures of Pennsylvania; *Lithomylacris*, g. n., p. 48, including *L. angustum*[*-tus*], sp. n., p. 48, pl. v. figs. 2 & 3, upper coal-measures of Pennsylvania, *L. pittstonianum*[*-nus*], sp. n., p. 50, from the same, and *L. simplex*, sp. n., p. 51, pl. v. fig. 5, from the upper coal-measures of the same State; *Necmylacris*, g. n., p. 52, includes *N. laocanum*[*-nus*], sp. n., p. 53, pl. v. fig. 12, and *N. heros*, sp. n., p. 54, pl. v. fig. 9, from the lower coal-measures of that State. The BLATTINARIÆ are thus subdivided:—*Etoblattina*, g. n., p. 56, includes *Blattina primæva*, Gold., pl. iii. fig. 7, *B. labachensis*, Gold., pl. iii. fig. 5, *B. euglyptica*, Germ., pls. ii. fig. 16, iv. fig. 7, *B. affinis*, Gold., pl. ii. fig. 2, *B. flabellata*, Germ., pl. ii. fig. 4, *B. anthracophila*, Germ., pl. ii., fig. 1, *B. weissigensis*, Gein., pl. vi. fig. 5, *E. dohrni* = *B. euglyptica*, pars, Gold., pl. ii. fig. 5, *E. lesquereuxi*, sp. n., p. 67, pl. vi.

figs. 3 & 4, middle carboniferous of Pennsylvania, *B. anaglyptica*, Germ., pl. ii. fig. 15, *B. vetusta*, Lesq., pl. vi. fig. 12, *Blattidium mantidioides*, Gold., pl. iii. fig. 8, and woodcut, *Blattina carbonaria*, Germ., pl. ii. fig. 3, *B. didyma*, Germ., pl. ii. fig. 13, *B. russoma*, Gold., pl. ii. fig. 6, *B. leptophlebica*, Gold., pl. iii. fig. 9, *B. manebachensis*, Gold., pl. ii. fig. 14, *E. elongata*, Sc., = *B.* sp., Geinitz, without name, pl. ii. fig. 10, *B. parvula*, Gold., pl. ii. fig. 9, and *B. insignis*, Gold., doubtfully pertaining to genus, pls. ii. fig. 7, iv. fig. 9; *Archimylacris*, Sc. (1868), includes *A. acadius*, Sc., pl. vi. figs. 8 & 14, and *A. parallelum*[*-lus*], sp. n., p. 85, pl. vi. fig. 6, from the lower coal-measures of Pennsylvania; in *Anthracoblattina*, g. n., p. 87, are *B. spectabilis*, Gold., pl. ii. fig. 8, *A. sopita*, Sc., = *B. didyma*, Gein., *nec* Germ., pl. iv. fig. 8, *B. dresdensis*, Gein., *vide infrà*, woodcut, *B. porrecta*, Gein., pl. iv. fig. 5, *B. winteriana*, Gold., pl. iv. fig. 12, *B. remigii*, Dohrn, pl. iv. fig. 2, and *B. ruckerti*, Gold., pl. iv. fig. 1; *Gerablattina*, g. n., p. 97, comprises *B. goldenbergi*, Mahr, pl. iii. fig. 13, *B. clathrata*, Heer, pl. iii. fig. 4, *B. intermedia*, Gold., pl. iii. fig. 11, *B. scaberata*, Gold., pl. iii. fig. 3, *B. geinitzi*, Gold., pl. ii. fig. 11, *B. muensteri*, Germ., pl. ii. fig. 12, *G. producta*, Sc., = *B. euglyptica*, Gold., *pars*, nec Germ., pl. iii. fig. 2, *B. germari*, Heer, pl. iii. fig. 6, *B. mahri*, Gold., pl. iii. fig. 14, *B. weissiana*, Gold., pl. iii. fig. 1, *G. balteata*, sp. n., p. 110, pl. vi. figs. 9 & 10, upper carboniferous of Virginia, and *B. fascigera*, Sc., pl. vi. figs. 1 & 2; *Hermatoblattina*, g. n., p. 115, comprises *B. lebachensis*, Gold., pl. iv. fig. 11, and *B. wemmetsweileriensis*, Gold., pl. iv. fig. 14; *Progonoblattina*, g. n., p. 118, includes *B. helvetica*, Heer, pl. iii. fig. 10, and *B. fritschi*, Heer, pl. iii. fig. 12; *Oryctoblattina*, g. n., p. 121, has for type *B. reticulata*, Germ., pl. iv. fig. 13; *Petrablattina*, g. n., p. 123, includes *B. gracilis*, Gold., pl. iv. fig. 4, and *B. sepulta*, Sc., pl. vi. fig. 7. The following species cannot be definitely referred, viz., *B. tischbeini*, Gold., pl. iv. fig. 10, *B. latinervis*, Heer, pl. iv. fig. 3, *B. venosa*, Gold., pl. iv. fig. 6, and *Polyzosterotes granosus*, Meyer. A tabular view of the genera is to be found on p. 27; it cannot be reproduced here.

Phyllodromia germanica is found in houses in the Ardennes; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. clix.

Amœba blattæ and its connection with *Blatta orientalis*; Leidy, P. Ac. Philad. 1879, p. 204.

Blattina dresdensis, sp. n., Geinitz & Deichmüller, SB. ges. Isis, 1879, p. 12, woodcuts, fossil in the Carboniferous of Saxony.

Ectobia brunneri, sp. n., V. L. Seoane, MT. schw. ent. Ges. v. p. 485, Ferrol.

MANTIDÆ.

WOOD-MASON, JAMES. On the Systematic Position of some little-known Asiatic *Mantidea*, with descriptions of two new species belonging to the genus *Hestias*. P. A. S. B. 1879, pp. 257–259.

Hestias, Saussure. Wood-Mason, *l. c.*, refers this genus to the subfamily *Harpagidæ*, and places in it the following species:—*H. brunneriana*, Sauss., *H. rogenhoferi* (= *Pachymantis rogenhoferi*, Sauss.), *H.*

phyllopus (= *Mantis phyllopus*, De Haan), and *H. pictipes*, p. 258, Central India, and *inermis*, ibid., Nâga Hills, spp. nn.

Oxypilus, Serv., should be transferred from the subfamily *Mantidæ* to the *Harpagidæ*; Wood-Mason, *l. c.* p. 259.

On stridulation in *Mantidæ*: A. H. Swinton, P. E. Soc. 1879, p. i.; Wood-Mason, *l. c.* pp. iii.–v.

Saltatory powers; Stainton & Moggridge, P. E. Soc. 1879, p. ix.

Mantis religiosa at Port-sur-Saône (Haute-Saône); L. Fairmaire, Bull. Soc. Ent. Fr. (5) ix. p. clxxi.

Sigerpes, g. n., Wood-Mason, P. A. S. B. 1879, p. 259. Proposed for *Sibylla tridens*, Sauss., and *S. occidentalis*, sp. n., *ibid.*, W. Africa.

Phasmatidæ.

Parectatosoma, g. n., Wood-Mason, J. A. S. B. xlviii. p. 117. Allied to *Ectatosoma*, but differs as follows:—The prothorax relatively longer and more spiny, the ♂ devoid of ocelli and brachypterous, the abbreviated tegmina in both sexes shorter than the abbreviated wings, the upper crest of all the femora produced into a sharp spine. Proposed for *P. hystrix*, ibid., and *P. echinus*, p. 118, spp. nn., Madagascar.

Gryllidæ.

Pierce, Newton B. Sound-producing Organs of the Cricket. Am. Nat. xiii. pp. 322–324, woodcuts.

A lucid, illustrated explanation of the peculiar mechanism. The apparatus on the under side of the inner margin of one wing-case is drawn rapidly over the squamous surface of the corresponding upper side of the other, on which the vibratory flanges on the under side act; the call is formed during the outward stroke of the wing-cases, which are slightly separated, and the insect assumes a statue-like position when stridulating.

Hemimerus talpoides, Walker. Under the title, "Spicilegia Entomologica Genevensia: i. Genre *Hemimerus*," Saussure enters into a minute examination of this insect (placed by Walker in the *Gryllidæ*), and arrives at the conclusion that it will not fit into any existing Order of insects, and he proposes for it a new one, which he names *Diploglossata*. The most extraordinary part of its structure is the presence of *two superposed palpigerous labia*. Mém. Soc. Phys. Genèv. xxvi. pp. 399–418, pl. i. (also published separately, pp. 1–26, pl. i.).

Myrmecophila acervorum. A succinct, but interesting, account of the habits of this ant-parasite, with a list of the species of ants in the nests of which it has been found, according to the observations of R. Türk, appears in Act. Soc. Esp. viii. pp. 15 & 16.

Brachytrypes megacephalus, Lef., said to be very destructive to vines near Palermo; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. lxxx.

Gryllotalpa vulgaris, L. De Selys-Longchamps, CR. Ent. Belg. xxii. p. ciii., mentions that for the second time he had observed this insect swimming perfectly.

LOCUSTIDÆ.

BERTKAU, P. Ueber den Tonapparat von *Ephippigera vitium*. Verh. Ver. Rheinl. xxxvi. pp. 269–276.

Gives the result of a personal examination of the apparatus with regard to Landois's previous writings on the subject. In this genus the wings in both sexes are so abbreviated that they consist of little more than the stridulating apparatus. Both sexes stridulate, but the method is different in each, which the author advances as opposed to Landois's adaptation of Darwin's theory that originally the apparatus was possessed by both sexes, and was the same in both. Concludes with notes on the geographical distribution, which the author says is much more extended than is generally supposed.

BRUNNER VON WATTENWYL, C. Neue Phanopteriden. J. Mus. Godeffr. xiv. pp. 195 200.

Contains, besides descriptions of new species, a revision of the group of *Ephippitythæ*, including two new genera.

RITZEMA, J. De Muziekorganen van *Ephippigera vitium*, Serv. Tijdschr. Ent. xxii. pp. 210–216, pl. xi. figs. 6–10.

Brunner von Wattenwyl's "Monographie der Phaneropteriden" [*cf.* Zool. Rec. xv. *Ins.* p. 262) analytically reviewed by De Saussure, in Le Naturaliste, i. pp. 7 & 8.

Orchelimum vulgare, Harris, new to the Quebec fauna; Provancher, Nat. Canad. xi. pp. 301 & 302, redescribed.

Saga serrata. R. Türk gives a note on the habits of this species in Act. Soc. Esp. viii. p. 16.

Saga monstrosa, Krauss, = *syriaca*, Lucas; Krauss, Verh. z.-b. Wien, xxix. p. 63.

Thamnotrizon similis, Brunner, = *littoralis*, Fieb.; *id. ibid.*

Rhacocleis buchichi, Brunner, = *neglecta*, Costa; *id. ibid.*

Platycleis alpina, Fieb., = *brachyptera*, L.; *id. ibid.*

Ephippigera vitium, L., very destructive to mulberry-trees at Vaucluse; M. Girard, Bull. Soc. Ent. Fr. (5) ix. p. xlvi.

Ephippigera duricui, Bolivar, = *E. rugosicollis*, Serv.?; Dubrony, Ann. Mus. Genov. xiv. p. 152.

Odontura stenoxypha, Fieb., occurs in the island of Sardinia; *id. l. c.* p. 151.

Locusta viridissima. Notes on habits, with especial reference to carnivorous propensities; R. Laddiman, Ent. xii. pp. 21–23.

Stalia, Scudder [*cf.* Zool. Rec. xii. p. 493], having been preoccupied, is changed to *Eustalia*; Scudder, P. Bost. Soc. xx. p. 95.

Alectoria, g. n., Brunner, *l. c.* p. 196. Allied to *Ephippitytha*, Serv.; pronotum with the anterior margin as well as the sides armed with a spine; disk crested. Type, *A. superba*, sp. n., *ibid.*, woodcut, Peak Downs, Queensland.

Protina, g. n., *id. l. c.* p. 197. Allied to *Diastella*, Brun.; fastigium of the vertex obtuse. Type, *P. guttulata*, sp. n., p. 197, woodcut, Peak Downs.

Cædicia porrecta, sp. n., *id. l. c.* p. 198, Rockhampton.

Polichne brevipes, id. *l. c.* p. 199, Peak Downs, *longipes*, ibid., Rockhampton, *argentea*, ibid., Peak Downs, *spinulosa*, p. 200, Rockhampton, *angustiloba*, ibid., Rockhampton and Peak Downs: spp. nn.

Conocephalus hamatus, Scudder, P. Bost. Soc. xx. p. 87, Guatemala, *aduncus*, ibid., Cuba, *cuspidatus*, p. 88, Cuba, *prora*, p. 89, Nicaragua, *acutulus*, ibid., California, *malivolans*, p. 90, Florida, *aries*, p. 91, Mexico, *hebes*, p. 92, Cuba, N. Orleans, Tehuantepec, *retusus*, p. 93, Georgia, *clausus*, p. 94, Mexico: spp. nn.

Acrydiidæ.

Packard, A. S. The Rocky Mountain Locust in New Mexico. Am. Nat. xiii. p. 586.

Recent records on the invasion of New Mexico by *Caloptenus spretus*, from Southern Colorado. The Pueblo Indians have been in the habit of storing grain two or three years in advance, in anticipation of either drought or attacks of locusts.

Posada-Arango, A. Note sur le Criquet voyageur de la Colombie. Le Naturaliste, i. pp. 4 & 5.

Concerns an insect found in the States of Colombia, at the mouth of the river Patia, and very destructive there. Full description and account of habits given.

Riley, C. V. The Philosophy of the Movements of the Rocky Mountain Locust. P. Am. Ass. 1878 (1879), pp. 271–277, map.

The author divides the district infested by *Caloptenus spretus* into:—(1) the permanent region, (2) the sub-permanent region, (3) the temporary region. The principal causes of migration are hunger, the procreative instinct, increase of enemies, and instinctive impulse. The map illustrates the regions, &c., as indicated.

Brunner von Wattenwyl, SB. z.-b. Wien, xxix. pp. 26 & 27, calls attention to an unobserved structure in the hinder femora of *Acrydiidæ*. In the grooves of the under side, about one-fourth from the base, is a sort of hollow tubercle, filled in by a whitish cushion. It is found equally in those genera that do not stridulate, and so cannot be connected with the production of sound, but it is absent in the few genera that do not leap, and hence is probably connected with the springing motion. An abstract is given by the author in Le Naturaliste, i. p. 94.

Ctyphippus cærulescens, L., and *miniatus*, Pallas. Krauss, Verh. z.-b. Wien, xxix. p. 61, maintains that these are distinct species, and that the latter is not a red variety of the former, as is generally supposed.

Epacromia angustifemur, Ghiliani, = *thalassina*, F., *id. l. c.* p. 62.

Stauronotus annulipes, Türk, = *brevicollis*, Eversm., *id. ibid.*

Tettix charpentieri, Fieb., = *depressa*, Bris., *dohrni*, Fieb. = *depressa*, Bris., *nodulosa*, Fieb., = larva of *depressa*, *elevata*, Fieb.. = *depressa*, var.; *id. ibid.*

An aquatic species of this family found hopping about on the surface of pools near Pará, in Brazil; F. P. Pascoe, P. E. Soc. 1879, p. xliv.

Gomphocerus rufipes, Zett., new for the Norwegian fauna; Schφyen, Förh. Selsk. Chr. 1879, No. 3, p. 10.

New species:—

Melanopus tenebrosus, p. 63, North Carolina, *arizonæ*, p. 64, Arizona, *infantilis*, p. 65, Colorado and Wyoming, *variolosus*, p. 67, Kansas and Colorado, *flabellifer*, p. 68, Colorado, *fœdus*, p. 69, Colorado, *curtus*, p. 70, Colorado, *interior*, p. 71, Utah, Arizona, and Nevada, *bowditchi*, p. 72, Colorado, *flavidus*, p. 74, Colorado, Scudder, P. Bost. Soc. xx.

Pezotettix variegatus, p. 75, Colorado, Wyoming, Dacota, Arizona, &c., *dumicolus*, p. 76, Texas, *nudus*, p. 77, Texas, *lakinus*, p. 79, Kansas and Colorado, *texanus*, p. 80, Texas, *discolor*, p. 81, Texas, *flabellus*, p. 82, Texas, *pupæformis*[*pupif-*], p. 83, Texas, *aridus*, p. 84, Arizona, *aspirans*, p. 85, Colorado, *id. l. c.*

Œdipoda parnassica, Stein, MT. Münch. ent. Ver. iii. p. 138, Parnassus.

Stenobothrus saussurii, V. L. Seoane, MT. schw. ent. Ges. v. p. 486, Spain.

Acrydium patianum, Posada-Arango, Le Nat. i. p. 5, Colombia (= *A. peregrinum*, var. ?).

RHYNCHOTA.

BY

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

Berg, C. Hemiptera Argentina enumeravit speciesque novas descripsit. Bonariæ et Hamburgo: 1879, 8vo, pp. 316. (Reprinted from An. Soc. Arg. vi.–viii.)

A very important work in Latin and Spanish. The known species are enumerated, with full synonymy; and many new species, varieties, and larvæ, &c., are described.

Bolivar, J. Hemipteros nuevos del Museo de Madrid. An. Soc. Esp. viii. pp. 133–146.

Bolivar, J., & Chicote, C. Enumeracion de los Hemipteros observados en España y Portugal. An. Soc. Esp. viii. pp. 147–186, pls. ii. & iii.

The following known species are figured: *Torisa flavescens*, Am. & Serv., fig. 1, *Putonia torrida*, Stål, figs. 3 & 3 *a*, *Leprosoma inconspicuum*, Baer.? (? = *reticulatana*, Herr.-Schäff.), figs. 2 & 2 *a*, *Centroscelis spinosus*, Jak., figs. 4 & 4 *a*, *Caloscelis dimidiata*, Costa?, figs. 5 & 5 *a–f* (= *azaræ*, Perez, MS.), described, p. 176, *Psylla retamæ*, Puton, figs. 6 & 6 *a*, pl. ii. (redescribed, p. 184), *Derula flavo-guttata*, M. & R., fig. 1, *Podops dilatata*, Put., fig. 2, *P. inuncta*, F., fig. 3, *Aræopus crassicornis*, F., figs. 5 & 5 *a*, *Deltocephalus frauenfeldi*, Fieb., fig. 6, and *D. pictipennis*, Kirb., fig. 7, *Ommatidiotus dissimilis*, Fall., fig. 8, *O. falleni*, Stål, figs. 9 & 9 *a*, *Psylla aphalaroides*, Put., figs. 10 & 10 *a* (redescribed, p. 184), *Trioza mezomelas*, fig. 11, and *T.* sp. n., fig. 12, pl. iii.

Butler, A. C. Zoology of Rodriguez: *Hemiptera*. Phil. Trans. clxviii. pp. 549–553, pl. liv.

20 species enumerated; the following [described in Ann. N. H. (4) xvii.] are redescribed and figured: *Reduvius laniger*, figs. 6 & 6 *a*, p. 550, *Velia infernalis*, fig. 5, *Sigara felix*, figs. 8 & 8 *a*, p. 551, *Coccus ceratiformis*, fig. 9, and *Apintothrips fasciatus*, fig. 7, p. 552.

Distant, W. L. Scientific Results of the Second Yarkand Mission,

based upon the collections and notes of the late F. Stoliczka. *Rhynchota.* Calcutta: 1879, 4to, pp. 15, pl.

30 species are enumerated, with preliminary remarks on their geographical distribution.

[DISTANT, W. L.] *Hemiptera* from Upper Tenasserim. J. A. S. B. xlviii. pt. 2, pp. 37–41, pl. ii.

A list of species; *Chrysocoris porphyricolus*, Walk. ? = *purpureus*, Hope, var. (p. 38); *Cryptotympana recta*, Walk., *Cosmocarta tricolor*, St. F. & Serv., and *C. masoni*, Dist., are noticed and figured, and the last redescribed, p. 40, figs. 4–6.

HORVÁTH, G. VON. Hemipterologisches aus Transkaukasien. SB. Ges. Isis, 1879, pp. 93–97.

A list of 33 species, captured by Leder in 1878.

WHITE, F. List of the *Hemiptera* of New Zealand. Ent. M. M. xv. pp. 213–220. (Continued from 1878.)

Contains the *Homoptera*, and a list of all the species previously noticed, 81 in all: 54 *Heteroptera* and 27 *Homoptera*. The full synonymy of the latter is given, according to Stål.

——. Descriptions of New *Hemiptera*. J. L. S. xiv. pp. 482–489.

17 species described, most of which were collected by J. W. H. Trail on the Amazons.

Short notes on British *Hemiptera*; J. W. Douglas, Ent. M. M. xv. pp. 253–255.

Localities of various *Hemiptera*; O. M. Reuter, Bull. Soc. Ent. Fr. (5) ix. pp. xli.–xliii.

A paper by Jakovleff on the *Hemiptera* of the Caucasus, stated to have been published in 1879, and to be printed in Russian, with Latin diagnoses of new species, has not been seen by the Recorder.

Food-plants of various Indian *Hemiptera*; Distant & Moore, P. E. Soc. 1879, p. 1.

Notes on Japanese *Hemiptera*; Horváth, Ann. Ent. Belg. xxii. pp. cvii.–cx.

Note on European species of *Hemiptera* occurring in N. America; E. Bergroth, Ent. Nachr. v. pp. 38 & 39.

Supposed new Hemipterous insect; J. Davis, Sci. Goss. xv. p. 9, woodcuts.

HEMIPTERA-HETEROPTERA.

DISTANT, W. L. *Hemiptera* from the North-eastern Frontier of India. Ann. N. H. (5) iii. pp. 44–53, 127–133.

Contains a list of species of *Heteroptera* collected by A. W. Chennell, with remarks on the range, &c., of the more interesting known species, and descriptions of several new ones.

Horváth, G. von. *Hemiptera-Heteroptera* a J. Xantus in China et in Japonia collecta. Term. füzetek, iii. pp. 141–152, pl. vii.

The following known species are redescribed, or specially noticed: *Geotomus apicalis*, Dall., *Graphosoma rubro-lineatum*, Westw., *Scotinophara tarsalis*, Scott, *nec* Voll., is renamed *S. scotti* (p. 144), *Metochus abbreviatus*, Scott, belongs to *Dieuches*; *Pirates sinicus*, Walk., probably = *P.* (*Cleptocoris*) *lepturoides*, Wolff; *Ranatra pallidentata*, Scott, and *Sigara striata*, Fieb.

Lethierry, L., & Pierret, E. Premier Essai d'un Catalogue des Hétéroptères de Belgique. Ann. Ent. Belg. xxii. pp. 5–23.

Puton, A. Synopsis des Hémiptères-Hétéroptères de France. 2e partie. Tingidides, Phymatides, Aradides, Hebrides, Hydrometrides. Paris: 1879, 8vo, pp. 83–159.

The divisions adopted are as follows:—*Tingidides*: *Piesmini* (*Piesma*). *Tingidini*: *Cantacaderaria* (*Cantacader*), *Serenthiaria* (*Serenthia*), *Tingidaria* (*Campylostira*, *Orthostira*, *Dictyonota*), *Galeatus*, *Tingis*, *Eurycera*, *Monanthia* [subgen. *Platychila*, *Tropidochila*, *Catoplatus*, *Physatochila*, *Monanthia*, *Monostira*]. *Phymatides*: (*Phymata*). *Aradides*: (*Aradus Mezira*, *Aneurus*, *Aradosyrtis*). *Hebrides*: (*Hebrus*). *Hydrometrides*: *Mesovelini* (*Mesovelia*), *Aepophilini* (*Aepophilus*), *Hydrometrini* (*Hydrometra*), *Velini* (*Microvelia*, *Velia*), *Gerridini* (*Gerris*).

Reuter, O. M. Remarks on some British *Hemiptera-Heteroptera*. Ent. M. M. xvi. pp. 12–15.

The following species are noticed:—*Hadrodema pinastri*, Fall., var.; *Lopus superciliosus*, Linn., = *affinis*, Jakovl., = *gothicus*, L., var.; *Stiphrosoma steganoides*, Sahlb., = *leucocephala*, Fall., dark var.; *Anthocoris sarothamni*, D. & S., is distinct from *nemoralis*, Fabr.; *A. minki*, Dohrn, is a var. of the latter, but *pygmæus*, Fall., is distinct; *Triphleps obscurus*, D. & S., = *latus*, Fieb., = *minutus*, Linn., Fall., nec *minutus*, Fieb.; *Rhynarius obscurus*, Hahn, = *Triphleps niger*, Wolff, ? = *compressicornis*, Sahlb. The 3 British species of *Triphleps* are described, and *T. minutus*, Fieb., is renamed *majusculus*, p. 15; *Anthocoris obscurella*, Zett., is not *Xylocoris ater*, Duf., but belongs to the genus *Scoloposcelis*, Fieb.

——. Diagnoses Hemipterorum novorum. Œfv. Finsk. Soc. xxi. pp. 30–41.

——. De Hemipteris e Siberia orientali nonnullis adnotationes criticæ. *L. c.* pp. 42–63.

36 species are enumerated, few of which are new. The following known species are noticed in detail, redescribed, or their synonymy is corrected:—*Phimodera nodicollis*, Burm., *lævilinea*, Stål; *Nysius thymi*, var., Stål, = *grœnlandicus*, Zett.; *N. ericæ*, Stål, = *punctipennis*, Herr.-Schäff., = *pubescens*, Sahlb.; *N. ericæ* and *eximius*, Stål, belong to *Ortholomus*; *Rhyparochromus convivus*, Stål, is a *Trapezonotus*; *Oxycarenus viduus*, Stål, is probably a *Philomyrmex*; *Geocoris albipennis*, Stål, = *lapponicum*, Zett.; *Anthocoris sibiricus*, Reut.; *Deræocoris tri-*

annulatus, Stål, is a *Calocoris*; *C. tenebrosus*, Reut.; *Der. nigro-nasutus*, *approximatus*, and *mutans*, Stål, belong to *Lygus*; *L. distinguendus*, Reut.; *Der. dalmanni*, Stål, = *Pœciloscytus vulneratus*, Wolff.; *D. simulans*, Stål, is a *Capsus*; *Leptomerocoris prolixus*, Stål, (= *Lopus cruciatus*, Sahlb.), and *L. mundulus*, Stål, belong to *Macrotylus*; *Labops burmeisteri*, Stål, is a good species; *Anapus kirschbaumi*, Stål, is a *Labus*; *Eurymerocoris flaveolus*, Stål, belongs to *Oncotylus*; *Macrocoleus soror*, Reut.; *Coriscus flavo-marginatus*, Scholtz; *Nabis fuminervis*, Stål, = *Coriscus* (*N.*) *minor*, Reut., = *N. brevis*, Scholtz; *Salda laticollis*, Reut.

[Reuter, O. M.] Till en djurgeografisk fråga, ett litet bidrag. *L. c.* pp. 64–82.

The writer reviews Sahlberg's article on the *Hemiptera-Heteroptera* of North-western Siberia, and argues that the northern species probably originated in the Altai, and that we cannot regard Scandinavia as a geographical centre. General remarks on the distribution of European *Hemiptera* are added.

——. Till kännedomen om mimiska *Hemiptera* och deras lefnads historia. *L. c.* pp. 141–198.

An exhaustive treatise on mimicry in *Hemiptera*, with special reference to those which mimic ants, either in colour, form, or pattern. These species are frequently dimorphic. A few new genera and species are described, and the following unpublished forms of known species are described:—*Alydus calcaratus*, Linn. (larva), *A. rupestris*, Mey. (pupa), *Megalonotus limbatus*, Klug (pupa), *Camptopus lateralis*, Germ. (larva and pupa), *Mimocoris coarctatus*, Muls. & Rey (♀), and *Myrmecoris gracilis*, Sahlb., varr. *rufuscula* (p. 174) and *fusca* (p. 175), *Systellonotus alpinus*, Frey-Gessner (both sexes redescribed), *S. thymi*, Sign. (♂). The following synonyms are also noted:—*Alydus calcaratus*, Linn. (= *hirsutus*, Kol.), *Pilophorus*, Hahn (= *Camaronotus*, Fieb.), *Microphysa pselaphiformis*, Curt. (= *Zygonotus stigma*, Fieb.), *Ceratocombus coleoptratus*, Zett. (= *C. muscorum*, Fall.), *Coriscus lativentris*, Boh. (= *Nabis subapterus*, Fieb.).

Vollenhoven, S. C. Snellen Van. Bijvoegsel tot de lijst der inlandsche *Hemiptera-Heteroptera*. Tijdschr. Ent. xxii. pp. 227–231, pl. vii.

The following species are described and figured:—*Pachymerus pini*, Linn., and *phœnicius*, Rossi, *Berytus montivagus*, Meyer-Dür, p. 228, *Lygus coccineus*, Meyer-Dür, p. 229, *Monanthia ciliata*, Fieb., p. 230, and *Salda pilosella*, Thoms., p. 231, pl. xii. figs. A–F.

White, F. B. List of the *Hemiptera* collected on the Amazons by J. W. H. Trail in the years 1873–75, with descriptions of the new species. Part i. Tr. E. Soc. 1879, pp. 267–276.

25 species or varieties (*Hydrometridæ* to *Corixidæ*) are enumerated, 13 new. A new genus and subgenus are also characterized.

Additions to the list of Morayshire *Heteroptera*; G. Norman, Ent. M. M. xv. pp. 255 & 256.

Pentatomidæ.

Agonoscelis. Von Harold describes the species allied to *A. versicolor*, Fabr., and tabulates the males and females separately. The known species noticed are *versicolor*, Fabr. (= *rostratus*, Fabr., = *pubescens*, Thunb., = *acinorum*, Germ., = *gambiensis* and *infuscata*, Westw.), *puberula*, Stål, and *sanguinea*, Westw.; *A. nubila*, Fabr., from the East Indies is closely allied to these African species; but *A. brachyptera*, Schaum, figured in Peters' "Reise nach Mossambique," does not belong to the genus, but = *Afrania* (*Strachia*) *wahlbergi*, Stål. MT. Münch. ent. Ver. iii.

Elasmostethus fieberi recorded as new to France, and briefly described; Puton, Bull. Soc. Ent. Fr. (5) ix. pp. vii. & viii.

New genera and species :—

Cælocoris, Bolivar, An. Soc. Esp. viii. p. 134. Belongs to the division *Odontotarsia*, Stål; allied to *Alphocoris*, but with a prolongation below the eyes covering the base of the antennæ; types, *C. æliodes* and *gibbosus*, spp. nn., *l. c.* p. 135, Abyssinia.

Tornosia, id. *l. c.* p. 137. Allied to *Podops*; type, *T. insularis*, sp. n., *l. c.* p. 137, Zanzibar.

Syllobus, Signoret, Bull. Soc. Ent. Fr. (5) ix. p. clxxii. Lateral lobes of the head joined beyond the median line, and forming two rounded reflexed lobules, the borders first convex near the eyes, then concave, and sinuated at the extremity; second joint of antennæ very short. Type, *Cydnus emarginatus*, Stål.

Scoparipes, id. *l. c.* p. clxxiii. Hind tibiæ flattened and grooved in the middle on the inside; a ridge on the outside fringed with stiff bristles; tibiæ spined on the ridges as usual; head bordered with spinules and long hairs. Type, *Cydnus latipes*, Hope.

Masthletinus, Reuter, Œfv. Finsk. Soc. xxi. p. 48. Allied to *Sciocoris* and *Menaccarus*; type, *M. abbreviatus*, sp. n., *l. c.*, E. Siberia.

Œstopis, Distant, Ann. N. H. (5) iii. p. 48. Allied to *Atelocera* and *Memmia*; type, *Œ. terra*, sp. n., *l. c.*, Khasia Hills.

Belopis, id. *l. c.* p. 49. (Affinities not stated.) Type, *B. unicolor*, sp. n., *l. c.* p. 50, Khasia Hills.

Cratonotus, id. *l. c.* Allied to *Durmia*, Stål; type, *C. coloratus*, sp. n., *l. c.*, Khasia Hills.

Thyreocoris flavo-bisignatus, Corrientes, p. 17, *setiger*, Buenos Aires, p. 19, *circumfusus* and *xanthopus*, Entre-Rios, p. 20, *longirostris*, p. 21, and *pampeanus*, p. 277, Buenos Aires; Berg, Hemipt. Argent.

Tetyra pœcila, id. *l. c.* p. 22, Argentine Republic.

Coptochilus lentiginosus, id. *l. c.* p. 26, Argentine Republic.

Sternodontus purpureus, Reuter, Œfv. Finsk. Soc. xxi. p. 47, Siberia.

Phimodera carinata (and varr. *nigra*, *carinata*, *callosa*, and *pallida*), id. *l. c.* p. 44, E. Siberia.

Coptosoma colmeiroi, Zanzibar, and *raffrayi*, Abyssinia, Bolivar, An.

Soc. Esp. viii. pp. 133 & 134; *C. breviceps*, Horváth, Term. füzetek, iii. p. 142, Ningpo.

Brachyplatys burmeisteri (= *Thyreocoris silphoides*, Burm., *nec* Fabr.), Distant, Ann. N. H. (5) iii. p. 46, N. E. India.

Leptolobus zanzibaricus, Bolivar, *l. c.* p. 136, Zanzibar.

Canthecona tibialis, Khasia Hills, and *binotata*, Naga Hills, Distant, *l. c.* pp. 46 & 47.

Picromerus robustus, id. *l. c.* p. 48, Sadia, N. E. India.

Podisus australis, Berg, *l. c.* p. 278, Buenos Aires.

Cyrtomenus ciliatus, *læviculus*, Buenos Aires, and *nigro-punctatus*, Mendoza, pp. 10–12, *constructus*, Buenos Aires, p. 277, *id. l. c.*

Lactistes vicinus, Bombay, *truncato-serratus*, N. India, *protumidus*, Abyssinia, and *obesipes*, New Holland, Signoret, Bull. Soc. Ent. Fr. (5) ix. p. clxxii.

Macroscytus umbonatus, Berg, *l. c.* p. 14, Catamarca and Tucuman.

Agonoscelis æquata, Loanda, p. 41, *sansibarica*, Zanzibar, p. 42, and *longirostris*, Angola, p. 44, Harold, MT. Münch. ent. Ver. iii.; *A. bicolor*, Distant, Tr. E. Soc. 1879, p. 210, pl. v. fig. 6, Antananarivo, Madagascar.

Dalpada confusa, id. *l. c.* p. 121, Second Yark. Miss. Rhynch. p. 3, fig. 1, Murree.

Melpia integra, Berg, *l. c.* p. 49, Uruguay.

Atelocera ustulata, Bolivar, *l. c.* p. 137, Zanzibar.

Euschistus taurulus and *imitator*, Berg, *l. c.* pp. 44 & 45, Buenos Aires.

Thyanta æruginosa and *patagiata*, id. *l. c.* pp. 54 & 55, Buenos Aires.

Œbalus [*h*]*ypsilonoides*, id. *l. c.* p. 41, Buenos Aires.

Mormidea paupercula, Corrientes, and *nigro-binotata*, Buenos Aires, *id. l. c.* pp. 39 & 279.

Brachystethus tricolor, Bolivar, *l. c.* p. 138, Baeza, Ecuador.

Palomena reuteri, Distant, Tr. E. Soc. 1879, p. 122, and Second Yark. Miss. Rhynch. p. 4, fig. 2, Murree.

Halyomorpha scutellata, id. Ann. N. H. (5) iii. p. 51, Khasia Hills, Bombay.

Acledra gregalis, Berg, *l. c.* p. 51, Buenos Aires.

Menida distincta, Distant, Tr. E. Soc. 1879, p. 122, Second Yark. Miss. Rhynch. p. 6, fig. 3, Murree, Sind Valley.

Eurydema wilkinsi (Osch., MS.), *id. ll. cc.* p. 123, & p. 5, fig. 4, Yanghihissar; *E. amœnum*, Horváth, Term. füzetek, iii. p. 144, pl. vii. figs. 1 & 1 *a*, China.

Tropidocoris nigricornis, Reuter, Œfv. Finsk. Soc. xxi. p. 30, Imeritia.

Nezara musiva and *erythrocnemis*, Berg, *l. c.* pp. 56 & 57, Buenos Aires.

Thoreyella trinotata, id. *l. c.* p. 58, Buenos Aires.

Piezosternum rubens, Distant, *l. c.* p. 210, pl. v. fig. 8, Antananarivo, Madagascar.

Aspongopus putoni, Bolivar, *l. c.* p. 139, Zanzibar.

Macrina dilatata, W. L. Distant, Ann. N. H. (5) iii. p. 52, Naga and Khasia Hills.

Coreidæ.

Pachylis gigas, Burm. ?, figured. It lives on *Acacia albicans*, and emits a red fluid by means of organs described and figured; A. Duges, Nat. Mex. iii. pp. 52 & 53, figs. 1–7 (1876).

Gonocerus juniperi, Dahl, wanting the fourth joint of one antenna; Samie & Clavaud, Actes Soc. Linn. Bord. xxxii. pp. ci., cii., cxvii. & cxviii.

Cletomorpha denticulata, Stål, var. from N.E. India described; Distant, Ann. N. H. (5) iii. p. 130.

Cloresmus brevicornis, Herr.-Schäff., is quite distinct from *nepalensis*, Hope; *id. ibid.*

Syromastes longicornis, Costa, = *fundator*, Herr.-Schäff, = *marginatus*, Linn.; A. Puton, Bull. Soc. Ent. Fr. (5) ix. p. cliii.

Parabrachytes, g. n., W. L. Distant, Tr. E. Soc. 1879, p. 213. Allied to *Brachytes*: 1st joint of antennæ a little shorter than the 2nd, apices of 2nd and 3rd joints incrassated; and pronotal angles moderately dilated and somewhat rounded. Types, *P. coloratus*, pl. v. fig. 3, and *obscurus*, spp. nn., p. 214, Antananarivo, Madagascar.

New species :—

Paryphes (*Sundarus*) *pontifex*, F. B. White, J. L. S. xiv. p. 482, Rio Juruá.

Prionolomia gigas, Distant, Ann. N. H. (5) iii. p. 128, Khasia Hills.

Mygdonia elongata, id. Tr. E. Soc. 1879, p. 211, pl. v. figs. 2, 2 *a*, & 2 *b*, Antananarivo, Madagascar.

Pachylis argentinus, Berg, Hemipt. Argent. p. 64, Argentine Republic and Uruguay.

Mictis expansa, Distant, *l. c.* p. 212, Antananarivo.

Dalcera flaviventris, Berg, *l. c.* p. 282, Cordova.

Homœocerus dilatatus, Horváth, Term. füzetek, iii. p. 145, pl. vii. fig. 2, China.

Notobitus excellens, Distant, Ann. N. H. (5) iii. p. 129, Khasia and Naga Hills.

Gonocerus lictor, Horváth, *l. c.* p. 146, pl. vii. fig. 3, China.

Eubule glyphica, Berg, *l. c.* p. 78, Buenos Aires.

Sethenira sordida, id. *l. c.* p. 80, Buenos Aires.

Anasa guttifera, id. *l. c.* p. 82, Buenos Aires.

Zicca stali, id. *l. c.* p. 84, Argentine Republic.

Harmostaria procerus, id. *l. c.* p. 91, Argentine Republic.

Stenocephalus pallidus, Aden, and *lateralis*, E. Indies, Signoret, Bull. Soc. Ent. Fr. (5) ix. p. lviii.

Corizus rubricosus, Bolivar. An. Soc. Esp. viii. p. 139, Abyssinia.

Berytidæ.

Megalomerium meridionale, Costa, noticed; A. Puton, Bull. Soc. Ent. Fr. (5) ix. pp. cix. & cx.

LYGÆIDÆ.

MULSANT, E., & REY, C. Histoire naturelle des Punaises de France. 6me Tribu. Les Lygéides. Ann. Soc. L. Lyon, xxv. pp. 131–189.

An elaborate monograph ; no new species or genera are described. The *Lygæidæ* are divided as follows :—Pyrrhocoriens—*Pyrrhocoris* : Lygéens—1, Lygéaires (*Lygæus*, *Graptostethus*, and *Lygæosoma* ; 2, Arocataires (*Arocatus*) ; 3, Orsillaires (*Orsillus* and *Nysius*).

On the synonymy of various *Lygæidæ* ; J. W. Douglas, Ent. M. M. xv. pp. 235 & 236, xvi. pp. 22 & 23, A. Puton, Bull. Soc. Ent. Fr. (5) ix. pp. xlvii. & xlviii.

Engistus commendatorius (Perez, MS.), Puton, described ; Bolivar & Chichote, An. Soc. Esp. viii. p. 161.

Peritrechus gracilicornis, Put., recorded as new to Britain, and briefly characterized ; *P. puncticeps*, Thoms., = *P. nubilus*, Vollenh. (*nec* Fall.), = *geniculatus*, Hahn ; Douglas, *l. c.* p. 201.

Pachymerus, Latr. Note on the use of the name ; A. Puton, *l. c.* p. cliii.

Lygæus venustus, Bœb. (*familiaris*, Panz.). Yellow aberration noticed ; P. Thierry-Mieg, Feuill. Nat. ix. p. 91.

Aneuropharina, subfam. n., Berg, Hemipt. Argent. p. 285. "Hemelytra sæpissime incompleta, corio membranaque venis destitutis." To include :—

Aneuropharus, g. n., *l. c.* p. 285. Type, *A. leucocnemis*, sp. n., *l. c.*, Buenos Aires.

Lipogomphus, g. n., *l. c.* p. 286. Type, *L. lacuniferus*, sp. n., *l. c.* p. 287, Buenos Aires.

New species :—

Stygnus mayeti, Puton, Bull. Soc. Ent. Fr. (5) ix. p. xvi., Beziers.

Nysius major and *rubricatus*, Berg, Hemipt. Argent. pp. 101 & 102, Buenos Aires.

Arocatus pilosulus, Distant, Tr. Ent. Soc. 1879, p. 123, Second Yark. Miss. Rhynch. p. 9, fig. 5, Murree.

Graptostethus trisignatus and *quadrisignatus*, id. Ann. N. H. (5) iii. p. 130, Naga and Khasia Hills.

Lygæus (*Spilostethus*) *amanus*, Bolivar, An. Soc. Esp. viii. p. 140, Abyssinia.

Bochrus foveatus, Distant, *l. c.* p. 131, Garo Hills, N.E. India.

Ischnodemus inambitiosus, F. B. White, J. L. S. xiv. p. 484, Rio Juruá.

Geocoris picticeps, Bolivar, *l. c.* p. 140, Abyssinia ; *G. callosulus*, Berg, *l. c.* p. 105, Argentine Republic.

Lethæus lepidus, F. B. White, *l. c.* p. 484, Rio Juruá.

Pamera pagana, id. *l. c.* p. 484, Rio Solimoes ; *P. flavicosta*, Berg, *l. c.* p. 109, Buenos Aires.

Cnemodus albimacula, id. *l. c.* p. 110, Uruguay.

Pyrrhocoridæ.

Lipostemmatina, subfam. n., Berg, Hemipt. Argent. p. 288. "Corpus cum corio et clavo pilosulum; ocelli desunt; hemelytra completa, membrana venis tribus vel quatuor brevibus et obsoletissimis instructa." For *Lipostemmata*, g. n., *l. c.* Type, *L. humeralis*, sp. n., *l. c.*, Buenos Aires.

Fibrenus bullatus, sp. n., F. B. White, J. L. S. xiv. p. 483, Manaos.

Largus lentus, id. *l. c.* p. 483, Rio Juruá; *L. martinezi*, Napo, and *amorii*, Rio Quinto, Bolivar, An. Soc. Esp. viii. p. 141 : spp. nn.

Scantius abyssinicus, sp. n., id. *l. c.* p. 142, Abyssinia.

Dysdercus albo-fasciatus, sp. n., Berg, Hemipt. Argent. p. 115, Buenos Aires.

Tingididæ.

Serenthia femoralis, Th., var. *confusa*, described; Puton, Pet. Nouv. ii. p. 297.

Orthostira musci, Schr., var. *ditata* from the Alps described, *id. ibid.*, Hém. Hét. France, ii. p. 94; *O. parvula*, var. *minor* from S. France, described, *id. l. c.* p. 99.

Monanthia (*Platychila*) *testacea*, Herr.-Schäff., var. *egena* from Oran described, p. 111, *M.* (*Tropidochila*) *kiesenwetteri*, Muls. & Rey, var. *antennalis*, from Sarepta, and var. *pauperata*, Caucasus, p. 115, note, *M.* (*T.*) *geniculata*, Fieb., var. *griseola*, Corsica and Sardinia, p. 116, *M.* (*T.*) *flavipes*, Horv. (*nec* Sign.), renamed *horvathi*, p. 119, *id. l. c.*; for *M. kiesenwetteri*, varr., *cf.* also Pet. Nouv. ii. p. 297.

Piesma pupula, sp. n., Puton, Pet. Nouv. ii. p. 297, Hém. Hét. France, ii. p. 86, Corsica.

Orthostira uniseriata, Caucasus, and *suturalis*, France, spp. nn., *id. ll. c.* pp. 297, 94, note, & 95.

Dictyonota marqueti, sp. n., *id. ll. cc.* pp. 297 & 103, E. Pyrenees.

Monanthia (*Platychila*) *ciliaris*, sp. n., *id.*, Bull. Soc. Ent. Fr. (5) ix. pl. lix., Caucasus.

Leptobyrsa cucullata, sp. n., Berg, Hemipt. Argent, p. 135, Buenos Aires.

Gargophia subpilosa, sp. n., *id l. c.* p. 136, Argentine Republic.

Acanthochila abducta, sp. n., F. B. White, J. L. S. xiv. p. 485, Fonteboa.

Phymatidæ.

Phymata crosa, Fabr. Account of structure and habits; it is very destructive to all insects, whether noxious or beneficial; A. J. Cook, Canad. Ent. xi. pp. 17-20, woodcuts.

Aradidæ.

Aradus annulicornis, Reut. (*nec* Fieb.), renamed *anisotomus*; Puton, Hém. Hét. France, ii. p. 137.

Helenus, g. n., F. B. White, J. L. S. xiv. p. 485. Allied to *Hesus*, Stål, but with shaggy pubescence, and the sternum and venter interruptedly sulcate. Type, *H. hesiformis*, sp. n., *l. c.*, Manaos.

Aradus melancholicus, sp. n., Puton, Pet. Nouv. ii. p. 297, Hém. Hét. France, ii. p. 134, France.

Brachyrrhynchus centralis, sp. n., Berg, Hemipt. Argent. p. 139, Chaco.

Capsidæ.

Reuter, O. M. Hemiptera Gymnocerata Europæ. Hémiptères Gymnocérates d'Europe, du Bassin de la Méditerranée, et de l'Asie Russe décrites. Tome 1ière. pp. 187, pls. viii. Tome 2me. pp. 193–312, pls. v. Helsingfors: 1878 & 1879, 4to.

The author begins with the *Capsidæ*, monographing the *Plagiognotharia* in vol. i. and the *Oncotylaria* in vol. ii.; pl. i. in both volumes is devoted to generic details. The following known species are figured:—

Vol. i.: *Tuponia hippophaes* (Mey.), Fieb., *prasina*, Fieb., *unicolor*, Scott, *Maurodactylus nigricornis*, Jak., *alutaceus*, Fieb., *bicolor*, Fieb., *Megalodactylus macula-rubra*, Muls. & Rey, *Auchenocrepis minutissima*, Ramb., *Sthenarus ochraceus*, Scott, pl. ii. figs. 1–9; *S. rotermundi*, Scholtz, *Asciodema obsoletum* and *fieberi*, Dougl. & Scott, *Tragiscocoris fieberi* (Mey.), Fieb., ♂ & ♀, *Campylomma verbasci*, Herr.-Schäff., *Neocoris nigritulus*, Zett., var. β, *Agalliastes pulicarius*, Fall., and *evanescens*, Boh., pl. iii. figs. 1–9; *A. wilkinsoni*, Dougl. & Scott, ♂ & ♀, *Atomoscelis onustus*, Fieb., *Plagiognathus spilotus*, Fieb., *viridulus*, Fall., ♂ & ♀, *fulvipennis*, Kirschb., *albipennis*, Fall., var., and *Criocoris nigripes*, Fieb., pl. iv. figs. 1–9; *C. tibialis*, Fieb., *Excentricus punctipes*, Fieb., *Atractotomus sulcicornis*, Kirschb., *albipennis*, Reut., *tigripes*, Muls. & Rey, *femoralis* and *rufus*, Fieb., *rhodani* (Mey.), Fieb., and *mali*, Mey., pl. v. figs. 1–9: *A. oculatus*, Kirschb., *magnicornis*, Fieb., *Psallus albicinctus* and *diminutus*, Kirschb., *dilutus* (Mey.), Fieb., *argyrotrichus*, Fieb., *salicis*, Kirschb., *lepidus*, Fieb., and *scholtzi* (Mey.), Fieb., pl. vi. figs. 1–9; *P. vitellinus*, Scholtz, *obscurellus*, Fall., *quercus*, and *simillimus*, Kirschb., *variabilis*, Fall., *laricis* (Frey.) Reut., *ancorifer*, Fieb., *ambiguus* and *betuleti*, Fall., pl. vii. figs. 1–9; *Icodema infuscatum*, Fieb., *Phylus avellanæ*, Mey., *lituratus*, Fieb., *plagiatus*, Herr.-Schäff., *limitatus*, Fieb., *Harpocera thoracica*, Fall., ♂ & ♀, *Agalliastes punctatus*, and *vittatus*, Fieb., pl. viii. figs. 1–9.

Vol. ii.: *Macrotylus luniger*, Fieb., *nigricornis*, Fieb. (= *melanocerus*, Put.), ♂ ♀, *lutescens*, Fieb., *elevatus*, Fieb., *bicolor*, Fieb., *mundulus*, Stål, *Pronototropis punctipennis*, Fieb., ♂ ♀, pl. ii. figs. 1–9. *Amblytylus nasutus*, Kirschb., *affinis*, Fieb., *brevicollis*, Fieb., *longiceps*, Flor, *jani*, Fieb., *Macrocoleus chrysotrichus*, Fieb., *tanaceti*, Fall., *aurantiacus*, Fieb., and *Macrotylus longirostris*, Fieb., pl. iii. figs. 1–9, *Macrocoleus exsanguis*, Herr.-Schäff., *Placochilus seladonius*, Fall., *Tinicephalus rubiginosus*, Fieb., *discrepans*, Fieb., ♂ ♀, *Solenoxyphus crassiceps*, Reut., p. 257, = *Psallus* (?) *fusco-venosus*, Fieb., *Conostethus roseus*, Fall., ♂ ♀, and *Stenoparus falleni*, Fieb., pl. iv. figs. 1–9, *Anoterops trisignatus*, Assm., fig. 1, *Oncotylus setulosus*, Herr.-Schäff., *punctipes*, Reut., *pyrethri*, Beck, ♂ ♀,

flavcolus, Stål, ♂ ♀, and *Amblytylus* (?) *lunula*, Fieb., figs. 3–9, pl. v. Many new genera, but comparatively few new species, are described.

[Reuter, O. M.] Capsidæ Turkestanæ. Diagnoser öfver nya Capsider från Turkestan. Œfv. Finsk. Soc. xxi. pp. 199–206.

Pamerocoris anthocorides, Uhl., is distinct from *Teratodella anthocoridis*, Reut.; E. Bergroth, Ent. Nachr. v. pp. 108 & 109.

Atractotomus magnicornis and *Lygus limbatus*, Fall., recorded as new to Britain, and redescribed; E. Saunders, Ent. M. M. xvi. pp. 98 & 122.

Plagiotylus maculatus, Fieb., noticed; A. Puton, Bull. Soc. Ent. Fr. (5) ix., p. cx.

Stenoparia putoni, Fieb., var. *punctata*, from Sardinia, described; Reuter, Hem. Gymnoc. Eur. ii. p. 306.

New genera and species :—

Epimecis, Reuter, Œfv. Finsk. Soc. xxi. p. 30. Type, *E. cyllocoroides*, sp. n., *l. c.* p. 31, Tauria.

Eurycyrtus, id. *l. c.* p. 33. Type, *E. bellevoyii*, sp. n., *l. c.* p. 34, Egypt.

Læmocoris (Jakovl.), id. *l. c.* p. 183. Allied to *Systellonotus*; type, *L. reuteri*, sp. n., *l. c.* p. 184, Krasnowodsk.

Megalobasis, id. *l. c.* p. 205. Allied to *Exæretus*; type, *M. bipunctatus*, sp. n., *ibid.*, Turkistan.

Nasocoris, id. *ibid.* Affinities not stated; type, *N. argyrotrichus*, sp. n., *l. c.* p. 206, S. Russia and Turkistan.

Maurodactylus, id. Hem. Gymnoc. Eur. i. p. 27. Allied to *Tuponia*, to contain *M. instabilis*, sp. n., *l. c.* p. 28, Turkistan, and *M. nigricornis*, Jak., *alutaceus* and *bicolor*, Fieb.

Asciodema, id. *l. c.* p. 33. Allied to *Tinicephalus*; to contain *A. obsoletum* and *fieberi*, Dougl. & Scott.

Paredrocoris, id. *l. c.* p. 36. Allied to last. Type, *P. pectoralis*, sp. n., *l. c.* p. 37, pl. i. fig. 5 (details), Sarepta.

Campylomma, id. *l. c.* p. 52. Next to *Sthenarus*; to contain *C. nigronasuta*, p. 53, and *diversicornis*, p. 55, spp. nn., Turkistan, *Capsus verbasci*, Herr.-Schäff. (type), and (?) *Agalliastes lucidus*, Jakovl., Turkistan.

Malacotes, id. *l. c.* p. 69. Allied to *Atomoscelis*. Type, *M. mulsanti*, sp. n., *l. c.* p. 70, pl. i. figs. 13 *a–c* (details), S. France.

Excentricus, id. *l. c.* p. 89. Allied to *Atractotomus*. Type, *Capsus planicornis*, Herr.-Schäff., fig. 16 *d* (antennæ), and *A. punctipes*, Fieb., figs. 16 *a–c* (details), pl. i., *E. punctipes*, var. *pictipes*, from Irkutsk, is described, *l. c.* p. 91.

Plesiodema,* id. *l. c.* p. 155. Allied to *Agalliastes*. Type, *Phytocoris pinetellus*, Zett. [genera marked *, Zool. Rec. xii.].

Icodema,* id. *l. c.* p. 157. Allied to *Phylus*. Type, *Plagiognathus infuscatus*, Fieb.

Pronototropis, id. *l. c.* (ii.) p. 248. Allied to *Oncotylus* and *Phænicocapsus*; type, *O. punctipennis*, Fieb.

Voruchia, id. *l. c.* p. 252. Placed next to *Placochilus*; type, *V. vittigera*, sp. n., *l. c.*, Turkistan.

M[illegible]acosoma, id. *l. c.* p. 253. Next to last; type, *M. punctipenne*, sp. n. *c.* p. 254, Turkistan.

Sol[illegible]yphus,* id. *l. c.* p. 255. To contain *Macrocoleus lepidus* (Fieb.), W. Put., *[illegible]llus* (?) *fusco-venosus*, Fieb., renamed *crassiceps* (p. 257), and (?) *Ag[illegible]aliastes kergisicus*, Frey-Gessner.

Leucopterum, id. *l. c.* p. 259. Next to last; to contain *L. longicolle*, Turkistan, *candidatum*, p. 260, *fasciatum* (Jakovl., MS.), pl. v. fig. 2, p. 261, and *L.* (?) *pallens*, S. Russia, p. 262; spp. nn.

Pastocoris, id. *l. c.* p. 271. Allied to *Oncotylus*; type, *O. putoni*, Reut.

Eurycolpus, id. *l. c.* p. 284. Allied to *Oncotylus*; type, *Eurymerocoris flaveolus*, Stål.

Onychumenus, id. *l. c.* p. 286. Next to last; type, *Capsus decolor*, Fall.

Atomophora, id. *l. c.* p. 287. To contain *A. eximia*, *pantherina*, and *alba*, Turkistan, and *fusco-maculata*, Caspian, pp. 288–291, spp. nn., *l. c.*

Irbisia, id. Öfv. Fin. Soc. xxi. p. 57. Allied to *Orthocephalus*; type, *Leptomerocoris sericans*, Stål.

Boopidocoris, id. *l. c.* p. 202. Allied to *Stiphrosoma*; type, *B. vitticollis*, sp. n., *ibid.*, Turkistan.

Lygidea, id. *l. c.* p. 54. Allied to *Hadrodema*; type, *Deræocoris illotus*, Stål.

Macrocapsus, id. *l. c.* p. 55. Allied to *Deræocoris*; type, *D. brachialis*, Stål.

Camponotidea, id. *l. c.* p. 176. Allied to *Myrmecoris*; type, *M. saundersi*, Put.; add *C. fieberi*, sp. n., *ibid.*, Smyrna.

Dicyphus orientalis, p. 203, *thoracicus* and *testaceus*, p. 204, Reuter, Öfv. Fin. Soc. xxi., Turkistan.

Systellonotus (?) *brucki* (Fieb.), Spain, and *S. unifasciatus* (Fieb.), Algiers, *id. l. c.* pp. 181 & 182.

Macrocoleus signoreti, Landes, *bolivari*, fig. 1, Spain, and *naso*, Corsica, fig. 2, pl. i. (details), pp. 219–221, *femoralis*, Alsace, p. 230, *krueperi*, Oran, p. 231; *id.* Hem. Gymnoc. Eur. ii.

Amblytylus testaceus, id. *l. c.* p. 215, Hungary.

Psallus chrysopsilus, Hungary, p. 112, *albipes* (Jakovl., MS.), Astracan, p. 114, *cognatus* (Jakovl., MS.), Sarepta, *callunæ*, Landes, &c., p. 122, *luridus*, France (?), Tyrol, Hungary, pl. i. fig. 18 *d* (head), p. 133, *piceæ* (= *Capsus varians*, pt. ?, Mey.), Switzerland, p. 135, *nebulosus*, Turkistan, p. 142, *atomosus*, Sarepta, p. 150, *laticeps*, Jenisei, p. 180, *id.* Hem. Gymnoc. Eur. i.; *P. criocoroides*, id. Öfv. Fin. Soc. xxi. p. 39, Avignon.

Tinicephalus flavo-pilosus, id. Hem. Gymnoc. Eur. ii. p. 234, Corsica.

Pachyxyphus cæsareus, id. *l. c.* p. 243, pl. i. fig. 7 *a* (head), Spain.

Oncotylus vitticeps, p. 276, and *desertorum*, Turkistan, p. 277, *persicus*, N. Persia, *caspicus*, Astracan, and *reuteri* (Osh., MS.), Tashkend, pp. 281–283, *id. l. c.*

Plagiognathus fusciloris, Vaucluse, and *P.* (?) *breviceps*, Alai, *id.*, Hem. Gymnoc. Eur. i. pp. 73 & 82; *P.* (?) *annulicornis*, id. *l. c.* p. 298, Kisilkum.

Tuponia pallida, pl. i. figs. 1 *a–c*, p. 17, *roseipennis*, Turkistan, p. 21,

and *affinis*, Transylvania, p. 22, *id.* Hem. Gymnoc. Eur. i.; *T.* [illegible]*ufera* [*arcif-*], id. Öfv. Fin. Soc. xxi. p. 38, Astracan.

Sthenarus pusillus, Naples, p. 44, *maculipes*, Austria, p. 46, [illegible]*milis*, Vosges, p. 174, Reuter, Hem. Gymnoc. Eur. i.

Neocoris basalis, id. *l. c.* p. 59, Turkistan.

Criocoris tarsalis, id. *l. c.* p. 85, Hungary.

Atractotomus parvulus, Vosges, and *putoni*, Avignon, *id. l. c.* pp. 95 & 175.

Byrsoptera rossica, Charkow, and *fuscicornis*, Turkistan, *id. l. c.* pp. 167 & 168.

Atomoscelis brevicornis, Öfv. Fin. Soc. xxi. p. 39, Astracan.

Orthocephalus confinis, Sarepta, and *niger*, Turkistan, *l. c.* pp. 35 & 203.

Labops (*Pachytoma*) *brevipennis*, id. *l. c.* p. 203, Turkistan.

Pachytoma jakovleffi, id. *l. c.* p. 36, Astracan.

Diplacus nigripes and *limbatus*, id. *l. c.* p. 172, Turkistan.

Pilophorus sinuaticollis, id. *l. c.* p. 202, Turkistan.

Orthotylus parvulus, id. *l. c.* p. 38, Astracan.

Macrotylus bipunctatus, id. Hem. Gymnoc. Eur. ii. p. 207, S. France.

Hadrodema parvula, id. Öfv. Fin. Soc. xxi. p. 35, Daya.

Globiceps cruciatus, Corsica, and *suturalis*, Switzerland, *id. l. c.* pp. 36 & 37.

Platycranus putoni, id. *l. c.* p. 38, Algeria.

Lygus rufimanus, Daya, Marseilles, p. 34, *pachycnemis*, and *L.* (*Orthops*) *sanguinolentus*, Turkistan, p. 200, *id. l. c.*

Pœciloscytus brevicornis, id. *l. c.* p. 201, Turkistan.

Lopus (?) *insignis*, id. *l. c.* p. 31, Spanish Pyrenees.

Capsus (*Deræocoris*) *uruguayensis*, Uruguay, p. 120, *fratruelis*, p. 289, *C.* (*D.*) *pygmæus* and *chlorogaster*, p. 290, Berg, Hemipt. Argent., Buenos Aires.

Camptobrochis pilipes, Reuter, *l. c.* p. 201, Turkistan.

Phytocoris stoliczkanus, Distant, Tr. E. Soc. 1879, p. 124, Second Yark. Miss. Rhynch. p. 10, fig. 6, Murree, &c.; *P. argentinus*, Berg, *l. c.* p. 122, Argentine Republic.

Resthenia stigmosa, p. 123, *crucifera*, p. 124, *cinnamomea* and *picea*, p. 125, Buenos Aires, *correntina*, Corrientes, p. 127, and *platensis*, p. 128, *pallida* and *univittata*, p. 291, and *multifaria*, Buenos Aires, p. 292, *id. l. c.*

Monolonion ornatum, id. *l. c.* p. 129, Buenos Aires.

Eccritotarsus ruficeps, Argentine Republic, and *purpurissatus*, Buenos Aires, *id. l. c.* pp. 130 & 131.

Calocoris ventralis, Corsica, and *sulphureus*, Spain, p. 32, *fedtschenkoi*, Turkistan, p. 199, Reuter, l. c.; *C. insularis*, Horváth, Term. füzetek, iii. p. 147, Nagasaki: *C. stoliczkanus* and *forsythi*, Distant, *ll. c.* pp. 124 & 125, and p. 10, figs. 7 & 8, Murree.

Megacœleum brevirostre, Reuter, *l. c.* p. 200, Turkistan.

Miris costicollis, Berg, *l. c.* p. 118, Buenos Aires.

Isometopus mirificus, sp. n., Mulsant & Rey, Ann. Soc. L. Lyon, xxv. p. 323, Lyons.

ANTHOCORIDÆ.

WHITE, F. B. Descriptions of new *Anthocoridæ*. Ent. M. M. xvi. pp. 142–148.

The genus *Cardiostethus* is discussed, and the species tabulated.

Anthocoris nemorum, and other *Hemiptera*, &c., said to be injurious to hops; R. McLachlan, P. E. Soc. 1879, pp. xliii. & xliv.

Cimex lectularius in Sacramento (California) and Chili; C. A. Dohrn, S. E. Z. xl. pp. 367–369.

New genera and species :—

Xylæcocoris, Reuter, Öfv. Fin. Soc. xxi. p. 40. Allied to *Brachysteles*, Fieb.; body ovate, antennæ shorter and differently formed, scutellum with no transverse impression; type, *X. ovatulus*, sp. n., *l. c.*, Beziers.

Lilia, F. B. White, Ent. M. M. xvi. p. 147. Affinities uncertain; type, *L. dilecta*, sp. n., *l. c.*, Maui, Hawaiian Islands.

Piezostethus nigritulus, Reuter, *l. c.* p. 40, Berlin.

Brachysteles wollastoni, White, *l. c.* p. 142, Madeira.

Triphleps tristicolor, California, and *reedi*, Chili, *id. l. c.* p. 145.

Acompocoris alienus, Madeira, and *antevolens*, California, *id. l. c.* pp. 145 & 146.

Dolichomerus reuteri, id. *l. c.* p. 146, Missouri and Georgia.

Dilasia (?) *denigrata*, Hawaii, and *D.* (?) *decolor*, Honolulu, *id. l. c.* pp. 146 & 147.

Cardiostethus continuus, Madeira, *consors*, p. 143, *poweri*, N. Zealand, *clarus*, Amazon, p. 144, *C.* (?) *colludens*, Brazil, p. 148, *id. l. c.*

Myrmedobia antica, Reuter, *l. c.* p. 186, Corsica.

SALDIDÆ.

Salda pilosella, Thoms., = *pallipes*, F., var.; *S. geminata*, Costa, = *cocksi*, Curt., southern form. *S. elegantula*, Fall., and *cincta*, Herr.-Schäff., are probably also varieties. A. Puton, Bull. Soc. Ent. Fr. (5) ix. pp. clii. & cliii.

Salda argentina, sp. n., Berg., Hemipt. Argent. p. 293, Buenos Aires.

REDUVIIDÆ.

Reduvius nigricollis, Dall., var. from N.E. India noticed; W. L. Distant, Ann. N. H. (5) iii. p. 133.

New genera and species :—

Panstrongylus, Berg, Hemipt. Argent. p. 167. Allied to *Lamus*, Stål; type, *P. guentheri*, sp. n., *l. c.* p. 168, Buenos Aires.

Pleurosigynius, id. *l. c.* p. 178. Allied to *Oncerotrachelus*; type, *P. lynchi*, sp. n., *l. c.* p. 179, Buenos Aires.

Endochus stalianus, Horváth, Term. füzetek, iii. p. 147, pl. vii. fig. 4, Nagasaki.

Pantoleistes grandis, Distant, Tr. E. Soc. 1879, p. 215, pl. v. figs. 5 & 5*a*, Fianarantsoa, Madagascar.

Ulpius obscurus, pl. v. figs. 4 & 4*a*, p. 215, *bicolor*, Fianarantsoa, and *festivus*, Antananarivo, Madagascar, p. 216, *id. l. c.*

Velinus annulatus, id. Ann. N. H. (5) iii. p. 131, Khasia Hills, &c.

Cosmolestes annulipes, id. *l. c.* p. 132, Garo Hills, N.E. India.

Reduvius (*Harpiscus*) *reuteri*, id. Tr. E. Soc. 1879, p. 125, Second Yark. Miss. p. 11, fig. 9, Sind Valley.

Cosmoclopius pallidus, Berg, Hemipt. Argent. p. 149, Cordova.

Zelus (*Z.*) *personatus*, Buenos Aires, p. 150, *Z.* (*Diplodus*) *illotus*, Corrientes, p. 153, *id. l. c.*

Harpactor rufipes, Bolivar, An. Soc. Esp. viii. p. 142, Abyssinia.

Heniartes theresina, id. *l. c.* p. 156, Corrientes.

Hammatocerus reuteri (= *cinctipes*, Berg, p. 159, *nec* Stål), *id. l. c.* p. 295, Argentine Republic.

Physorrhynchus (*Loricerus*) *signoreti*, Bolivar, An. Soc. Esp. viii. p. 143, Zanzibar.

Pirates (*Cleptocoris*) *brachypterus*, *cinctiventris*. Nagasaki, and *P.* (*Lestomerus*) *cruciatus*, pl. vii. fig. 5, China, Horváth, *l. c.* p. 148.

Opistoplatys sorex, id. *l. c.* p. 149, China.

Eumerus insignis, Bolivar, *l. c.* p. 143, Zanzibar.

Melanolestes argentinus, Berg, *l. c.* p. 163, Argentine Republic.

Sminthus marginellus, Distant, J. A. S. B. xlviii. pt. 2, p. 38, pl. ii. fig 1, Upper Tenasserim.

Spiniger (*Acrocoris*) *fulvo-maculatus*, Argentine Republic, Bolivia, and *S.* (*Pantopsilus*) *longipes*, Buenos Aires, Berg, *l. c.* pp. 171 & 172.

Velitra xantusi, Horváth, *l. c.* p. 149, pl. vii. fig. 6, Ningpo.

Centromelus edentulus and *scorpionius*, Berg, *l. c.* pp. 174 & 175, Buenos Aires.

Rhyparoclopius cornutulus, id. *l. c.* p. 176, Chaco.

Hydrometridæ.

Gerris gibbifera, Schum., var. *flaviventris*, described; Puton, Pet. Nouv. ii. p. 297. *G. thoracica*, auctt., and *plebeia*, Horv.: synonymy discussed; Douglas & Reuter, Ent. M. M. xvi. pp. 42, 43, 67 & 68.

Aepophilus, Signoret, in Puton, Hém. Hét. France, ii. p. 144, note. Type of a new subfamily of *Hydrometridæ* (*Aepophilini*, Puton, *l. c.*), intermediate between the *Mesovelini* and *Hydrometrini*. The sectional characters are given as follows:—No ocelli, pronotum united on the disk, raised in front and at the sides; claws very large, legs and antennæ stout; 1st joint of antennæ much shorter than 2nd; elytra shortened. Type, *A. bonnairii*, Sign., *l. c.* p. 445, note, Ile de Ré, where it occurs at low water in company with *Aepus robini* (compare also J. W. Douglas, Ent. M. M. xvi. p. 69).

Neovelia, g. n., F. B. White, J. L. S. xiv. p. 487. Allied to *Microvelia*, &c.; type, *N. traili*, sp. n., *l. c.* Manaos.

New species:—

Hydrometra metator, F. B. White, J. L. S. xiv. p. 486, Rio Juruá; *H. mensor*, id., Tr. E. Soc. 1879, p. 267, Manaos; *H. argentina*, Berg, Hemipt. Argent. p. 182, Buenos Aires.

Hygrotrechus remigrator, Horváth, Ann. Ent. Belg. xxii. p. cix. Kiusiu, Japan.

Limnotrechus gracilicornis, id. *ibid.*, Kiusiu.

Gerris (*Limnotrechus*) *sahlbergi*, Distant, Tr. E. Soc. 1879, p. 125, Second Yark. Miss. p. 12, fig. 10, Leh.

Hydrobates regulus, F. B. White, J. L. S. xiv. p. 488, Rio Purus.

Limnogonus (?) *lotus* and *L.* (?) *lubricus*, id. *l. c.* pp. 488 & 489, Manaos.

Halobates platensis, Berg, *l. c.* p. 183, Argentine Republic; *H.* (?) *orientalis*, Distant, *ll. c.* p. 126, & p. 12, figs. 11, 11 *a–e*, 12 *a*, *b*, Jhelam Valley.

Velia major, Puton, Pet. Nouv. ii. p. 297, Hém. Hét. France, ii. p. 150, S. Europe, Algeria; *V. vivida*, Nicaragua, and *virgata*, Manaos, p. 486, F. B. White, *l. c.*; *V. agavis*, Blasquez, Nat. Mex. i. p. 289, fig. 14 (1870), Mexico [appears to be one of the *Lygæidæ*].

Microvelia mimula, F. B. White, *l. c.* p. 487, Manaos.

Mesovelia mulsanti, id., Tr. E. Soc. 1879, p. 268, Rio Purus.

Pelogonidæ.

Pelogonus victor, sp. n., Bolivar, An. Soc. Esp. viii. p. 144, Pichincha.

Naucoridæ.

Naucoris perezi, sp. n., Bolivar, An. Soc. Esp. viii. p. 144, Abyssinia.

Ambrysus fucatus, sp. n., Berg, Hemipt. Argent. p. 187, Argentine Republic.

Pelocoris nigriculus and *lautus*, Berg, *id. l. c.* p. 188, Buenos Aires; *P. procurrens*, F. B. White, J. L. S. xiv. p. 489, N. Brazil: spp. nn.

Nepidæ.

Belostoma killing small fish; H. Turner, Am. Nat. xiii. pp. 585, 710, & 711.

Zaitha zelotypus, sp. n., F. B. White, Tr. E. Soc. 1879, p. 270, Montealegre, Amazons.

Ranatra linearis. Habits and transformations; C. Wilmott, Sci. Goss. xv. pp. 252 & 253, A. G. Laker, Ent. xii. pp. 142-145.

Helotenthes, g. n., Berg, Hemipt. Argent. p. 194. Allied to *Curicta*, Stål; type, *M. bonaerensis*, sp. n., *l. c.* p. 195, Buenos Aires.

Ranatra brachyura, Horváth, Term. füzetek, iii. p. 150, China; *R. rabida*, F. B. White, Tr. E. Soc. 1879, p. 270, Lages, Rio Negro: spp. nn.

Notonectidæ.

Martarega, g. n., F. B. White, Tr. E. Soc. 1879, p. 271. Resembles *Anisops* in appearance, but differs in structure; type, *M. membranacea*, sp. n., *l. c.* p. 272, Manaos and Rio Purus.

Anisops amnigenus, id. *ibid.*, Manaos; *A. fuscipennis*, Berg, Hemipt. Argent. p. 198, Argentine Republic: spp. nn.

Enithares glauca, Bolivar, An. Soc. Esp. viii. p. 145, Abyssinia; *E. maculata*, Distant, Tr. E. Soc. 1879, p. 216, pl. v. fig. 7, Antananarivo, Madagascar: spp. nn.

Plea maculosa, sp. n., Berg, Hemipt, Argent. p. 199, Argentine Republic.

Corisidæ.

Corisa cavifrons, var. from Belgium described; Lethierry & Pierret, Ann. Ent. Belg. xxii. p. 22, note.

Heterocorixa, g. n., F. B. White, Tr. E. Soc. 1879, p. 272. New subgenus of *Corixa*, which it resembles in facies, but the form of the eyes and the structure of the left hemelytron resemble *Sigara*, while the short pronotum recalls that of *Cymatia*. Type, *Corixa* (*H.*) *hesperia*, sp. n., *l. c.* p. 273, Prainha.

Corisa vittipennis, *fallax*, and *bellula*, spp. nn., Horváth, Term. füzetek, iii. p. 151, China (Ningpo, &c.).

Sigara selecta, p. 273, Manaos, *signata*, Rio Purus, *socialis*, Upper Amazons, &c., p. 274, and var. *sobrina*; *seducta*, Rio Juruá, and *simulans*, Upper Amazons, Tonantins, p. 275, White, *l. c.* spp. nn.

HEMIPTERA-HOMOPTERA.

Oshanin, B. [Materials for a Fauna of the *Homoptera* of Turkistan. Ann. Turk. Section of the Society of the Friends of Science, Anthropology, and Ethnography, i. pp. 99–163.]

A Russian paper, with Latin diagnoses of new species of *Orgerius* and *Dictyophara*.

Spångberg, J. *Homoptera* nonnulla Americana nova vel minus cognita. Œfv. Ak. Förh. xxxvi. (6) pp. 17–26, pls. xv. & xvi.

The following known species are noticed:—*Gypona fusiformis*, Spångb., ♂, p. 18, *Terulia ferruginea*, p. 20, pl. xv. fig. 3, *nigripes* and *fasciaticollis*, Stål, pl. xv. fig. 4, & pl. xvi. fig. 5, p. 21.

CICADIDÆ.

CARLET, G. Mémoire sur l'appareil musical de la Cigale. Grenoble: 1879, 8vo, pp. 39.

A. H. Swinton describes and figures the supposed auditory organs in the *Cicadidæ*; Ent. M. M. xvi. pp. 79–82, woodcut.

Cicada. Structure of the legs in the pupa (with figures of *C. fraxini*); J. Künckel d'Herculais; Ann. Soc. Ent. Fr. (5) ix. pp. 358–362, pl. x. figs. 7 & 8.

Cicada montana, Scop. Its generic synonymy is discussed by J. W. Douglas, Ent. M. M. xv. pp. 209 & 210.

New species:—

Platypleura madagascariensis, Distant, Tr. E. Soc. 1879, p. 217, Tamatave, Madagascar; *P. insignis*, id., J. A. S. B. xlviii. pt. 2, p. 39, pl. ii. fig. 2, Upper Tenasserim.

Huechys thoracica, id. *ibid.* fig. 3, Upper Tenasserim.

Melampsalta mangu, F. B. White, Ent. M. M. xv. p. 214, Canterbury, New Zealand.

Odopœa insignifera, Berg, Hemipt. Argent. p. 203, Argentine Republic.

Tettigades cinnabarina, id. *l. c.* p. 205, Mendoza.

Fidicina gastracanthophora, Argentine Republic, p. 206, *pullata*, Corrientes, p. 207, *bonaerensis*, Argentine Republic and Uruguay, p. 208, and *pusilla*, Argentine Republic, p. 209, *id. l. c.*

Tympanoterpes sibilatrix, id. *l. c.* p. 210, Argentine Republic, Brazil, Bolivia.

Proarna dactyliophora, id. *l. c.* p. 211, Tucuman.

Carinata diplographa, id. *l. c.* p. 212, Buenos Aires.

FULGORIDÆ.

FIEBER, F. X. Les Cicadines d'Europe d'après les originaux et les publications les plus recentes. Quatrième partie. Descriptions des espèces. R. Z. (3) vii. pp. 65–80.

Contains the commencement of *Fulgorida* (*Liburnia*). [Only the first part of R. Z. for 1879 appears to have been published during that year.]

Dictyophara pannonica, Creutz., *iberica*, Fieb., and *europæa*, Linn., recorded as new to the fauna of Turkistan; Oshanin, Ann. Turk. Soc. i. pp. 133 & 135.

Orgerius ellypticus, Oshanin, redescribed by him, *l. c.* p. 157.

New genera and species:—

Domima, Berg, Hemipt. Argent. p. 216. Intermediate between *Acmonia* and *Aliphera*, Stål. Type, *O. badia*, sp. n., *l. c.*, Buenos Aires.

Cixiosoma, id. *l. c.* p. 220. Allied to *Cixius*. Type, *C. platensis*, sp. n., *l. c.* p. 221, Buenos Aires.

Aulocorypha, id. *l. c.* Not closely allied to any known genus. Type, *A. punctulata*, sp. n., *l. c.* p. 222, Buenos Aires.

Aka, F. B. White, Ent. M. M. xv. p. 216. Allied to *Myndus*, Stål. Type, *Cixius finitimus*, Walk.

Semo, id. *l. c.* p. 217. Allied to *Duilius*, Stål. Type, *S. clypeatus*, sp. n., *ibid.*, New Zealand.

Agandecca, id. *ibid.* Allied to *Messeis*, Stål; head and thorax formed as in *Cixius*. Type, *A. annectens*, sp. n., *l. c.* p. 218, New Zealand.

Cona, id. *l. c.* p. 218 (*Delphacides*). Type, *C. celata*, id. *ibid.*, New Zealand.

Orgerius perezi, Bolivar & Chicote, An. Soc. Esp. viii. p. 177, Madrid ; *O. megacephalus*, p. 139, *longiceps*, p. 141, *kowlkovi*, Bokhara, &c., p. 143, *dimorphus*, Kumsan, p. 144, *medius*, Hissar Mountains, p. 146, *stali*, Bokhara, p. 148, *skobelevi*, Alai Mountains, p. 150, *reuteri*, Bokhara, p. 152, *chomatovi*, Ugam Valley, p. 154, *similis*, Tashkend, p. 158, *fuscus*, Ischu Valley, p. 160, and *fedschenkoi*, Tashkend, p. 161 ; Oshanin, Ann. Turk. Soc i.

Hyalesthes mlokosiewiczi, Signoret, Bull. Soc. Ent. Fr. (5) ix. p. lxvi., Persia.

Homalocephala intermedia, Bolivar, An. Soc. Esp. viii. p. 145, Zanzibar.

Lystra bombycida, J. Blasquez, Nat. Mex. i. p. 288, figs. 13 & 15 Mexico [1870].

Dictyophara striata, Kokand, p. 129, *avocetta* and *scolopax*, Bokhara, &c., pp. 131 & 133, Oshanin, l. c. ; *D. sulcirostris* and *sororcula*, Berg, Hemipt. Argent. pp. 218 & 219, Buenos Aires.

Olearius dimidiatus, id. *l. c.* p. 220, Argentine Republic.

Delphax maculipes, id. *l. c.* p. 223, Buenos Aires.

Aracopus lethierrii, Mulsant & Rey, Ann. Soc. L. Lyon, xxv. p. 319, St.-Maurice (Nord).

Liburnia cognata, Corrientes, *univittata*, Buenos Aires, p. 224, *xiphias*, Argentine Republic and Uruguay, p. 225, *nigricula*, Corrientes, and *nimbata*, p. 226, *fusco-terminata*, p. 296, Buenos Aires, Berg, *l. c.*

Acanonia chloris, id. *l. c.* p. 228, Argentine Republic, Uruguay.

Ormenis cestri, id. *l. c.* p. 229, Argentine Republic, Uruguay.

Byblis proxima, id. *l. c.* p. 230, Buenos Aires.

Cercopidæ.

Phymatostetha sp. from the Island of Johanna noticed ; A. G. Butler, Ann. N. H. (5) iv. p. 41.

Machærota ensifera, Burm., and *gupionata*, Stål, redescribed ; Signoret, Bull. Soc. Ent. Fr. (5) ix. pp. xlviii. & xlix.

Considia secunda, sp. n., Berg, Hemipt. Argent. p. 231, Buenos Aires.

Tomaspis katzensteini, Argentine Republic, *entreriana*, Entre-Rios, p. 233, *correntina*, Corrientes, p. 234, *aguirrii*, Argentine Republic, *perezi*, Buenos Aires, p. 235, *argentina* and *knoblauchi*, p. 236, Argentine Republic, spp. nn., *id. l. c.*

Sphenorrhina costaricensis and *conspicua*, spp. nn., Distant, Ent. M. M. xvi. pp. 61 & 62, Cache, Costa Rica.

Macherota spangbergi, p. xlviii., *punctulata*, Silhet, and *punctato-nervosa*, China, p. xlix., spp. nn., Signoret, Bull. Soc. Ent. Fr. (5) ix.

Aphrophora jactator, sp. n., F. B. White, Ent. M. M. xv. p. 214, New Zealand.

Membracidæ.

Telamona salvini, sp. n , Distant, Ent. M. M. xvi. p. 11, Chinantha.

Polyglypta godmani, sp. n., *id. ibid.*, Irazu.

Adippe maculata, sp. n., *id. ibid.*, Irazu.

Hyphinoe cornuta, sp. n., *id. l. c.* p. 12, Irazu.

Cyphonia colenophora and *bonaerensis*, spp. nn., Berg, Hemipt. Argent. pp. 239 & 240, Buenos Aires.

Acutalis variabilis, sp. n., *id. l. c.* p. 244, Argentine Republic and Uruguay.

Pyranthe frustratoria, sp. n., *id. l. c.* p. 296, Tucuman.

Iassidæ.

Scott, J. On Certain British *Hemiptera-Homoptera*: Revision of the genus *Eupelix*. Ent. M. M. xv. pp. 231–233.

The genus is characterized, and 3 species (*E. cuspidata*, Fabr., and *producta* and *spathulata*, Germ.) recorded as British, and redescribed.

Signoret, V. Essai sur les *Iassides*, Stål, Fieb., et plus particulièrement sur les Acocéphalides, Puton. Ann. Soc. Ent. Fr. (5) ix. pp. 47–92, 259–280, pls. i. ii. vii. & viii.

The genera are tabulated, and many known genera and species are redescribed and figured. The following synonyms are given:—*Eupelix depressa*, Fabr. (= *spathulata*, Germ.), *cuspidata*, Fabr. (= *fuliginosa*, Oliv.), *Acocephalus nervosus*, Schrank (= *striatus*, Fourcr., = *striolatus*, *rusticus*, *variegatus*, *transversus*, *striatellus*, Fabr., var. *costatus*, Panz., ? *fasciatus*, *cardui*, *obscurus*, *sparsus*, *rugosus*, *unicolor*, *bicinctus*, *pallidus*, and *pulverulentus*, Curt., *adustus*, Hardy, = *bifasciatus*, Fieb.), *A. elongatus*, Leth. (= *dispar* var., Herr.-Schäff.), *A. albifrons*, L. (= *livens*, Zett., *testata* and *concinnæ*, Curt., *arcuatus* and *confusus*, Kirschb., *nigro-punctatus* and *albifrons*, Sahlb., *polystolus*, Scott, and *ornatus*, Fieb.), *Anoscopus brunneo-bifasciatus*, Geoff. (= *acocephalus* and *diatæmops*, Amyot), *A. carinatus*, Stål (= *variegatus*, ♂, Fieb.), *A. bifasciatus*, L. (= *trifasciatus*, De Geer, *tristriatus*, Gmel., *obliquus* and *subrusticus*, Germ., *granulatus* and *interruptus*, Fieb.), *A. tricinctus*, Curt. (= *nigrita*, Kirsch), *trifasciatus*, Fourcr. (= *dispar*, Zett., *bistriatus*, Gmel., *transversalis*, Fourcr., *serratulæ*, Fabr., ? *albiger*, Germ., *arenicola*, March., and *albifrons*, Fieb.), *A. histrionicus*, Fabr. (= *costatus*, Walk.), *flavo-strigatus*, Don. (= *rivularis*, Germ.), *Strongylocephalus megerlii*, Fieb. (? = *Amblycephalus irroratus*, Curt.), *Dorydium paradoxum*, Burm. (= *lanceolatum*, Sign., ? = *porrectum*, Fourcr.), *Hecalus afzeli*, Stål (= *Acocephalus foliaticeps*, Stål), *Spangbergiella vulneratus*, Uhl. (figured as *S. lacordæ*, Sign., pl. viii. fig. 29), *Parabolocratus viridis*, Uhl. (= *Gypona reverta*, Uhl., olim), *P. eximius*, Kirsch (= *glaucescens*, Fieb.).

Spångberg, J. Species *Gyponæ*, generis Homopterorum. Sv. Ak. Handl. Bihang v. pp. 75 (1878).

The number of species is raised to 96, all of which are described. 11 additional species, unknown to the writer, are simply enumerated.

Typhlocyba. The 24 Dutch species enumerated; Snellen van Vollenhoven, Tijdschr. Ent. xxii. pp. ix.–xii.

Dicranoneura aureola, Fall. (= *Typhlocyba chlorophana*, Herr.-Schäff.), recorded as new to Britain, and redescribed; J. W. Douglas, Ent. M. M. xv. p. 202.

Petalopoda, g. n., Spångberg, Œfv. Ak. Förh. xxxii. (6) p. 18. Allied to *Terulia*; types, *P. annulipes*, Cayenne, and *pictifrons*, Brazil (St. Paul), spp. nn., *l. c.* pp. 18 & 19, pl. xv. figs. 1 & 2.

New species:—

Tettigonia albo-maculata, *scutellata*, p. 62, *costaricensis* and *rufofasciata*, p. 63, Distant, Ent. M. M. xvi., Costa Rica; *T. tribunicia*, p. 250, *consularis*, Buenos Aires, p. 251, *missionum* and *doeringii*, p. 252, *xanthophis*, Argentine Republic, p. 254, *capitanea*, Buenos Aires, and *argentina*, Argentine Republic, p. 255, Berg, Hemipt. Argent.

Epiclines bdellostoma, id. *l. c.* p. 258, Argentine Republic.

Gypona plebeia, Bogota, *rugosa*, Mexico, p. 6, *pruinosa*, Texas, Georgia, *scrupulosa*, S. Carolina, *brachycephala*, p. 9, *albicans*, p. 11, *brevipennis*, p. 12, *lugubrina*, p. 13, *tristis*, p. 14, *assimilis*, Bogota, *glaucina*, p. 16, *affinis* and *stali* (= *glauca*, Stål, *nec* Fabr.), Brazil, p. 17, *mexicana*, Mexico, p. 18, *melanota*, New Jersey, Georgia, *splendidula*, p. 19, *varians*, *octinervis*, Bogota, p. 22, *bimaculata*, Mexico, p. 23, *concolor* and *abdominalis*, Bogota, p. 24, *spinifera*, p. 28, *fusiformis*, Amazons, &c., p. 29, *dorsalis*, Mexico, p. 30, *mirabilis*, Cayenne, p. 31, *pulchra*, Bogota, *angulata*, Texas, p. 32, *vitticollis*, Colombia, p. 33, *tenella*, Georgia, *bigemmis* (= *aurulenta*, Burm., *nec* F.), Rio Janeiro, p. 34, *paupercula*, Argentine Republic, p. 35, *bogotana*, p. 36, *gibbiceps* and *minuta*, Bogota, p. 37, *meditabunda*, Texas, *limbata*, p. 39, and var. *fuscipennis*, Bogota, p. 40, *citrina*, Texas, p. 45, *pectoralis*, p. 46, *limbatipennis*, Illinois, p. 47, *bicolor*, Cayenne, p. 52, *puncticollis*, Texas, p. 54, *obtusa*, Bogota, p. 55, *quadrinotata*, Georgia, Texas, p. 56, *ocellata*, Puna, Taiti ?, p. 57, *albo-guttata*, Cayenne, Brazil, p. 58, *marmorata*, Bogota, p. 59, *conspersa*, Mexico, *irrorella*, Texas, p. 60, *sanguinolenta*, Georgia, Texas, p. 63, *grisea*, Georgia, p. 64, *australis*, Buenos Aires, *mœsta*, Surinam, p. 66, *punctata*, Bogota, p. 67, *mystica*, Mexico, Bogota, p. 71, and *fraterna*, Texas, p. 72, J. Spångberg, Sv. Ak. Handl. Bihang v. (1878); *G. laticeps*, id. Œfv. Ak. Förh. xxxii. (6) p. 17, Banda; *G. spangbergi*, p. 259, *latipes* (Stål, MS.), Buenos Aires, &c., and *binotulata*, Corrientes, p. 261, Berg, *l. c.*

Cephalius frontalis (Fieb., MS.), Signoret, Ann. Soc. Ent. Fr. (5) ix. p. 61, pl. i. fig. 5, Constantine.

Acocephalus sahlbergi, Dauria, and *assimilis* (Fieb., MS.), S. Europe, Algeria, *id. l. c.* pp. 72 & 75, pl. ii. figs. 11 & 13; *A. dubius*, Berg, *l. c.* p. 264, Argentine Republic, Uruguay.

Dorydium westwoodi, F. B. White, Ent. M. M. xv. p. 215, Christchurch, New Zealand.

Parabolocratus flavidus, N. America, and *ægyptiacus*, Egypt, Signoret, *l. c.* pp. 276 & 277, pl. viii. figs. 31 & 32.

Tassus borealis, N. America, *mysticus*, Peru, p. 25, *gratiosus*, Mexico, p. 26, pl. xvi. figs. 8–10, Spångberg, Œfv. Ak. Förh. xxxvi. (6).

Terulia elegans and *pulchella*, id. *l. c.* pp. 22 & 23, pl. xvi. figs. 6 & 7.

Athysanus negatus, F. B. White, *l. c.* p. 215, New Zealand ; *A. coronatus*, p. 265, *maximus*, *fraterculus*, p. 266, *desertorum*, Buenos Aires, and *picinus*, Argentine Republic, p. 267, Berg, *l. c.*

Deltocephalus sexpunctatus, p. 268, *variegatus*, p. 269, *gentilis*, p. 270, *venosulus* and *respublicanus*, p. 271, *id. l. c.*, Buenos Aires, &c.

Platymetopius longiceps, id. *l. c.* p. 272, Buenos Aires.

Hecalus lynchi, id. *l. c.* p. 273, Buenos Aires.

Typhlocyba photophila, Corrientes, and *salinarum*, Buenos Aires, *id. l. c.* pp. 273 & 274.

Fieberia pulcherrima, id. *l. c.* p. 275, Argentine Republic.

Psyllidæ.

Loew, F. Mittheilungen über Psylloden. Verh. z.-b. Wien, xxix. pp. 549–598, pl. xv.

In addition to new species, the following are noticed at considerable length :—*Rhinocola aceris*, Linn., *ericæ*, Curt., figs. 10 & 11, *targionii*, Licht., figs. 12 & 13, *Aphalara picta*, Zett., figs. 14 & 15 (not *calthæ*, Linn.), *A. nebulosa*, Zett., *Diaphorina putoni*, Loew, *Psylla pyrisuga*, Först., fig. 16, *costato-punctata*, Först., fig. 17, *costalis*, Flor, *peregrina*, Först., *visci*, Curt., fig. 18, *pineti*, Flor, *alaterni*, Först., figs. 26–28, *hartigi*, Flor, *betulæ*, Linn., *limbata*, Meyer-Dür, figs. 19–21, *Trioza striola*, Flor, *unifasciata*, Loew, fig. 22, *albiventris*, Först., *margine-punctata*, Flor, *ægopodii*, Loew, fig. 23, *senecionis*, Scop., figs. 21–25, *cerastii*, Loew, *chrysanthemi*, Loew, *dispar*, Loew, fig. 29, *proxima*, Flor, and *meyerdueri*, Loew (= *distincta*, Loew, *nec* Flor), fig. 31.

Captures in Yorkshire in 1877 ; S. L. Mosley, Tr. Yorksh. Nat. Union, i. Series D, pp. 17 & 18.

Spanioneura fonscolombii, Först. Nymph described ; Scott, Ent. M. M. xvi. pp. 85 & 86.

Trioza lauri : generative system ; Targioni, Atti Soc. Ital. xi. Adunanze, pp. 19 & 20.

New species :—

Aphalara jakowleffi, Scott, Ent. M. M. xv. p. 266, Astracan.

Psylla phœoptera, Switzerland, figs. 1 & 2, and *affinis*, France, figs. 3 & 4, Loew, Verh. z.-b. Wien, xxix. pp. 549 & 551, pl. xv.

Arytæna adenocarpi,, id. *l. c.* p. 552, pl. xv. fig. 5, Landes.

Floria horvathi, Scott, *l. c.* xvi. p. 84, Hungary.

Trioza atriplicis, Lichtenstein, Bull. Soc. Ent. Fr. (5) ix. p. cxv., and Ent. M. M. xvi. p. 82 (♀ described ; Scott, *l. c.* p. 114), Montpellier ; *T.*

dichroa, Scott, *l. c.* xv. p. 265, Astracan; *T. scotti*, Austria, p. 554, fig. 6, *crithmi*, France, p. 556, fig. 7, and *rumicis*, Austria, &c., p. 557, figs. 8 & 9, Loew, *l. c.* pl. xv.

Aphididæ.

Buckton, G. B. Monograph of the British *Aphides*. Vol. ii. (Ray Soc.) London: 1879, 8vo, pp. 176, pls. xxxix.–lxxxvi.

The present volume includes the following genera of *Aphidinæ*: *Rhopalosiphum*, *Melanoxanthus*, *Siphocoryne*, *Aphis*, *Hyalopterus*, *Chætophorus*, *Pterocomma*, *Cryptosiphum*, and *Brachycolus*. The British species belonging to these genera are fully described and figured, with notes on food-plants, habits, &c. The following synonyms occur, although the synonymy appears not to be given at length: *Rhopalosiphum lactucæ*, Kalt., Pass., Walk., is distinct from *Siphonophora lactucæ*, Pass., or Koch, which are likewise distinct species. *R. dianthi*, Schr., = *persicæ*, Morr. (*nec* Fonsc., Sulz., Kalt.), = *rapæ*, *florisrapæ*, and *dubia* ?, Curt., = *vastator*, Smee, = *persicicola*, Boisd.; *Aphis ægopodii*, Fabr., = *Siphocoryne capreæ*, and *Rhopalosiphum pastinaceæ* and *cicutæ*, Koch, probably belong to the same species; *Aphis carotæ*, Koch, = *subterranea*, Walk.; *A. malvæ*, Walk., Pass., &c., is distinct from *Siphonophora malvæ*, Pass., which probably = *S. pelargonii*, Kalt.; *A. mali*, Fab., = *pomi*, De Geer; *A. prunifex* and *calamaphis*, Amyot, and ? *prunifoliæ*, Fitch, = *pruni*, Réaum.; *A. fabæ*, Kirb., *genistæ*, Scop., ? *ulicis*, Fabr., ? *euphorbiæ*, Kalt., *A. dahliæ* and *Cinara rumicis*, Mosl., and *rumicifex* and *genistifex*, Amyot, = *rumicis*, Linn.; *A. chenopodii*, Schr., = *atriplicis*, L. (? Fabr.); *A. chrysanthemi*, Koch, and ? *leucanthemi*, Scop., = *cardui*, L.; *A. pyri*, Fonsc., is distinct from *pyri*, Koch; *A. persicæ*, Fonsc., Kalt., Walk., Koch, Pass., but not of Sulzer or Schrank, = *amygdali*, Fonsc.; *A. prunifex*, Amyot, = *Hyalopterus pruni*, Fabr.; *A. calamaphis*, Amyot, = *H. arundinis*, Fabr.; *H. aquilegiæ*, Koch, = *trirhoda*, Walk.; *Phyllophorus testudinatus*, Thornton, *Chelymorpha testudo*, Clark, *Periphyllus testudo*, Hoev., and probably *Aphis perforatus*, Sign., = *Chætophorus aceris*, Linn., dimorphous forms; *Lachnus punctatus*, Burm., ? = *Chæt. populneus*, Kalt. The various insects (*Neuroptera*, *Diptera*, and *Hymenoptera*) which feed, or are parasitic on *Aphides*, are also discussed at some length, and various species are figured.

Coudere, V. Quelques mots sur le *Phylloxera*, son entomologie, ses métamorphoses, ses mœurs, ses habitudes, sa prodigieuse fécondité. Villeneuve-sur-Lot: 1879, 8vo, pp. 44.

Courchet, L. Note sur les Aphides du térébinthe et du lentisque. Rev. Montp. viii. pp. 1–14.

Lichtenstein, J. Les Pucerons des Ormeaux (*Aphides-Coccidæ*) avec description de deux insectes nouveaux (*Pemphigus ulmi*, p. 9, *Rhitsemia pupifera*, p. 22). Feuill. Nat. x. pp. 6–9, 22–24.

Passerini, G. Aggiunte alla Flora degli Afidi Italiani colla descrizione di alcune specie nuove. Bull. Ent. Ital. xi. pp. 44–48.

Riley, C. V., & Monell, J. Notes on the *Aphidiæ* of the United States, with descriptions of species occurring West of the Mississippi. Part i.—Biological Notes on the *Pemphiginæ*, with descriptions of new species, by C. V. Riley; pp. 1–17. Part ii.—Notes on *Aphidinæ*, with descriptions of new species, by J. Monell; pp. 18–32. [*Cf.* also, P. Am. Ass. 1878, pp. 288 & 289.]

Riley points out that *Pemphiginæ* do not migrate from trees to the roots of grass to hibernate, as Lichtenstein supposed, and remarks on the difficulties in the way of classifying these insects. The natural history of several species is given at length, including *Colopha ulmicola*, Fitch, pp. 9–13, pl. i. figs. 2 *a–g*, and *Hormaphis spinosus*, Shimer, pp. 14 & 15. Monell mentions the described N. American genera and species of *Aphidinæ* more briefly, but redescribes several.

Torelli, L. Sulla *Phylloxera vastatrix*. Seconda Memoria. Atti Ist. Venet. (5) v. pp. 3–41.

Discusses the history of the insect since 1872, when the former report was published. Several public documents are appended.

General notes on *Aphides*; E. A. Fitch, Ent. xii. pp. 245–250.

On preserving *Aphides* for collections; Lichtenstein, Ent. M. M. xv p. 191, CR. Ent. Belg. xxii. pp. xlix. & l.

Aphides destructive to potatoes; Dragendorff, SB. Ges. Dorp. v. p. 31.

Remarks on the transformations of *Aphides*; Lichtenstein, CR. Ent. Belg. xxii. pp. xii.–xiv.

Notes on the habits of the *Aphides* of the elm; Kessler, Ber. Ver. Cassel, xxvi. & xxvii. p. 57, Ent. Nachr. v. pp. 279–284, 316–319.

Schizoneura compressa, Koch, and *Tetraneura alba*, Ratz. (? = *T. pallida*, Hal.). Comparative description of galls, and the former figured; F. Loew, Verh. z.-b. Wien, xxix. pp. 65–70.

Pelonium kirbii, Lacord., *nec* Gray, = *Enoplium rufipes*, Klug; the latter is distinct from *trifasciatum*, Cast. C. A. Dohrn, S. E. Z. xl. pp. 184 & 185.

Lachnus pini, Kalt. Metamorphoses; Canestrini & Fanzago, Atti Soc. Pad. v. pp. 173–176.

Lichtenstein's notes on *Pemphiginæ*, &c., translated from CR. lxxxvii. pp. 782 & 783, Ann. N. H. (5) iii. pp. 174 & 175.

Pemphigus, sp. n., on terebinth, *id.* Bull. Soc. Ent. Fr. (5) ix. p. cxv.

Haploneura lentisci, migrations; *id.* S. E. Z. xl. pp. 181 & 182.

Tetraneura ulmi. Migrations; *id.* Ent. M. M. xv. pp. 190 & 191.

Phylloxera vastatrix. Fertilized eggs in the upper layers of soil; Boiteau, C. R. lxxxix. pp. 772–774. See also Balbiani, *l. c.* pp. 846 & 847. 1027 & 1028. Oviposition of the winged insect in Languedoc; V. Mayet, *l. c.* pp. 894 & 895. *Phylloxera* carried by wind; Faucon, *l. c.* p. 983. Notes by Lafitte, p. 1029. Many other viticultural observations in C. R. lxxxviii. & lxxxix. Mode in which its attacks destroy the vine by rotting it, and opening the way to fungous parasites; Millardet, Assoc. Fr. vii. pp. 653 & 654. Discussion; Lichtenstein, &c., C. R. Congrès Int. 1878, i. pp. 162–190. Probably indigenous to America; Collet, Am. Nat.

xiii. pp. 269 & 270. Nervous system described; Mark & Riley, Psyche, ii. pp. 201-207, 225 & 226. Its occurrence in Italy; Nature, xix. pp. 375 & 400, Bull. Ent. Ital. xi. pp. 129–133.

New genera and species:—

Melanoxanthus, Buckton, Mon. Brit. Aph. ii. p. 21. Allied to *Rhopalosiphum*. Type, *Aphis salicis*, Linn.

Pterocomma, id. *l. c.* p. 142. Intermediate between *Aphis*, *Hyalopterus*, and *Callipterus*. Type, *P. pilosa*, sp. n., *l. c.* p. 143, pl. lxxxiii., London.

Cryptosiphum, id. *l. c.* p. 144. Rostrum moderate, wings short, rounded, veined like *Aphis*; cornicles and tail absent or indistinct. Type, *C. artemisiæ* (? Pass.), sp. n., *l. c.* p. 145, pl. lxxxiv., Brandon.

Brachycolus, id. *l. c.* p. 146. Differs from *Hyalopterus* in the short limbs, and from *Cryptosiphum* in the moderately long tail. Type, *Aphis stellariæ*, Hardy (= *A. holci*, Hardy), redescribed and figured, *l. c.* p. 147, pl. lxxv. figs. 1–3.

Lachnus longistigma, Monell, "Valley Naturalist," June, 1878, St. Louis.

Schizoneura americana, Riley, Bull. U. S. Geol. Surv. v. p. 4, pl. i. figs. 1 *a–h*, Iowa.

Pemphigus retro-flexus, Courchet, Rev. Montp. viii., Montpellier; *P. populi-monilis*, Colorado, Kansas, p. 13, pl. ii. figs. 3 *a–g*, *populi-transversus*, Texas, p. 15, pl. ii. figs. 5 a–d, *populi-ramulorum*, Colorado, *aceri-folii*, p. 16, & *fraxini-folii*, St. Louis, p. 17, Riley, *l. c.*

Siphonophora bipontis, Passerini, Bull. Ent. Ital. xi. p. 45, Tortona, on *Inula bifrons*; *S. achyrantes*, p. 18, *calendulella*, *tuliparum*, p. 19, *tiliæ*, *liriodendri*, and var. *rufa*, *cratægi*, p. 20, *sonchella* and *calendulæ*, p. 21, Monell, Bull. U. S. Geol. Surv. v., St. Louis.

Aphis edentula, figs. 1–3, p. 39, *pedicularis*, figs. 4 & 5, p. 41, pl. xlviii., *penicillata*, p. 51, pl. li. figs. 5 & 6, *cucurbitæ*, p. 56, pl. liv. figs. 1 & 2, *lentiginis*, p. 59, pl. lv. figs. 1 & 2, *petasidis*[*-tis*], p. 69, pl. lviii. figs. 1 & 2, *aucupariæ*, p. 76, pl. lx. figs. 3–5, *acetosæ* (? = *molluginis*, Koch), p. 80, pl. lxii. figs. 5–7, *instabilis*, p. 94, pl. lxviii. figs. 1–5, *bellis*, p. 98, pl. lxix. *bis*, figs. 1, 2, & 4, *opima*, p. 101, pl. lxxi., Buckton, *l. c.*, Britain; *A. candicans* and *phelipææ*, Bologna, on *Orobanche ramosa*, and *A. tormentillæ*, Italy, on *Tormentilla erecta*, Passerini, *l. c.* pp. 46–48; *A. lutescens*, *calendulicola*, p. 23, *hyperici*, p. 25, *loniceræ* and *helianthi*, p. 26, Monell, *l. c.*, St. Louis.

Hyalopterus dilineatus [*bi-*] and *melanocephalus*, Buckton, *l. c.* pp. 113 & 116, pls. lxxvi. & lxxvii., Britain.

Rhopalosiphum salicis, St. Louis, and *rhois*, United States, Monell, *l. c.* pp. 26 & 27.

Callipterus ulmifolii, United States, *walshi*, *asclepiadis*, p. 29, *discolor*, *punctata*, *hyalinus*, *betulæcolens*[*betuli-*], p. 30, *caryæ*, and *C.* (?) *quercicola*, St. Louis, p. 31; *id. l. c.*

Chætophorus betulæ, Buckton (? = *granulatus*, Koch), *l. c.* p. 139, pl. lxxxii. figs. 1 & 2, Walthamstow, on birch; *C. viminalis*, United States, p. 31, *smithiæ* and *quercicola*, Illinois, p. 32, Monell, *l. c.*

COCCIDÆ.

HONEGGER, H. Einführung und Cultur der Cochenille auf den kanarischen Inseln. Zool. Gart. 1879, pp. 10–17.

MASKELL, W. M. On some *Coccidæ* in New Zealand. Tr. N. Z. Inst. xi. pp. 187–228, pls. v.–viii.

Signoret's classification is followed, and the New Zealand species, indigenous and introduced, are described and figured, inclusive of the following known species (several others, known or undetermined, being more briefly mentioned):—*Mytilaspis pomorum*, L., p. 192, pl. v. figs. 1 *a–e* & 2 *a–d*, *Aspidiotus epidendri*, Bouché, p. 197, pl. v. figs. 6 *a–d*, *A. budlæi*, Sign., p. 198, *Diaspis boisduvali*, Sign., p. 200, figs. 9 *a–b*, *rosæ*, Sandb., p. 201, fig. 9 *c*, *D.* sp., p. 202, fig. 10 *c*, *Lecanium hesperidum*, auctt., p. 205, figs. 12 *a–e*; *Lecanium*, details figured, figs. 11 *a–e*, pl. vi.

Notes on *Coccidæ* injurious to oranges; V. Signoret, Bull. Soc. Ent. Fr. (5) ix. p. lxvi.

Coccus on mango in Yucatan yielding cement; Nature, xx. p. 18.

Guerinia tinctoria, Targioni, redescribed by him; Atti Soc. Ital. xi. Adunanze, pp. 17 & 18.

Diaspis, sp. n., described but not named; Targioni & Blankenheim, Atti Soc. Ital. xi. Adunanze, p. 17.

Lecanium tulipiferæ redescribed by A. J. Cook, Am. Nat. xiii. pp. 324–326, woodcuts.

New genera and species:—

Ritsemia, J. Lichtenstein, C. R. lxxxviii. pp. 870 & 871; Ann. N. H. (5) iii. pp. 456 & 457; S. E. Z. xl. pp. 387–389. Intermediate between the *Coccidæ* and *Phylloxera*, having the antennæ of the former and the general form of the latter; may be placed in the *Coccidæ*, near *Gossyparia*, Sign. The male is apterous. Type, *R. pupifera*, sp. n., *ll. cc.*, parasitic on elm. (The other *Coccidæ* and *Aphididæ* feeding on elm are also noticed.)

Powellia, W. M. Maskell, Tr. N. Z. Inst. xi. p. 223. With 4 wing-like appendages: affinities doubtful; ? intermediate between *Aphis* and *Coccus*. Type, *P. vitreo-radiata*, sp. n., *ibid.* pl. viii. figs. 22 *a–g*, New Zealand.

Ctenochiton, id. *l. c.* p. 208. In sub-sect. *Lecanio-diaspidæ*, Sign.: young with abdominal lobes, test glassy and transparent, afterwards waxy, and in one species finally felted; females retaining feet and antennæ until after producing the young. To contain *C. perforatus*, p. 208, figs. 13 *a–f*, 14 *a* & *b*, *viridis*, p. 211, fig. 14 *b*, *elongatus*, figs. 14 *c* & *d*, and *spinosus*, figs. 15 *a–d*, p. 212, spp. nn., *l. c.* pl. vii., New Zealand.

Inglisia, id. *l. c.* p. 213. Allied to *Ctenochiton*; test limpet-shaped; abdominal lobes present, segmental fringe absent. Type, *I. patella*, sp. n., *ibid.* pl. vii. figs. 16 *a–f*, New Zealand.

Asterochiton, id. *l. c.* p. 214. Entirely enclosed in a test; affinities doubtful, probably belonging to the *Lecaniides*; types, *A. lecanioides*, figs. 17 *a–c*, and *aureus*, fig. 17 *d*, spp. nn., *l. c.* pp. 215 & 216, pl. vii., New Zealand.

Mytilaspis pyriformis, p. 194, figs. 3 *a–c*, *cordylinidis*, p. 195, figs. 4 *a–c*, and *drimydis*, p. 196, figs. 5 *a–c*, id. *l. c.* pl. v., New Zealand.

Aspidiotus atherospermæ, figs. 7 *a* & *b*, *dysoxyli*, figs. 7 *c* & *d*, p. 198, and *aurantii*, p. 199, figs. 8 *a–c*, id. *l. c.* pl. vi., New Zealand (the last introduced from Sydney).

Diaspis gigas, id. *l. c.* p. 201, pl. vi. figs. 10 *a–d*, New Zealand.

Acanthococcus multispinus, id. *l. c.* p. 217, pl. viii. figs. 18 *a–g*, New Zealand.

Eriococcus araucariæ, id. *l. c.* p. 218, New Zealand.

Dactylopius calceolariæ, figs. 19 a–d, *glaucus* and *poæ*, figs. 19 *e–g*, id. *l. c.* pp. 218–220, pl. viii., New Zealand.

Icerya purchasi, id. *l. c.* p. 221, pl. viii. figs. 20 *a–f* & 21 *a–d*, New Zealand.

Lecanium phyllococcus, W. H. Ashmead, Canad. Ent. xi. p. 160, Florida.

Aleurodidæ.

Aleurodes. On the various forms of this genus; Douglas, Ent. M. M. xvi. pp. 43 & 44.

Spondyliaspis, g. n., V. Signoret, Bull. Soc. Ent. Fr. (5) ix. p. lxxxv. Buckler having the form of a *Spondylus*; larva and pupa with four rudiments of wings. To contain *S. spinosulus*, *cereus*, and *bancrofti*, spp. nn., *l. c.* p. lxxxvi., on *Eucalyptus* at Brisbane.

VERMES.

BY

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

CLAUS has commenced to issue a fourth edition of his "Zoologie," in which pp. 375–509 are devoted to the *Vermes*.

LEUCKART has commenced a second edition of his "Die Parasiten des Menschen," and has also published a more popular "Allgemeine Naturgeschichte der Parasiten," with 91 woodcuts (Leipzig).

COBBOLD has issued a volume under the title of "Parasites, &c." (London : 1879).

F. W. HUTTON has published a "Catalogue of the hitherto described Worms of New Zealand." Trans. N. Z. Inst. xi. pp. 314–327.

EHLERS has published a "Preliminary Report on the Worms" (Reports on the Results of Dredging, &c. iv.) (Bull. Mus. C. Z. v. No. 12) : from which we learn that the greater part of the collection is Annelidan, the Nemertines are represented by fragments, there is only one *Sagitta* ; of four Gephyrean genera, a species of one (*Phascolosoma*) was brought up from depth of 1568 fathoms. Below the 600-fathom line were found examples of *Aphroditidæ*, *Polynoidæ*, *Eunicidæ*, *Opheliidæ*, *Ampharetidæ*, and *Serpulidæ*. The *Eunicidæ* play an important part, just as they are the Annelids best represented in the lithographic shales of Bavaria.

VERRILL (Bull. U. S. Nat. Mus. No. 15) gives a list of the Annelids collected during the Howgate Polar Expedition (Cumberland Gulf and Penny Harbour) : *Harmothoe imbricata*, *Nereis pelagica*, *Phyllodoce grœnlandica*, *Syllis* sp., *Cistenides granulata*, *Thelepus cincinnatus* (not *circinnatus*; as Malmgren and others write), *Spirorbis lucidus*, *S. quadriangularis* (pp. 141 & 142).

Phascolosoma margaritaceum collected in Cumberland Sound ; *id. l. c.* p. 142.

STUDER (Arch. f. Nat. xlv. pp. 114, 123-125, 136) gives a list of the 49 *Vermes* (including 10 *Bryozoa*) found at Kerguelen's Land ; he describes as new *Thalassema verrucosa* (Betsy Cove).

LUNEL gives (Bull. Soc. Vaud. xvi. pp. 168 & 169) a list of the parasites and intestinal worms found in the fishes of the Lake of Geneva.

PLATYHELMINTHES.

1. Bütschli, O. Bemerkung über den excretorischen Gefässapparat der Trematoden. Zool. Anz. ii. pp. 588 & 589.

2. Geddes, P. Observations on the Physiology and Histology of *Convoluta schultzii*. P. R. Soc. xxviii. pp. 449–457. [See also Arch. Z. expér. viii. pp. 51–59.]

3. Graff, L. Kurze Mittheilungen über fortgesetzte Turbellarienstudien II. Zool. Anz. ii. pp. 202–205.

4. ——. *Geonemertes chalicophora*, eine neue Land-nemertine. Morph. JB. v. pp. 430–449, pls. xxv.–xxvii.

5. Hallez, P. Contributions à l'histoire naturelle des Turbellariés. Lille: 1879, 4to, pp. 213, 11 pls.

6. Hoek, P. P. C. Ueber den encystirten Scolex von *Tetrarhynchus*. Niederl. Arch. Zool. v. pp. 1–19, pl. i.

7. Hubrecht, A. A. W. The Genera of European Nemerteans critically revised, with description of several new species. Notes Mus. Leyden, No. 4, Oct. 1879, pp. 193–233.

8. ——. Vorlaufige Resultate forgesetzer Nemertinen-Untersuchungen. Zool. Anz. ii. pp. 474–476.

9. Kennel, J. v. Die in Deutschland gefundenen Landplanarien, *Rhynchodemus terrestris*, O. F. Müller, und *Geodesmus bilineatus*, Mecznikoff. Arb. Inst. Würzb. v. pp. 120–160, pl. vii.

10. Lang, A. Untersuchungen zur vergleichenden Anatomie und Histologie des Nervensystems der Plathelminthen. I. MT. z. Stat. Neap. i. pp. 459–488, 2 pls.

11. Levinsen, G. M. R. Bidrag til Kunskab om Grønlands Turbellarie fauna. Vid. Medd. 1879, pp. 165–204, pl. iii.

12. Linstow, — von. Helminthologische Studien. Arch. f. Nat. xlv. pp. 165–189, pls. xi. & xii.

12A. ——. Helminthologische Untersuchungen. JH. Ver. Württ. xxxv. pp. 313–342, pl. v.

13. Mégnin, P. Nouvelles observations sur le développement et les métamorphoses des Ténias des Mammifères. C. R. lxxxviii. pp. 88 & 89; J. de l'Anat. Phys. xv. pp. 225–248, pls. xiii.–xvi.

14. ——. Sur une nouvelle forme de Ver vésiculaire trouvée chez une Gerboise. C. R. lxxxix. pp. 1045 & 1046. [See also J. de l'Anat. Phys. 1880, pp. 181–192, pls. vii.–x.]

15. Mereschkowsky, C. Ueber einige Turbellarien des Weissen Meeres. Arch. f. Nat. xlv. pp. 35–56, pl. iv.

16. Moniez, R. Sur le *Tænia giardi* et sur quelques espèces du groupe des Inermes. C. R. lxxxviii. pp. 1094–1097.

17. [Moniez, R.]. Note préliminaire sur les Bothriocéphaliens et sur un type nouveau du groupe des Cestodes, les *Leuckartia*. Bull. Sci. Nord. (2) ii. pp. 67–79.

18. ——. Sur quelques points d'organisation du *Solenophorus megacephalus*. Tom. cit. pp. 113–123.

19. ——. Note sur le *Tænia krabbei*, espèce nouvelle de Tænia armé. *Tom. cit.* pp. 161–163.

20. ——. Note sur deux espèces nouvelles de Tænias inermes, *T. vogti* et *T. benedeni*. Tom. cit. pp. 163 & 164.

21. ——. Note sur les métamorphoses des Cestodes. *Tom. cit.* pp. 233–240.

22. ——. Note sur une particularité de la formation des œufs dans la Ligule. *Tom. cit.* pp. 323 & 324.

23. ——. Note sur les Cysticerques. *Tom. cit.* pp. 346 & 347.

24. ——. Note sur l'histologie des Tétrarhynques. *Tom. cit.* pp. 393–395.

25. Perroncito, E. Ueber eine neue Bandwurm-art (*Tænia alba*). Arch. f. Nat. xlv. pp. 235–238, pl. xvi.

26. Taschenberg, O. Zur Systematik der monogenetischen Trematoden. Z. ges. Naturw. lii. pp. 232–266.

27. ——. *Didymozoon*, eine neue Gattung in Cyten lebender Trematoden. *Tom. cit.* pp. 605–617, pl. vi.

28. Taschenberg, E. O. Beiträge zur Kenntniss ecto-parasitischer mariner Trematoden. Abh. Ges. Halle, xiv. pp. 293–343, 2 pls.

29. Vejdovsky, F. Vorläufiger Bericht über die Turbellarien der Brunnen von Prag, nebst Bemerkungen über einige einheimische Arten. SB. böhm. Ges. 1879, pp. 501–507.

30. Viguier, C. Anatomie comparée des Hirudinées. (Organisation de la Batrachobdelle [*B. latasti*].) C. R. lxxxix. pp. 110–112.

31. Wright, R. Ramsay. Contributions to American Helminthology. P. Canad. Inst. 1879, pp. 1–23, pls. i. & ii.

New Genera and Species, &c.

Levinsen (11) describes as new :—
Aphanostomum latissimum.
Convoluta grœnlandica.
Mecynostomum cordiforme, M. lentiferum.
Mesostomum marmoratum, var. *grœnlandica, M. violaceum, M. agile.*
Vortex punctatus.
Anoplodium (?) *mytili.*
Gyrator grœnlandicus, G. assimilis.
Plagiostomum caudatum.
Acmostomum grœnlandicum.
Cylindrostomum album, C. discors, C. ærstedi, C. elongatum.
Monocelis alba, M. hirudo.
Microstomum grœnlandicum.

Ulianinia, g. n. Corpus mollissimum. Anterior pars corporis impressione transversa a corpore cetero distincta. Pharynx (num pharynx vera ?) annuliformis vel mesostomiformis, valde extensilis, in medio corpore sita. Organa urticaria eadem forma ac in *Microstomo lineari*, &c. For *U. mollissima*.

Graffia, g. n. Corpus molle. Anterior pars corporis propter impressionem transversam latam et profundam plane colliformem capitiformis. Pharynx (num pharynx vera ?) annuliformis vel mesostomiformis, valde extensilis in parte tertia posteriore corporis, sita, &c. For *G. capitata*.

Amphiporus fabricii.

For Hallez's (5) new species of *Turbellaria*, see *infrà*.

Leuckartia, g. n. (17), a Bothriocephalid with genital organs both ventral and lateral, an unarmed head, and central vitelligenous glands ; found in the pyloric tubes of a Salmon from an unknown locality [no specific type described or named].

Tænia krabbii, sp. n., (19) ; cysticercus found in the Reindeer, the adult probably lives in the Dog.

Tænia vogti and *T. benedeni*, spp. nn., (20) ; both from the Sheep.

Linstow (12) describes as new *Tænia leptodera*, *T. poculifera*, and *Scolex petromyzi*. *T. parcirostris* and *T. murina*, Duj., are re-figured.

Linstow (12 A) describes as new :—

Distomum megaloon (intestine of *Lacerta agilis*) (p. 337).

Monostomum aculeatum (intestine of *Testudo græca*) (p. 338).

Tænia octo-coronata (intestine of *Phœnicopterus antiquorum*) (p. 339), *T. sulcata* (?= *T. myoxi*, Rud.) (intestine of *Myoxus glis*), *T. rudolphiana* (= *T. loxiæ recurvirostræ*, Blumenbach), *T. globata* (intestine of *Parus major*), *T. breviceps* (intestine of *Fringilla montana* and *F. cœlebs*) (p. 341), the last four are unarmed.

New localities for some old species are also given.

Perroncito's (25) new species (*T. alba*) is to be distinguished from *T. expansa* and *T. denticulata*, with which it has often been confounded ; he mentions by name *T. vogti* and *T. benedeni*, spp. nn.

Moniez (16) distinguishes *T. giardi* from *T. denticulata*.

The following *Turbellaria* are described by Mereschkowsky (15) [see Zool. Rec. xv. *Verm.* p. 4] :—

Alaurella viridirostrum.

Prostomum boreale, *P. papillatum*.

Mesostomum graffi.

Vejdovsky (29) describes the following new species :—*Mesostomum hallezianum*, *Derostomum typhlops*, *Stenostomum ignavum*, *S. fasciatum*.

Graff's (4) new species most resemble *G. palvensis* ; it probably came to the Frankfort Gardens with the earth of an Australian palm ; it resembles *Malacobdella* by the opening of the proboscis into the mouth.

Gulliver (Phil. Tr. clxviii. pp. 557–563. pl. v.) describes as new *Tetrastemma rodericanum* and *Geoplana whartoni* ; the genus *Geoplana* is redefined.

Verrill reports *Amphiporus stimpsoni* and *Amphiporus* sp. from Penny Harbour and Cumberland Gulf ; Bull. U. S. Nat. Mus. No. 15, p. 143.

The new species described by Wright (31) are: *Distomum asperum* (p. 6, from *Botaurus minor*); *D. reticulatum* (p. 7, from *Ceryle alcyon*); *Polystomum oblongum* (p. 12, from *Aromochelys* [*Sternothaerus*] *odoratus*).

Sphyranura (g. n.) *osleri*, p. 15, from *Menobranchus lateralis*; allied to *Polystomum*, but differing in general form, in the number of the suckers, and in the characters of the genital apparatus; anteriorly there are two contractile bladders.

Didymozoon Taschenberg, (27), g. n., on the gill-lamellæ of *Pelamys sarda*; the elongated worms have a distinct neck, but no suckers; an intestine may or may not be present. The species of the genus are: *D. thynni*, *D. scombri*, *D. pelamydis*, *D. sphyrænæ*, and *D. auxis*. Two worms were found in each cyst.

Tristomum molæ defined by Taschenberg, Z. ges. Naturw. lii. p. 886; *T. cephala* is probably a synonym.

Geoplana moseleyi and *Rhynchodemus* (?) *testaceus*, Hutton, Tr. N. Z. Inst. xii. p. 277, New Zealand.

Taschenberg divides the monogenetic *Trematoda* thus (26):

I. Fam. *Tristomeæ*.
1. Subfam. *Tristomidæ*, Bened.
2. Subfam. *Monocotylidæ*, Tasch.
3. Subfam. *Udonellidæ*, Bened.

II. Fam. *Polystomeæ*.
1. Subfam. *Octobothriidæ*, Tasch.
2. Subfam. *Polystomidæ*, Bened.
3. Subfam. *Microcotylidæ*, Tasch.
4. Subfam. *Gyrodactylidæ*, Bened.

Hubrecht (7) describes as new *Cephalotrix signata* (p. 207), *Polia curta* (p. 209), *P. minor* (id.), *Cerebratulus pantherinus* (p. 212), *C. dohrni* (p. 215), *C. grubii* (id.), *C. tristis* (p. 216), *C. hepaticus* (p. 217), *Amphiporus dubius* (p. 222), *A. marmoratus* (p. 223), *A. pugnax* (p. 224), *Tetrastemma diadema* (p. 228), *T. octo-punctatum* (p. 229), *Œrstedia vittata* (p. 229), *O. unicolor* (p. 230), *Nemertes marioni* (p. 231). The characters of *Œrstedia*, Quatrefages, are emended. *Langia*, g. n., representative of the *Langiidæ*, "the margins of the body are slightly frilled, and lapped up over the back, which takes the aspect of a partly closed tube from the head to the tail;" for *Langia formosa*, sp. n.

Hubrecht (7) proposes to divide the order *Nemertini* into three sub-orders, with the following families:—

I.—*Palæonemertini*.
Fam. *Cephalotrichidæ*.
Fam. *Carinellidæ*.
Fam. *Valenciniidæ*.
Fam. *Poliidæ*.

II.—*Schizonemertini*.
Fam. *Lineidæ*.
Fam. *Langiidæ*.

III.—*Heteronemertini.*
Fam. *Amphiporidæ.*
Fam. *Tetrastemmidæ.*
Fam. *Nemertidæ.*

An analytical and a phylogenetic table are given. It is shown that the genus *Lobilabrum*, De Blainville, was "established on a specimen the tip of whose snout had been abnormally severed by an oyster." The number of European species of *Nemertini* is stated to be 57.

Anatomy, Development, &c.

Hubrecht (8) gives a brief summary of his anatomical results; he finds a dorsal median nerve-cord, in some a transverse commissure at the caudal end, the whole of the nervous tissue is impregnated with hæmoglobin; he also noted indications of metamerism.

E. O. Taschenberg (28) enters into a detailed account of the anatomy of *Tristoma papillosum* and *T. coccineum*.

The observations of Lang (10) were made on a transparent Planarian (*P. graffi*, sp. n.); towards the middle of the body he found a rather large bilobed nervous knot, consisting of fibrous bands and ganglion-cells; it gives off a large number of nerves, ten or eleven being counted on either side of the middle line; in this latter there runs an unimpaired and thinner nerve; fine anastomosing nerve-filaments connect the nerve-trunks with one another. The brain lies in a pyriform "lacuna." Other marine *Planariæ* only differ in details of size, &c. No circulatory or water-vascular system was detected.

Geddes (2) has investigated the green colouring-matter of *Convoluta*, and finds that in sunlight gas is evolved by them, of which 45 to 55 per cent. is oxygen; large quantities of vegetable starch can be obtained from their bodies, and the ash contains iodine; they may be called vegetating animals. Rhythmically contractile pseudopodia were observed in the ectodermal cells; the term "sagittocysts" is suggested for the rod-like bodies in the Planarian integument; the chlorophyll is diffused through the protoplasm of the containing cells, and is not collected into granules. Observations made on *Bonellia* did not demonstrate the presence of chlorophyll.

See also E. Ray Lankester, Q. J. Micr. Sci. xix. pp. 434–437.

According to Graff (3), *Planaria limuli* has the lens of the eye made up of a number of cells, the longitudinal nerve-trunks are well developed, and are united at the posterior end, above the sucker, without any diminution in size. Development is effected without any metamorphosis, and within the cocoon; each cocoon contains from two to nine embryos, and is attached by a stalk to the gill-lamella of the King-crab.

Vejdovsky (29) finds in *Stenostomum leucops*, auctt., an oval gland, lying above the water-vessels in the pharyngeal region, which opens behind the cerebral ganglion; he looks upon its orifice as homologous with the cephalic pore of the *Oligochæta*. The *Stenostomidæ* among the *Turbellaria* are regarded as most near to the Amedullate *Oligochæta*.

Von Kennel's paper (9) is an important contribution to our knowledge of the anatomy of the Planarians.

Mégnin (13) is of opinion that the armed *Tæniæ* exhibit a suppressed development; in a Carnivore, hooks are necessary; in a Herbivore, the *Tænia* may pass into a more retired position. This doctrine is criticized by Moniez (21).

Moniez (23) states that he has been continuing his observations on the development of the head of the *Tæniæ*. [See Bull. Sci. Nord. (2) i. 1878, No. 11.]

On *Distomum crassicolle* (with "brief notes on Huxley's proposed Classification of Worms"), see Minot, P. Bost. Soc. iii. pp. 1–12, pl. i.

Hallez (5), according to Bull. Sci. Nord. (2) ii. pp. 325–338, divides his work into three parts; in the first, which deals with the anatomy and etiology of the *Turbellaria*, we have to note: (1) the excretory water-vascular system is only found in the *Rhabdocœla*; it is absent in the *Dendrocœla*. (2) Observations on *Stenostomum leucops* and *Microstomum lineare* have shown that the ovaries are formed by budding, at the expense of the intestine, while the testes (in the latter species, at any rate) are derived from the ectoderm. Although the *Turbellaria* are hermaphrodite, the male organs are generally in activity before the female. The author directs attention to the development of the spermatozoa and the characters of the accessory male glands. The presence of two kinds of ova is referred to conditions of alimentation. The embryology of these forms has been chiefly studied in *Leptoplana tremellaris* and *Eurylepta auriculata*; the gastrula is formed by epiboly. Certain general conclusions are drawn. The points of difference between the *Rhabdocœla* and *Dendrocœla* are insisted on, and a phylogenetic table is presented. The following new forms are described by the author:—

Microstomum giganteum.
Dinophilus metameroides.
Vortex graffi.
Prostomum giardi.
Vorticeros schmidti.
Turbella inermis.
Monocelis balani.

NEMATOHELMINTHES.

32. Joseph, G. Ueber die in den Krainer- Tropfsteingrotten einheimischen frei lebenden Rundwürmer (Nematoden). Zool. Anz. ii. pp. 275–277.

33. Lewis, T. R. The Nematoid Hæmatozoa of Man. Q. J. Micr. Sci. xix. pp. 245–259, pl. xii.

34. Mayzel, W. Ueber die Vorgänge bei der Segmentation des Eies von Würmern (Nematoden) und Schnecken. Zool. Anz. ii. pp. 280–282.

35. Turnbull, C. S. *Filaria* in the Eye. Veter. ii. 657–664.

Antonio Peñafiel has a paper, "Apuntes para la Helminthologia mexicana" in Nat. Mex. 1870, pp. 53–56. Herrerca, *tom. cit.* pp. 173–176, has a note on *Strongylus micrurus*.

Joseph (32) found fourteen species, one of which was also a marine form.

Mayzel's (34) observations on Nematoids were made on *Ascaris nigrovenosa* and *Strongylus auricularis*.

Linstow (12) describes as new:—*Dorylæmus fasciatus*, *D. tenuis*, *Diplogaster viviparus*, *Rhabditis macrura*, *Ascaris aurita*, *A. petromyzi*, *Filaria spermospizæ*, *Heteracis longicaudata*, *H. longicirrata*, *Tropidocerca globosa*, *T. inermis*, *Trichosoma striatum*, *Mermis setiformis*, *Distomum inerme*, *D. flavo-cinctum*, *D. limnophili*.

Ascaris piscicola, Linstow [Zool. Rec. xv. *Verm.* p. 6], is the embryonic form of *A. acus*, Rud.; the ♀ of *F. hamata* is described, as is the embryo of *Angiostoma macrostoma*.

Linstow (12 A) describes as new:—

Ascaris tiara (intestine of *Varanus ornatus*), *A. heringi* (intestine of *Myrmecophaga jubata*) (p. 320), *A. gallinulæ* (intestine of *Gallinula chloropus*), *A. philomelæ* (intestine of *Luscinia philomela*) (p. 321).

Filaria ascaroides (bronchi of *Cercopithecus mona*) (p. 322), *F. involuta* (gastric wall of *Strix flammea*) (p. 323), *F. recta* (gastric wall of *Podiceps cristatus*) (p. 324), *F. leptoptera* (stomach of *Falco milvus*) (p. 325), *F. mogalli* (under integument of *Tetrao mogallus*) (p. 325), *F. cœlebs* (gastric walls of *Lanius rufus*) (p. 326), *F. turdi* (gastric walls of *Turdus merula*) (p. 327).

Physaloptera pyramidalis (tendons of toes of *Cholœpus didactylus*), *P. crassa* (intestine of *Alauda arvensis* (p. 329).

Oxyuris fœcunda (intestine of *Simia satyrus*) (p. 330), *O. hamata* (*Myopotamus coypus*) (p. 331).

Strongylus (? = *Eucyathostomum*) *spinulosus* (*Capra ibex*) (p. 331), *S. alatus* (intestine of *Manis tetradactyla*), *S. longicirratus* (intestine of *Bos grunniens*) (p. 332), *S. aculeatus* (intestine of *Macacus cynomolgus*) (p. 333).

Trichocephalus serratus (intestine of *Felis domestica*) (p. 334).

Trichosoma longivaginatum (intestine of *Alauda arvensis*) (p. 335).

Gordius mantidis-pustulatæ (body-cavity of *M. pustulata*) (p. 336).

The paper of Da Silva Lima on *Filaria medinensis* and its entrance into the human body is translated in Veter. lii. pp. 67–69, 151–154, 235–238, 319–322.

J. H. Steel gives (*tom. cit.* p. 69) a list of the parasites of the Ass.

In 1878, 138 persons suffered from trichinosis in Germany (Vet. Journ. viii. p. 299); the disease is spreading in Navarre (*tom. cit.* p. 218).

In Atti Soc. Ital. 1879, pp. 855–858, Grassi & Parona publish a note "Intorno all' *Anguillula intestinalis* parassita dell' uomo.

Fayrer's address (Feb. 5, 1879, reprinted from Med. Times and Gaz.) on the relation of *Filaria sanguinis-hominis* to the endemic diseases of India is to be consulted.

ACANTHOCEPHALI.

Linstow (12 A) describes as new *Echinorrhynchus ingens* (from intestine of *Procyon lotor*) (p. 337).

ROTATORIA.

36. Hudson, C. T. On *Œcistes umbella* and other Rotifers. J. R. Micr. Soc. ii. pp. 1–9, pls. i. & ii.

[J. Deby thinks that *Pedalion*, Hudson, is synonymous with *Hexarthra*, Schmarda (J. R. Micr. Soc. ii. pp. 384 & 385); Hudson points out differences (*tom. cit.* pp. 386 & 387).]

37. Joseph, G. Zur Kenntniss der in den Krainer Tropfsteingrotten einheimischen Rädesthiere. Zool. Anz. ii. pp. 61–64.

37 A. Maggi, L. Primo elenco dei Rotiferi o Sistolidi della Valcuvia. Atti Soc. Ital. xxi. pp. 320–325.

An abridged account (with plate) is given of Balbiani's observations on *Notommata vaucheri* [Zool. Rec. xv. *Verm.* p. 8] in J. R. Micr. Soc. ii. pp. 530–544.

Joseph (37) describes as a new genus *Apodoides*, closely allied to *Euchlanis*; *A. stygius*, sp. n.

On *Melicerta ringens* and *Plumatella repens*; see A. Hamilton, Tr. N. Z. Inst. xii. pp. 301–303.

GEPHYREA.

38. Spengel, J. W. Beiträge zur Kenntniss der Gephyreen. I. Die Eibildung, die Entwicklung und das Männchen der *Bonellia*. MT. z. Stat. Neap. I. pp. 357–420, pls. viii.–xii.

39. ——. Ueber die Organisation des *Echiurus pallasi*. Zool. Anz. ii. pp. 542–547.

Spengel (38) states that the ovary of *Bonellia* is placed in the ventral portion of the body, and is connected with the ventral blood vessel, the peritoneal investment of which is concerned in the formation of the ova; an amphigastrula is noted, for the first time, among the *Gephyrea*. The males form green scales on the proboscis of the female, to which they are very firmly attached, in large numbers; they are altogether larval in character, save that they have lost the two bands of cilia; they are essentially Gephyrean in the important points of their organization—development, after the larval stages, being directed only to the maturation of the male organs.

In (39), Spengel gives a succinct account of the results of his researches.

Thalassema verrucosa, sp. n., Studer, Arch. f. Nat. xlv p. 124, Betsy Cove, Kerguelen Island.

Phascolosoma annulata[*-tum*], and *Sipunculus lutulentus*, spp. nn., Hutton, Tr. N. Z. Inst. xii. p. 278, New Zealand.

ANNULATA.

40. Cosmovici, L. C. E. Sur la cavité du corps des Annélides sédentaires et leurs organes segmentaires; quelques remarques sur le genre *Phascolosoma*. C. R. lxxxviii. pp. 1092–1094.

41. ——. Sur les organs segmentaires et les glandes genitales des Annélides polychætes sédentaires. *Tom. cit.* pp. 393–396.

42. Fraisse, P. Ueber Spermatophoren bei Regenwürmerm. Arb. Inst. Würzb. v. pp. 38–54, pl. iv.

43. Graber, V. Morphologische Untersuchungen über die Augen der freilebenden marinen Borstenwürmer. Arch. mikr. Anat. xvii. pp. 243–324, pls. xxviii.–xxx.

44. Greef, R. Ueber die Alciopiden des Mittelmeeres und insbesondere des Golfs von Neapel. MT. z. Stat. Neap. i. pp. 448–456, pl. xiv.

45. ——. Ueber pelagische Anneliden von der Küste der canarischen Inseln. Z. wiss. Zool. xxxii. pp. 237–284, pls. xiii.–xv.

46. ——. *Typhloscolex muelleri*, W. Busch. *Tom. cit.* pp. 661–672, pl. xxxix.

47. Haswell, W. A. On six new species of Annelids, belonging to the Family *Amphinomidæ*. Pr. Linn. Soc. N. S. W. iii. pp. 341–347.

48. Kirk, T. W. On some New Zealand *Aphroditæ*, with descriptions of new species. Tr. N. Z. Inst. xi. pp. 397–400.

49. Langerhans, P. Die Wurmfauna von Madeira. Z. wiss. Zool. xxxii. pp. 513–593, pls. xxxi.–xxxiii.

50. ——. Ditto ii. *Op. cit.* xxxiii. pp. 261–316, pls. xiv.–xviii.

51. Levinsen, G. M. R. Om to nye Slaegter af arctiske chætopode Annelider. Vid. Medd. 1879, pp. 9–18, pl. i.

52. Marenzeller, Emil von. Südjapanische Anneliden. i. Denk. Ak. Wien, xli. (ii.) pp. 109–152, pls. i.–vi.

53. McIntosh, W. C. On a remarkably branched *Syllis* dredged by H.M.S. 'Challenger.' J. L. S. xiv. pp. 720–724.

54. Mojsisovics, —. Zur Lumbriciden hypodermis. Zool. Anz. ii. pp. 89–91.

55. Stossich, M. Beiträge zur Entwickelungsgeschichte der Chætopoden. SB. Ak. Wien, lxxvii. [1878], Abth. i. pp. 533–544, pls. i. & ii.

56. Théel, H. Les Annélides polychètes des Mers de la Nouvelle-Zemble. Sv. Ak. Handl. xvi. No. 3 pp. 3–75, pls. i.–iv.

57. Vejdovsky, F. Beiträge zur vergleichenden Morphologie der Anneliden. 1. Monographie der Enchytraeiden. Prague: 1879.

58. ——. Vorläufige Mittheilungen über die forgesetzten Oligochæten Studien. Zool. Anz. ii. pp. 183–185.

59. ——. Ueber die Entwickelung des Herzen von *Criodrilus*. SB. böhm. Ges. 4 July, 1879; preliminary communication.

60. Webster, H. E. On the *Annelida Chætopoda* of the Virginian coast. Tr. Albany Inst. ix. pp. 202–272, pls. i.–xi.

New Genera and Species.

Greef (45) describes as new genera from the Canary Islands:—*Pontodora* (Syllidean): *P. pelagica* (p. 245, pl. xiv. figs. 19–22); *Pelagobia* (Syllidean): *P. longicirrata* (p. 247, pl. xiv. figs. 23–25); *Phalacrophorus* (Lycoridean): *P. pictus* (p. 249, pl. xiv. figs. 26–31); and as new species, *Sacconereis canariensis* (p. 251, pl. xiv. figs. 31–36), *Tomopteris kefersteini* (p. 275, pl. xv. figs. 40, 41, 43, 46, & 47), *T. lævipes* (p. 276, pl. xv. figs. 44 & 45), and *T. eschscholtzi* (p. 276, pl. xv. figs. 42, 48, & 51). *Alciopa krohni*, sp. n., Greef (44), Mediterranean.

Langerhans (50) describes as new:—*Polynoe zonata, Chrysopetalum cæcum, Leonnates pusillus, Lycoris funchalensis, Perinereis floriclava, Diopatra madeirensis, Hyalinœcia rubra, Amphiro johnsoni, Halla sulfurea, Staurocephalus pallidus, Nephthys agilis, Phyllodoce (Carobia) dohrni, P. (Anaitis) madeirensis. Eulalia (Eumida) notata, Mystides cæca, M. bidentata, Notophyllum alatum, N. frontale, Alciope (Halodora) petersi, Vanadis tentaculata.*

Langerhans (49) gives a revision of the *Syllidea*, which are very numerous in Madeira. He divides the genera of the family into three tribes:—

I.—Palpi not fused. *Syllidæ.*

A. Pharynx smooth anteriorly, armed with one tooth.	
a. Cirri and antennæ moniliform.	
α Tooth anterior	1. *Syllis.*
β Tooth posterior	2. *Opisthosyllis.*
b. Appendages unjointed.	
α Tooth anterior	3. *Pionosyllis.*
β Tooth posterior	4. *Opisthodonta.*
B. Pharynx smooth anteriorly: no tooth.	
α All the appendages jointed	5. *Xenosyllis.*
β Anterior appendages unjointed	6. *Syllides.*
C. Pharynx denticulate anteriorly; a dorsal tooth.	7. *Eusyllis.*
D. Pharynx denticulate anteriorly; no well-developed dorsal tooth.	
a. Anteriorly only ventral teeth	8. *Odontosyllis.*
b. Anteriorly a corona.	
α Pharynx straight	9. *Trypanosyllis.*
β Pharynx coiled	10. *Amblyosyllis.*

II.—Palpi fused, prominent. Pharynx straight, no teeth.

A. Ventral cirri present.

a. 2 antennæ	1. *Oophylax.*
b. 3 antennæ	
α No tentacular cirri	2. *Exogone.*
β 2 pairs of tentacular cirri	3. *Grubea.*
γ 1 pair of tentacular cirri	
aa. Head and buccal segment fused.	4. *Sphærosyllis.*
bb. Head and buccal segment distinct	5. *Pædophylax.*
c. 4 antennæ	6. *Cystonereis.*

B. No ventral cirri.

a. 1 antenna	7. *Spermosyllis.*
b. 2 antennæ	8. *Microsyllis.*
c. 3 antennæ	9. *Exotocas.*

III.—Palpi fused; no pharyngeal teeth. *Autolyteæ.*

A. Ventral cirri.

a. Antennæ and dorsal cirri club-shaped	1. *Eurysyllis.*
b. Appendages club-shaped.	
α Pharynx straight, short	2. *Anoplosyllis.*
β Pharynx coiled, long	3. *Heterosyllis.*

B. No ventral cirri (*Autolyteæ*, s. str.).

a. Buccal segment with two pair of tentacular cirri, but no dorsal appendages.	
α Dorsal cirri filiform.	
aa. Dorsal cirri: i. & ii. longer	4. *Autolytus.*
bb. Dorsal cirri: i. ii. & iii. longer	5. *Proceræa.*
Dorsal cirri foliaceous	6. *Myrianida.*
b. Buccal segment with a pair of dorsal appendages, and two pairs of tentacular cirri	7. *Virchowia.*

Of these, *Syllis* is divided into four subgenera: *Haplosyllis*, *Typosyllis*, *Ehlersia*, and *Syllis*; *E. rosea* (p. 538), and *E. simplex* (p. 538) are new species.

Opisthosyllis, g. n. (p. 541). *O. brunnea* (p. 541), and *O. viridis* (p. 543), spp. nn.

Pionosyllis weismanni (p. 546), sp. n.

Opisthodonta, g. n. (p. 547), *O. morena.*

Eusyllis kuppferi, sp. n. (p. 552).

Trypanosyllis æolis, sp. n. (p. 558).

Amblyosyllis madeirensis and *A. immatura* are probably already described species (p. 561).

Sphærosyllis ovigera, sp. n. (p. 567).

Pædophylax insignis, sp. n. (p. 570).

Proceræa fasciata, sp. n. (p. 581).

Virchowia, g. n. (p. 582): *V. clavata.*

Théel (56) describes as new:—

Polynoe borealis, sp. n.

Bylgia, g. n. "Lobus cephalicus antice in prominentias non productus.

Antennæ e parte anteriore lobi cephalici productæ. Tentaculum nullum." *B. elegans*, sp. n.

Nephthys minuta, sp. n.

Mysta papillifera, sp. n.

Mystides, g. n. "Tentacula quatuor, longa. Cirri tentaculares, utrinque tres, par primum in segmento primo, secundum et tertium in segmento secundo. Cirri anales nulli?" *M. borealis*, sp. n.

Castalia multipapillata, sp. n.

Lumbrinereis minuta, sp. n.

Aricia tulbergi, sp. n.

Eumenia longisetosa, sp. n.

Maldane tenuis, sp. n.

Praxilla polaris, sp. n.

Samytha pallescens, sp. n.

Apomatus (?) *globifer*, sp. n.

Théel gives tables of the northern species of *Polynoe* (p. 15), compares some species of *Nephthys* (pp. 30 & 31), gives a key to the northern species of *Castalia* (p. 39); and concludes with a list of the *Polychæta* collected at Nova Zembla, Greenland, and Spitzbergen (pp. 68–70).

Webster (60) describes *Lepidonotus squamatus*, Kinberg, as differing somewhat from the European form: *L. angustus*, Verrill, is a variety of it; *L. variabilis*, sp. n. (p. 205, pl. i. figs. 6–11, pl. ii. figs. 12–14); *Antinoe parasitica*, sp. n. (p. 208, pl. ii. figs. 15–22); *Phyllodyce fragilis* (p. 214, pl. iii. figs. 32–37); *Eumida maculosa*, sp. n. (p. 215, pl. iv. figs. 38–41); *Syllis fragilis*, sp. n. (p. 217, pl. iv. figs. 42 & 43); *Sphærosyllis fortuita*, sp. n. (p. 221, pl. iv. figs. 44–48); *Pædophylax dispar*, sp. n. (p. 223, pl. iv. fig. 49, pl. v. figs. 50–55); *Proceræa tardigrada*, sp. n. (p. 227), *P.* (?) *cærulea*, sp. n. (p. 230); *Nereis irritabilis*, sp. n. (p. 231, pl. v. figs. 56–64, pl. vi. figs. 65–69); *Drilonereis* (char. emend.) *longa*, sp. n. (p. 241, pl. vii. figs. 84–88); *Staurocephalus sociabilis*, sp. n. (p. 243, pl. vii. figs. 89–91); *Trophonia arenosa*, sp. n. (p. 245, pl. vii. figs. 92–97); *Spiochætopterus* (char. emend.) *oculatus*, sp. n. (p. 247, pl. viii. figs. 98–102; *Nerine heteropoda* (p. 249, pl. viii. figs. 103–110); *Polydora hamata*, sp. n. (p. 251, pl. viii. figs. 111–116, pl. ix. 117 & 118), *P. cæca*, sp. n. (p. 252, pl. ix. figs. 119–122); *Aricia rubra*, sp. n. (p. 253, pl. ix. figs. 123–126); *Sabellaria varians*, sp. n. (p. 259, pl. ix. figs. 133–156, pl. x. figs. 137–139); *Pectinaria* (*Lagis*) *dubia*, sp. n. (p. 261, pl. x. figs. 140–144); *Melinna maculata*, sp. n. (p. 261, pl. x. figs. 145–147); *Lysilla alba*, sp. n. (p. 263, pl. x. fig. 148); *Potamilla tortuosa*, sp. n. (p. 265, pl. x. figs. 149–153).

The following are new genera:—*Lepidametria* (p. 209), differing from *Halosydna* in having pointed setæ in the lower ramus and a distinct facial tubercle; the elytra differ in number and arrangement; from *Lepidasthenia* it differs in having setæ in the dorsal rami. *L. commensalis* (p. 210, pl. iii. figs. 23–31).

Aricidea has one antenna, dorsal rami with cirri, ventral rami with cirri on anterior segments only. Branchiæ on anterior segments only. Setæ all simple. First segment with setæ, no tentacular cirri. *A. fragilis* (p. 255, pl. ix. figs. 127–132).

Cabira (incertæ sedis); sides of head produced into thin plates, which are covered with papillæ. First segment with two pairs of tentacular cirri, without setæ. Dorsal cirri on all segments; no ventral cirri. Ventral setæ, stout hooks beginning on the sixth setigerous segment, one to each ramus. *C. incerta* (p. 267, pl. xi. figs. 155–157).

Phronia (incertæ sedis). Head divided into palpi. Body elongate, flattened, composed of numerous segments. First segment with two pairs of tentacular cirri, without setæ. Feet uniramous. Setæ all simple capillary. *P. tardigrada* (p. 268, pl. xi. pp. 158–163).

Of the 30 species described by Von Marenzeller (52), 24 are new; these are:—

Euphrosyne superba.
Aphrodite japonica.
Polynoe (*Lepidonotus*) *gymnonotus*; *P.* (*L.*) *pliolepis.*
Polynoe (? *Lanilla*) *lamellifera.*
Nereis mictodonta; *N.* (*Alitta*) *oxypoda.*
Notophyllum japonicum.
Carobia castanea.
Eulalia albo-picta.
Hesione reticulata.
Syllis inflata.
Onuphis holobranchiata.
Eunice congesta, E. microprion.
Lumbriconereis japonica, L. heteropoda.
Glycera opisthobranchiata, G. decipiens.
Sternaspis costata.
Chatopterus cautus.
Cirratulus dasylophius, C. comosus.
Acrocirrus validus.

General observations on the species are postponed for the second part of the paper.

Lepidonotus giganteus, sp. n., Kirk (48).

Haswell (47) describes as new:—*Amphinome nitida* and *prælonga*, *Notopygus flavus* and *parvus*, *Chloeia macleayi*, *Euphrosyne mastersi.*

G. A. Hansen, N. Mag. Naturv. xxiv., records as spp. nn. from the North Seas:—*Polynoe arctica*, p. 267, pl. i. figs. 1–5, *Aricia arctica*, p. 269, pl. ii. figs. 1–8, and *Myriochele danielsseni*, p. 270, pl. ii. figs. 9–11.

The branched *Syllis*, *S. ramosa*, described by McIntosh (53) was found in a Hexactinellid Sponge, dredged near Cebu; no head was observed; the body of the animal "appears to have a furor for budding," these buds give off other buds, and the tail, or distal point, is early formed; their number seems to be indefinite.

McIntosh (Phil. Tr. clxviii. pp. 258–263, pl. xv.) describes *Hermadion longicirratus*, *Eupolynoe mollis*, *Nereis eatoni*, *Amphitrite kerguelenensis*, *Neottis antarctica*, *Serpula* sp., *Lineus corrugatus*, from Kerguelen.

Grube (*tom. cit.* pp. 554–556) describes *Perichæta rodericensis*, sp. n., and *Amphinome* (*Eurythoe*) *pacifica*, from Rodriguez.

Levinsen describes (51) *Dysponetus pygmæus*, fam., g., & sp. nn. *Paractius littoralis*, fam., g., & sp. nn. Eunicearum. The following are the diagnoses of the two genera :—

Dysponetus. Corpus elongato-ovatum e segmentis paucis omnibus setigeris compositum ; lobus cephalicus appendicibus brevissimis pedunculatis septem instructus; pedes biremes, remis bene sejunctis, dorsalibus setas simplices cirrosque elongatos foliiformes, ventralibus setas compositas cirrosque minutos gerentibus ; branchiæ nullæ; segmentum anale cirrorum loco processu coniformi instructum; proboscis amphoriformis maxillis duabus elongatis antico anguste hastiformibus munita.

Paractius. Corpus elongatum ; lobus cephalicus appendicibus brevibus inarticulatis quatuor instructus, quarum duæ in parte dorsali, duæ sub marginibus lateralibus lobi cephalici affixæ sunt ; segmenta duo sequentia nuda ; pedes uniremes setas paucas (simplices et compositas gerentes), cirri nulli ; segmentum anale cirris duobus ejusdem formæ ac appendices cephalicæ ; proboscis maxillis inferioribus duabus maxillisque superioribus utrinque octo, quarum quatuor posteriores hamatæ sunt.

Greef (46) finds that *Sagitella* and *Acicularia* are distinguished from *Typhloscolex* by characters which are merely of specific value. If the presence of the anterior row of setæ is not a specific character, we shall have :—

(i.) *T. muelleri* (*Sagitella kowalevskii*, Wagner, form *b*; larva of *A. virchowi*, Greef, and *S. barbata*, Ulianin).

(ii.) *T. kowalevskii* (*S. kowalevskii*, Wagner, form *a* ; *A. virchowi*, Langerhans ; *S. kowalevskii*, Ulianin).

(iii.) *T. præcox*, Ulianin.

Cosmovici (40) adds a fourth to the hermaphrodite species of *Spirorbis* ; *S. communis*, which is very common at Roscoff.

Vejdovsky (57) in the second, or systematic portion of his monograph, (1) defines the family *Enchytræidæ*, and the three genera, *Pachydrilus*, *Enchytræus*, and *Anachæta*, the last name is to take the place of the name *Achæta*, already in use (as *Acheta*) among the *Gryllidæ* ; in it the setæ are replaced by gland-cells, the cephalic pore is at the most anterior end of the cephalic lobe ; there are no dorsal pores ; the segmental organs are modified into salivary glands in the 3–5 segments, and the testicular tubes are amorphous.

Of the species, the following are now described for the first time, or were defined in the preliminary communication [Zool. Rec. xiv. *Verm.* p. 17] :—*Pachydrilus fossor*, *P. sphagnetorum*, *Enchytræus puteanus*, *E. leptodera*, *E. buchholzi*, *E. hermicultor* (*E. vermicularis*, Ratzel), *E. lobifer*, *E. adriaticus*, *E. perrieri*, *E. leydigi*, *E. hegemon*, *Anachæta eiseni*.

Anachæta bohemica, sp. n., Vejdovsky (58).

Acanthrodrilus kerguelenensis, sp. n., Lankester, Phil. Tr. clxviii. pp. 264–269.

Megascolides, g. n., McCoy, Nat. Hist. Vict., Prodromus of the Zoology, Decade i. [1878] pp. 21–25, pl. vii., woodcuts. Body very large, of 300 to 500 rings, thickest a little behind the mouth ; slightly dilated at the tail ;

cingulum extends only over the ventral third of about three rings. *M. australis*, sp. n., may extend to six feet in length, Gippsland.

Terebella lewisiana (Mantell); Davies, Geol. Mag. (n.s.) vi. p. 145.

Anatomy, &c.

Fraisse (42) describes the spermatophores of *Lumbricus agricola* as being from one and a half to two millimètres in length, and attached from the twenty-third to the twenty-seventh segments of the worm. The same structures in *L. communis*, *L. riparius*, and *L. olidus* are also described. Soft just after copulation, they gradually harden on exposure to the air.

Whitman gives, P. Am. Ass. 1878 (1879), pp. 263–270, an account of the changes in the eggs of *Clepsine*, which precede the cleavage-period.

Vejdovsky (59), in a note, forms the family of *Amedullata* for the genus *Æolosoma* (*Æ. ehrenbergi*, *quaternarium*, and *tenebrarum*, spp. nn.); the ventral cord is in them completely absent. *Æ. tenebrarum* has a primitive rudiment of the ventral cord in the form of a very indistinct ectodermal thickening in the median ventral line; the cerebrum is in the form of two ganglia, and is connected with the ectoderm.

The same author (58) proposes to form the family *Discodrilida* for the reception of *Branchiobdella*, it is most nearly allied to the *Chætogastridæ*. He points out that the characters of the "dissepimental glands" in the *Enchytræidæ*, lead to their being regarded as secreting organs. True sympathetic nerves are to be seen in *Anachæta*, and the gustatory organs of this genus are the homologues of the "jaws" in the buccal cavity of *Branchiobdella*.

Vejdovsky (57) gives, p. 49, a summary of the chief results to which he has been led; of these, some of the most important are:—

(1) The discovery that the structures lying in the 4–7 segments, which were looked upon by Ratzel as ganglionic bodies belonging to the œsophageal nervous system, are merely special septal glands, which have no connection with the œsophageal commissures.

(2) The demonstration of the presence of the cephalic pore in every species of the *Enchytræidæ*; by this some of the spermatozoa escape to the exterior.

(3) The setæ are developed in the hypodermis, or their place is taken by modified unicellular glands.

(4) In the central line of the ventral surface the ectoderm becomes thickened, and the ventral nerve-cord is developed; along this so-called ventral line there is a break in the muscular layer; the transverse muscles are inserted into the neurilemma of the ventral cord.

(5) A bulb is developed in the œsophagus, by the thickening of its endoderm.

(6) In the more posterior portions of the body the dorsal blood-vessel is converted into a blood-sinus, which is enclosed in the walls of the enteron.

(7) There are no blood corpuscles.

(8) The excretory organs are different externally from those of all

other *Limicolæ* with the exception of *Chætogaster limnæi*; three chief portions are to be distinguished—the antiseptal, or part which lies in front of the dissepiment, has a ciliated infundibulum; the postseptal, or part behind the dissepiment, is connected with the exterior by an elongated ...t duct; the orifice is always in front of the ventral setæ. In *...ydrilus*, thereis a pair developed as far forwards as the third seg...ent.

(9) The testes are developed in the tenth and eleventh segments and are amorphous (*Anachæta*, *Enchytræus*) or pyriform structures (*Pachydrilus*). The ovary is developed on the dissepiment between the eleventh and twelfth segments.

(10). The seminal ducts have no relation to the segmental organs; and the same seems to be true of the oviduct.

Vejdovsky (59) finds that the heart of *Criodrilus* arises from two completely separated rudiments, which gradually approximate until they form an unimpaired vessel or heart: this heart is best developed in the median segment of the trunk. Comparisons are instituted between it and the heart of *Lumbricus* and of the *Hermellidæ*, as well as of the *Arthropoda* and *Vertebrata*.

Graber (43) finds that the eye of the *Chætopoda* is always formed on a common type; it is generally spherical in form, and has an outer portion, modified from the general cuticular investment, and forming the dioptric organ, and an inner retina, or perceptive part. Although homotypical with the eyes of the *Tracheata*, they are not homologous, but only analogous organs; similar analogous arrangements may be seen in the eye of the *Cephalopoda*. On this subject, see also Chatin, Ann. Sci. Nat. (6) vii. No. 1, pp. 22–33.

The researches of Stossich (55) on *Serpula uncinata* and *S. glomerata* point to the existence in them of an invaginate Gastrula, and of the presence of cilia on the inner wall of the alimentary canal, as well as on the surface of the free-swimming larva; the cleavage cavity is converted directly into the cœlom; the larvæ attach themselves by means of a tongue-shaped mass, which is developed at the end of the body, beneath the "anal vesicle."

N. Kleinenberg gives an account of his investigations into the development of *Lumbricus terrestris*; Q. J. Micr. Sci. xix. pp. 206–244, pls. ix.–xi.

G. J. Hinde (J. G. Soc. xxxv. pp. 370–388, pls. xviii.–xx.) gives an account of Annelid jaws from certain Palæozoic formations. He describes most under new specific names, but intimates that these are rather to be regarded as means for palæontological reference than as indicating so many separate species of Annelids; in any case, errant Annelids must have been abundant in Palæozoic times, and many seem to have been closely related to existing forms.

ORTHONECTIDA.

61. Giard, A. Les *Orthonectida*. Classe Nouvelle du phylum des *Vermes*. J. de l'Anat. Phys. xv. pp. 449–465, pls. xxxiv.–xxxvi. [See also Bull. Sci. Nord. 1879–80, pp. 338–341.]

62. [Giard, A.] Nouvelles remarques sur les *Orthonectida*. C. R. lxxxix. pp. 1046–1049.

63. Metschnikoff, E. Zur Naturgeschichte der Orthonectiden. Zool. Anz. ii. pp. 547–549.

64. ——. Nachträgliche Bemerkungen. *Tom. cit.* pp. 618–620.

Giard (61) gives a more detailed account of the *Orthonectida* [cf. Zool. Rec. xiv. *Verm.* p. 20]; he defines them as *Metazoa* which retain throughout life the Planula-form, with a ciliated ectoderm, a tuft of stiff hairs in the anterior region, and an external metameric segmentation. Reproduction is effected by the gemmation of sporocysts developed from the endoderm, or oviparously, the sexual elements being probably in distinct individuals. The genus *Rhopalura* has a papilliferous ring, an ectoderm formed of large cells, and a distinctly muscular endoderm. *R. ophiocomæ*, 108 mm. long. *Macintoshia* [*Intoshia*, G.] has no papilliferous ring, and an ectoderm formed of a large number of small cells. *I. gigas* (in *Ophiocoma neglecta*), *I. linei* (in *Lineus gesserensis*), and *I. leptoplanæ* (in *Leptoplana tremellaris*).

The *Orthonectida* are degraded by parasitism, and stand in the phylum above the *Gastraida*, and below the *Dicyemida*, *Gasterotricha*, and *Protohelmintha*.

Metschnikoff (64) believes that *R. ophiocomæ* and *I. gigas*, Giard, are series of the same species, and that his own *R. giardi* (63), found in *Amphiura squamata*, is identical with them; the smaller form is regarded as the male, and the so-called muscular elements as the tails of spermatozoa. This and other criticisms are dealt with by Giard (62).

ECHINODERMATA.

BY

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CLAUS (Grundzüge der Zoologie: 4th ed., pp. 305-374) and ZITTEL (Handbuch der Palæontologie, pp. 308-560) discuss the *Echinodermata*.

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1. AGASSIZ, A. Preliminary Report on the *Echini* of the Exploring Expedition of H.M.S. 'Challenger.' P. Am. Ac. xiv. pp. 190–212.

2. BELL, F. J. Observations on the Characters of the *Echinoidea*. I. On the Species of the Genus *Brissus*, and on the Allied Forms *Meoma* and *Metalia*. P. Z. S. 1879, pp. 249–255.

3. ——. Note on the number of Anal Plates in *Echinocidaris*. L. c. pp. 436 & 437.

4. ——. Observations, &c. II. On the Species of the Genus *Tripneustes*, Agassiz. *L. c.* pp. 655–662, pl. xlix.

5. CARPENTER, P. H. On the Genus *Actinometra*, Müll., with a morphological account of a new species, *A. polymorpha*, from the Philippine Islands. Part I. Tr. L. S. (2) ii. pp. 1–122, pls. i.–viii.

6. ——. Preliminary Report upon the *Comatulæ* of the 'Challenger' Expedition. P. R. S. 1879, pp. 383–395.

7. ——. On the Apical and Oral Systems of the *Echinodermata*. II. Q. J. Micr. Sci. xix. pp. 176–206.

8. ——. On the Nomenclature of the Plates of the Crinoidal Calyx. Rep. Brit. Assoc. 1879, p. 333.

9. ——. The Nervous System of *Comatula*. L. c. p. 418.

10. DUNCAN, P. M. On the Zoological Position of the Ophiurans obtained by Dr. Wallich during the Voyage of H.M.S. 'Bulldog,' in 1860. Ann. N. H. (5) iii. pp. 382–385. [*Ophiacantha spinulosa.*]

——. On some *Ophiuroidea* from the Korean Seas. J. L. S. xiv. pp. 445–482, pls. ix.–xi.

12. LJUNGMAN, A. W. Förteckning öfver Spetsbergens Holothurider. Œfv. Ak. Forh. 1879, No. 9, pp. 127–131.

13. Ludwig, H. Das Mundskelet der Asterien und Ophiuren. Z. wiss. Zool. xxxii. pp. 672–688.

14. ——. Echinodermenstudien. Zool. Anz. ii. pp. 540–542.

15. ——. Notiz über *Trichaster elegans*. L. c. pp. 18–20.

16. ——. Bemerkungen zu *Aspidura*, Pohlig. L. c. pp. 41–43.

17. ——. Die Echinodermen des Mittelmeeres. MT. z. Stat. Neap. I. pp. 523–580.

18. Lyman, T. *Ophiuridæ* and *Astrophytidæ* of the 'Challenger' Expedition. II. Bull. Mus. C. Z. vi. No. 2, pp. 17–83, pls. xi.–xix.

19. Martens, E. von. Vorzeigung eines eigenthümlichen sechsarmigen Schlangensterns, *Ophiothela dividua*, sp. n. SB. nat. Fr. 1879, pp. 127–130, woodcut.

20. Perrier, É. Les Stellérides de l'Ile Saint-Paul. Arch. Z. expér. viii. pp. 47–51, pl. iv.

21. Selenka, E. Keimblätter und Organanlage der Echiniden. Z. wiss. Zool. xxxiii. pp. 39–55, pls. v.–vii.; SB. Soc. Erlang. 1879, pp. 100–108.

22. Sladen, W. P. On the *Asteroidea* and *Echinoidea* of the Korean Seas. J. L. S. xiv. pp. 424–445, pl. viii.

23. ——. On the Structure of *Astrophiura*, a new and aberrant genus of *Echinodermata*. Ann. N. H. (5) iv. pp. 401–415, pl. xx.; Zool. Anz. ii. pp. 10 & 11.

24. ——. On *Lepidodiscus lebouri*, from the Carboniferous of Northumberland. J. G. Soc. xxxv. pp. 744–751, pl. xxxvii.

25. Stewart, C. On Certain Organs of the *Cidaridæ*. Tr. L. S. (2) i. pp. 569–572, pl. lxx.

26. Viguier, C. Anatomie comparée du squelette des Stellérides. Arch. Z. expér. vii. pp. 33–250, pls. v.–xvi. [See also *op. cit.* viii. pp. i.–v.]

27. Woods, J. E. Tenison. A List of Australian Starfishes. Tr. Phil. Soc. Adelaide (1878-9), pp. 89–93.

28. ——. The *Echini* of Australia. P. Linn. Soc. N. S. W. ii. [1878] pp. 145–176, 342–344.

29. —— On some new Australian *Echini*. Op. cit. iv. pp. 282–291, pls. xiii. & xiv.

On the *Echinodermata* of Kerguelen's Land; see E. A. Smith, Phil. Tr. clxviii. pp. 270–281, pls. xvi. & xvii.; and of Rodriguez, *l. c.* pp. 564–568, pl. li. figs. 1–3.

Ludwig (17) finds 93 certain and 23 probable species of *Echinodermata* in the Mediterranean.

Woods (28) gives a list of the species found in the Australian seas, with short descriptions; the nomenclature followed throughout is that of A. Agassiz. He points out that there is not much connection between the present and the tertiary faunæ.

General Morphology of the Group.

This important subject is still being admirably and fully discussed, and the researches of Ludwig & Carpenter appear to be of very high importance; Viguier has applied his observations to the practical purpose of systematic zoology.

Ludwig (14) gives a preliminary notice of his later studies; these have led to the following, among other, conclusions:—

(1) The stalked larva of *Antedon* has, primitively, only one stone-canal and only one pore; they have the same relation as in the *Asteroidea*—lying in the same inter-radius, and in the one next to that which is occupied by the anus.

(2) In all save the *Ophiuroidea*, the enteric tract coils from left to right.

(3) The blood-vascular system of the *Ophiuroidea* presents the same relations, typically, as in the *Asteroidea* or *Echinoidea*; an ab-oral ring, which lies partly under the radial shields, and which is homologous with the dorsal ring of *Asteroidea* and *Echinoidea*, has been discovered.

(4) The oral shields of the *Ophiuroidea*, and the oral plates of the *Crinoidea* are homologous with the genital plates of the *Echinoidea* and *Asteroidea*.

The following are the chief results of Viguier's comprehensive investigation into the skeletal characters of the *Asteroidea* (see also *infrà*); he insists on the value of the skeleton as an aid in classification; the mouth is limited by a number of pieces, some of which, derived from the ambulacral and ad-ambulacral series, are paired; there is also an azygous "odontophore." The ambulacral or ad-ambulacral ossicles may project furthest into the mouth. The "odontophore" is regarded as being homologous with the peristomial plates of *Euryale*, and with the corresponding parts in Ophiurids; a comparison is instituted between the "teeth" of the dentate *Echinoidea*, and the "odontophore" of the Asterid. As against Hæckel's "Corm-theory" he insists that there is no regular segmentation in the general Asterid skeleton, and that the radial cœca are not divided in correspondence with the segments of the body as they are in all Annelids.

Ludwig (13) criticises Viguier's views, especially insisting on the fact that only one ad-ambulacral piece (and not two) bounds every sucker (with the two ambulacral pieces); he holds very strongly that the "tooth" belongs to the ambulacral and not to the ad-ambulacral series. In the same paper, he takes occasion to state that he has found in *Astrophyton arborescens* a more extended metamorphosis of the constituent parts of the peristome than has been observed in any Ophiurid.

The second part of Carpenter's essay (7) [see Zool. Rec. xv. *Ech.* p. 4] should be consulted by all who are interested in the morphology of this group; it is too condensed to be usefully abstracted.

Stewart (25) has made the important observation that in the *Cidaridæ* there are beneath the outer forked extremities of the five compasses, five diverticula of the chamber that occupies the interval between the jaws and their muscles; water would seem to enter the interior of these

organs, which appear to be gills, and to replace in function the external branchiæ of most other regular *Echinoidea*. Ludwig (Z. wiss. Zool. xxxiv. p. 82) makes very similar observations, in complete ignorance of those of Stewart (Zool. Anz. iii. p. 162), and extends the observation to the *Diadematidæ*. Special armed pedicellariæ are described as existing in the *Cidaridæ*. [illegible] I.

Bell's observations (2 & 4) take as their starting-point the "Revision of the Echini" by Alex. Agassiz, the definitions in which are critically examined; in (2), he gives tables of measurements to exhibit the characters of the paired anterior and posterior ambulacra, and shows that from them no specific difference can be formulated as existing between *Brissus unicolor* and *B. carinatus*; the same being true of the angles formed by the fasciole, he comes to the conclusion that the species should be united. On p. 255, he gives in a condensed form the characters of *Meoma*, *Brissus*, and *Metalia*, and points out that the first of these exhibits the most simple arrangement. In (4), he deals in a somewhat similar way with the genus *Tripneustes* (rejecting the name *Hipponoe*): he figures the different parts of the dentary apparatus, and points out the gradation in characters which are to be detected in the three species of the genus.

Bell (3) examines the arrangement of the anal plates in *Echinocidaris*, and shows that the number four may be reduced or exceeded; out of 31 specimens examined, 9 had either more or less than four plates.

The organs noticed by Noll (Zool. Anz. ii. p. 405) in some *Echinoidea* are stated by Ludwig (*l. c.* p. 455) to be the well-known "Mund-fusschen."

Haacke (Zool. Anz. ii. p. 641) describes an abnormal arrangement of the intestine in *Asteracanthion rubens*.

Barrois (J. de l'Anat. Phys. xv. p. 1) describes the development of *Asteriscus verruculatus*. From the gastrula, which is of the primitive type, a tri-lobed larva is developed, the side lobes of which fall away. At one point in its life, the young exhibits great asymmetry, and has the mouth eccentric in position. The ambulacral joints of the arms are said to increase in number in just the same way as the zonites of Annelids, and he would extend the remark from the *Asteroidea* to the *Echinoidea*.

Viguier's elaborate memoir (26) is of interest, as a serious attempt to come to a rational classification of the *Asteroidea*. Without entering, in any way, into the question of how far he has been successful, a short notice of some of his results may be given. The class *Stelleridæ* consists of two subclasses, (1) "Asteries ambulacraires," (2) "A. adambulacraires." These names apply to the two types on which the mouth-parts are developed in the subclasses. In the former, the paired ambulacral pieces are said to extend further into the mouth, while the adambulacral pieces are truncated, and the odontophore (why the azygous intermediate piece is so named, it is hard to say) is massive and without apophyses. In the second subclass, the adambulacral pieces are never completely truncated, and the odontophore is nearly always provided with apophyses. The pedicellariæ are pedunculated in the former, and the ambulacral suckers are ordinarily arranged in four rows; in the second, the pedicellariæ are sessile, and the ambulacral suckers almost always sessile.

In the first subclass, there are three families—(1) *Asteridæ*, (2) *Heliasteridæ*, (3) *Brisingidæ*; the last contains the three genera, *Labidiaster*, *Brisinga*, and *Pedicellaster*. In the second subclass, there are (4) *Echinasteridæ*, (5) *Linckiidæ*, (6) *Goniasteridæ*, (7) *Asterinidæ*, (8) and the *steridæ*, (9) *Astropectinidæ*, (10) *Archasteridæ*. The last family comprises as its only genus *Archaster*, which Viguier thinks necessary to separate from *Astropecten*.

Sladen (23) proposes to form a family, *Astrophiuridæ*, for *Astrophiura permira*, g. & sp. nn., Madagascar, and to define it thus:—"Brachia cum disco ophiurano in corpore pentagonali inclusa. Dentes absunt. Oris armatura simplex et imperfecta. Pori pedum ambulacralium septis angustis ad perpendiculum radii directis disjuncti. Cava interbrachialia perlata." Unless this form be an extraordinary example of adaptation, it is probable that the describer is quite justified in regarding it as diminishing the distance between the *Asteroidea* and *Ophiuroidea* in a very marked degree.

Von Martens (19) makes his new *Ophiothela* the text for some interesting remarks on the heteractinism of certain *Echinodermata*, and finds that his present observations confirm him in his previously published belief, that when Starfishes have more than five arms, it is in consequence of gemmation after division or injury. (See also Naturf. 1879, pp. 103 & 104.)

In an elaborate and comprehensive monograph, P. H. Carpenter (5) deals with the genus *Actinometra*. After an historical survey, he proceeds to a consideration of the characters of the genus, and shows by the subjoined scheme the relations of *Antedon* and *Actinometra*, as defined by Lütken and himself, to *Alecto* and *Actinometra*, as used by J. Müller:—

Alecto . . .	Ambulacra symmetrically distributed on the disc.	Mouth central.	*Antedon* . . . Oral pinnules not specially distinguished.
		Mouth eccentric.	
Actinometra.	Ambulacra unsymmetrically distributed on the disc.	Mouth eccentric.	*Actinometra*. Oral pinnules with a terminal comb.

Pp. 49–51 contain a diagnosis of *A. polymorpha*, sp. n., and its four varieties.

The skeleton is then examined, and some of its parts are discussed in detail. It is shown that in *Comatula* "the walls and floor of the cavity inclosing the chambered organ are formed almost entirely by what was once a stem-segment, while in *Pentacrinus* this cavity is a part of the central space inclosed within the radial and basal pentagons, which respectively form the ventral and dorsal portions of its side walls." An intermediate condition may be observed in the fossil *Apiocrinidæ*.

Carpenter (Zool. Anz. ii. pp. 569–571) details the history of the discovery of the true character of the "chambered organ of *Comatula*," in answer to Greef's claim (SB. Ges. Marburg, No. 4, 1879).

Carpenter's researches (6) on the *Comatulæ* of the 'Challenger' Expedition enable him to explain the riddle of Lütken's genus *Phanogenia*.

The stellate condition of the centro-dorsal in that genus appears to be one of the "concluding stages of a long series of changes in the shape and relations of the centro-dorsal, which do not commence until some time after the loss of the stem."

With regard to the so-called "ventral nerve," the author is able to show that out of 51 *Actinometræ*, 28 have grooveless arms; sections show the absence of the "ventral nerve." In some examples, one of the posterior ambulacral grooves does not extend beyond the disc, and the two arms to which it should have gone receive no branches from any of the adjacent grooves; in a gigantic Philippine species, many of its hundred arms are "nerveless." These facts have a very important bearing on the nervous character of the "sub-epithelial bands."

R. S. Bergh, in Bidrag til Opfattelsen af Klφvning og Kimbladdannelse hos Echiniderne (Vid. Medd. 1879, pp. 255–264), gives a wood-cut of the gastrula-stage of *Psammechinus miliaris*.

Genera and Species.

ECHINOIDEA.

The following are the names of the new species or genera described by Agassiz (1):—

Dorocidaris bracteata (closely allied to *D. papillata*).

Porocidaris elegans.

Goniocidaris florigera.

Salenia hastigera.

Podocidaris prionigera.

Aspidodiadema (g. n.), intermediate between the *Cidaridæ* proper and the *Diadematidæ*, for *A. tonsum* and *micro-tuberculatum*.

Micropyga (g. n., allied to *Astropyga*) *tuberculata*.

Asthenosoma pellucida [*-dum*], *grubii*, *coriacea* [*-eum*], and *tessellata* [*-tum*].

Phormosoma luculenta [*-tum*] and *tenuis* [*-ue*].

Prionechinus (g. n.) *sagittiger*.

Cottaldia forbesiana.

Trigonocidaris monolini.

Echinus horridus.

Catopygus recens.

Palæotropus loveni.

Pourtalesia hispida, *laguncula*, *carinata*, *ceratopyga*, and *rosea*.

Cionobrissus (g. n.; somewhat like *Brissopsis*) *revinctus*.

Echinocrepis (g. n.) *cuneata*.

Spatagocystis (g. n.); like some of the following new genera, this has decided affinities to the *Pourtalesiæ*, and some similarity to *Holaster*, *Cardiaster*, and *Ananchytes*; for *S. challengeri*.

Urechinus (g. n.) *naresianus*.

Cystechinus (g. n.), with the general appearance of *Ananchytes*, for *C. wyvillii*, *clypeatus*, and *cesica*.

Homolampas fulva.

Argopatagus (g. n.), allied to *Homolampas*, for *A. vitreus*.
Palæopneustes murrayi.
Genicopatagus (g. n.) *affinis*.
Hemiaster gibbosus and *zonatus*.
Rhinobrissus hemiasteroides.
Schizaster claudicans and *japonicus*.

Echinus darnleyensis, J. E. T. Woods (28), Australia.
Echinanthus tumidus, id. *l. c.*, habitat doubtful.
Evechinus australiæ, id. *l. c.*, Australia (= *E. chloroticus*, juv.; *id.* 29).
Phyllacanthus parvispina, id. (29, p. 286), Australia.
Hemiaster apicatus, id. *l. c.* p. 283, Australia.
Peronella decagonalis, id. P. Linn. Soc. N. S. W. ii. p. 126, from a tertiary formation, New Guinea.
Temnechinus macleayana [*-nus*] id. *ibid.*, same locality.

Cotteau (C. R. lxxxviii. pp. 778–781, with a note by Hébert) states that 58 new species of *Echinoidea* have been found in the "cénomanien" (Miocene) of Algeria; and, *l. c.* pp. 1217–1219, has a note on the *Saleniidæ* of the Jurassic era in France.

On the Jurassic *Cidarida* of France; Cotteau, Bull. Soc. Géol. (3) vii. pp. 246–249.

On the Echiniferous limestone of Rennes-les-Bains; Coquand, *tom. cit.* pp. 326–337.

ASTEROIDEA.

Goniodiscus granulifer, sp. n., Giebel, Z. ges. Naturw. (2) lii. pp. 471–474 (hab. unknown).
Astropecten formosus, sp. n., Sladen (22), Korean Sea.
Cribrella densispina, sp. n., *id. l. c.*, same habitat.
Asteracanthion rubens, var. n. *migratum*, id. *l. c.*, same habitat.

Perrier (20) describes *Culcita veneris*, sp. n., and points out the interest of the presence at St. Paul's Island of *Asterina exigua*, Lamk., which is found at the Cape of Good Hope, in the Indian Ocean, and on the East Coast of Australia.

On Triassic *Asterida*, see Eck, Z. geol. Ges. xxxi pp. 263–267 (*Trichasteropsis sentfti*, sp. n.).

OPHIUROIDEA.

Lyman (18) describes the following new species and genera:—
Amphiura maxima, bellis, incana, argentea, acacia, constricta, iris, tomentosa, lanceolata, glabra, angularis, dilatata, concolor, dalea, cernua, glauca, verrilli, canescens, and *patula*.
Amphipolis being combined with *Amphiura*, *Amphiura antarctica* (Studer), is renamed *studeri*.
Ophiocnida pilosa and *scabra*.

Amphilepis patens, papyracea, and *tenuis*.
Ophiactis resiliens, flexuosa, cuspidata, nana, hirta, and *canotia*.
Ophiostigma africanum.
Ophiopolis japonica.
Ophiochondrus stelliger.
Ophioconis antarctica and *pulveralenta*.
Ophiomyces grandis and *spathifer*.
Pectinura arenosa and *heros*.
Ophiopeza aster.
Ophiothrix aristulata, capillaris, berberis, and *cæspitosa*.
Ophiochiton lentus.
Ophioglypha meridionalis.
Ophiacantha discoidea, valenciennesi, normani, and *abnormis*.
Astrotoma murrayi.

Astroceras, g. n. Disk and arms covered with smooth soft skin; disk small; its interbrachial outlines re-enteringly curved; radial shields narrow and rather high, running nearly to centre; arms somewhat knotted by a contraction between each pair of joints; upper arm-plates divided in halves like high ribs, bearing a jointed spine at their upper end; side arm-plates, towards middle of arm, having a long process to which are articulated the two spine-like tentacle-scales; teeth, a clump of grains on sides of mouth-angles, answering to mouth-papillæ; two vertical genital openings. Stands next *Ophiocreas* and *Astroschema*, and resembles *Euryale asperum* in its peculiar elongated side arm-plates bearing spine-like rough tentacle scales, and by the large spines on the upper surface of the arm. For *A. perzamena*, sp. n.

Ophiocreas carnosus, caudatus, abyssicola, and *œdipus*.
Astroschema horridum, salix, brachiatum, tumidum, and *rubrum*.

Astroclon, g. n. Arms beginning to branch at a considerable distance from the disk, and having but few forks, nearly as in *Trichaster*. Disk rising well above the arms, and granulated, as are the latter. The tips of the twigs are encircled at each joint by a double belt of hook-bearing grains. Along the under surface of the base of the arm are two longitudinal lines of large, transverse slits, a pair to each joint, from which issue short tentacles; and above them on either side is a row of peg-like tentacle-scales. Mouth angles naked on their sides, but with a bunch of spine-like papillæ at the apex. Two very large genital openings in each interbrachial space. For *A. propugnatoris*, sp. n.

There is added to this paper an "Index to Species of *Ophiuridæ* and *Astrophytidæ*," which is valuable as giving references to Lyman's descriptions of the specimens obtained by L. F. de Pourtalès on the U. S. Coast Survey, and by the 'Hassler,' 'Blake,' and 'Challenger' Expeditions; "the whole forming a list of the greater portion of the deep-sea Ophiurans and Astrophytons now known."

Ophiothela dicidua, sp. n., Von Martens (19).

Aspidura (Pohlig): see Eck, Z. geol. Ges. xxxi. pp. 35-53.

Duncan (11) describes as new:—
Ophioglypha forbesi, p. 449, *striata, sculpta*, and *sladeni*.

Ophiolepis mirabilis, p. 460.
Ophionereis variegata, p. 462.
Amphiura luetkeni and *koreæ*, p. 464.
Hemipholis microdiscus, p. 467.
Ophiactes affinis, p. 469.
Ophiacantha dallasi, p. 471.
Ophiothrix koreana, p. 473, and var.
Ophiothela verrilli, p. 477.

CRINOIDEA.

Antedon phalangium, sp. n., Marion, Ann. Sci. Nat. (6) viii. art. 7.
Actinometra polymorpha, sp. n., Carpenter (5), pp. 49–51.

P. de Loriol (Monogr. des Crin. foss. de la Suisse, iii. in Abh. schw. pal. Ges. vi. pp. 125–300, with 7 pls.) discusses various forms, and establishes a new genus, *Gymnocrinus* (intermediate between *Eugeniacrinus* and *Cyathidium*.

On Triassic Encrinites, see Eck, Z. geol. Ges. xxxi. pp. 257–263.

Porocrinus radiatus, sp. n., Beyrich, SB. nat. Fr. 1879, pp. 60–63.

HOLOTHUROIDEA.

Cucumaria glacialis, sp. n., Ljungman (12).

Koren & Danielssen (N. Mag. Naturv. xxiv.) describe from the Northern Seas two new genera and species:—*Trochostoma*, for *T. thomsoni* (pp. 229–257, pls. i.–iii.); *Irpa*, for *I. abyssicola* (pp. 257–265, pl. iv.).

The Recorder has not been able to see Théel's paper on *Elasmopoda*, an account of which by C. W. Thomson appears in Nature, xxi. pp. 470–473 (but the reference there given is not correct). The report is therefore deferred till next year.

CŒLENTERATA.

HYDROZOA AND CTENOPHORA, BY ALFRED GIBBS BOURNE.

ANTHOZOA, BY SYDNEY J. HICKSON, B.Sc. (LOND.), &c.

HYDROZOA AND CTENOPHORA.

1. ALLMAN, G. J. Hydroida of Kerguelen's Land. Phil. Tr. clxviii. pp. 282–285, pl. *Cf.* also Ann. N. H. (4) xvii. [1876], p. 115, and Zool. Rec. xiii. *Cœl.* p. 12.

Seven species were collected. One is the widely-distributed *Sertularella polyzonias*; the others are new. Only one of these belongs to the Gymnoblastic Hydroids. There is one new genus (*Hypanthea*). According to the author, there is little about the fauna, as represented by this collection, which can be referred to as impressing on it anything of a special or characteristic facies.

1A. ARMSTRONG, J. New Hydroid Zoophytes. J. A. S. B. xlviii. pt. 2, p. 98, 4 pls.

2. ASPER, G. Ueber die *Hydra* der Limmat. Viert. Ges. Zürich, xxiv. pp. 115–120.

3. BERGH, R. S. Studien über die erste Entwickelung des Eies von *Gonothyræa loveni*, Allm. Morph. JB. v. pp. 22–61, 2 pls.

The development of the egg in *Gonothyræa* is described at some length; following this, are some general observations on eggs, in which the author classifies eggs according to the changes which occur in the germinal vesicle, and the position of the latter during those changes. Bergh denies the total disappearance of the germinal vesicle. The process of segmentation in *Gonothyræa* is described at length, and followed by observations on segmentation in general.

4. CHUN, C. Histiologische Bemerkungen über Rippenquallen. Zool. Anz. iii. pp. 329–332.

The special record of Chun's work upon the *Ctenophora* will be best postponed till next year, his elaborate and beautifully illustrated monograph [1880] being the first of the series to be published in connection with the Zoological Station at Naples.

5. Ciamician, J. Ueber den feineren Bau und die Entwickelung von *Tubularia mesembryanthemum*, Allm. Z. wiss. Zool. xxxii. pp. 323–347, 2 pls.

The development takes place in the gonophore; segmentation is irregular, and leads to the formation of an epibolic gastrula, four large central cells constituting the hypoblast. Balfour and Kleinenberg have failed to detect an epibolic gastrula, or any such irregularity as Ciamician describes. The larva is hatched in the form known as Actinula, and soon becomes fixed by the ab-oral end, and forms a colony.

6. Clarke, S. F. Report on the *Hydroida* collected under the supervision of Prof. Al. Agassiz during the exploration of the Gulf Stream and Gulf of Mexico. Bull. Mus. C. Z. v. No. 10, pp. 239–252.

Three species of *Gymnoblastea* were found, 2 of which are new; 23 species of *Calyptoblastea*, 8 of which are new, and 1 belongs to an interesting new genus, *Nematophorus*.

7. Claus, C. *Agalmopsis utricularia*, sp. n. Eine neue Siphonophore des Mittelmeers. Arb. z. Inst. Wien, ii. pp. 199–202, pl.

There are large vesicles at the extremities of the nematophores—hydrostatic in function—beset at the base with eight stinging threads, which are well developed. These appear to be only modifications of similar structures found in *A. sarsi*.

8. Du Plessis, G. Étude sur la *Cosmetira salinarum*, sp. n. Nouvelle Méduse paludicole des environs de Cette. Bull. Soc. Vaud. (2) xvi. pp. 39–45, pl.; *cf.* also Ann. N. H. (5) iii. pp. 385–389.

Du Plessis found this form in June, 1876, in the discharging canal of the salt works at Villeroy, near Cette, clinging to the under surface of floating *Algæ*. The canal is narrow and shallow, and the bottom consists of black putrid mud. The water becomes very hot from the sun, and sometimes exceeds 77° F. It is only found in June and July.

9. Eimer, J. Versuche über kunstliche Theilbarkeit von *Beroe ovatus*, angestellt zum Zweck der Controle seiner morphologischen Befunde über das Nervensystem dieses Thieres. Arch. mikr. Anat. xvii. pp. 213–240.

Eimer shows that there is no distinctly localized central nervous system in *Beroe*. The nerve-cells, which may be functional centres, are scattered over the whole body, but are more closely aggregated at the anal pole. He gives two sets of experiments. The first set consisted of a transverse division of the *Beroe* into three segments; all movements of the swimming plates stopped, but soon reappeared in the anal segment, and, after some interval, in the others. Afterwards, small pieces were cut off, and in all, movements occurred after the shock had passed away. In the second set of experiments, a row of swimming plates was excised, and the anal portion of this was cut off; all movements ceased, but gradually reappeared, commencing with the anal end, the movements having the same direction as in the uninjured animal.

10. [Eimer, J.] Ueber Tastapparate bei *Eucharis multicornis*. Tom. cit. pp. 342–346.

Specially modified cells occur at the ends of the "tactile processes" and between these bodies are tufts of setæ. Eimer has no doubt that nerves end in the cells and setæ; the latter are tactile, and although the former may receive impressions they probably only secrete a viscid substance.

11. ——. Die Medusen physiologisch und morphologisch auf ihr Nervensystem untersucht. Tübingen: 1878, 4to, pp. viii. & 277, 13 pls.

[Omitted from Zool. Rec. xv.]

12. Greene, J. R. Note on a Specimen of *Charybdea haplonema*. P. Z. S. 1879, pp. 793–802.

This is the same as Fritz Müller's species, *Tamoya haplonema*, but has been placed by Claus in his genus *Charybdea*. Greene gives an account of the bibliography of the *Charybdeidæ*.

13. Hæckel, E. Ueber Ursprung und Stammenverwandtschaft der Ctenophoren. SB. Jen. Ges. 1879, pp. 70–79.

The homology of the *Ctenophora* and the *Hydrozoa* will no doubt be further worked out by Hæckel, but the anatomy of *Ctenaria ctenophora*, g. & sp. nn. (order *Gymnoblastea-Anthomedusæ*, fam. Cladonemiden), and other allied forms, has proved almost beyond a doubt that the true homology of the Ctenophores is not, as formerly supposed, with the *Anthozoa*. *Ctenaria* possesses on the outer surface of the umbrella (exumbrella) eight rows of modified cells—not ciliated—but homologous with the eight rows of swimming plates of the *Ctenophora*.

14. ——. Ueber die Organisation und Classification der Leptomedusen. *Tom. cit.* pp. 1–3.

15. ——. Ueber die Organisation und Classification der Trachymedusen *Tom. cit.* pp. 108 & 109.

16. ——. Ueber die Organisation und Classification der Narcomedusen. *Tom. cit.* pp. 125–127.

17. ——. Das system der Medusen. Erster Theil einer Monographie der Medusen. Denk. Ges. Jena, 1879, 360 pp., atlas with 40 pls.

The present volume deals in a most complete and exhaustive manner with the group *Hydromedusæ*, for which, rejecting his previous term, *Aphacellæ* (1878), Hæckel adopts Gegenbauer's term *Craspedotæ*. *Craspedotæ* are defined as *Medusæ* devoid of gastral filaments (phacellæ); with ectodermal gonads, and a true velum; devoid of true marginal lappets; with a double centralized nerve-ring; phylogenetically (in all probability) and ontogenetically (up to the present in the majority) they are descended from Hydroid polyps devoid of gastral filaments; ontogenetically there is mostly an alternation of generations; the sexual Craspedote-generation is derived by lateral budding from the asexual Hydrostome-generation. *Craspedotæ*, according to Hæckel, may be divided into two grades: 1. *Leptolinæ*; *Craspedotæ*, sometimes devoid of otocysts, sometimes with velar marginal bodies, with ectodermic otolithic cells;

tentacles generally soft and flexible, all probably passing through a hydriform phase, containing the two orders, *Anthomedusæ*, gonads gastral, and *Leptomedusæ*, gonads radial. 2. *Trachylinæ*; *Craspedotæ*, having tentaculocysts with endodermal otolithic cells; tentacles generally stiff and rigid; no form yet known passing through a hydriform phase; containing the two orders, *Trachomedusæ*, gonads radial, and *Narcomedusæ*, gonads gastral (or in radial pocket-like outgrowths of branchial wall). Throughout the work the author shows that here, as among the calcareous sponges, it is impossible to say definitely what is a good species, the existence of such being incompatible with the doctrine of evolution.

Hæckel describes 83 genera and 148 species as new; of the new species 125 were named in his "Prodromus."

The following table gives the relation of Gegenbauer's families to Hæckel's orders:—

Oceanidæ	*Anthomedusæ.*
Thaumantidæ, *Eucopidæ*, *Æquoreidæ*	*Leptomedusæ.*
Geryoniidæ, *Trachynemidæ*	*Trachomedusæ.*
Æginidæ	*Narcomedusæ.*

18. Hartmann, R. Ueber einige Verhältnisse der Organisation von *Pleurobrachia pileus*. SB. nat. Fr. 1879, pp. 25 & 26.

Hartmann points out two round, red, granular pigment-spots co-existing with the well developed auditory vesicle. He describes special ganglia at the oral pole giving nerves to the swimming-plates.

19. Hertwig, O. Ueber die Musculatur der Cœlenteraten. SB. Jen. Ges. 1879, pp. 142–146.

The author distinguishes between the neuro-muscle cells as found in the ectoderm of *Hydra*, and the epithelio-muscle cells as found in the velum and sub-umbrella of *Medusæ*, and recognizes in the latter kind an intra-epithelial and a sub-epithelial form.

20. Hertwig, R. Ueber die Geschlechtsorgane der Cœlenteraten und ihre systematische Bedeutung. *Tom. cit.* pp. 116–121. [See Zool. Rec. xv. *Cœl.* p. 12.]

21. Hyatt, A. Common Hydroids, Corals, and Echinoderms. (Forms No. V. of the Boston Society of Nat. Hist. Guides for Science Teaching.) Boston: 1879, 12mo (32 pp.).

The author reproduces a few of the well-known drawings of these forms, and fills up a small pamphlet with letterpress intended to create in school children a love for the study of nature.

22. Jentink, F. A. Ueber Trembley's Umkehrungsversuch an *Hydra*. Tijdschr. Nederl. Dierk. Ver. iv. Versl. pp. li.–liii.

[The Recorder has not seen this paper.]

23. Kling, O. Ueber *Craterolophus tethys*. Ein Beitrag zur Anatomie

und Histologie der Lucernarien. Morph. JB. v. pp. 141–166, 2 pls.

Kling describes nematocysts in both ectoderm and endoderm, and special gland cells in the latter in addition to the ordinary flagellate cells, the filaments on which are said to have an important digestive function. The distal ends of the tentacles bear specialized ectoderm cells. The marginal papillæ are said to resemble rudimentary tentacles. The generative bands arise as ingrowths of the ectoderm cells, which are at first hollow.

24. Lapworth, C. On the Geological Distribution of *Rhabdophora*. Ann. N. H. (5) iii. pp. 245–257, 449–455.

The author considers it likely that the Graptolites will fix the minor divisions of the deep-water beds, and determine their parallelism in areas now geographically separated among the Lower Palæozoics, as the Ammonites do among the Jurassic rocks. If so, the study of the geological distribution can hardly be over-estimated.

25. Martens, E. von. Die systematische Stellung der Rippenquallen. Naturforscher, No. 50, pp. 470 & 471.

[Not seen by the Recorder.]

26. Mereschkowsky, C. On an Anomaly among the *Hydromedusæ*, and their mode of nutrition by means of the ectoderm. Ann. N. H. (5) iii. pp. 177–181, pl.

The author finds this anomaly in numerous specimens of *Bougainvillea paradoxa* which he found in the White Sea ("Studies on the *Hydroida*," *op. cit.* i. 1878, p. 323). The manubrium, mouth, and stomach are totally aborted, a circular and four radial canals still remaining. The specimens were otherwise normal and appeared healthy, the ectoderm cells having taken upon themselves the function of nutrition.

27. Moseley, H. N. On the Structure of the *Stylasteridæ*, a family of Hydroid Stony Corals. Nature, xx. pp. 339–341. [See Zool. Rec. xv. *Cœl.* pp. 17–19.]

28. Romanes, G. J. Concluding Remarks on the Locomotor System of *Medusæ*. P. R. Soc. xxviii. pp. 266 & 267.

These deal with what the author calls "artificial rhythm," the sensibility of lithocysts to light, the effect of altering the directions of the constant current in the muscular tissue, the ganglionic influence of lithocysts at remote points, and, finally, the power of healing after incisions.

29. Thompson, D'Arcy. On some new and rare Hydroid Zoophytes (*Sertulariidæ* and *Thuiariidæ*) from Australia and New Zealand. Ann. N. H. (5) iii. pp. 97–114, 2 pls.

The information we possess as to the Hydroid fauna of Australia and New Zealand, has never hitherto been gathered together and correlated. The species described here were obtained from various sources. Many specimens are from the refuse of Harvey's great collection of Australasian sea-weeds; another portion from Dr. Ferd. Müller's collection from Adelaide and the Gulf of St. Vincent; while the remainder were prin-

cipally collected by Dr. Jolliffe in New Zealand. The collection contains 20 forms. Of these, 6 are referable to the genus *Sertularella*, 9 to *Sertularia*, 4 to *Thuiaria*, and 1 to *Pericladium*; 10 of these are new species.

30. G. Wintheр, Nat. Tidsk. xii. p. 303, deals with the internode in *Sertularia gracilis* = *S. pumila*, var., and *S. tenera* = *cupressina*, var. (according to the author).

New genera and species:—

Sub-Class II.—HYDROMEDUSÆ.

Order i.—Gymnoblastea-Anthomedusæ.

Pennaria symmetrica, Clarke (6), p. 240, pl. i. figs. 2 & 3, Bahia Honda, Cuba.

Eudendrium distinctum, id. *l. c.* p. 241, pl. i. figs. 4–6, 10 miles north of Zoblos Island; *E. ramosum*, Armstrong (1 A), Cape Comorin, 40 fath., Arakan, 10–70 fath. The gonophores are borne upon atrophied hydranths, from which the tentacles have disappeared.

Order ii.—Calyptoblastea-Leptomedusæ.

Obelia hyalina, Clarke (6), p. 241, pl. iv. fig. 21, 10 miles north of Zoblos Island.

Campanularia coronata, id. *l. c.* p. 242, pl. iv. fig. 22, 10 miles north of Zoblos Island.

Lafoea serrata, id. *l. c.* p. 242, pl. iv. fig. 25, near Havana, Cuba, depth 292 fath.; *L. robusta*, id. *l. c.* p. 243, pl. iv. fig. 24, long. 84° 21′ W., depth 101 fath.

Sertularia complexa, id. *l. c.* p. 246, pl. iv. figs. 26–28 *b*, Yucatan. Attached to an *Alga*.

Plumularia gracilis, id. *l. c.* p. 246, pl. v. figs. 29 & 30 *c*, off Havana, Cuba, depth 175 fath. Very closely allied to *P. gemmata*, Allman, differing in the arrangement of branches, internodes, and nematophores.

Cladocarpus tenuis, id. *l. c.* p. 247, pl. v. figs. 31 & 31 *b*, lat. 25° 33′ N., long. 84° 21′ W., depth 101 fath. Closely allied to *C. dolicotheca*, Allman, differing in the shape of the hydrothecæ and in having a more slender habit.

Nematophorus, g. n., *id. l. c.* Trophosome; hydrosome pinnate, plumose; stem and pinnæ divided into internodes; hydrothecæ adnate to the pinnæ, unilateral; a peculiar rounded process at the base of each pinna, with a small opening on the median line near the inner or proximal end. Supracalycine, mesial, and cauline nematophores present; gonosome not known. For *N. grandis*, sp. n., *id. l. c.* p. 248, pl. v. figs. 32–35, 10 miles north of Zoblos Island, lat. 24° 8′ N., long. 82° 51′ W., depth 339 fath. The most prominent point of this interesting species

is the great development of nematophores, which are very large, those in the stem being among the largest known.

Cosmetira salinarum, Du Plessis (8), Villeroy, near Cette. Differs very slightly from *Cosmetira punctata*, found in the sea near Cette and elsewhere. Stomach and radial canals green, tentacles black; size, half a franc piece.

Sertularella neglecta, D'A. Thompson, p. 100, pl. xvi. fig. 1, Australia (probably Bass's Straits); *S. ramosa*, id. *l. c.* p. 102, pl. xvi. figs. 5 & 5 *a*, New Zealand.

Sertularia flexilis, id. *l. c.* p. 103, pl. xvii. figs. 1 & 1 *a*, Sealer's Cove. *S. flosculus*, id. *l. c.* p. 104, pl. xvii. figs. 2 & 2 *a*, Adelaide (?); profusely clothing a *Fucus*; it has the same affinities as, and may possibly prove identical with, *Dynamena divergens*, Lamouroux. *S. pulchella*, id. *l. c.* p. 108, pl. xviii. figs. 3 & 3 *a*, George Town. *S. insignis*, id. *l. c.* p. 109, pl. xix. figs. 1 & 1 *a*, George Town; distinguished from all other species of Sertularians by the abnormal arrangement of the hydrothecæ.

Thuiaria ambigua, id. *l. c.* p. 111, pl. xix. figs. 2 & 2 *a*, Sealer's Cove.

Pericladium novæ-zelandiæ, id. *l. c.*, Pandan Bank, off Cape Maria Van Diemen, New Zealand, depth 15 fath. The pinnæ are in no case bifurcate or branched in any way, but show traces of an approach to the whorled or spiral arrangement so characteristic of the other species. The stem is a simple hollow tube; the pinnæ are united to it by distinct joints. With this exception, the zoophyte is jointless. According to Norman's suggestion, and the method followed by Mereschkowsky (Ann. N. H., Dec. 1878), *Pericladium novæ-zelandiæ* should be referred to the genus *Selaginopsis*, the only example yet recorded from the southern hemisphere.

Lafoea elongata, Armstrong (1 A), Pigeon Island and Kankan Coast, Diamond Island, off the coast of Pegu.

Halicornaria setosa, id. *l. c.* Cape Negrais, 80 fath., Cheduba Island, 8–10 fath.; *H. plumosa*, id. *l. c.*, Cape Comorin, 35–40 fath., Cheduba Island, 10–15 fath.

Himaria compressa, id. *l. c.*, Diamond Island, Kankan Coast, Cape Comorin.

Antennella allmanni, id. *l. c.*, Cape Comorin, 50 fath., Cheduba Island, 8–10 fath.

Sertularella rigosa, id. *l. c.*, Cape Comorin, 40 fath., Arakan Coast, 10–15 fath.

Desmoscyphus humilis, id. *l. c.*, St. George's Island, West coast of India.

Order vi.—Siphonophora.

Agalmopsis utricularia, Claus (7), Mediterranean. Nutrient polyps have long stalk, relatively broad hydrophyllia; between every two hydrophyllia are set six to nine tentacles with generative buds; the male buds have a distinct investment.

HECKEL (17)* characterizes the following genera and species:—

ANTHOMEDUSÆ (Hæck.).

Fam. 1—CODON[I]IDÆ, Hæck. (1877).

Subfam. i.—Sarsiidæ, Forbes.

Codonium, g. n. p. 13, for *C. princeps*, sp. n., pl. i. figs. 1 & 2, West coast of Greenland, Baffin's Bay, etc. *C. codonophorum*, sp. n., p. 14, pl. i. fig. 3, Corfu. *C. gemmiferum* = *Sarsia gemmifera*, *C. pulchellum* = *Sarsia pulchella*, Forbes, = *Ectopleura pulchella*, Agassiz, = *Syncoryne pulchella*, Hincks, = *E. pulchella*, All.

Sarsia siphonophora, sp. n., p. 20, pl. i. fig. 4, Canary Islands.

Bathycodon, g. n., p. 26, for *B. pyramis*, Hæck.

Subfam. ii.—Dinemidæ, Hæck.

Dicadonium, g. n., p. 27, for *D. cornutum*, sp. n., p. 27, pl. i. fig. 6, Red Sea, *D. dissonema*, sp. n., p. 27, Australia.

Subfam. iii.—Euphysidæ, Hæck.

Amphicodon, g. n., p. 35, for *A. fritillaria*, Hæck., = *Corymorpha fritillaria*, Steenstrup, = *Steenstrupia fritillaria*, Ag., = *Diplena fritillaria*, All., = *Hybocodon prolifer*, Böhm; *A. globosus*, Hæck., = *Steenstrupia globosa*, Sars, = *Triplena globosa*, Hæck.; *A. amphipleurus*, sp. n., p. 37, pl. i. figs. 7–9, = *Triplena amphipleura*, Hæck.

Subfam. iv.—Amalthæidæ, Hæck.

Amalthæa amœbigera, sp. n., = *Corymorpha amœbigera*, Hæck., p. 38, pl. i. figs. 10 & 11, Lanzarote.

Fam. 2—TIARIDÆ, Hæck.

Subfam. i.—*Protiaridæ*, Hæck.

Protiara, g. n., p. 46. Occupies the same position among *Tiaridæ* as *Tetranema* does among *Thaumantidæ* or *Eucopium* among *Eucopidæ*. Contains only *P. tetranema*, Hæck., = *Oceania tetranema*, Pér. & Les., = *Carminrothe beroe*, Slabber (1775).

Modeeria irenium, sp. n., p. 48, Azores.

Corynetes arcuata, sp. n., p. 49, Brazil.

Subfam. ii.—*Amphinemidæ*, Hæck.

Amphinema, g. n., p. 49, for *A. titania*, Hæck., = *Oceania dinema*, Pér. & Les., = *O. diadema*, Eschs., = *Dianæa diadema*, Lam., = *Saphenia dinema*, Forbes, = *S. titania*, Gosse, = *Stomotoca dinema*, Ag., and *A. apicatum*, Hæck., = *Saph. apicata*, MacCrady, = *St. apicata*, Ag.

Codonorchis, g. n., p. 51, for *C. octahedrus*, sp. n., p. 51, Croisic, Brittany, 20 mètres.

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* Hæckel has described several of these before in his Prodrom. System. Medus. 1877, but in almost every case either the generic or specific name, or both, have been changed. The 83 new genera contain 94 new and 59 known species. 14 of the new genera are founded for 21 species, all previously known; and considering that the "system" will in all probability be very widely adopted, the Recorder has thought it advisable, for purposes of reference, to give all the species for which new genera have been founded, with a complete synonymy.

Stomatoca pterophylla, sp. n., p. 52, pl. iv. fig. 10, = *Stomatocanna pterophylla*, Hæck., West Indies, 20° 36′ N., 76° W.

Subfam. iii.—*Pandeidæ*, Hæck.

Conis cyclophthalma, sp. n., p. 55, pl. iv. fig. 1, Gibraltar.

Tiara conifera, sp. n., p. 59, Greenland; *T. reticulata*, sp. n., p. 60, pl. iii. fig. 11, S. Atlantic.

Catablema, g. n., p. 62, for *C. campanula*, sp. n. ?, p. 63, pl. iv. figs. 4 & 5, = ? *Medusa campanula*, O. Fab., = ? *Melicertum campanula*, Oken & Ag., 1862, = ? *Dianæa campanula*, Lam., = ? *Campanella fabricii*, Lesson, Coast of Greenland; *C. vesicarium*, Hæck., = *Turris vesicaria*, Al. Ag., *C. eurystoma*, sp. n., p. 64, pl. iv. figs. 6 & 7, = *Catablemium eurystoma*, Hæck.

Callitiara, g. n., p. 67, for *C. polyophthalma*, sp. n., p. 67, pl. iii. figs. 1–5, Lanzarote.

Fam. 3.—Margelidæ, Hæck. (1877).

Subfam. i.—Cytæidæ, L. Ag. (1862).

Cybogaster dissonema, sp. n., p. 76, Croisic, Brittany.

Dysmorphosa minima, sp. n., p. 78, pl. vi., fig. 7, = *Gastroblastus minimus*, Hæck., 1877, Heligoland, *D. octostyla*, sp. n., p. 78, pl. vi. fig. 6, = *Gastroblastus octostyla*, Hæck., 1877, Corfu.

Cytæandra (a derivative of *Cytæis*), g. n., p. 79, for *C. areoliata*, Hæck., *Hydractinia areolata*, Alder, = *Rhizocline areolata*, All., = *Podocoryne areolata*, All., = *P. areolata*, Hincks; *C. polystyla*, sp. n., p. 79, Croisic.

Subfam. ii.—Lizusidæ, Hæck. (1877).

Lizusa, g. n., p. 80, for *L. octocilia*, Hæck., = *Medusa octocilia*, Dalyell, = *Diplectana octocilia*, = *Bougainvillea diplectanus*, Busch, = *Eudendrium ramosum*, Van Beneden, 1866; *L. multicilia*, sp. n., p. 81, pl. vi. fig. 13, = *Margelium multicilium*, Hæck., Straits of Gibraltar.

Lizzia elisabethæ, sp. n., p. 83, pl. vi. fig. 12, = *Lizusa elisabethæ*, Hæck., Jersey.

Lizzella, g. n., p. 83, for *L. octella*, sp. n., = *Rathkea octella*, Hæck., Japan.

Subfam. iii.—Thamnostom [at] idæ, Hæck. (1877).

Thamnitis, g. n., p. 84, for *T. tetrella*, sp. n., p. 84, Brazil, and *T. nigritella*, Hæck.

Thamnostylus, g. n., p. 85, for *T. dinema*, sp. n., p. 85, S. of Kerguelen's Island, 65° 42′ S., 79° 49′ W., 240 mètres.

Thamnostoma, g. n., p. 85, for *T. dibolia*, Hæck., = *Lizzia dibolia*, Busch, *T. macrostoma*, sp. n., p. 86, Singapore.

Subfam. iv.—Hippocrenidæ, MacCrady (1857).

Hippocrene platygaster, sp. n., p. 91, = *Margelis platygaster*, Hæck., Lanzarote, Cape Verde, Trinidad.

Nemopsis heteronema, sp. n., p. 93, pl. v. figs. 6–9, = *Favonia heteronema*, Hæck., Iceland, Norway.

Margellium, g. n., p. 94, for *M. octopunctatum*, Hæck., = *Lizzia octopunctata*, Forbes, 1848, *M. gratum*, Hæck., = *Lizzia grata*, Al. Ag.

Fam. 4—Cladonem [at] idæ, Gegenbauer (1856).

Subfam. i.—Pteronem [at] idæ, Hæck.

Pteronema, g. n., p. 101, for *P. darwini*, sp. n., p. 101, pl. vii. figs. 1 & 2,

Australia, *P. ambiguum*, Hæck., = *Microstoma ambiguum*, Lesson, = *Zanclea ambigua*, L. Ag.

Gemmaria sagittaria, sp. n., p. 103, pl. vii. figs. 3 & 4, Cuba.

Subfam. ii.—Dendronem[at]idæ, Hæck.

Ctenaria, g. n., p. 107, for *C. ctenophora*, sp. n., p. 108, pl. vii. figs. 5–7, Japan.

Dendronema, g. n., p. 110, for *D. stylodendron*[*-drum*], sp. n., p. 110, pl. vii. fig. 8, Lanzarote.

Leptomedusæ (Hæck.).

Fam. 5—Thaumantiidæ, Gegenbauer (1856).

Subfam. i.—Laodicidæ, L. Ag. (1862).

Tetranema, g. n., p. 125, for *T. eucopium*, sp. n., = *Prothaumantias eucopium*, Hæck., p. 125, pl. viii. figs. 1 & 2, Gibraltar; *T. aeronauticum*, Hæck., *Thaumantias aeronautica*, Forbes, = *Prothaumantias aeronautica*, Hæck.

Dissonema, g. n., p. 126, for *D. saphanella*, sp. n., p. 126, pl. viii. fig. 3, = *Prothaumantias dissonema*, Hæck., Australia.

Octonema, g. n., p. 126, for *O. eucope*, sp. n., p. 127, Sandwich Islands.

Thaumantias forbesi, sp. n., p. 129, = ? *T. thompsoni*, Forbes, Norwegian Coast; *T. eschscholtzi*, sp. n., p. 129, pl. viii. fig. 4, Greenland.

Staurostoma, g. n., p. 130, for *S. laciniata*[*-tum*], Hæck., = *Staurophora laciniata*, L. & Al. Ag., *S. arctica*[*-cum*], sp. n., p. 131, = *Staurophora arctica*, Spitzbergen.

Laodice ulothrix[*hylo-*], sp. n., p. 133, pl. viii. figs. 5–7, = *Cosmetira ulothrix*, Hæck., Lanzarote.

Subfam. ii.—Melicertidæ, L. Agassiz (1862).

Melicertella, g. n., p. 134, for *M. panocto*, sp. n., p. 135, = *Melicertum panocto*, Hæck., Azores.

Melicertissa, g. n., p. 135, for *M. clavigera*, sp. n., p. 135, pl. viii. figs. 8–12, = *Melicertum clavigerum*, Hæck., = *Melicertella clavigera*, Hæck., Lanzarote.

Melicertidium, g. n., p. 138, for *M. octo-costatum* = *Oceania octo-costata*, Sars, = *Æquorea octo-costata*, Lesson, *Stomobrachium octo-costatum*, Forbes, = *Thaumantias milleri*, Landsborough, *Melicertum octo-costatum*, Hæck., = *Melicertum campanulatum*, Ehrenb., = *Melicertum pusillum*, L. Ag.

Subfam. iii.—Orchi[o]stom[at]idæ, Hæck.

Orchi[*o*]*stoma*, g. n., p. 138, for *O. steenstrupi*, sp. n., p. 139, pl. xv. figs. 3–5, = *Crematostoma orchistoma*, Hæck., Antilles, 20° N., 81° W., and *O. pileus*, Hæck., = *Mesonema pileus*, Lesson, = *Crematostoma pileus*, L. Ag.

Fam. 6—Cannotidæ, Hæck. (1877).

Subfam. i.—Polyorchi[i]dæ, Al. Ag. (1862).

Staurodiscus, g. n., p. 145, for *S. tetrastaurus*, sp. n., p. 145, pl. ix. figs. 1–3, = *Staurodiscalma tetrastaura*, Hæck., Lanzarote, *S. heterosceles*, sp. n., p. 146, = *Staurodiscema heterosceles*, Hæck., Lanzarote.

Ptychogena pinnulata, sp. n., p. 148, North Sea.

Polyorchis pinnatus, sp. n., p. 149, pl. viii. fig. 13, Sandwich Islands.

Subfam. ii.—Berenicidæ, Eschscholtz (1829).

Cannota, g. n., p. 151, for *C. dodecantha*, sp. n., Coast of New Guinea.

Dyscannota, g. n., p. 151, for *D. dysdipleura*, = *Willia ornata*, Al. Ag. (*nec* MacCrady).

Berenice capillata, sp. n., p. 154, pl. iv. fig. 5, Cape Verde Islands.

Dipleurosoma amphithectum, sp. n., p. 155, pl. ix. fig. 9, West Coast of Norway.

Subfam. iii.—Williidæ, Forbes (1848).

Dicranocanna, g. n., p. 156, for *D. furcillata*, sp. n., p. 156, North-west Coast of Africa.

Toxorchis, g. n., p. 156, for *T. arcuatus*, sp. n., p. 157, pl. ix. figs. 6–8, Lanzarote.

Willetta, g. n., p. 157, for *W. ornata*, Hæck., = *Willsia ornata*, MacCrady.

Willia furcata, sp. n., p. 158, Brittany.

Cladocanna, g. n., p. 160, for *C. thalassina*, Hæck., = *Berenice thalassina*, Péron, Eschscholtz, L. Ag., = *Berenice euchroma*, Blainville, Milne Edwards, L. Ag., = *Æquorea thalassina*, Lam., = *Cavieria euchroma*, Lesueur (*nec* Péron), and *C. polyclada*, sp. n., p. 161, New Guinea.

Fam. 7—Eucopidæ, Gegenbauer (1856).

Subfam. i.—Obelidæ, Hæck.

Eucopium, g. n., p. 168, for *C. primordiale*, sp. n., p. 168, pl. xi. figs. 1–3, = *Eucope primordialis*, Hæck., Corsica, *E. pictum*, Hæck., = *Eucope picta*, Keferst. & Ehl., *E. quadratum*, Hæck., = *Thaumantias quadrata*, Forbes, = *Eucope quadrata*, Hæck.

Saphonella, g. n., p. 169, for *S. dissonema*, sp. n., p. 169, pl. xi. fig. 5, Sandwich Islands.

Subfam. ii.—Phiali[i]dæ, Hæck.

Phialium, g. n., p. 180, founded for two North American *Eucopidæ*: *P. duodecimale*, Hæck., = *Euchilota duodecimalis*, Al. Ag., L. Ag., = *Phialis duodecimalis*, Hæck., and *P. dodecasema*, Hæck., = *Euchilota duodecimalis*, Al. Ag., = *Phialis dodecasema*, Hæck. (1877).

Phialis, g. n., p. 181, for *P. cruciata*, Hæck., = *Halopis cruciata*, Al. Ag., separated from *Mitrocomium*, having always 12 marginal vesicles [otocysts].

Mitrocomium, g. n., p. 181, 16 marginal vesicles [otocysts], for *M. cirratum*, sp. n., p. 182, pl. ix. figs. 9–11, Corfu.

Mitrocomella, g. n., p. 184, for *M. polydiadema*, Hæck., = *Tiaropsis polydiademata*, Romanes, = *Phialis polydiadema*, Hæck. (1877).

Mitrocoma minervæ, sp. n., p. 189, South Coast of Africa.

Subfam. iii.—Eutimidæ, Hæck.

Eutimium, g. n., p. 190, for *E. elephas*, sp. n., p. 190, pl. xii. figs. 10–12, = *Eutima elephas*, Hæck., Heligoland.

Eutimeta, g. n., p. 194, for *E. gentiata*, sp. n., p. 194, pl. xii. figs. 6–9, = *Eutima gentiata*, Hæck., Lanzarote.

Eutimalphes, g. n., p. 194, for *E. pretiosa*, sp. n., p. 195, pl. xi. fig. 8, Australia; *E. indicans*, Hæck., = *Tiaropsis indicans*, Romanes.

Octorchidium, g. n., p. 195, for *O. tetranema*, sp. n., p. 196, pl. xi i. fig. 9, = *Octorchis tetranema*, Hæck., Corsica.

Octorchandra, g. n., p. 197, for *O. germanica*, Hæck., = *Octorchis germanica*, Hæck. (1877), = *Tima species*, Schulze; *O. canariensis*, sp. n., p. 198, pl. xiii. fig. 1, Lanzarote, and *O. variabilis*, Hæck., = *Eutima variabilis*, MacCrady, Al. Ag., = *Octorchis variabilis*, Hæck. (1877).

Subfam. iv.—Irenidæ, Hæck.

Irenium, g. n., p. 199, for *I. quadrigatum*, sp. n., p. 199, pl. xi. figs. 12 & 13, West Coast of Africa.

Tima teuscheri, sp. n., p. 306, pl. xii. figs. 3–5, = *Irene teuscheri*, Hæck., Brazil, 3° N., 25° W.

Fam. 8—ÆQUOR[E]IDÆ, Eschs. (1829).

Subfam. i.—Octocannidæ, Hæck. (1877).

Octocanna, g. n., p. 213, for *O. octonema*, sp. n., p. 213, = *Octocanella octonema*, Hæck., Red Sea, *O. polynema*, sp. n., Indian Ocean, Singapore.

Subfam. ii.—Zygocannidæ, Hæck. (1877).

Zygocanna, g. n., for *Z. costata*, sp. n., p. 214, pl. xv. figs. 7 & 8, New Guinea, *Z. pleuronota*, sp. n., p. 215, = *Æquorea pleuronota*, Péron & Lesueur; *Polyxenia pleuronota*, Eschs. (diagnosis of previous observers altogether insufficient), N. Coast of Australia.

Zygocannota, g. n., p. 215, for *Z. purpurea*, Hæck., = *Æquorea purpurea*, Pér. & Les., Milne-Edwards, L. Ag., = *Polyxenia purpurea*, Eschscholtz.

Zygocannula, g. n., p. 216, for *Z. diploconus*, sp. n., p. 216, pl. xv. fig. 6, = *Zygocanna diploconus*, Hæck., Indian Ocean, Schmidt; *Z. undulosa*, Hæck., = *Æ. undulosa*, Péron & Lesueur, = *Polyxenia undulosa*, Less., = *Zygocanna undulosa*, Hæck. (1877).

Subfam. iii.—Polycannidæ, Hæck.

Æquorea discus, sp. n., p. 219, = *Æquoranna discus*, Hæck., Messina.

Staurobrachium, g. n., p. 224, for *S. stauroglyphum*, Hæck., = *Æquorea stauroglypha*, Pér. & Les., = *Laodice stauroglypha*, L. Ag. (1862), = *Æquorea forbesiana*, Gosse, = *Rhegmatodes forbesianus*, L. Ag. (1862), = *Staurobrachium forbesianum*, Hæck. (1877).

Mesonema eurystoma, sp. n., p. 227, = *Mesonella eurystoma*, Hæck., Adriatic Sea.

Polycanna, g. n., p. 229, for *P. fungina*, sp. n., p. 229, pl. xiv. figs. 4–7, = *Rhacostoma funginum*, Hæck., Norway, Christiansand; *P. germanica*, sp. n., p. 230, pl. xiv. figs. 1–3, = *Crematostoma germanicum*, Hæck.; *P. italica*, Hæck., = *Crematostomum italicum*, Hæck., = *Æquorea italica*, Pér., = *Æ. rissoana*, Risso, Della Chiaje; *P. vitrina*, Hæck., = *Æ. vitrina*, Gosse, = *Zygodactyla vitrina*, L. Ag., Hincks, = *Æ. allantophora*, Pér. & Les., L. Ag., = *Zygodactyla allantophora*, Hæck. (1877); *P. grœnlandica*, Hæck., = *Æ. grœnlandica*, Pér. & Les., = *Zygodactyla grœnlandica*, L. Ag., Al. Ag., = *Medusa aquorea*, Fab., = *M. globularis*, Modeer, = *Æ. globularis*, Mörch, = *Rhacostoma atlanticum*, L. Ag.; *P. cressa*, Hæck., = *Zygodactyla cressa*, Al. Ag.; *P. flava*, Hæck., *Crematostoma flava*, A. Ag., Al. Ag., = *Zygodactyla flava*, Hæck. (1877).

Trachomedusæ, Hæck. (1866).

Fam. 9—Petasidæ, Hæck. (1877).

Subfam. i.—Petachnidæ, Hæck. (1877).

Petasus, g. n., p. 247, for *P. atavus*, sp. n., p. 248, pl. xviii. fig. 1, Mediterranean, and *P. tetranema*, sp. n., p. 248, Lanzarote.

Dipetasus, g. n., p. 248, for *D. digonimus*, sp. n., p. 249, pl. xviii. fig. 2, Kerguelen Island.

Petasata, g. n., p. 249, for *P. eucope*, sp. n., p. 249, pl. xviii. fig. 3, Red Sea.

Petachnum, g. n., p. 250, for *P. tiaropsis*, sp. n., p. 250, Chinese Sea.

Gossea circinata, sp. n., p. 252, pl. xviii. fig. 4, Atlantic Coast of France.

Subfam. ii.—Olindiadæ[-iidæ], Hæck. (1877).

Olindias muelleri, sp. n., p. 253, pl. xv. figs. 9–13, = *Olindora muelleri*, Hæck. (1877).

Fam. 10—Trachynem[at]idæ, Gegenbauer (1856).

Subfam. i.—Marmanem[at]idæ, Hæck. (1877).

Trachynema octonarium, sp. n., p. 260, Lanzarote.

Marmanema, g. n., p. 261, for *M. tympanum*, Hæck., = *Surinthea tympanum* (et *globosa*), Gegenbauer (1856), Keferstein & Ehlers (1861), and L. Ag. (1862), = *Surinthonema globosum*, Hæck. (1877); *M. mammæforme*[*mammif-*], sp. n., p. 262, pl. xvii. figs. 13–15, = *Surinthonema mammæforme*, Hæck. (1877), Lanzarote; *M. clavigerum*, sp. n., p. 263, pl. xvii. figs. 1 & 2, = *Cordylonema clavigerum*, Hæck. (1877); *M. umbilicatum*, Hæck., = *Calyptra umbilicata*, Leuckart (1856), = *Rhopalonema umbilicatum*, L. Ag. (1862), = *Cordylonema umbilicatum*, Hæck. (1877).

Rhopalonema cœruleum, sp. n., p. 264, pl. xvii. figs. 3–6, Lanzarote; *R. polydactylum*, sp. n., p. 265, pl. xvii. figs. 7–11, Mediterranean.

Subfam. ii.—Pectyllidæ, Hæck. (1877).

Pectyllis, g. n., p. 265, for *P. arctica*, sp. n., p. 266, Greenland, Halifax.

Pectis, g. n., p. 266, for *P. antarctica*, sp. n., p. 266, SS.W. of Kerguelen's Island, 1260 fath.

Pectanthis, g. n., p. 267, for *P. asteroides*, sp. n., p. 267, Gibraltar, 600 fath., Adriatic Sea, 200 fath.

Fam. 11—Aglauridæ, L. Ag. (1862).

Subfam. i.—Aglauthidæ, Hæck. (1877).

Aglantha, g. n., p. 271, for *A. globuligera*, sp. n., p. 272, pl. xvi. fig. 8, = *Circella globuligera*, Hæck. (1877), Lanzarote; *A. digitalis*, Hæck., = *Medusa digitalis*, O. F. Müller, Fabr., = *Melicerta digitalis*, Pér. & Les., = *Dianæa digitalis*, Lam., = *Irene digitalis*, Eschs., = *Turris digitalis*, Mörch, = *Turris borealis*, Less., = *Circe rosea*, Forbes, L. Ag., = *Circella digitalis*, Hæck. (1877), = *Trachynema digitale*, Al. Ag.; *A. camtschatica*, Hæck., = *Circe camtschatica*, Brandt, = *Circe impatiens*, Al. Ag., = *Trachynema camtschaticum*, Al. Ag.

Aglaura nausicaa, sp. n., p. 274, pl. xvi. fig. 1, = *Aglaurella nausicaa*, Hæck. (1877), Corfu; *A. laterna*, sp. n., p. 274, pl. xvi. fig. 2, Lanzarote.

Agliscra, g. n., p. 276, for *A. elata*, sp. n., p. 276, pl. xvi. fig. 9, =

Circella elata, Hæck. (1877), and *A. elongata*, Hæck., = *Circe elongata*, Lesson.

Subfam. ii.—Persidæ, Hæck. (1877).

Stauraglaura, g. n., p. 277, for *S. tetragonima*, sp. n., p. 277, pl. xvi. figs. 10 & 11, Australia.

Persa lucerna, sp. n., p. 278, pl. xvi. figs. 12 & 13, Corfu; *P. distogonima*, sp. n., p. 279, Algiers.

Fam. 12—Geryonidæ, Esch. (1829).

Subfam. i.—Liriopidæ, Hæck. (1864).

Liriantha, g. n., p. 286, for *L. tetraphylla*, Hæck., = *Geryonia tetraphylla*, Cham., Esch., = *Liriope tetraphylla*, Gegenb. & Hæck., = *Xanthea tetraphylla*, L. Ag.; *L. appendiculata*, Hæck., = *Geryonia appendiculata*, Forbes, = *Liriope appendiculata*, Gegenb. & L. Ag., = *Xanthea* (vel *Liriope*) *appendiculata*, Hæck.; *L. scutigera*, Hæck., = *Liriope scutigera*, MacCrady & L. Ag., = *Xanthea* (vel *Liriope*) *scutigera*, Hæck.; *L. catharinensis*, Hæck., = *Liriope catharinensis*, F. Müller & L. Ag., = *Glossocodon catharinensis*, Hæck., = *Glossoconus catharinensis*, Hæck.; *L. mucronata*, Hæck., = *Liriope mucronata*, Gegenb., Keferst., & Ehlers, = *Liriope exigua*, L. Ag., = *Glossocodon mucronatus*, Hæck., = *Glossoconus mucronatus*, Hæck., = *Eurybiopsis anisostyla*, Gegenb.

Liriope cerasus, sp. n., p. 289, pl. xviii. fig. 15, Lanzarote; *L. crucifera*, sp. n., Indian Ocean.

Glossoconus canariensis, sp. n., p. 292, Lanzarote.

Glossocodon luetkeni, sp. n., p. 293, pl. xviii. fig. 5, Azores; *G. agaricus*, sp. n., p. 293, New Zealand.

Subfam. ii.—Carmarinidæ, Hæck. (1864).

Geryones, g. n., p. 293, for *G. elephas*, sp. n., p. 294, pl. xviii. fig. 7, S. Africa (Indian Ocean ?).

Carmaris, g. n., p. 296, for *C. umbella*, sp. n., p. 296, Coast of Peru, Schmidt; *C. giltschi*, sp. n., p. 296, pl. xviii. fig. 8, Australia.

Narcomedusæ, Hæck. (1877).

Fam. 13—Cunanthidæ, Hæck. (1877).

Cunantha, g. n., p. 314, for *C. primigenia*, p. 314, pl. xix. fig. 1, *petasoides* and *striata*, p. 315, spp. nn., Mediterranean.

Cunarcha, g. n., p. 315, for *C. alginoides*, sp. n., Lanzarote.

Cunoctantha, g. n., p. 316, for *C. discoidalis*, Hæck., = *Cunina discoidalis*, Keferst. & Ehlers; *C. octonaria*, Hæck., = *Cunina octonaria*, MacCrady; *C. kœllikeri*, Hæck., = *Cunina kœllikeri*, F. Müller; and *C. polygonia*, Hæck., = *Cunina polygonia*, Hæck. (1877).

Cunoctona, g. n., p. 317, for *C. lanzerotæ*, sp. n., p. 318, pl. xx. figs. 1–6, = *Cunina lanzerotæ*, Hæck. (1877), Lanzarote; *C. nausithoe*, sp. n., p. 318, S. Africa.

Cunina oligotis, sp. n., p. 319, S. Africa; *C. multifida*, sp. n., p. 322, Indian Ocean.

Cunissa, g. n., p. 322, for *C. polyporpa*, sp. n., p. 322, Singapore; *C. polypera*, sp. n., p. 323, Indian Ocean.

Fam. 14—Peganthidæ, Hæck. (1877).

Polycalpa, g. n., p. 327, for *P. zonaria*, sp. n., p. 327, Mediterranean; *P. zonorchis*, sp. n., p. 327, Venezuela; *P. forskalli*, sp. n., p. 328, Red Sea.

Polyxenia cyanolina, sp. n., p. 330, Indian Ocean.

Pegasia sieboldi, sp. n., p. 331, Atlantic Ocean.

Pegantha, g. n., p. 332, for *P. martagon*, sp. n., p. 332, Chinese Sea, *P. pantheon*, sp. n., S. Pacific, 80 fath., *P. biloba*, sp. n., p. 333, Sandwich Islands, *P. triloba*, sp. n., p. 333, pl. xix. figs. 4-7, Indian Ocean, *P. quadrilata*, sp. n., p. 333, near Ascension, *P. magnifica*, sp. n., p. 333, Pacific Ocean.

Fam. 15—Æginidæ, Gegenbauer (1856).

Subfam. i.—Æginetidæ, Hæck.

Ægina rhodina, sp. n., p. 338, pl. xx. figs. 11-15, Lanzarote, *Æ. canariensis*, sp. n., p. 339, Lanzarote, *Æ. eschscholtzi*, sp. n., p. 339, Azores.

Æginella, g. n., p. 340, for *Æ. dissonema*, sp. n., p. 341, pl. xx. fig. 16, = *Campanella dissonema*, Hæck. (1877), Lanzarote; *Æ. bi-tentaculata*, Hæck., = *Charybdea bi-tentaculata*, Quoy & Gaim., = *Æginopsis bi-tentaculata*, J. Müller, = *Campanella capitulum*, Blainville & L. Ag.; *Solmundella bi-tentaculata*, Hæck. (1877).

Æginela octonema, sp. n., p. 341.

Subfam. ii.—Æginuridæ, Hæck.

Æginopsis mertensi, sp. n., p. 343, Japanese Sea.

Æginura, g. n., p. 343, for *Æ. myosura*, sp. n., p. 343, pl. xix. figs. 8 & 9, Australia.

Subfam. iii.—Æginodoridæ, Hæck.

Æginodiscus, g. n., p. 344, for *Æ. actinodiscus*, sp. n., p. 344, Indian Ocean.

Æginodorus, g. n., p. 344, for *Æ. alderi*, Hæck., = *Polyxenia alderi*, Forbes.

Æginor[r]hodus, g. n., p. 345, for *Æ. rosarius*, sp. n., p. 345, S. Atlantic, 600 fath.

Fam. 16—Solmaridæ, Hæck. (1877).

Subfam. i.—Solmissidæ, Hæck.

Solmissus, g. n., p. 349, for *S. ephesius*, sp. n., p. 350, Mediterranean; *S. albescens*, Hæck., = *Cunina albescens*, Gegenb., = *C. moneta*, Leuck., = *C. solmaris*, Hertwig, = *Solmissus moneta*, Hæck., = ? *Forcolia lineolata*, Pér. & Les.; *S. faberi*, sp. n., p. 350, Atlantic, 32° S. by 26° W.; *S. bleeki*, sp. n., S. Africa.

Subfam. ii.—Solmundinæ, Hæck.

Solmundus, g. n., p. 351, for *S. tetralinus*, sp. n., p. 351, pl. xix. fig. 10, Lanzarote.

Solmundella, g. n., p. 352, for *S. mediterranea*, Hæck., = *Æginopsis mediterranea*, J. Müll., Gegenb., Leuck., Metschn. & Kölliker, = *Campanella mediterranea*, L. Ag.; *S. muelleri*, sp. n., p. 352, Lanzarote.

Subfam. iii.—Solmonetidæ, Hæck.

Solmoneta, g. n., p. 353, for *S. flavescens*, Hæck., *Pachysoma flavescens*, Kölliker, *Æginela flavescens*, Gegenb., *Polyxenia flavescens* (vel *leucostyla*),

Metschn., *Solmaris flavescens*, Hæck. (1877); *S. limulata*, sp. n., p. 345, Lanzarote; *S. aureola*, sp. n., p. 354, pl. xix. fig. 11, Red Sea; *S. flavibrachia*, Hæck., = *Polyxenia flavibrachia*, Brandt, = *Solmaris flavibrachius*, Hæck. (1877).

Solmaris, g. n., p. 355, for *S. godeffroyi*, sp. n., p. 355, pl. xix. fig. 12, = *Solmarium godeffroyi*, Hæck. (1877), Tropical Pacific, *S. griseum*, Hæck., = *Æquorea grisea*, Q. & G., *Ægina grisea*, Lesson, *Solmarium griseum*, Hæck. (1877), *S. punctatum*, Hæck., = *Æquorea punctata*, Q. & G., *Ægina punctata*, Esch., = *Scyphis punctata*, Lesson, = *Solmarium punctatum*, Hæck. (1877), *S. astrozona*, sp. n., p. 357, = *Solmarium astrozona*, Hæck. (1877), Chinese Sea, *S. leucostylus*, Hæck., = *Polyxenia leucostyla*, Will (*nec* Metschn.), = *Solmarinus leucostylus*, Hæck. (1877), *S. lenticula*, sp. n., p. 357, = *Solmarinus lenticula*, Hæck. (1877), Indian Ocean, *S. gegenbauri*, Hæck., = *Ægineta solmaris*, Gegenb., =? *Ægineta paupercula*, Gegenb., = *Solmerinus gegenbauri*, Hæck. (1877), *S. rhodoloma*, Hæck., = *Æquorea rhodoloma*, Brandt, = *Paryphasma rhodoloma*, Leuck., = *Solmarius rhodoloma*, Hæck., *S. corona*, Hæck., = *Ægineta corona*, Keferst. & Ehlers, = *Solmarinus corona*, Hæck. (1877), and *S. coronantha*, sp. n, p. 359, pl. xx. figs. 7–10, = *Solmarinus coronantha*, Hæck. (1877), Lanzarote.

ANTHOZOA.

1. Brüggemann, F. Ueber die Corallen der Insel Ponapè. J. Mus. Godeffr. xiv. pp. 201 & 212.

2. ——. Corals of Rodriguez. Phil. Tr. clxviii. pp. 569–579.

3. Bolsche, W. Ueber einige Corallen aus der Westphalischen Kreide. JB. Ver. Osnabrück, 1879.

[Not seen by the Recorder.]

4. D'Achiardi, A. Nuova specie di *Trochocyathus* (*canavarii*) nella Calcaria Titonica di Monte Primo. Atti Soc. Tosc. iv. pp. 139 & 140.

5. Dana, J. Corals and Coral Islands. New York: 1879.

The English edition of this was mentioned in Zool. Rec. ix.

6. Duncan, P. M. On the Upper Greensand Coral Fauna of Haldon, Devonshire. J. G. Soc. xxxv. pp. 89–97, pl. viii.

A critical description of genera and species in the collection of Mr. W. Vicary, of Exeter.

7. Eaton, A. E. Note on the *Actinozoa* of Kerguelen's Land. Phil. Tr. clxviii. p. 281.

9. Etheridge, R., jun. The History of Palæozoic Actinology in Australia. Tr. R. Soc. Viet. xiv. pp. 102–108.

10. Haacke, W. Zur Blastologie der Korallen. Jen. Z. Nat. xiii. pp.

This is a morphological study of the Corals, in which the author discusses the position these animals occupy in the different classifications of the animal kingdom which have been proposed by Hæckel and other biologists. The author comes to the conclusion that the corals can no

longer be considered either regularly radial or bilaterally symmetrical; they are either "centripipedische," or less frequently an "amphitect pyramidale."

11. HEIDER, A. VON. *Cerianthus membranaceus*, Haime. Ein Beitrag zur Anatomie der Actinien. SB. Ak. Wien, lxxix. pt. 1, pp. 204–254, pls. i.–vi.

The anatomy of this genus has been studied more elaborately by the Hertwigs (12).

12. HERTWIG, O. & R. Die Actinien, anatomisch und histologisch mit besonderer Berücksichtigung der Nervenmuskelsystems untersucht. Jen. Z. Nat. xiii. Hefte 3 & 4, 220 pp., 10 pls.; also published separately under the title "Zur Blättertheorie," Heft 1.

The first chapter of the special part deals with the anatomy and histology of *Sagartia parasitica*, *Adamsia diaphana*, *Anthea cereus* and *cinerea*, *Actinoloba diaphana*, *Tealia crassicornis*. In describing the ectoderm of the tentacles and peristome, the authors divide it into three layers, epithelial, nervous, and muscular. These three were previously described by Heider, who joined the muscular layer with the supporting lamella (Stützlamelle) to form the mesoderm. Heider found three kinds of cell in the epithelium, the nettle cells, gland cells, and "glimmer" cells, to which the authors add a fourth, the sense cells. The mesoderm, consisting of a supporting lamella alone, is situated between the muscular sheaths of the ectoderm and endoderm; in *Anthea* and *Sagartia* it may be divided into an outer and inner layer. In the endoderm, the same layers may be found as in the ectoderm, with slight modifications. The presence of a distinct nervous layer in the endoderm of these forms is definitely established. The yellow globular bodies often found in the endoderm cells are said by the authors to be vegetable unicellular parasites similar to the "yellow bodies" of the *Radiolaria*. The second section of this chapter deals with the histology of the theca and foot, and the third section with that of the œsophagus. In the endoderm of the œsophagus there are two kinds of gland cells, some with little globules and ciliated, and others having a granular network, nucleated and without cilia. In treating of the anatomy of the septa, which occupies the next section, the structure of the generative organs, the mesenteric filaments, and the acontia is described. The ova arise from the endodermal epithelium cells lining the mesenteries, and, as they grow, become pushed into the substance of the supporting lamina which occupies the middle of the septum. The spermatozoa probably arise from the endoderm in a similar manner. The mesenteric filaments and acontia differ in their mode of attachment, and also in the fact that the former possess a greater number of gland cells than nettle cells, and the latter a greater number of nettle cells than gland cells. The second chapter deals with the anatomy and histology of *Cerianthus*, *Edwardsia*, and *Zoanthus*.

The second part commences with the systematic position of the *Cœlenterata*, discussing the relationships of the *Actiniidæ*, *Cerianthidæ*, *Zoanthidæ*, and *Edwardsiæ*. The *Zoanthidæ* are probably the earliest type. They are provided with very numerous septa, and the arrangement and

origin of these is strongly radial. The longitudinal septal muscles are but slightly developed. The *Cerianthidæ* seem to approach the *Zoanthidæ*, whereas the *Actiniidæ* and *Edwardsiæ* are later types; there is an external longitudinal muscle in their walls, and their septal muscles are better developed than in the *Zoanthidæ*. The relationships of the *Actiniidæ* may be chiefly determined by the peculiar development of their septa. The *Edwardsiæ* form a smaller, but well characterized group, and are distinguished by having eight septa and a variable number of tentacles. The authors divide the *Cœlenterata* into the *Entocarpæ* and *Ectocarpæ*; in the former, the genital organs are supported by the endoderm, and in the latter by the ectoderm. The *Entocarpæ* include the *Anthozoa*, *Acraspeda*, and probably also *Charybdea* and *Lucernaria*; the *Ectocarpæ* include the *Hydromedusæ*, *Siphonophora*, and *Ctenophora*. The second chapter of this part consists of a lengthy discussion of the "Blättertheorie" and the "Keimblättertheorie."

13. JOURDAN, E. Sur les Zoanthaires Malacodermes des Côtes de Marseilles. C. R. lxxxix. p. 452; abstract in Ann. N. H. (5) iv. p. 325.

In *Phellia*, the cellular layer of the ectoderm secretes a viscous mucus, which by agglutinating fragments of all sorts gives the body a peculiar appearance. In *Cerianthus*, the mesodermic layer is remarkable, being composed of a thick muscular region included between two planes of connective tissue.

14. KLUNZINGER, C. B. Die Korallthiere des Rothen Meeres. Berlin: 1879, 3 vols.

The first volume of this work appeared in 1877, and was recorded in Zool. Rec. xiv.

15. KOCH, G. VON. Bemerkungen über das Skelet der Korallen. Morph. JB. v. pp. 316–323.

It has been usually stated that the theca is the calcified basal part of the tissues of the polype; these researches prove, however, that the derma and the theca are independent formations. The theca seems to be formed by a thickening of the septa, which secondarily fuse together below. The paper is divided into three parts, the first dealing with the theca of the reef corals, the second of the skeleton of *Clavularia*, and the third of the fusion of the calcareous particles in different genera.

16. KRUKENBERG, C. F. W. Ueber den Verdauungsmodus der Actinien. Sep. Abdr. aus Vergleich.-physiolog. Studien an den Küsten der Adria. Heidelberg: 1879, pp. 38–56.

[Not seen by the Recorder.]

17. NICHOLSON, H. A. On the structure and affinities of the tabulate corals of the Palæozoic period. Edinburgh: 1879, 337 pp., 15 pls.

18. —— & ETHERIDGE, R., JUN. Description of Palæozoic Corals from Northern Queensland, with observations on the genus *Stenophora*. Ann. N. H. (5) iv. pp. 216 & 265.

The genus *Stenophora* must be referred to the *Favositidæ*, and is thus widely separated from *Chætetes* and *Monticulipora*, to which it bears a

striking resemblance. It, however, holds a unique position in that family, and has no near ally. At present it seems to be confined to the Carboniferous and Permo-Carboniferous Formation of Australia and Tasmania.

18 A. PACKARD, JUN., A. S. Zoology for Students and General Readers. New York: 1879, crown 8vo. The Actinozoa: pp. 74–91.

Among some general observations on structure and affinities of this class, the author specially describes (p. 76) the alimentary system in *Metridium* (fig. 50), with the phenomena of digestion.

19. RATHBUN, R. Brazilian Corals and Coral Reefs. Am. Nat. xiii. pp. 539–551.

The author describes another reef similar to the one at Itaparica (*cf.* Zool. Rec. xiv.), situated to the south of the entrance to the Parahyba do Norte.

20. VERRILL, A. E. Notice of recent Additions to the Marine Fauna of the Eastern Coast of North America. Nos. 3 & 5. Am. J. Sci. (3) xvii. pp. 239–241, & 474 refer to *Anthozoa*.

New genera and species :—

ZOANTHARIA MALACODERMATA.

ACTINIIDÆ.

Palythoa violacea, Brüggemann (2), p. 70, Rodriguez.

Actinernus, Verrill (20), p. 474. The tentacles are rather large, and adnate to the marginal lobes; the disk is large, and the margin frilled in some individuals; the disk and tentacles are not retractile. For *A. nobilis*, id. *ibid.*, Sable Island, N. S. 200–250 fath., George's Bank, &c.

Synanthus, id. ibid. *Actiniæ*, parasitic on branches of *Primnoa reseda*, &c., with a broadly expanded, thin base; new zooids arise by budding, so as to form a small colony connected by a common base. For *S. mirabilis*, id. *ibid.*, same localities as *Actinernus nobilis*.

ZOANTHARIA SCLERODERMATA.

TURBINOLIDÆ.

Trochocyathus canavarii, D'Achiardi (4), p. 139, Monte Primo, near Camerino.

OCULINIDÆ.

Baryhelia reticulata, Duncan (6), p. 92, pl. viii. fig. 1, Haldon, Devon.
Pocillipora pulchella, Brüggemann (1), p. 203, Ponapè.

ASTRÆIDÆ.

Galaxea tenella, Brüggemann (1), p. 203, Ponapè; *G. lævis*, id. (2), p. 570, Rodriguez.

Astræa delicatula, Brüggemann (1), p. 204, Ponapè.

Haldonia, Duncan (6), p. 91. *Eusmilinæ aggregatæ*. Corallum massive, corallites united by walls, calices circular, no columella; pali exist before primary septa; costæ well developed, not uniting; endotheca abundant, closing the calice inferiorly. For *H. vicarii*, id. *ibid.*, Haldon.

Mussa umbellata, Brüggemann (2), p. 571, Rodriguez; *M. distans*, Klunzinger (14), iii. p. 7, Red Sea.

Thamnastræa ramsayi, Duncan (6), p. 92, pl. viii. fig. 6, Haldon.

Stelloria incrustans, Duncan (6), p. 91, pl. viii. figs. 4 & 5, Haldon.

Acanthastræa angulosa, Brüggemann (2), p. 573, Rodriguez.

Prionastræa rodericana and *scabra*, id. *ibid.*, Rodriguez.

Sclerophylla, Klunzinger (14), iii. p. 4. Polypary with very thick epithelium at the basis; the ridges in the neighbourhood of the lips of the cups well developed, each provided with a little spicule; the columella has the tendency to become very thick. For *S. margaritolica*, id. *ibid.*, Red Sea.

Echinoporidæ.

Echinopora spinulosa, Brüggemann (2), p. 573, Rodriguez.

Fungiidæ.

Oroseris haldonensis, Duncan (6), p. 92, pl. viii. figs. 9 & 10, Haldon.

Pavonia seriata, p. 206, *P. minor* and *P. prismatica*, p. 207, Brüggemann (1), Ponapè.

Pachyceris carinata, id. *l. c.* p. 208, Ponapè.

Actinacis stellulata, fig. 7, *insignis*, fig. 8, Duncan (6), p. 93, pl. viii., Haldon.

Trochoceris constricta, id. *ibid.* figs. 11 & 12, and *morrisi*, id. *l. c.* p. 94, figs. 13–15, Haldon.

Madreporidæ.

Madrepora obtusata, p. 7, *pustulosa*, p. 8, *ocellata*, p. 9, *pallida*, p. 10, *pyramidalis*, p. 12, *canaliculata*, p. 12, *vagabunda*, p. 15, *eurystomata*, p. 16, *scandens*, p. 26, *subtilis*, p. 28, and *capillaris*, p. 29, Klunzinger (14), ii., Red Sea; *M. monticulosa*, Brüggemann (2), p. 576, Rodriguez.

Montipora gracilis, Klunzinger, *l. c.* p. 37, Red Sea; *M. prolifera*, Brüggemann (1), p. 209, Ponapè; *M. divaricata*, id. (2), p. 577, Rodriguez.

Fistulipora proporoides, Nicholson (17), p. 310, Canandaigua, New York.

Monticulipora winteri, id. *l. c.* p. 321, Devonian of Gees, near Gerolstein, Eifel.

Porita decipiens, p. 210, and *tumida*, p. 211, Brüggemann (1), Ponapè; *P. columnaris*, p. 41, and *echinulata*, p. 43, Klunzinger, *l. c.*, Red Sea.

Synaræa undulata, Klunzinger, *l. c.* p. 45, Red Sea.

Favositidæ.

Araeopora, Nicholson (17), p. 165. Corallum massive, corallites polygonal and firmly fixed by their walls, which are extensively perforated by apertures, placing the visceral chambers of contiguous tubes in direct communication; trabeculæ rudimentary, and no columella or cœnenchyma. For *A. australis*, id. *ibid.*, Devonian in Queensland.

Nyctophora, id. *l. c.* p. 184. Corallum massive, composite and spheroidal; walls of the corallites thin and so completely amalgamated that no trace of original lines of division can be detected; mural pores numerous; septa 10–15, in the form of marginal vertical ridges extending along the whole length of the tubes. For *N. billingsi*, id. *ibid.*, Trenton Limestone, Peterborough, Ontario.

ALCYONARIA.

Pennatulidæ.

Virgularia (?) *grandiflora*, Verrill (20), p. 239, in lat. 42° 46′ N., long. 63° 45′ W., 220–260 fath.

Funiculina armata, id. *l. c.* p. 240, 40 miles S.W. of Sable Island, Nova Scotia, 300–400 fath.

SPONGIIDA.

BY

STUART O. RIDLEY, B.A., F.L.S., &c.

CHIEF PAPERS ON RECENT SPONGES.

1. CARTER, H. J. A. On *Holastrella*, a Fossil Sponge of the Carboniferous era, and on *Hemiastrella*, a New Genus of Recent Sponges; Ann. N. H. (5) iii. p. 141, pl. xxi. B. Contributions to our Knowledge of the *Spongida*; tom. cit. pp. 284 & 343, pls. xxv.–xxix.

2. ——. On a New Species of Excavating Sponge (*Alectona millari*); and on a New Species of *Rhaphidotheca* (*R. affinis*). J. R. Micr. Soc. ii. p. 493, pls. xvii. & xvii. *a*, figs. 1–4.

3. DESZO, B. Die Histiologie und Sprossen-entwickelung der Tethyen, besonders der Tethya lyncurium, Lieberkühn (auctorum). Arch. mikr. Anat. xvi. p. 626, pls. xxx.–xxxiii.

4. GANIN, M. Materialen zur Kenntniss des Baues und der Entwickelung der Schwämme [in Russian]. Warsaw: 1879.

5. KELLER, C. Studien über Organisation und Entwickelung der Chalineen. Z. wiss. Zool. xxxiii. p. 317, pls. xviii.–xx., woodcut; *cf.* also preliminary notice, Zool. Anz. ii. p. 303.

6. MARSHALL, W., & MEYER, A. B. Ueber einige neue und wenig bekannte Philippinische Hexactinelliden. MT. Mus. Dresd. ii. p. 261, pls. xxiv. & xxv.

7. METSCHNIKOFF, E. Spongiologische Studien. Z. wiss. Zool. xxxii. p. 349, pls. xx.–xxiii.

8. SCHMIDT, O. Spongien des Meerbusens von Mexico. Heft i. Jena: 1879, 4 pls. [Deals with the *Lithistidæ*.]

9. SCHULZE, F. E. Untersuchungen über den Bau und die Entwickelung der Spongien. VII^te^ Mittheilung. Die Familie der *Spongidæ*. Z. wiss. Zool. xxxii. p. 593, pls. xxxiv.–xxxviii.

——. Ditto. VIII^te^ Mittheilung. Die Gattung *Hircinia*, Nardo, und *Oligoceras*, n. g. *Op. cit.* xxxiii. p. 1, pls. i.–iv.

11. Selenka, E. Ueber einen Kieselschwamm von achtstrahligem Bau, und über Entwickelung der Schwamm-knospen. Z. wiss. Zool. xxxiii. p. 467, pls. xxvii. & xxviii.

12. Sollas, W. J. a. On *Plectronella papillosa*, a New Genus and Species of Echinonematous Sponge; Ann. N. H. (5) iii. p. 17, pls. iv.-vii., woodcuts. b. On *Pharetronema zingiberis*, a New Genus and Species of Renierid Sponge; *tom. cit.* p. 404, pl. xxx.

13. ——. On *Plocamia plena*, a New Species of Echinonematous Sponge. *Op. cit.* iv. p. 44, pls. vi. & vii., woodcuts.

Not seen by Recorder :—

Krukenberg, C. F. W. Verdauung der Spongien, Vergleich. physiolog. Studien an den Küsten der Adria. Heidelberg: 1879, p. 64.

——. Tetronerythrin in Schwämmen. Centralbl. med. Wissensch. 1879, No. 40.

Verrill, A. E. Preliminary Check-List of the Marine *Invertebrata* of the Atlantic Coast from Cape Cod to the Gulf of St. Lawrence. New Haven: 1879. Also *id.* in P. U. S. Nat. Mus. 1879: *Porifera* of the N.E. Coast of America (Includes more than 100 species of Sponges, with *Cladorrhiza grandis*, sp. n., from Nova Scotia).

Classification.

Keller (5), p. 348, considers the Sponges as true *Cœlenterata*, standing nearest to the Corals in their histological characters.

H. A. Nicholson, in the second edition of his "Manual of Palæontology for the Use of Students" (Edinburgh and London), classes the Sponges as the last Order of the *Rhizopoda*.

Faunistic Notices.

A. Agassiz, in a report on American dredgings in the Caribbean Sea, reprinted in Pop. Sci. Rev. (n.s.) iii. p. 352, mentions a *Hyalonema* with, and another without, a *Zoanthus* attached, also a *Dactylocalyx* and a *Euplectella* and another form from this district.

H. J. Carter, *Spongiidæ* (in Zoology of Kerguelen Island), Phil. Tr. clxviii. p. 286, gives notes on 8 Holorrhaphidote and Calcareous Sponges from Kerguelen; no new species; several are identical with British species [*infrà*].

A. M. Norman, Note on Sponges dredged off Coast of Norway, J. of Conch. 1879, ii. p. 11 [*infrà*].

T. Studer mentions *Leucosolenia*, sp. n., and *Halichondria* spp., *Rossella* sp., without descriptions, as found at Kerguelen Island; Arch. f. Nat. xlv. p. 119.

Emil v. Marenzeller, Verh. z.-b. Wien, xxviii. pp. 687–694, discusses the best methods of rearing bath-sponges as articles of commerce.

Genera, Species, &c., referred to.

Carnosa (Carter).

Close alliance of some *Suberitida* to the *Gummiuida*; (1) p. 300.

Halisarca, (7) p. 372, pl. xxi. figs. 1–2 *c*. Food particles enter the mesoderm as well as endoderm.

H. pontica, l. c. p. 375.

Halisarca dujardini, (7) p. 349, pl. xx. figs. 1–19, & xxi. figs. 3 & 4. Two varieties are found at Naples, the larva of the one being nearly twice as large as that of the other. The testes have an epithelial coat. The young ova are hardly distinguishable from some ordinary mesodermic cells. Among the cleavage cells, smaller and larger cells are distinguishable after the second cleavage. The cavity is filled with cells, grouped into rosette-like masses, the future mesoderm cells. The larva has but two chief body layers, ectoderm and mesoderm. A thin cellular external epithelium is formed. The water canals originate in the mesoderm without invagination.

Halisarca lobularis. Free swimming buds of this species observed by F. E. Schulze, Zool. Anz. ii. p. 636, to be formed in the autumn by extrusion of hollow outgrowths which contain ciliated chambers; they are ultimately set free, and swim about as semi-transparent capsules, 2–3 mm. in diameter; they throw out gelatinous processes from the body-wall, terminated by fine amœboid pseudopodia; their internal structure is essentially that of the adult. They become fixed and spread out into flat crusts, reproducing the ordinary features of the adult. The author considers that this method of reproduction may be intended in this case to perpetuate the species by mobile germs, at a time when the ordinary sexual method is in abeyance.

Corticium wallichi, Carter, (1) p. 353, pl. xxix. figs. 5–9, re-characterized; from South Sea; in cavities of *Stylaster sanguineus*, Cape of Good Hope, Seychelles, and (2) p. 495, = *Gummina*, or, rather, *Alectona*, Carter, g. n. [*infrà*].

Spirastrella cunctatrix, Schmidt, (1) p. 357. Perhaps = *Chondrilla phyllodes*, Schmidt; now found at Mauritius and S. Australia.

Ceratina and Psammonemata (Carter).

Spongiidæ, (9) p. 593. Family defined as having small, semicircular, ciliated chambers, each provided with a special excretory duct, and surrounded by a very granular connective tissue, whose skeleton consists of a network of solid, concentrically laminated spongin-fibres, containing here and there foreign bodies, but never proper siliceous structures, and devoid of the fibres with "filaments." The genera *Euspongia*, Bronn, *Hippospongia*, g. n., Schultze, *Phyllospongia*, Ehlers, *Carteriospongia*, Wyatt, *Cacospongia*, Schmidt, *Stelospongia*, Schmidt, are assigned to the family.

The skeleton-fibres of *Spongiidæ*, ibid. p. 633, consist of an axial and a

peripheral part, and are formed as a cuticular excretion of certain specially-modified connective tissue-cells, or spongoblasts.

Euspongia, (9) p. 613, characterized; species enumerated. *E. officinalis*, Linn., *l. c.* p. 611, includes also *E. mollissima* and *E. adriatica*, Schmidt, and probably *Spongia agaricina*, Esper; distinguished from *E. zimocca*, the only other Mediterranean species of the genus (*vide infrà*). Six varieties distinguished from the Mediterranean; viz., i., var. *mollissima*, pl. xxxv. figs. 1 & 2, Schmidt, = the fine Levantine bath-sponge of commerce; ii., *lamella*, pl. xxxvii. fig. 1, perhaps = *S. agaricina*, Esper; iii., *adriatica*, pl. xxxv. figs. 1–4, pl. xxxvi. fig. 3, pl. xxxvii. figs. 1 & 8, pl. xxxviii.; iv., *irregularis*, pl. xxxv. fig. 5; v., *exigua*, pl. xxxiv. figs. 5–7, pl. xxxv. figs. 6–8, pl. xxxvi. figs. 3, 8–11, pl. xxxvii. figs. 9 & 10; vi., *tubulosa*, pl. xxxiv. fig. 8, pl. xxxvi. figs. 2, 4, & 12. The last three varieties are perhaps included in *E. nitens*, Schm.; they have an irregular form, and oscula irregularly distributed on the surface. The varieties range in colour from black to yellowish-grey; the positions and diameters of the oscula vary. Water-canal system described, p. 623. The arrangement of ciliated chambers and their ducts agrees in the main with those of *Aplysina*. Histology, p. 625. Of the three distinct body layers, the outer cellular layer is generally discernible, but in some cases a superficial cuticle overlies it; the connective-tissue layer contains contractile fibre-cells. Ciliated chambers have the shape of half or three-quarters of a sphere. The ova are developed in groups of 10–30. Sexes distinct. Some star-shaped cells, with distinct walls, are formed at one stage of the transformation of the mesoderm; in older embryos, the wall becomes thinner, and then resembles the same cells in late stages of *Spongelia* larvæ, with whose ova and segmentation-stages those of *Euspongia* agree entirely. *Aplysilla*, too, seems not to differ essentially in its ciliated larvæ from these genera.

Euspongia equina, Schm., *Spongia gossypina* and *merandriniformis*, Duch. & Mich., (9) p. 614, are all referred to *Hippospongia*, g. n., Schulze.

Hircinia, Nardo, (10) p. 1. *H. typica*, *flaccescens*, *hirsuta*, *hebes*, Schm., p. 11, = *H. variabilis*, Schm., p. 12, pls. i. & iii. fig. 1, pl. iv., as mere varieties, not constant in form, colour, or character of surface. The surface is covered with a fine network, formed by the radiation of about ten broad fibres, which give off secondary fibres, from the point of each superficial prominence, or *conulus*; all the fibres contain foreign particles. The water-canal system agrees with that of *Euspongia* and *Cacospongia*. A pavement epithelium covers, as usual, the outer surface and the interior of the water-canals. The connective-tissue layer shows little that is peculiar. A partially distinct ovarian capsule lined by pavement epithelium occurs, as in other horny Sponges. The primary skeleton-fibres sometimes break up into networks. The secondary fibres are sometimes free from foreign bodies.

Filaments of *Hircinia*, (10) p. 32; their character not definitely determined; form and structure of different kinds described; their chemical composition and position in the Sponge agree better with the theory their foreign origin than with any other.

Sarcotragus spinosulus, Schmidt, (10) p. 26, = *Hircinia*, and di

guished, with *S. fœtidus* and *S. muscarum*, from *H. variabilis*, by the superior diameter of their filaments, by the greater openness of their network, and the inferior firmness and lighter colour of their dermal layer. Balls of spermatozoa have been found with ripe ova in the same specimen.

Sarcotragus fœtidus, (10) p. 30, = *Hircinia*; best distinguished by its finger-shaped conuli. Primary fibres rounded. *S. muscarum*, (10) p. 31, = *Hircinia*. Conuli with broad bases.

Cacospongia mollior, Schmidt, (9) p. 649, pl. xxxiv. fig. 9, pl. xxxv. figs. 11–13, pl. xxxvii. fig. 11. To include *C. carduelis*, Schmidt. The flat and the upright forms differ very greatly in their skeletons. In its soft structure, it agrees with *Euspongia officinalis* on the whole.

Cacospongia scalaris, Schmidt, (9) p. 651, pl. xxxiv. fig. 10, pl. xxxv. fig. 15, pl. xxxvii. figs. 6 & 12. Ova and segmentation-stages agree with those of *Euspongia officinalis*.

Cacospongia cavernosa, Schmidt, (9) p. 653, pl. xxxiv. figs. 11 & 12, pl. xxxv. fig. 17, pl. xxxvii. figs. 7, 13, & 14. Ova and segmentation-stages as in preceding.

Rhaphidonemata (Carter).

Siphonochalina coriacea, (7) p. 373, pl. xxii. figs. 15–18. Food particles found in mesoderm only.

Echinonemata (Carter).

Plectronellina, Sollas, (12) p. 26, new group of family *Ectyonida*, Carter, based on *Plectronella*, g. n.

Plocamia, Schmidt, (13) p. 47, made the type of a new group, *Plocamianina*, Sollas, of *Ectyonida*, Carter.

Dictyocylindrus, Bowerbank, (1) p. 296, nearly allied to *Tricentrium*.

Dictyocylindrus vickersi, Bowerbank, (1) p. 292, pl. xxvii. figs. 5–8, = *Tricentrium*, Ehlers; West Indies.

Plectronella papillosa, Sollas, = *Tricentrium muricatum*, Ehlers, (1) p. 293, pl. xxvii. fig. 13; West African Coast.

Halichondria plumosa, from Kerguelen Island, recorded by Carter, Phil. Tr. clxviii.

The spicules of a Sponge, apparently nearly allied to *Axos*, are described by F. Barnard, Q. J. Micr. Soc. Victoria, i. p. 14, pl. i. figs. 5–8, from the Northern Territory, Australia.

Holorrhaphidota (Carter).

Halichondria panicea, *carnosa*, *sanguinea*, *Isodictya rosea*, *Thalysias subtriangularis*, *Tethya antarctica*, collected at Kerguelen Island during the Transit of Venus Expedition; notes on structure, &c., by H. J. Carter, Phil. Tr. clxviii. pp. 286–288.

Wyvillethomsonia wallichi and *Trichostemma hemisphericum*, Kors Fjord, Norway; Norman, J. of Conch. 1879, ii. p. 13.

Reniera sp. The newly-fixed larvæ have an internal cavity, according to F. C. Noll, Zool. Anz. ii. p. 402. Under increase of temperature they were observed to grow rapidly to a length of 8–9 mm., and they then emitted light in the dark when the glass on which they grew was made to vibrate, *id. tom. cit.* p. 455.

Esperia lorenzii, Schmidt, (1) p. 341, pl. xx. fig. 26. Part of development observed.

Spicules of an unknown Sponge described by H. J. Carter, J. R. Micr. Soc. ii. p. 502, pl. xvii. *a*, fig. 12, as found on a Foraminifer, *Aphrosina informis*, from Atlantic, North of Scotland; they resemble those of *Esperia villosa*.

Rhaphidiotheca marshall-halli, Kent, (2) p. 498, pl. xvii. *a*, figs. 2–4.

Tethya lyncurium, Lieberkühn, (1) p. 626, pls. xxx.–xxxiii. The histology and gemmation of this species is fully described. The buds are extruded from the parent on the ends of the large spicules; they commence to develop in the parent as cellular germs, afterwards forming a true endoderm and ectoderm, and going through regular but immobile embryonic stages. In *op. cit.* xvii. p. 161, the specimens from Trieste are shown by the same writer to be monœcious; he gives an account of the structure, especially of the connective tissue, of these specimens, p. 151, pl. xii. A var. *villosa*, Schmidt MS., is noticed, and one, *lævis*, Schmidt MS., is distinguished as having its dermis divided into plates; (1) p. 647.

Hemiastrellina, Carter, (1) p. 147. New group of *Suberitida*, Carter, based on *Hemiastrella*, g. n.

Eccalonida, Carter, (2) p. 496. New family formed to receive the three boring genera, *Cliona*, *Thoosa*, *Alectona*, and possibly should also contain *Samus*.

Thoosa, Hancock, (1) p. 352, probably based on spicules of a species of *Samus*, Gray.

Vioa johnstoni, Schmidt, (1) p. 149. The two forms to which Schmidt assigns this name appear specifically distinct from each other.

Alcyonium purpureum, Lamarck, (1) p. 149. A Suberitic form, resembling one form of *Vioa johnstoni*, Schmidt.

Cliona from marble. J. A. Ryder, Am. Nat. xiii. p. 279, gives some account of a species from the north-east coast of the United States, and argues on behalf of the manufacture of the canals by the Sponge itself; ova or gemmules were found in it.

Samus anonymus, Gray, (1) p. 350, pl. xxix. figs. 1–4, re-characterized; from West Indies, Australia, South Seas. Occurs in conjunction with *Cliona mucronata*, Sollas.

Tetilla, Schmidt, (11) pp. 468 & 479, re-characterized; budding observed in both male and female. *T. euplocamus*, Schmidt, *l. c.* p. 468, pl. xxvii. fig. 5, exhibits budding; Rio de Janeiro.

Dercitus bucklandi, Bowerbank, (12) pp. 22, pl. vii. Its quadriradiate spicules show, among other varieties, triradiate and quinqueradiate forms.

Lithistidæ (8). Cells distinguished in the surface layer. The linear spicules grow out from the surface of the Sponge, and are cast off after becoming completely developed. Development of spicules observed, but not from so early a stage as the cell-condition; the point and the processes originate independently of the central canal, though this may send out secondary offshoots later. In *Scleritoderma*, the adult spicule can be traced from a linear surface form, which becomes more develop as it sinks deeper. All *Rhizomorina* with 4-axial superficial spicules at

transitional forms, and so are all *Tetracladina* which manifest diminution in the number of spicular axes.

An adult Sponge is neither an individual nor a colony ("Stock"), but an organic mass which becomes differentiated into organs.

Discodermia, (8) p. 22.

Corallistes clavatella, Schmidt, (8) p. 24, pl. iii. figs. 2, 3, 5, = *Discodermia*, from Gulf of Mexico, connects the *Tetracladina* and *Rhizomorina*: var. *nodosa*, l. c. p. 25, pl. iii. fig. 1 *n–o*, distinguished.

Liodermatium ramosum, Schmidt, (8) p. 28, pl. i. fig. 8, = *Siphonidium*, g. n., Sombrero, 240 fath., Morro Light, 212 fath.

Spongilla, (7) p. 375, has no collar-cells in winter; but then and at some other times temporarily contracts into a solid mass. *S. lacustris* and *fluviatilis*, l. c. p. 373; digestion observed to take place in mesoderm.

Spongilla fluviatilis, Rep. E. Kent Soc. xx. pp. 26 & 42, growth observed under microscope on glass cell; origin from ovaries and physiology of the young Sponge given by Fullagar.

Spongilla fluviatilis, Ganin (4). From the account of this work given in Zool. JB. Naples, i. p. 211, the embryonal and later development of *Spongilla fluviatilis* is described as commencing with a total and equal segmentation, forming solid morula, which acquires an internal cavity whose lining cells become the endoderm, while the other cells of the primitive central layer form the mesoderm, the primitive outer layer forming the ciliated ectoderm. The mesoderm-cells aggregate especially at the hinder pole and give the gastric cavity its hemispherical shape; the mesoderm early developes spicula; a space between the ectoderm and mesoderm appears to the author to represent a body cavity. The larva becomes fixed by its posterior endoderm-cells, and becomes flattened out. The mesoderm-cells almost fill up the gastric cavity by their disproportionate growth; the cavity however persists and forms the ciliated chambers by evagination. The mouth opening is formed by a cleft made through the mesoderm and endoderm on the upper wall of the gastric cavity, and it thus opens only into the body cavity, not to the exterior, from which it is shut off by the ectoderm. Pores are then formed between the ectodermal cells and connect the mouth opening with the exterior; it is thus homologous with a dermal pore. In the adult the ectoderm forms two layers, the mesoderm has differentiated a thin hyaline ground-substance; the endoderm forms a unilaminar epithelium, clothing the surface of the various cavities of the water canals, with the exception of the interior of the body cavity and of the mesodermic septa. From the above facts as to the distribution of the endoderm in *Spongilla*, a Cœlenterate nature is assigned to Sponges.

HEXACTINELLIDA.

Hexactinellidæ, A. K. Zittel, Beiträge zur Systematik der Fossilen Spongien (Stuttgart: 1879), reprinted from JB. f. Mineral. [*cf.* under Fossil SPONGES]. Principles of proper classification set forth; the skeleton spicules are a safer guide than the flesh spicules. Modifications of canal system described: they include a canal system proper and an after-canal system. The author considers that the entire organization of

the Sponge, the structure and thickness of its walls, form and position of the central cavity, the manner of growth in the polyzoic forms, and especially the presence or absence and structure of the rooting apparatus, furnish most important classificatory characters.

Rossella philippinensis, Gray, (6) p. 273.

Labaria hemispharica, Gray, (6) p. 275.

Semperella schultzii, Semper, (6) p. 276, pl. xxiv. & xxv. figs. 18 & 19. Development of its spined spicules traced.

Sclerothamnus, (6) p. 273. Marshall, in a note, modifies his original description of its canal system ; it is allied to *Periphragella*. The Synauloid group of Hexactinellids must be abandoned.

Dactylocalyx pumiceus, Stutchbury, J. R. Micr. Soc. ii. p. 123, pls. vii. & viii. figs. 1–3, 6 & 7. Redescribed by Sollas ; the dermis contains long fine acerate spicules, sometimes terminally clavate ; alterations in skeleton take place with age, *e.g.*, the hollow nodes are filled up. A new variety, var. *stutchburyi*, Sollas, described, *l. c.* p. 131, pls. v. vi. & viii. figs. 4 & 5.

Myliusia, (6) p. 268. More nearly related to *Cœloptychium* than to any recent Sponge, though the siliceous material is more developed on the exterior in the latter than in the former, and it is monozoic, not polyzoic ; the divergence between the spicules of the two may be got over by Prof. Zittel's admission of the probable foreign origin of many of those assigned by him to *Cœloptychium*.

Aulodictyon [*-um*], (6) p. 272, defined.

CALCAREA.

Ascetta, (7) pp. 367 & 371, has no gastrula stage, the mesoderm and endoderm are formed from an internal parenchymatous mass ; it must be considered as distinct from *Ascandra* on embryological grounds ; the latter with *Sycandra* and *Leucandra* represent another type.

Ascetta blanca, (7) p. 358, pls. xxii. figs. 9–14, xxiii. figs. 16–21, has an external pavement-epithelium ; the mesoderm cells are pale, with a few fine granules. Observations on development : the mesoderm- and endoderm- cells are derived from the ciliated ectoderm-cells ; the endoderm does not form a continuous lining to the canal system ; food particles enter mesoderm- as well as endoderm- cells.

Ascetta primordialis, (7) pp. 358 & 373, pls. xxii. figs. 3–5, 7 & 8, xxiii. figs. 1–15, has external pavement epithelium. Observations on development : neither early nor late does any clear distinction between the mesoderm- and endoderm- cells appear.

Leucosolenia botryoides. G. Vasseur, Arch. Z. expér. viii. p. 1, figs. 1 & 2, treating of the asexual reproduction of this Sponge, shows that closed buds are produced on the parent, covered with long, projecting acerate spicules about six times as long as those of the parent ; they become detached, and adhere to *Algæ* by their closed ends.

Ute capillosa, Schmidt, described by H. J. Carter, Phil. Tr. clxviii. p. 288, Kerguelen Island.

Sycandra, (7) p. 367, pl. xxi. figs. 5, 6, & 9–16. Invagination observed in the embryo ; fusion of ectoderm-cells into syncytium is only apparent[1]

some of the spicules at any rate are found at an early stage outside the proplasm of the cells, some within cells.

Sycandra raphanus. (7) pl. xxi. figs. 7 & 8; embryonic stages described. Also stated by Vosmaer, Tijdsch. Nederl. Dierk. Ver. iv. p. cix., to derive its ova from the mesoderm. All stages are seen, from the spindle-shaped cell to the ripe ovum; the segmentation proceeds unsymmetrically after the third division; the embryo is at first cylindrical, open at both ends; it becomes closed, and after the free stage settles down and is invaginated.

Sycandra sp. ?, (7) pl. xxi. figs. 19 & 20. Embryonic stages figured.

Leucandra aspera, (7) p. 370, pl. xxi. figs. 17 & 18, xxii. fig. 6. Embryonic stages closely resemble those of *Sycandra*.

Wagnerella borealis, Mereschk., is, according to P. Mayer, Zool. Anz. ii. p. 357, no Sponge at all, but a Heliozoan found commonly at Naples. An appearance of budding is imparted by the ascent of the nucleus into the head, and its division while there into eight pieces.

New Genera and Species.

Carnosa.

Chondrilla succiformis, Carter, (1) p. 299, pl. xxvi. figs. 9, 11, & 12, Mauritius.

Ceratina and Psammonemata.

Oligoceras, F. E. Schulze, (10) p. 34. Distinguished from other *Ceratosa* by the slight development of the horny skeleton, which has only occasional horizontal fibres; primary fibres branching, full of foreign bodies; in soft parts agrees with *Cacospongia*. *O. collectrix*, id. *l. c.* p. 34, pls. ii. fig. 6, iii. figs. 5–7, Lesina, Adriatic.

Hippospongia, Schulze, (9) p. 614. Based on *Euspongia equina*, Schmidt. Characterized chiefly by a system of circular meandrine anastomosing canals, 5–10 mm. broad, occupying most of the substance, and by lacking the straight principal fibres at right angles to the surface.

Chalinula fertilis, Keller, (5) p. 318, pls. xviii. xix. & xx. figs. 24 & 25, 27–29, Gulf of Naples. Monozoic or polyzoic; the ectoderm, a layer of flat cells, meets the endoderm at the osculum. Has great contractile powers; besides the oscula, it is perforated by permanent openings, or *dermal ostia*, leading into canals, and by transitory openings, or dermal pores, finer and sieve-like, leading into subdermal spaces; the gastral cavity and afferent canals, except perhaps the subdermal spaces, are clothed by endoderm. The collar-cells agree with those of *Reniera*. Three sets of skeleton-fibres, viz., radial, longitudinal, and circular. Sexes distinct; males thin and slender, females twice or three times their size at the sexual period, when the latter assume a rosy colour. The spermatozoa occur in capsules lined with epithelium; ovarian capsule surrounded by many granular, probably nutritive, cells; segmentation total, but unequal. No cleavage cavity; endoderm-cells imperfectly invaginated, primitive mouth filled by a plug of yelk. Mesoderm formed by the outer of the two cells into which each primitive endoderm cell divides. Spicula first appear in the periphery near the yelk-plug. The females perish

after the birth of the embryos. The hinder pole of the embryo becomes ciliated after birth, and develops a temporary depression, probably representing a primitive mouth ; the embryo settles on its posterior pole, and then applies its side to the object to which it becomes fixed. The stomachal cavity commences in the interior by recedence of the cells, and ultimately breaks its way out, forming an osculum.

Genesis of acerate spicules, each within a mesoderm cell, in this species, (5) p. 328.

Starch cells detected in it, (5) p. 323.

Sabella and *Stephanoscyphus* found living commensally in it, (5) p. 327.

ECHINONEMATA.

Dictyocylindrus laciniatus and *pykii*, Carter, (1) pp. 296 & 297, pl. xxvii. fig. 14, Mauritius.

Trikentrion [*Tricentrium*] *læve*, id. *l. c.* p. 294, pl. xxvii. figs. 9–12, West African Coast.

Plectronella, Sollas, (12) p. 17, *P. papillosa*, id. *l. c.* pls. iv.–vi. Echinonematous, branching ; skeleton spicules acerate, smooth ; flesh spicules undulating ; echinating spicules triradiate, the projecting ray roughened and blunt; marine, habitat ? ; the echinating spicules have branches from the central canal projecting into them.

Latruncula corticata, Carter, (1) p. 298, pl. xxvii. figs. 1–4, said to be from the Red Sea.

Rhaphidistia spectabilis, Carter, (1) p. 300, pl. xxvi. figs. 10, 13 & 14, Mauritius.

Hymerrhaphia spiniglobata, Carter, on *Stylaster sanguineus*, South Sea ; (1) p. 301, pl. xxvi. figs. 15 & 16.

Trachycladus, Carter, (1) p. 343, referred to group *Pluriformia* of fam. *Ectyonida*. *T. lævispirulifer*, id. *l. c.* pl. xxviii. figs. 1–5. Of shrub-like external form; skeleton spicules smooth, acerate; flesh spicules minute, smooth, vermicular, and minute, smooth, bacillar. South Australia.

Plocamia plena, Sollas, (13) p. 44, pls. vi. & vii. Sarcode bright yellow when dry. West Africa, Lat. 15° S. No horny matter present.

HOLORRHAPHIDOTA.

Amorphina stellifera, Carter, (1) p. 344, pl. xxix. fig. 10. Has minute stellate flesh-spicules. Coloured pink by an *Alga* resembling *Palmella*. South Australia.

Pharetronema, Sollas, (12) p. 404. Renierid. Allied to the fossil *Pharetrospongia*. *P. zingiberis*, id. *l. c.* pl. xxx. Fibres of internal network composed of smooth acerate spicules; they radiate to exterior, where they meet and arch over to form dermal network, which bears prominent pencils of spicules. Flesh spicules very fine, filiform. Jamaica. Varieties of the acerate spicules, p. 406, exhibit various forms of the point, and also show budding.

Rhaphidotheca affinis, Carter, (2) p. 497, pl. xvii. *a*, figs. 1 & 3. On *Amphihelia oculata*. Atlantic, north of Scotland.

Suberites spinispirulifer, Carter, (1) p. 345, pl. xxviii. figs. 6 & 7, Port Elizabeth, Cape of Good Hope.

S. angulo-spicatus, id. *l. c.* p. 346, pl. xxviii. fig. 8. Spicules undulating acerate. Jamaica.

S. fuliginosus, id. *l. c.* p. 347, pl. xxviii. fig. 9. Skeleton spicules all spined. Colour black.

Tethea maza, (11) p. 472, pl. xxviii., between tide marks, Bay of Rio de Janeiro. Produces immense numbers of buds; they are penetrated by ciliated chambers from the parent. Subcortical cavities formed by splitting of the mesoderm, and therefore comparable to the body cavity of higher animals.

Tethea caudata, Deszo (Schmidt, MS.), (3) p. 628, Mexico; mentioned, and its body-layers described.

Alectona, Carter, (2) p. 494. Based on an excavating variety of *Corticium wallichi*, Carter, here named by the same author *Alectona millari*, and figured, pl. xvii. Found boring in *Amphihelia oculata*, and also partially free. Atlantic, north of Scotland.

Stellettinopsis, Carter, (1) p. 348. *S. corticata*, id. *l. c.* p. 348, pl. xxviii. figs. 10–15, Port Adelaide, Australia; *S. simplex*, id. *l. c.* p. 349, pl. xxviii. figs. 16–18, Torres Straits?. Both have long, smooth, acerate skeleton, and minute stelliform flesh spicules, and either sceptriform or bacillar flesh spicules besides.

Hemiastrella, Carter, (1) p. 146. Spiculation half composed of bodiless stellate spicules; the remainder of linear spicules. *H. typus*, Carter, *l. c.* pl. xxi. fig. 9, Marine; *H. affinis*, id. *l. c.* p. 147, pl. xxi. fig. 10.

Axos flabelliformis, Carter, (1) p. 285, pl. xxvi. figs. 1–4, Australia?. *A. spinipoculum*, id. (1) p. 286, pl. xxv., Port Jackson, Australia; *cf.* id. *op. cit.* (5) iv. p. 106.

Tetilla radiata, Selenka, (11) p. 468, pl. xxvii. figs. 1–4, 6–8, Bay of Rio de Janeiro, 3 fath. Budding observed. It has eight regularly-branching longitudinal water-canals.

LITHISTIDÆ of Gulf of Mexico, Schmidt (8).

(*a*) *Anomocladina.*

Vetulina, p. 19. Based on *V. stalactites*, sp. n., *id. l. c.* pls. i. fig. 1, ii. fig. 9. Distinguished by the centres of the skeleton spicules being enlarged by outgrowths of adjacent spicules, as well as by addition of layers of siliceous matter. Barbadoes, 100 fath.

(*b*) *Tetracladina.*

Tereopsis, p. 20, pl. ii. fig. 10. No species named; connected perhaps with *Terea*, Zitt.; 80–92 fath.

Rimella, p. 21. Based on *R. clava*, sp. n., *id. l. c.* pls. i. fig. 2, ii. figs. 5, 7, & 11. Agrees with *Aulaxinia*, Zittel, in outward form, but wants the distinct superficial layer of that species, and differs from it in the shape of the spicules. Near Havannah, 292 fath.

Collinella, p. 21. Based on *C. inscripta*, sp. n., *l. c.* pls. i. fig. 3, ii. fig. 12. Agrees closely with *Trachysycon*, Zittel. Near Morro Light, 292 fath.

Discodermia amphiaster, p. 23, pl. iii. fig. 4, near Havannah; *D. nucerium*, id. *l. c.* p. 25, pl. i. fig. 4, pl. iii. figs. 1 *a–l*, 6, latitude of Havannah, 120–240 fath.

(c) *Rhizomorina.*

Poritella, p. 27. Based on *P. decidua*, sp. n., *id. l. c.* Has the superficial habit of *Chonella*, Zittel, and agrees in the general characters of its spicules and their connections with *Platychonia*, Zittel. Various localities in Gulf of Mexico, 100–805 fath.

Sulcastrella, p. 27. Based on *S. clausa*, sp. n., *id. l. c.* pls. i. fig. 5, ii. fig. 6, iii. fig. 7. Has the outward appearance of *Astrobolia*, Zittel, but its stellate grooves lead into large oscula. Sand Key, 129 fath.

Amphibleptula, p. 28. Based on *A. madrepora*, sp. n., *id. l. c.* pls. i. fig. 6, iii. fig. 7 *a*. Appears connected with *Pomelia*, Zittel; also resembles *Stichophyma*, Pomel. Barbadoes, 100 fath., near Havannah, 292 fath.

Siphonidium, p. 28. Based on *Liodermatium ramosum*, Sdt.

Scleritoderma, p. 28. Based on *S. packardi*, id. *l. c.* pl. ii. fig. 3, Gulf of Mexico. Provisionally established.

Aciculites, p. 29. Based on *A. higginsi*, id. *l. c.* pl. ii. figs. 1 *m–s*, 4 *a–d*, & 13, latitude of Havannah, 100 fath. Perhaps connected with *Azorica pfeifferæ*.

Gastrophanella, p. 29. Based on *G. implexa*, id. *l. c.* pls. i. fig. 7, iii. fig. 8. Lat. 25° 23′ N., long. 83° 31′ W., 107 fath.; 22° 9′ N. 82° 20′ W., 127 fath. Connected with *Scytalia*, Zittel.

Setidium, p. 30. Based on *S. obtectum*, id. *l. c.* pls. i. fig. 9, ii. fig. 14. Near Havannah, 128–240 fath. Spicules very intimately united, cannot be isolated.

Tremaulidium, p. 31. Based on *T. geminum*, id. *l. c.* pls. ii. figs. 1 *a–l*, 2, iv. figs. 1 & 2. Lat. 25° 33′ N., long. 83° 1′ W., 131 fath.

Collectella, O. Schmidt, Zool. Anz. ii. p. 379. Based on *C. avita*, id. *l. c.*, Lithistid. Contains forked-anchor spicules as well as discoderm discs; the former are developed from quadriradiate spicules, the latter are forms specially modified to suit their position at the surface.

HEXACTINELLIDA.

Hyalocaulus, Marshall & Meyer, (6) p. 264. Pedicillate; skeleton network continuous, meshes roundish, composed of 6-radiate spicules. Openings chiefly confined to upper surface. Free spicules uni-axial, also has spined 6-radiates. *H. simplex*, iid. *l. c.* pl. xxv. figs. 1–5, on *Euplectella*, off Cebu, Philippines.

Myliusia zitteli, Marshall & Meyer, (6) p. 266, pl. xxv. figs. 10–17. Polyzoic. Development of lantern spicules traced; their trabeculæ are formed by the fusion of outgrowing spines. Off Cebu, Philippines.

Aulodictyon [*-um*] *costiferum*, Marshall & Meyer, (6) p. 270. Apparently near *Farrea calida*, Bowerbank. Off Cebu, Philippines. *A. intermedium*, iid. *l. c.* p. 270, pl. xxv. figs. 6–9. Contains long spined uni-axial spicules.

ANATOMY AND PHYSIOLOGY.

F. M. BALFOUR, Q. J. Micr. Soc. xix. p. 103, commenting on the most recent investigations as to the morphology and systematic position of the Sponges, considers that the stage of the larva of *Sycandra* and of many other Sponges, in which one half consists of amœboid granular cells and the other of clear ciliated cells, may be a transitional form between

Protozoa and *Metazoa*, representing a colony of *Protozoa*, one half of the cells being nutritive and the other half locomotor and respiratory forms.

The Sponges are a far lower branch of the *Metazoa* than the *Calenterata*, owing to digestion being effected by them within internal cells as well as by those lining the alimentary canal. Metschnikoff, (7) p. 374.

Thickness of Sponge-fibres as a guide to distinction of species, (9) p. 634, is only useful when applied to the connecting (or horizontal) fibres of washed-out skeletons; the mean and maximum measurements are to be taken, not the minimum.

The tendency of cylindrical spicules is to assume a globular form, (13) p. 50, that of acerates is to branch at the point. Spines of spined acerates of *Plocamia* not penetrated by axial canal; *l. c.* Resistance of certain spicules to action of potash on interior; *l. c.* Composition of residual membrane left by silicious Sponge-spicule, after treatment with acid, is doubtful; *l. c.* p. 51. Heads of axial spicules more generally eroded than their shafts; *l. c.* p. 52.

Great variations observed by Marshall & Meyer, (6) p. 276, in the amount of spiculin contained in siliceous spicules; there is an abundance of it in the long axial spicules of *Hyalonema*, but mere traces in *Euplectella* and *Eurete*.

"Spinispirula," term applied to a form of spicule found in sundry Suberite Pachytragid and Pachastrellid Sponges, (1) pp. 301 & 355; the spinulo-multi-angulated cylindrical form of Bowerbank.

"Sceptrella," (1) p. 358, term applied to the sceptre-like spicules of *Podospongia loveni*, *Latrunculia cratera*, and other Suberitic Sponges; it assumes different forms, and perhaps graduates into the spinispirula.

Sponge spicules generally lose in length as they gain in thickness, and the maximum size varies with different specimens; (1) p. 284.

W. J. Sollas, Ann. N. H. (5) iii. p. 170, while correcting a statement in Ann. N. H. (5) ii. p. 359, about a Calcareous Sponge-spicule, mentions finding large free triradiate calcareous spicules with central canals enlarged by solution. Passage from spiculose horny fibre in Sponge, to a wholly spicular not-horny form is quite gradual, (13) p. 48. Close family relation between the different skeleton spicules of a Sponge, *Plocamia*, (13) p. 48, pl. vii., shown by study of their varieties; the dermal spicules giving origin on the one hand to the axial spicule and on the other to the young form of the acerate, and thence to the adult spined and non-spined acerate spicules.

Variations from the typical form exhibited by four to five per cent. of the triradiate echinating spicules of a species of Sponge, (12) p. 19. They pass through uni-axial and quadriradiate forms. The characters of the central canal, however, show the former really to belong to a biradiate type; and in general indicate in Sponges the true character of the spicule, since it originates in the spicule-cell.

The amœboid character of the sponge cell is strongly insisted on in connection with the nutrition of Sponges, by H. J. Carter, Ann. N. H. (5) iv. p. 375. This may lead even to the retraction of the cilium of a ciliated cell, and its assumption of an amœba-like form. The spongozoon *does* (*l. c.* p. 378) take in food; it also very likely has reproductive functions.

A summary of the literature of the nutrition and reproduction of Sponges is given.

Ciliated epithelium of interior of Sponges, (7) p. 376, is very unstable, and tends to revert to its former mesodermic condition; and the three embryonic body-layers have not the distinct characters which they have in higher forms. The Gastrula stage is wanting in the lower Sponges.

The theory of the connective-tissue character of the mesoderm of Sponges is supported by the development of the *Chalineæ*; (5) p. 322.

Absorption of food always observed to be shared by the mesoderm-cells, sometimes to the exclusion of those of the endoderm, (7) p. 371, as in *Spongilla*, &c.

The division of labour presented by the two kinds of endodermal epithelium in the higher Sponges is a derived, not a primitive, condition, (5) p. 326.

W. C. Macintosh, Rep. Brit. Ass. xlix. p. 373, describes a branching Syllidean Annelid found in the canals of a Hexactinellid Sponge from Cebu.

Intimate association of Sponges and Corals on rocks in the sea; J. R. Micr. Soc. ii. p. 110.

Fossil Sponges, Chief Papers on.

14. Zittel, A. K. Studien über fossile Spongien. III. Abtheilung *Monactinellidæ*, *Tetractinellidæ*, und *Calcispongiæ*. Abh. bayer. Ak. xiii. pt. 2, p. 1, pls. xi. & xii., to which the pages given below refer.

Translated in Ann. N. H. (5) iii. pp. 304 & 364, iv. pp. 61 & 120, and mainly reproduced in JB. f. Mineral. and "Beiträge zur Systematik der Fossilen Spongien,"

——. Beiträge zur Systematik der Fossilen Spongien. Stuttgart: 1879, 10 pls.

A reprint of Zittel's recent papers in JB. f. Mineral., reproducing in the main those originally published in Abh. bayer. Ak. ii. cl. xiii., reported in Zool. Rec. xiv. & xv. and the present volume. It sums up in a most convenient form the author's recent important work, embracing all the groups of the Fossil Sponges. The systematic work on the *Hexactinellidæ* is the same as that given in Zool. Rec. xiv. with the exception of a few unimportant alterations; the plates, four in number, are added from JB. f. Mineral., and should be consulted. See also *antea*, p. 7; for *Lithistidæ*, Zool. Rec. xv.; and for *Monactinellidæ*, *Tetractinellidæ*, *Calcispongidæ*, infrà (14).

Sinzow, —. Ueber Kreideschwämme des Saratowschen Gouvernments. 6 pls. [In Russian.] Denksch. neuruss. naturf. Ges. vi. 1, p. 1.

[Not seen by Recorder.]

H. J. Carter, Ann. N. H. (5) iv. p. 431, records the result of an examination of some Fossil Sponges from the Farringdon Coral Rag and of some other specimens, and confirms Zittel's opinion that *Peronella multidigitata* is a Calcisponge; a species of *Corynella* appears to be a Lithi-

stid; *Pharetrospongia strahani* is probably Renierid, and not Calcareous. A fossil *Chalina*, l. c. p. 437, was found in the Upper Greensand of South Devon.

Cf. also G. Mazzetti and A. Manzoni, in Atti Soc. Tosc. iv. pls. viii. & ix., on the Fossil Sponges of Montese.

W. J. Sollas, Rep. Brit. Ass. xlix. p. 350, is reported as ascribing an original siliceous character to certain calcareous fossil Sponge-remains, and applying the same arguments to the *Radiolaria* of the carboniferous rocks.

Holastrella, g. n., Carter, (1) p. 141. Composed wholly of normally 12-rayed stellate spicules, the rays arranged asymmetrically round the centre of the spicule. *H. conferta*, id. *l. c.* pl. xxi. figs. 1–8. Upper carboniferous limestone near Glasgow; converted into sulphate of barytes.

Hindia, g. n., Duncan, Ann. N. H. (5) iv. p. 91. Body free. Central space occupied by spicules, which form straight radiating and bifurcating canals opening at surface. Spicules calcareous, tripod-shaped, with four rays terminally swollen or fringed. *H. sphæroidalis*, id. *l. c.* pl. ix. figs. 1–6. Lower Helderberg calcareous shale, New Brunswick. Assigned to the Tetracladine *Lithistidæ*, or considered as representing a possible mimetic calcareous group of this order. Spicules traversed in some cases by the parasitic *Palæachlya penetrans*, Duncan, pl. ix. fig. 7.

Glenodictyum carpaticum, Matyasovszky, described as new, from the Carpathian sandstone; Term. füzetek, ii. pp. 264 & 300.

J. Sinzow (*op. cit. suprà*, from the account in Zool. Jahr. Ber. Naples, 1879) describes *Labyrintholites*, g. n., evidently Hexactinellid, with octohedric imperforate crossing-nodes to the fibres. *Polyscyphia* and *Zittelispongia*, Sinzow, gg. nn., also from the chalk (*op. cit.*).

Under *Monactinellidæ*, Zitt. (14), are included the two following new genera:—

Opetionella, Zittel, p. 4, pl. xi. fig. 1; near *Trachya*, Carter. Shape irregular. Consists of a thick layer of closely-packed parallel acerate spicules, from 5–10 mm. long. From the "*Cuvieri*-Pläner," near Salzgitter.

Scolior[*rh*]*aphis*, Zittel, *ibid.* pl. xii. figs. 1 & 2. Shape massive, irregular; consists of a mass of wavy doubly blunt cylindrical spicules with ring-like swellings, mixed with plain slightly pin-headed spicules. Upper chalk.

Cliona, Grant, (14) p. 5. The records of fossil species are doubtfully correct, the author has never found spicules in borings assigned to this genus.

Fam. 3 of Zittel's classification of *Lithistidæ*, Abh. bayer. Ak. ii. Cl. xiii. p. 67, omitted from Zool. Rec. xv. *Spong.* p. 14, is as follows:—

Fam. 3. *Anomocladina*. Skeleton elements consisting of four or more smooth arms meeting at a thickened centre, and forked at their ends; linear spicules also present in great numbers. *Cylindrophyma*, g. n., p. 134, pl. v. fig. 6, Upper Jura, *Melonella*, g. n., p. 134, pl. v. fig. 7, Upper Jura, *Lecanella*, g. n., p. 135, pl. vi. fig. 1, White Jura, *Mastosia*, g. n., p. 136, pl. vi. fig. 2, White Jura.

Under *Tetractinellidæ*, Marshall, defined (14), Siliceous Sponges, with spicules of the pyramidal type, are grouped. They include:—

Tethyopsis,* Zittel, g. n., p. 9, pl. xi. fig. 3. Shape irregular; main part of skeleton consists of very large parallel acerate spicules, radiating from the centre; the surface of a layer of smaller three-forked anchors and still smaller tridentate forks, of linear and quadriradiate forms. Upper Chalk.

Pachastrella primæva described from the Upper Chalk; Zittel, (14) p. 9, pl. xii. fig. 4.

Calcarea. (14) p. 11, Zittel believes he has proved the existence of these in the fossil state; three forms assigned by him to the group belong to a new division, *Pharetrones*, distinct from the *Leucones*, *Sycones*, and *Ascones* of Hæckel; they have chiefly uni-axial spicules, arranged parallel to each other in fibrous tracts; form of sponge various; canal system either that of *Leucones* or *Ascones*, or consisting of a series of concentric cavities surrounding the cloaca; surface formed either by main skeleton or by a special dermal skeleton agreeing with the epitheca of corals. Tables of distribution are given. They are solely fossil, and have not been found in the perfect state later than the chalk. To the group are assigned *Eudea*, Lamouroux, *Colospongia*, Laube, *Verticillites*, Defr., *Celyphia*, Pomel, *Elasmocœlia*, Römer, *Myrmecium*, Goldfuss, *Limnorea*, Lamouroux, *Stellispongia*, D'Orb., *Oculispongia*, From., *Crispispongia*, Quenstedt, *Elasmostoma*, From., *Diplostoma*, From., *Pharetrospongia*, Sollas, and *Liospongia*, D'Orb. (the latter perhaps allied to *Millepora*, according to a note in JB. f. Mineral.). Most of these are recharacterized by reference to their microscopic structure.

Zittel (14) describes the following new genera of his *Pharetrones*:—*Himatella*, p. 29, Trias; *Peronella*, p. 30, pl. xii. figs. 3 & 4, Trias to Upper Chalk; *Conocœlia*, Lower Chalk, and *Eusiphonella*, Upper Jura, p. 34; *Corynella*, p. 35, pl. xii. figs. 2, 5, & 6, Trias to Upper Chalk; *Sestrostomella*, p. 40, Trias to Chalk; *Blastinia*, Upper Jura, and *Synopella*, Chalk, p. 42; *Pachytilodia*, p. 46, "Tourtia" of Essen.

Protosycon, g. n., *id. l. c.* p. 48, pl. xii. fig. 7, White Jura (*Sycones*, Hæckel).

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* Name already applied to a recent Sponge, *T. columnifer*, by Stewart, Q. J. Micr. Sci. (n.s.) x. p. 181.—S. O. R.

PROTOZOA.

BY

STUART O. RIDLEY, B.A., F.L.S., &c.

THE GENERAL SUBJECT.

NICHOLSON, H. A. Manual of Palæontology for the use of Students. 2nd edn.; 2 vols. Edinburgh and London: 1879.

Classifies *Protozoa* as:—Class I., GREGARINIDÆ. Class II., RHIZOPODA. Order 1, *Monera*; 2, *Amœbea*; 3, *Foraminifera*; 4, *Radiolaria*; 5, *Spongida*. Class III., INFUSORIA.

Unicellular animals, *infrà* (3) p. 572, considered in relation to the cell-theory; they differ from mere histological cells, in constituting physiological as well as anatomical units.

GRUBER, A. Kleine Beiträge zur Kenntniss der Protozoen. Ber. Ges. Frieb. vii. p. 533 [cited from Zool. Jahr. Bericht, Naples, 1879]. [*Calcaria*, g. n.]

GRASSI, B. Dei Protozoi parassiti e specialmente quelle che sono nell' uomo. Gazz. Med. Ital.-Lomb. 1879, No. 45.

[Not seen by Recorder.]

NORSA, G. Intorno ai Protisti de Mantovano. Bollet. Scientif. i. p. 13.

LEUCKART, R. Die Parasiten des Menschen und die von ihnen herrührenden den Krankheiten. 2nd edn. ii. Leipzig and Heidelberg: 1879.

Systematic position of the *Volvocineæ* and limits of the animal and vegetable kingdoms: E. Maupas, C. R. lxxxviii. p. 1274, discusses these questions, combating Stein's arrangement of the *Volvocineæ* in the animal kingdom, for true vegetable cells may possess vacuole contractiles, and zoospores of *Algæ* may have nuclei.

INFUSORIA.

CHIEF PUBLICATIONS:—

1. ENTZ, G. Ueber einige Infusorien des Salzteiches zu Szamosfalva. Term. füzetek, ii. p. 219, pls. viii.-x. (in Hungarian), iii. p. 33 (German version).

2. Gruber, A. Neue Infusorien. Z. wiss. Zool. xxxiii. p. 439, pls. xxv. & xxvi. Reported in J. R. Micr. Soc. iii. p. 282, pls. vii. & viii.; *cf.* a short notice in Zool. Anz. ii. p. 518.

3. Robin, C. Mémoire sur la Structure et la Reproduction de quelques Infusoires tentaculés, suceurs et flagellés. J. de l'Anat. Phys. xv. p. 529, pls. xxxix.–xliii.

For the systematic part of this paper, see a full abstract, with many of the chief figures reproduced, in J. R. Micr. Soc. iii. p. 814, pls. xviii. & xix.

P. Hallez, in Travaux de l' Institut zoologique de Lille, fasc. ii. p. 84, enumerates as parasites of the freshwater Planarians, *Cyclochæta spongillæ*, Jackson, pl. v. figs. 22 & 23, ectoparasitic; an unnamed ciliated Infusorian, pl. v. figs. 20 & 21, from gastric tubes of *Planaria fusca*; *Opalina polymorpha*, in digestive canal of *Planaria fusca* and *Dendrocœlum lacteum*.

L. Maggi, Intorno alle Cothurnie parassiti delle branchie dei Gamberi nostrali. Boll. scientific. i. No. 3, p. 33; and *id.*, Sopra una varieta della *Cothurnia pyxidiformis*, D'Uked, *op. cit.* i. No. 5, p. 69. Cited from Zool. Jahr. Bericht, Naples, 1879.

Faunæ.

Some Australian *Infusoria* are described, but not fully named, by C. M. Maplestone, Q. J. Micr. Soc. Victoria, i. p. 15, pl. ii.

Infusorian fauna of Lake of Geneva and its relations, described by G. du Plessis & F. A. Forel, Bull. Soc. Vaud. (2) xvi. pp. 160, 325, viz.:— *Stentor cæruleus*, common, occurs also in the Lakes of Joux and Neufchatel; *S. polymorphus*, common in Lake of Geneva; *S. roeseli*, common in parts of the lake; *Spirostomum ambiguum*; *Bursaria truncatella*.

Eleven species of *Infusoria* are enumerated, (1) iii. p. 33, as new to the saltpans of Szamosfalva, in Hungary; the aspect of this Infusorian fauna is rather marine than freshwater.

Genera, Species, &c., referred to.

Vorticella nebulifera, Midl. Naturalist, ii. p. 86, pl. i. figs. 1 & 2; *Carchesium polypinum*, l. c. p. 87, pl. i. figs. 3–5; *Epistylis leucoa*, l. c. p. 89, pl. i. figs. 6 & 7; *Zoothamnium arbuscula*, l. c. p. 109, pl. ii.; described by H. E. Forrest.

Epistylis nutans, (2) p. 461, pl. xxvi. fig. 28.

Lembus verminus, O. F. Müller, Bull. Soc. Belg. Micr. iv. p. 58, at Ostend.

Oxytricha gibba, figured, showing intra-nuclear fibrillar network, by L. Maggi, Atti Soc. Ital. xxi. p. 327, figs. 1–3, to illustrate the relation of histological cells to unicellular animals.

Chætospira muelleri and *C. mucicola*, Lachmann, (1) ii. p. 242, iii. p. 56, are but one species, to be referred to *Stichotricha*, as *S. muelleri*, pt. x. figs. 1–3.

Stichotricha aculeata, Wrzesniowski, (2) p. 448, probably = *S. cornuta*, Claparède & Lachmann.

Chatospira, Lachmann, and *Stichochæta*, Clap. & Lachm., (2) p. 450, = *Stichotricha*, Perty.

Lacrymaria lagenula, Clap. & Lach., (1) ii. p. 233, iii. p. 47, pl. ix. figs. 1–4; in saltpan, Hungary.

Placus striatus, Cohn? (1) ii. p. 233, iii. pp. 46 & 70, pl. viii. fig. 7; in saltpan, Hungary. Probably is a young form of *Acineta tuberosa*, provided with a mouth.

Litonotus fasciola, Ehrenberg, (1) ii. p. 226, iii. p. 39, pl. viii. figs. 3–6. The two nuclei are often, probably always, connected by a filament. Conjugation observed. In saltpan, Hungary.

Enchelys, (1) iii. p. 50, re-characterized.

Enchelys gigas, Stein. (1) iii. p. 50, = *E. spathula*, Müller.

Enchelys nebulosa, Ehrb., (1) ii. p. 236, iii. p. 50; in saltpan, Hungary.

Opalina ranarum, described from *Discoglossus pictus*, by Everts, Tijdschr. Ned. Dierk. Ver. iv. p. 95.

A *Nyclotherus*, 3 *Balantidia*, and 4 *Opalinæ* enumerated from intestines of 3 Batrachians, by E. Maupas, C. R. lxxxviii. p. 921.

Ophryodendrum, (3) p. 539. Its nearest ally is *Acinetopsis*, g. n., *vide infrà*.

Ophryodendrum abietinum, Claparède & Lachmann, (3) p. 530, figs. 1–7; most often found on *Sertularia*. Structure and physiology described. No trichocysts observed. The tentacle is composed of a ribbon-like axis and a loose integument; the cirri are of a homogeneous hyaline substance; neither they nor the tentacle transmit any food particles through their substance. The worm-like parasite observed on it by Wright is not a *Gregarina*.

Podophrya gemmipara, R. Hertwig, = *P. lyngbii*, Clap. & Lachm., (3) p. 542, pl. xl. figs. 14–30. Development takes place in two ways, as observed by Hertwig: when by externally-produced ciliated buds, these buds discontinue their free condition, lose their cilia, become applied to some surface by the lower part of the body, first develop suckers on the upper surface, and then a pedicel at the opposite part; non-ciliated buds are also developed externally among the suckers of the parent, and assume its shape before being cast off.

Podophrya lyngbii, Ehrb., Bull. Ac. Belg. (2) xlv. p. 247, pl. iii.

Podophrya conipes, Mereschkowsky?, in cavities of eaten-out *Salpæ* mentioned by Haller, Z. wiss. Zool. xxxiii. p. 395.

Acineta: relations to *Podophrya*, &c.; (3) p. 561.

Acineta tuberosa, Ehrenberg, (1) ii. p. 246, iii. p. 60, pl. x. figs. 4–13. Different tentacles may be simultaneously employed in sucking various prey. Solid particles may be taken into the body through tentacles, which in this process contract to a mere wart. Development described; two distinct forms of embryos occur, one wholly ciliated, the other with four or five bands of cilia. Probably many of the *Enchelynæ* and *Trachelinæ* are merely stages in the development of *Acinetæ*.

Acineta tuberosa, Ehrb., Bull. Ac. Belg. (2) xlv. p. 247, pl. iii.

Acineta tuberosa, (3) p. 558, figs. 11–13; *A. patula*, l. c. p. 559, figs. 9 & 10; *Acineta* sp. ?, *l. c.* p. 560.

New Genera and Species.

PERITRICHA.

Tintinnus semiciliatus, Sterki, Z. wiss. Zool. xxxii. p. 460, pl. xxviii. figs. 5–9, Schleitheim, Switzerland. A tongue-like organ is seen to move in different directions in its mouth. The hinder end has no cilia. The oral cilia are flattened and membranous. *Cf.* also translation of the paper, Ann. N. H. (5) iv. p. 290.

Cothurnia socialis, Gruber, (2) p. 457, pl. xxvi. figs. 23–27, in sea-water from Frankfort. In colonies, forming networks. An operculum springs from the peristome. *C. operculata*, id. *l. c.* p. 432, pl. xxvi. figs. 29–33, sea-water from Frankfort. An operculum is attached to the tube.

Cothurnia corrugata, Davis, J. R. Micr. Soc. ii. p. 653, pl. xx., Brighton Aquarium. The upper end bears two forked setæ. It is sensitive to light.

Trichodina scorpænæ, (3) p. 561, figs. 31–36. On the branchiæ of various species of fish of the genera *Scorpæna* and *Trigla*, on the French coast. Toothed basal wheel described.

HYPOTRICHA.

Stichotricha socialis, Gruber, (2) p. 440, pl. xxv., mud from Vienna. Forms a dichotomously branching tube, and is readily induced to abandon it and form a fresh one. The material of the tube always remains slightly viscous. There is a row of very fine cilia within the peristome.

Sparotricha, Entz, (1) ii. p. 239, iii. p. 53. Differs from *Stichotricha* in having the peristomial cilia arranged as a continuous banner-like series, in the irregularity of arrangement of the other cilia, and in not rapidly changing its form; from *Uroleptus*, chiefly in the absence of the frontal hooks. *S. vexillifer*, Entz, (1) pl. ix. figs. 10 & 11, in saltpan, Hungary.

Ervilia salina, Entz, (1) ii. p. 237, iii. p. 52, pl. ix. figs. 12–14.

Oxytricha tubicola, (2) p. 450, pl. xxvi. figs. 11 & 12, mud from Vienna. Inhabits short tubes.

HOLOTRICHA.

Maryna, Gruber, (2) p. 451. *M. socialis*, Gruber, *l. c.* pl. xxvi. figs. 13–17, mud from Vienna. Body cup-shaped, cylindrical, one side cleft longitudinally; from the middle rises a funnel-shaped mass, cleft in the same direction as the body-mass. The latter is fringed with fine cilia, the central funnel with long bristles. Forms branching tubes, undergoes fission and encystation.

Tillina, id. *l. c.* p. 454. *T. magna*, id. *l. c.* pl xxvi. figs. 18–22, mud from Vienna. Length, $\frac{1}{2}$-mm. Bean-shaped, with strong ventral concavity, containing the mouth-opening; a posterior process contains the contractile vacuole; œsophagus ciliated, with two flexures. Dichotomous fission results in formation of four individuals.

Litonotus grandis, Entz, (1) ii. p. 220, iii. p. 34, pl. viii. figs. 1 & 2, in saltpans, Hungary. Its contractile powers reside in the transparent part of the protoplasm.

Opalina discoglossi, Everts, Tijdschr. Nederl. Dierk. Ver. iv. p. 93,

pl. iv., in alimentary canal of *Discoglossus pictus*, Naples. Development described.

Haptophrya gigantea, Maupas, C. R. lxxxviii. p. 921. Intestine of *Bufo pantherinus*, *Discoglossus pictus*, and *Rana esculenta*. Body traversed by a contractile canal. Transverse fission takes place, with temporary union between the segments.

SUCTORIA.

Acinetopsis, Robin, (3) p. 537, based on *A. rara*, sp. n., *id. l. c.* pl. xl. fig. 8. Distinguished from *Acineta* by absence of suckers and presence of a long and very mobile tentacle on the upper side of the body. Cf. *Ophryodendrum*. On *Sertularia*, at Concarneau.

Podophrya crustaceorum, Haller, Z. wiss. Zool. xxxiii. p. 395, pl. xxiii. fig. 40, on *Crustacea* of Italian seas.

ANATOMY AND PHYSIOLOGY.

Conditions of life and method of investigating cave-*Infusoria* given by G. JOSEPH, Zool. Anz. ii. p. 114.

Nucleoli discovered in *Stentor cæruleus*, *Condylostoma patens*, *Spirostomum ambiguum*, E. MAUPAS, C. R. lxxxix. p. 251, note, in numbers proportionate to that of the divisions of the nucleus. They occur also in most *Vorticellina* examined. Multiplicity of nuclei observed in *Enchelyodon*, *Enchelys*, *Uroleptus*, *Oxytricha*; l. c. p. 252.

E. SERRANO FATIGATI, in a note on the influences of the different colours on the development and respiration of the *Infusoria*, C. R. lxxxix. p. 959, states that violet light quickens, and green retards, the development of internal organs; violet light causes small masses of them to become scattered quicker than other lights; carbonic acid is produced most abundantly under violet, least so under green, light. Respiration is more active in violet, but less in green, than in white light.

Cf. also DODEL-PORT, on fertilization of Seaweeds by *Infusoria*. Kosmos (Leipzig) iii. p. 182. [Not seen by Recorder.]

RHIZOPODA.

CHIEF PUBLICATIONS:—

4. BRADY, H. B. Notes on some of the Reticularian *Rhizopoda* of the 'Challenger' Expedition. Q. J. Micr. Sci. (n.s.) xix. pp. 20 & 261, pls. iii.–v., viii.

5. CARTER, H. J. Notes on *Foraminifera*. Ann. N. H. (5) iii. p. 407.

6. HÆCKEL, E. Ueber die Phæodarien, eine neue Gruppe kieselschaligen marinen Rhizopoden. SB. Ges. Jena, 1879, p. 151.

7. HERTWIG, R. Der Organismus der Radiolarien. Denk. Ges. Med Naturw. Jena, ii. p. 129, 10 pls. *Cf.* also SB. Ges. Jena, 1878.

8. LEIDY, J. Freshwater Rhizopods of North America. U. S. Geol. Survey of the Territories, xii. p. 1, 47 pls.

Some of the synonymic notes were noticed in Zool. Rec. xv. from a short paper.

Not seen by Recorder :—

Siddall, J. D., & Brady, H. B. Catalogue of Recent British *Foraminifera*. 1879.

Berthelin, —. Liste des Foraminifères recueillis dans la Baie de Bourgneux et à Pornichet. Nantes : 1879.

Cattaneo, G. Intorno ai Rizopodi. Boll. scientific. i. pp. 8, 25, & 50.

Sars, G. O. Indberetninger till det Department for det Indre an de af ham i Aarene 1874–77 anstillede Undersögelser vedkommende Saltvands-fiskerierne. Christiania : 1878.

(*Foraminifera* of sea-bottom south of Iceland, &c.)

Faunæ.

Rhizopods of North America, (8) : — The districts examined by Leidy personally include parts of Pennsylvania, New Jersey, Connecticut, Rhode Island, Wyoming, and Partridge Island in the Bay of Fundy. Hints are given, p. 8, on habitats and methods of collecting and examining freshwater Rhizopods, with full and careful definitions of the orders, sub-orders, genera, and species discussed, and exhaustive synonymic details—too long to be inserted here as a rule—by which a great number of authors' names are reduced to synonymic rank. A very full bibliography, with a synonymic list of all described species is added. List of species observed to occur together in certain localities, varying from 9 to 38 in the different cases, are given.

The study of the structure of *Radiolaria* by Hertwig (7), was made on the Mediterranean species obtained at Messina; 10 new species are described, and a large number of those already known are noticed and figured; but the work is essentially anatomical, not zoological. [See *infrà* for the details.]

A. M. Norman gives an account of the *Foraminifera* of the sea-bottom at Oster Fjord near Bergen, Norway, in J. of Conch. 1879, ii. p. 10, as differing from British and usual North Atlantic soundings, in consisting chiefly of *Bulimina* and its allies.

List of the 3 *Rhizopoda* found at the bottom of the Lake of Geneva given, Bull. Soc. Vaud. (2) xvi. p. 325, by F. A. Forel; remarks on the fauna, *tom. cit.* p. 166, by G. du Plessis.

L. Maggi, Atti Soc. Ital. xxi. p. 317, gives a catalogue of the Rhizopods of Lombardy, some of which are described.

A. Agassiz in report on American dredgings in the Caribbean Sea, reprinted in Pop. Sci. Rev. (n.s.) iii. p. 352, mentions large blocks of recently formed white chalk mainly composed of *Globigerina* and *Rotalina*, also that many arenaceous forms were taken.

Fauna of Lake of Geneva, *vide infrà*, among Genera and Species.

Classification.

R. Hertwig, (7), classifies the *Rhizopoda* thus :—

I. Moneres. 1. *Gymnomoneres.* 2. *Lepomoneres.*

II. Amœbina. 1. *Gymnamœbæ.* 2. *Lepamœbæ.*

III. Thalamophora (Rhizopods with one or more nuclei and a chitinous monaxial shell, generally calcareous and always provided with 1–2 openings for the passage of pseudopodia).

1. *Monothalamia* (shell 1-chambered, not calcareous). (A) *Amphistomata*, (B) *Monostomata.*
2. *Polythalamia* (shell calcareous, &c.). (A) *Imperforata*, (B) *Perforato* seu *Foraminifera.*

IV. Heliozoa. 1. *Aphrothoraca* seu *Actinophryidæ.*
2. *Chalarothoraca* seu *Acanthocystidæ.*
3. *Desmothoraca* seu *Clathrulinidæ.*

V. Radiolaria. 1. *Thalassicollœ.* 2. *Sphærozoœ.* 3. *Tripyleæ.* 4. *Peripyleæ.* 5. *Monopyleæ.* 6. *Acanthometreæ.*

He adds two so-called supplementary tables, viz. :—

III. *Thalamophora.*
1. *Imperforata.* (A) *Amphistomata*, (B) *Monostomata.*
2. *Perforata* seu *Foraminifera.*

IV. *Radiolaria.*
1. *Heliozoa.* Radiolaria without central capsule.
2. *Cytophora.* Radiolaria with central capsule.

Rhizopoda divided by Leidy, (8) p. 7, into the orders, 1. *Protoplasta* ; 2. *Heliozoa* ; 3. *Radiolaria* ; 4. *Foraminifera* ; 5. *Monera.* The order *Protoplasta* is divided into the suborders (i.) *Lobosa* (*Amœba*, &c.) and (ii.) *Filosa* (*Pamphagus*, &c.)

Genera, Species, &c., referred to.

Radiolaria.

Acanthometridæ, (7) p. 134. None of the spines lie in the median plane, but all form angles of 45° with it. Certain forms stated by Häckel to be siliceous, prove to be entirely soluble in hydrochloric acid. The so-called cells of the capsule of Joh. Müller & Häckel, are nuclei. The yellow pigment bodies are cells. A protoplasmic network occupies the innermost sarcode of the extracapsular portion in all species. The gelatinous cilia are not of the nature of pseudopodia. Development, p. 147 ; the changes of the nucleus are interesting.

Acanthophractidæ, (7) p. 153. Nearly allied to *Acanthometridæ*, the skeleton is in all cases soluble in hydrochloric acid.

Sphærozoidæ, (7) p. 157. Contains all the colonial *Radiolaria.* Reproduce by swarm-spores ; central capsule has one or a few small nuclei. In *Collozoum*, macro- and micro- spores are distinguishable.

Collidæ, (7) p. 160.

Sphæridea, (7) p. 167. Includes the *Ethmosphæridæ*, *Ommatidæ*,

and *Spongosphæridæ*; they agree closely in the characters of the soft parts; the distinction into *Ectolithia* and *Entolithia* is often one of age, not of species. Some forms, including *Tetrapyle*, Müller, and its allies, are distinguished as Fam. *Dysphæridæ*, as having undergone in their skeleton considerable modifications from the spherical type as exhibited in other *Sphæridea*; their inner shell lies outside the nucleus.

Discidæ, (7) p. 185. All have, typically, a spiral structure. A sarcodic flagellum occurs in all observed *Spongurida* except *Spongurus cylindricus*.

Acanthodesmidæ, (7) p. 196. The *Zygocyrtidæ* of Häckel are included among *Plagiacanthæ*, and *Dictyochæ* excluded from them; some species of *Acanthodesmia* are left doubtful as to position. Häckel's recent views as to their agreement in the possession of an annulate type of skeleton are confirmed. The membrane of the central capsule bears small rod-like bodies at the basal pole; the central capsule contains a single capsule, but no round transparent vesicles.

Plagiacanthidæ, (7) p. 200. Formed from the *Acanthodesmidæ* to contain *Plagiacantha*.

Cyrtidæ, (7) p. 202. Generally but one nucleus.

Pansolenia, Häckel, renamed *Tripyleæ*, (7) p. 215. The family contains *Aulacantha*, *Aulosphæra*, *Cœlodendrum*, all of which have three openings in the central capsule; a brownish mass covers one side of the capsule in perhaps all species; in many instances two central capsules have been observed, in others two internal vesicles; the membrane of the capsule is double; in some cases an intra-nuclear network of fibrils was found.

Phæodaria, Häckel, (6). New group of marine *Radiolaria*, defined as: Unicellular *Rhizopoda*, the central capsule containing a large nucleus; cell membrane double, perforated; in the extra-capsular sarcode lies excentrically a peculiar aggregation of dark pigment granules, called a *Phæodium*, and enveloped in a thick gelatinous envelope traversed by the pseudopodia. A strongly developed extra-capsular skeleton of various and often complicated form is generally present, usually sending out hollow radii. The group is divided as follows:—

Order I. PHÆOCYSTIA. Siliceous skeleton absent, or consisting of hollow spicules outside the capsule, scattered or regularly arranged.

Fam. 1. *Phæodinidæ*. No siliceous skeleton. Genera, *Phæodina*, *Phæocolla*.

Fam. 2. *Cannor*[*r*]*haphidæ*; genera, *Cannor*[*r*]*haphis*, *Thalassoplancta*, *Dictyocha*.

Fam. 3. *Aulacanthidæ*; genera, *Aulacantha*, *Aulancora*, *Aulographium*.

Order II. PHÆOGROMIA. Skeleton consisting of a single reticulate shell with one or more chief openings; sometimes with hollow processes as well.

Fam. 4. *Challengeri*[*i*]*dæ*; genera, *Challengeria*, *Tuscarora*[!], *Gazelletta*, *Porcupinea*, *Entocannula*, *Lithogromia*.

Fam. 5. *Castanellidæ*; genera, *Castanella*, *Castanidium*, &c.

Fam. 6. *Circoporidæ*; genera, *Circoporus*, *Porostephanus*, &c.

Order III. PHÆOSPHÆRIA. Skeleton composed of numerous hollow tubes, arranged so as to form a large reticulate shell.

Fam. 7. *Aulosphæridæ*; genera, *Aulosphæra*, *Aulodictyum*, *Auloplegma*.

Fam. 8. *Cannosphæridæ*; genera, *Cannacantha*, *Cannosphæra*, *Cœlacantha*.

Order IV. PHÆOCONCHIA. Skeleton composed of two reticulate valves, often beset with simple or compound tubes.

Fam. 9. *Conchari[i]dæ*; genera, *Conchariun*, &c.

Fam. 10. *Cœlodendri[i]dæ*; genera, *Cœlodendrium*, &c.

This classification is derived to a great extent from the results of the 'Challenger' Expedition, which has furnished immense numbers of new forms, chiefly from the Pacific, said to amount to upwards of 2000 species.

Acanthometra elastica, (7) pl. i. fig. 2, *serrata*, l. c. pl. i. fig. 7, pl. iii. fig. 10, *cuspidata*, l. c. pl. ii. fig. 5, *claparedii*, l. c. p. 151, pl. i. figs. 5 & 10, pl. ii. fig. 14.

Acanthochiasma rubescens, (7) pp. 136, 138, & 146, pl. i. fig. 1, pl. ii. fig. 7, no distinct central capsule, the contractile fibres are replaced by a contractile membrane, *krohni*, l. c. pl. ii. fig. 6.

Acanthostaurus purpurescens, (7) p. 151, pl. iii. figs. 6, 7, 13, & 15.

Amphilonche belonoides, (7) pl. i. fig. 3, pl. ii. fig. 2.

Dorataspis cruciferа, (7) pl. i. fig. 6.

Acanthocystis chætophora, (8) p. 264, pl. xliii. figs. 1–6.

Acanthocystis sp. ?, (8) p. 268, pl. xliii. figs. 7–13; another sp. ?, *l. c.* p. 270, pl. xliii. figs. 14–16: both from N. America.

Hyalolampe fenestrata, (8) p. 271, pl. xlv. fig. 9.

Clathrulina elegans, (8) p. 273, pl. xliv. Developmental stages described.

Diploconus fasces, (7) p. 156, pl. ii. fig. 3.

Xiphacantha serrata, (7) p. 130, pl. ii. fig. 4. Has a single nucleus.

Thalassicola sanguinolenta, (7) p. 165, pl. iii. fig. 1; *pelagica*, l. c. p. 163, pl. iii. fig. 4; *nucleata*, l. c. p. 162.

Thalassolampe primordialis, (7) p. 160, pl. iii. fig. 5; *margarodes*, l. c. p. 162.

Collozoum inerme, (7) pl. iii. fig. 12.

Haliommatidium muelleri, (7) pp. 154 & 155. Has a single nucleus.

Haliomma erinaceus, *echinaster* ?, *echinaster*, (7) pp. 169 & 170, pl. iv. figs. 1, 6 & 9. Some of the skeleton lies within the capsule.

Rhizosphæra trigonacantha, (7) pl. iv. figs. 3 & 10.

Actinomma asteracanthium ?, (7) p. 170, pl. iv. fig. 4. Some of the skeleton lies within the capsule.

Spongosphæra streptacantha, (7) pl. iv. fig. 5.

Tetrapyle octacantha, (7) p. 180, pl. iv. fig. 7, pl. vi. figs. 2 & 5.

Echinosphæra datura, (7) pl. iv. fig. 8. Tetrapyloid form; and pl. vi. figs. 1 & 3.

Diplosphæra gracilis ?, (7) p. 168, pl. v. fig. 1.

Arachnosphæra myriacantha, (7) pl. v. fig. 3.

Heliosphæra actinota, tenuissima, (7) pl. v. figs. 5 & 6; *inermis*, p. 168.

Lithelius primordialis, alveolina, (7) pp. 182 & 183, pl. vi. figs. 4 & 6.

Stylodictya arachnia, (7) pp. 187, 191, & 194, pl. vi. figs. 7, 8, 11, & 13; *quadrispina*, p. 190, pl. vi. figs. 9 & 12.

Euchitonia virchowi, (7) pl. vi. fig. 10.

Sticholonche zanclea, (7) p. 176. The capsule represents a nucleus; the internal vesicles do not.

Amphibrachium rhopalum, (7) p. 190.

Spongurus cylindricus, (7) p. 196. No sarcodic flagellum found.

Lithocircus productus, annularis, (7) pl. vii. figs. 4 & 5. In the former species, the pseudopodial cone lies in an eccentric plane, and is made up of fine lines, which end in bacillar bodies.

Lithomelissa thoracites, (7) pp. 204, 209 & 210, pl. viii. fig. 1.

Arachnocorys circumtexta, (7) pp. 206, 209 & 210, pl. viii. figs. 2 & 9.

Eucyrtidium galea, cranioides, (7) p. 210, pl. viii. figs. 3 & 4.

Eucecryphalus gegenbauri, (7) p. 204, pl. viii. figs. 5 & 6. Perhaps identical with *Halicalyptra orci*, Ehrenberg.

Carpocanium diadema, (7) pp. 207 & 210, pl. viii. figs. 7 & 8.

Cœlodendrum ramosissimum, (7) p. 221, pl. x. fig. 12. The reticulate shell lies outside the capsule.

Aulacantha scolymantha, (7) p. 216, pl. ix. fig. 33, pl. x. figs. 7 & 10.

Aulosphæra elegantissima, (7) p. 218, pl. ix. fig. 1, pl. x. figs. 2, 4, 5, 8 & 14.

Dictyocha messanensis, Ehrb., = *D. fibula*, (7) p. 217, pl. ix. fig. 5.

Actinophrys sol, (8) p. 235, pl. xl. No solid axis found in the pseudopodia; fission observed in detail.

Heterophrys myriopoda ?, (8) p. 243.

Heterophrys ? spp., (8) p. 244, pl. xlv. figs. 1–6, pl. xlvi. figs. 7–13, from N. America.

Rhaphidiophrys, (8) two species from N. America: *viridis* ?, p. 248, pl. xlvi. figs. 1–3, New Jersey; *elegans*, p. 250, pl. xlii.

Wagnerella borealis, described as a Calcisponge by Mereschkowsky [*cf.* Zool. Rec. xv.], is a Helizoan, common at Naples, according to P. Mayer, Zool. Anz. ii. p. 357. [Cf. *Spongiida*, p. 9.]

Actinosphærium eichhorni, (8) p. 259, pl. xli., from N. America.

FORAMINIFERA.

Sagrina, D'Orbigny, (4) p. 274, = dimorphous *Uvigerinæ*.

Spirillina tuberculata, Brady, (4) p. 279, pl. viii. fig. 28, characters emended, Kerguelen Island, 20–120 fath.

Chilostomella, Reuss, (3) p. 280.

Chilostomella ovoidea, Reuss, (4) p. 280, pl. viii. figs. 11 & 12, N. & S. Pacific, N. Atlantic, 95–2300 fath.

Allomorphina trigona, Reuss, (4) p. 281, pl. viii. figs. 13 & 14, S. Japan, Tahiti, 345 and 620 fath.

Pavonina flabelliformis, D'Orbigny, (4) p. 282, pl. viii. figs. 29 & 30, Admiralty Islands, W. Indies, Honolulu, 17–390 fath.

Globigerina, D'Orbigny, (4) p. 285. Described species enumerated and shortly described. The spiral forms are divided into three types: 1, based on *G. bulloides*; 2, on *G. inflata*; 3, on *G. rubra*.

Orbulina, (4) p. 289, to be accepted as subgenus of *Globigerina*.

Candeina, D'Orbigny, (4) p. 291, does not represent a distinct family, but is allied to *Globigerina*. *C. nitida*, D'Orb., *l. c.* pl. viii. fig. 7, Philippines, surface; S. Pacific and S. Atlantic, bottom.

Flabellina cuneata, Münster, (4) p. 271, found recent, off Ki Islands, 129 fath.

Hastigerina murrayanâ, Thomson, (4) p. 291, = *Nonionina pelagica*, D'Orbigny.

Squamulina, M. Schulze, (5) p. 409, not necessarily devoid of pores.

Squamulina scopula, var. *ramosa*, (5) p. 412.

Technitella legumen, Norman, (5) p. 412, is a Rhizopod.

Tinoporus lucidus, Brady, (5) p. 410, = *Planorbulina vulgaris*.

Polytrema, (5) p. 411.

Species of *Lagena*, (4) p. 269, found sometimes in variety at 2000–3000 fath.

Carpenteria, (5) p. 411. The upward prolongations of the primitive chambers are simple, not branched, as in *Polytrema*.

Rotalia spiculitesta, Carter, *l. c.* p. 414, from Red Sea; spicula proved to be calcareous.

Bulimina inconsistens, Egger, Oster Fjord, Norway, recent, J. of Conch. i. p. 10.

Trochammina, Parker & Jones, (4) p. 54, divided into *Ammodiscus*, Reuss, *Trochammina*, which is restricted to distinctly septate species, *Hormosina*, g. n., *Webbina*, D'Orbigny.

Trochammina incerta, (4) p. 26. The tests from great depths are little altered by nitric acid.

Hyperammina elongata, (4) pp. 25 & 32. The tests found on analysis to contain 92·5 per cent. silica, 2·0 per cent. peroxide of iron and alumina, 2·2 per cent. lime and magnesia.

Psammosphæra fusca, F. E. Schulze, (4) p. 27, pl. iv. fig. 2, from Brazil, where it commonly builds on Sponge spicules, N. and S Atlantic and N. Pacific, 250–2740 fath., and Isle of Skye.

Astrorrhiza catenata, Norman, (4) p. 42, pl. iv. figs. 12 & 13, N. Atlantic, S. Pacific.

Lituola, Lamarck, (4) p. 50, divided into subordinate genera, arranged thus: — I., Non-labyrinthic: *Placopsilina*, D'Orbigny, *Haliphysema*, Bowerbank ?, *Reophax*, Montfort, *Halophragmium*, Reuss. II. chamber cavities subdivided or labyrinthic: *Bdelloidina*, Carter, *Polyphragma*, Reuss ?, *Haplostiche*, Reuss, *Lituola*, Lamarck.

Miliolida, Carpenter, &c., (4) p. 261. Silica replaces carbonate of lime in the tests in some localities, at depths of 2500–4000 fath. The forms included in the family form an absolutely continuous series. *Triloculina* and *Quinqueloculina*, D'Orbigny, ought to be united, perhaps under the name *Miliolina*, Williamson.

Nubecularia tibia, Parker & Jones, (4) p. 266, pl. viii. figs. 1 & 2, from Upper Lias, Philippine Islands and Papua, 37–95 fath.

Dactylopora crusa, Parker & Jones, (4) p. 266, pl. viii. figs. 3 & 4.

Gromia terricola, (8) p. 276, pl. xlvii. figs. 1–4.

Biomyxa vagans, (8) p. 281, pl. xlvii. figs. 5–12, pl. xlviii.; occurs both nucleated and non-nucleated.

Pseudodifflugia gracilis?, (8) p. 198, pl. xxxiii. figs. 18–28, N. America, *P. amphora*, l. c. p. 201, new variety described, Wyoming.

Cyphoderia ampulla, (8) p. 202, pl. xxxiv. figs. 1–16.

Campascus cornutus, (8) p. 205, pl. xxxiv. figs. 17–24.

Euglypha (8). The species graduate into each other. Five species from N. America, viz., *E. alveolata*, p. 207, pl. xxxv. figs. 1–18, conjugation very fully observed; *ciliata*, p. 214, pl. xxxv. figs. 19 & 20, pls. xxxvi. & xxxvii. figs. 30 & 31; *cristata*, p. 218, pl. xxxvii. figs. 1–4; *mucronata*, p. 219, pl. xxxvii. figs. 11–14; *brachiata*, p. 220, pl. xxxvii. figs. 5–10.

Euglypha alveolata, figured from Australia, Q. J. Micr. Soc. Victoria, i. p. 17, pl. i. figs. 1–16, C. M. Maplestone.

Euglypha spinosa, (8) p. 221, pl. xxxviii., = *Placocista*, g. n.

Assulina seminulum, (8) p. 225, pl. xxxvii. figs. 15–27.

Trinema enchelys, (8) p. 226, pl. xxxix. Very variable in form and size, including many species of Ehrenberg.

Sphenoderia, (8). Two species from N. America, viz., *lenta*, p. 229, pl. xxxiv. figs. 25–41, and a new species.

Difflugia (8). 10 species in N. America, viz.: *D. globulosa*, p. 96, pl. xv. figs. 25–31, pl. xvi. figs. 1–24, shows transitions to *pyriformis*, which, *l. c.* p. 98, pls. x. xi. & xii. figs. 32 & 33, pl. xvi. fig. 38, pl. xix. figs. 24–26, has many varieties; *D. urceolata*, p. 106, pls. xiv. & xvi. figs. 32–34, pl. xix. figs. 28 & 29, merges into *acuminata*, p. 109, pl. xiii.; *D. cratera* ?, p. 108, pl. xii. figs. 19–21, pl. xvi. fig. 35, the tests may be merely those of a *Tintinnus*: *D. lobostoma*, p. 112, pl. xv. figs. 1–24, pl. xvi. figs. 25–29, sometimes three individuals conjugate; *D. arcula*, sp. n., or var., *vide* infrà; *D. corona*, p. 118, pl. xvii., merges into *lobostoma*; *D. constricta*, p. 120, pl. xviii.; *D. spiralis*, p. 124, pl. xix. figs. 1–23, observed to conjugate in various numbers at once.

Difflugia sphagni, Leidy, = type of *Heleopera*, g. n., Leidy (8), *vide infrà*.

Difflugia proteiformis, Ehrb., from the bottom of the Lake of Geneva, is more transparent than marsh specimens; it has the power of producing bubbles of gas internally, by which it mounts to the surface. G. DU PLESSIS, Bull. Soc. Vaud. (2) xvi. p. 167.

Hyalosphenia (8), 4 species in N. America, viz.: *cuneata*, p. 129, pl. xx. figs. 1–10; *papilio*, p. 131, pl. xxi., which always contains chlorophyll, and is very uniform in its characters; *tincta*, sp. n.; *elegans*, p. 140, pl. xx. figs. 19–29.

Quadrula symmetrica, (8) p. 142, pl. xxiv. figs. 20–25, from N. America.

Nebela (8). 7 species from N. America, viz.: *N. collaris*, p. 145, pls. xxii. & xxiii. figs. 1–7, pl. xxiv. figs. 11 & 12; *N. flabellum*, p. 152, pl. xxiii. figs. 8–19; *N. carinata*, p. 154, pl. xxiv. figs. 1–10; *N. hippocrepis*, p. 156, pl. xxv. figs. 9–14; *N. ansata*, p. 158, pl. xxv. figs. 1–8; *N. barbata*, p. 159, pl. xxiv. figs. 14–17; *N. caudata*, p. 160, pl. xxvi. figs. 21–24.

Hyalodiscus rubicundus ?, (8) p. 94, pl. xlv. figs. 17 & 18, N. America.

Echinopyxis aculeata, Ehrb., Amer. Quart. Micr. Journ. i. p. 83, pl. viii. fig. 3, America.

Arcella, (8) p. 156. Generally has two nuclei. The species doubtfully distinct. Gas-bubbles sometimes produced within the protoplasm. Five

species from N. America, viz.: *A. vulgaris*, p. 170, pls. xxvii. & xxviii. figs. 1–13; *discoides*, p. 173, pl. xxviii. figs. 14–38; *mitrata*, p. 175, pl. xxix., perhaps = *globosa*, Archer; *dentata*, p. 177, pl. xxx. figs. 10–19; *artocrea*, p. 178, pl. xxx. fig. 1–9.

Arcella vulgaris: stages of its development described and figured by G. Cattaneo, Atti Soc. Ital. xxi. p. 331, pl. vi. The germs which result from conjugation become nucleated and amœboid, and acquire a contractile vacuole; their protoplasm then becomes differentiated into endo- and ecto-plasm; in the fourth stage, the movements become less active, the ectoplasm becomes striated, and the nucleus forms round the nucleolus; in the eighth, the young *Arcella* is stationary, and consists of ecto-, meso-, and endo-plasm, with one, and afterwards several, contractile vacuoles; lastly, the shell is formed, the form becomes regular, the circular opening and several nuclei appear.

Arcella viridis, from Lombardy, described by Maggi, Atti Soc. Ital. xxi. p. 316.

Centropyxis aculeata, (8) p. 180, pl. xxx. figs. 20–34, pls. xxxi. & xxxii. figs. 29–37, N. America; the spineless *ecornis*, Ehrenberg, is to be regarded as a variety.

Cochliopodium (8). 2 species from N. America, viz.: *C. bilimbosum*, p. 184, pl. xxxii. figs. 1–25; *vestitum*, p. 188, pl. xxxii. figs. 26–28.

Pamphagus (8). 4 species enumerated from N. America, viz.: *P. mutabilis*, p. 191, pl. xxxiii. figs. 1–9; *hyalinus*, p. 194, pl. xxxiii. figs. 13–17, and 2 new species.

Dinamœba mirabilis, (8) p. 81, pls. vi. & vii. figs. 1–11, invested with a jelly-like cloak, beset with cilia resembling *Bacteria*; swallows long *Algæ*; N. America.

Uramœba, Leidy (8). Two species in N. America: *U. vorax*, p. 67, pl. ix. figs. 1–12, local; *U. botulicauda*, p. 71, pl. ix. figs. 13–17, very likely the young of preceding.

Amœba (3). 4 distinct N. American species admitted, viz.: *A. proteus*, p. 30, pl. i. figs. 1–8, pl. ii. figs. 1–13, pl. iii. figs. 22–25, pl. vii. figs. 13–19, pl. viii. figs. 17–30, the common *Amœba*, its structure and physiology described; observed to swallow *A. verrucosa*, which broke up inside it; *verrucosa*, p. 53, pl. iii., sluggish habits; *radiosa*, p. 58, pl. iv. figs. 1–18; *villosa*, p. 62, pl. i. figs. 9 & 10, pl. ii. figs. 14–16, pl. viii. figs. 1–16, doubtful whether yet found in N. America.

Amœba sabulosa, Leidy, (8) p. 73, = *Pelomyxa villosa*, sp. n.

Amœba princeps and *terricola*, in the Lake of Geneva, at the bottom; Bull. Soc. Vaud. (2) xvi. p. 166.

Amœba blattæ, (8) p. 300, = *Endamœba*, g. n.

New genera and species:—

Radiolaria.

Acanthometra astroides, R. Hertwig, (7) p. 135, Messina.

Heliosphæra insignis, id. *l. c.* p. 168, pl. v. fig. 7, Messina.

Diplosphæra spinosa, id. *l. c.* p. 177, pl. v. fig. 2, Messina.

Ceratospiris acuminata, id. *l. c.* p. 198, pl. vii. fig. 2, Messina.

Plagiacantha abietina, id. *l. c.* p. 200, pl. vii. fig. 6, Messina.

Tridictyopus elegans, R. Hertwig, (7) pp. 203, 209 & 210, pl. vii. fig. 3, Messina.

Eucecryphalus lævis, id. *l. c.* p. 205, pl. viii. fig. 6, Messina.

Cystidium inerme, id. *l. c.* p. 214, pl. viii. fig. 1, Messina; agrees in its soft structures with the *Acanthodesmidæ*, *Plagiacanthidæ*, and *Cyrtidæ*, but has no skeleton.

Cælacantha, id. *l. c.* p. 219. Differs from *Aulosphæra* in possessing a globular shell within the reticulate shell, and connected with it by bars. *C. anchorata*, id. *l. c.* pl. ix. fig. 2, pl. x. fig. 9, Messina.

Aulosphæra gracilis, id. *ibid.* pl. ix. fig. 4, pl. x. fig. 6, Messina, skeleton-pieces solid.

Actinophrys picta, Leidy, (8) p. 241, pl. xlvi. fig. 4, New Jersey. Distinguished by possessing chlorophyll granules.

FORAMINIFERA.

Cyclammina cancellata, Brady, (4) pp. 24 & 62. Differs from *Hyperammina* in having 80·5 per cent. silica, 8·9 per cent. iron and alumina, and 2·9 per cent. lime. From Atlantic and Pacific, 350-1900 fath.

Hyperammina ramosa, id. *l. c.* p. 33, N. and S. Atlantic and Pacific, 300–2600 fath.; *H. vagans*, id. *ibid.* pl. v. fig. 3, N. and S. Atlantic, N. Pacific, 2000 fath.

Jaculella, id. *l. c.* p. 35; based on *J. acuta*, sp. n., *id. ibid.* pl. iii. figs. 12 & 13, off Norway, Brazil, &c., 350 fath. Tubular, like worm tube, but rough internally.

Marsipella granulosa, id. *l. c.* p. 36, pl. iii. figs. 8 & 9, Azores, &c., 1000 fath.

Rhabdammina linearis, id. *l. c.* p. 37, pl. iii. figs. 10 & 11, W. Indies and off S. America, 390–1900 fath.

Rhizammina, id. *l. c.* p. 39; based on *R. algæformis* [*algi-*], sp. n., *id ibid.* pl. iv. figs. 16 & 17, off S.W. America, 2160 fath.

Sagenella, id. *l. c.* p. 41; based on *S. frondescens*, sp. n., *id. ibid.* p. lv. fig. 1, S. Pacific, 16–35 fath.

Aphrosina, Carter, J. R. Micr. Soc. ii. p. 500; based on a new species, *A. informis*, id. *ibid.* pl. xvii. *a*, figs. 5–11. Flat, spreading, amorphous, composed of flattened chambers, surface tessellated with polygonal areæ, each enclosing a pore. Resembles *Carpenteria*. On *Amphihelia oculata*, Atlantic, north of Scotland.

Sorosphæra, Brady, (4) p. 28. Test free, irregular; composed of a number of sphæroidal chambers, irregularly crowded together; walls thin, loosely arenaceous; no general aperture; maximum long diameter, 4.5 mm. *S. confusa*, id. *ibid.* pl. iv. figs. 18 & 19, off Azores and Buenos Ayres, in N. Pacific, and N. Atlantic, 900-2900 fath.

Astrorrhiza cornuta, id. *l. c.* pp. 31 & 43, pl iv. figs. 14 & 15, N. and S. Atlantic, S. Pacific, 350–1100 fath.

Aschemonella, id. *l. c.* p. 44. Free; chambers irregular, inflated, walls thin, roughish; length about 3 mm. *A. scabra*, id. *ibid.* pl. iii. figs. 6 & 7, N. and S. Atlantic, N. Pacific, 1000 to more than 2000 fath.

Thurammina, id. *l. c.* p. 45. Free or adherent, thin, set with many perforate mammillæ. *T. papillata*, id. *ibid.* figs. 4–8, cosmopolitan, deep

water, *T. albicans*, off S. America, &c., deep water, and *compressa*, id. *l. c.* p. 46, pl. v. fig. 9, N. Atlantic.

Placopsilina vesicularis, id. *l. c.* p. 51, pl. v. fig. 2, N. Atlantic, 1215 fath.

Reophax difflugi[i]formis, id. *l. c.* p. 51, pl. iv. fig. 3, N. and S. Atlantic, S. Pacific, 1900–2740 fath.; *R. nodulosa*, id. *l. c.* p. 52, pl. iv. figs. 7 & 8, S. Atlantic, N. and S. Pacific, &c., 1400–2000 fath.; *R. membranacea*, id. *l. c.* p. 53, pl. iv. fig. 9, off S. America, 1900 fath., &c.; *R. spiculifera*, id. *l. c.* p. 54, pl. iv. figs. 10 & 11, S. Pacific, 250–2300 fath.

Trochammina trusillata, id. *l. c.* p. 56, pl. x. figs. 10 & 11, Davis's Strait, N. and S. Atlantic, 390–2200 fath.; *T. ringens*, id. *l. c.* p. 57, pl. v. fig. 12, Davis's Strait, N. and S. Atlantic, N. Pacific, 1750–1900 fath.; *T. pauciloculata*, id. *l. c.* p. 57, pl. v. figs. 13 & 14, *T. coronata*, id. *l. c.* p. 59, pl. v. fig. 15, N. and S. Atlantic, 390–1900 fath.; *T. lituiformis*, id. *ibid.* fig. 16, N. and S. Atlantic, 390–900 fath.

Hormosina, id. *l. c.* p. 56. Subdivision of *Trochammina*, Parker & Jones. Typically composed of several segments in a single series; lageniform when the first segment is large. *H. globulifera*, id. *l. c.* p. 60, pl. iv. figs. 4 & 5, cosmopolitan, generally 1000–2000 fath.; *H. ovicula*, id. *l. c.* pl. iv. fig. 6, S. Atlantic, N. Pacific, S. of Australia, 1900–2600 fath.

Pelosina, id. *l. c.* p. 30. Test free, one- or many-chambered walls of mud, thick; a long chitinous neck. Near *Astrorrhiza* in affinities. *P. variabilis*, id. *ibid.* pl. iii. figs. 1–3, East of New Zealand, 1100 fath. &c. *P. rotundata*, id. *ibid.*, p. 31, pl. iii. figs. 4 & 5, N. Atlantic, 109–1675 fath.

Hauerina exigua, id. *l. c.* p. 267, Tropics, shallow water. *H. inconstans*, id. *l. c.* p. 268, wide distribution, 210–2300 fath.

Miliolina triquetra, id. *l. c.* p. 268, Papua, 37 fath. *M. alveoliniformis*, id. *ibid.*, Tropics, coast and shallow water.

Frondicularia spathulata, id. *l. c.* p. 270, off Ki Islands, 129 fath. *F. compta*, id. *l. c.* p. 271, Bass Strait, 38 fath.

Flabellina foliacea, id. *l. c.* p. 271, pl. viii. figs. 8–10, very like *Frondicularia foliacea*, Schwager; off Ki Islands, New Zealand, and east of N. America, 129–1240 fath.

Ramulina globulifera, id. *l. c.* p. 272, pl. viii. figs. 32 & 33, generally near islands, N. Atlantic and S. Pacific, 145–600 fath.

Sagrina virgula, id. *l. c.* p. 275, pl. viii. figs. 19–21, Eastern Archipelago and off Pernambuco, shallow water and 675 fath. *S. divaricata*, id. *l. c.* pl. viii. figs. 22–24, Papua, Tongatabu, 18–37 fath.

Spirillina inæqualis, id. *l. c.* p. 278, pl. viii. fig. 25, Nightingale Island, Honolulu Reefs, Admiralty Islands, &c., 70–150 fath. *S. limbata*, id. *l. c.* p. 278, pl. viii. fig. 26, Prince Edward's Island and Bass's Strait, 38–150 fath. *S. obconica*, id. *l. c.* p. 279, pl. viii. fig. 27, Prince Edward's Island, Kerguelen Island, 50–150 fath.

Planorbulina echinata, id. *l. c.* p. 283, pl. viii. fig. 31, chiefly off Pacific Islands, shallow water.

Globigerina æquilateralis, digitata, id. *l. c.* pp. 285 & 286, shortly described.

Pelomyxa villosa, Leidy, (8) p. 73, pls. v. & viii. figs. 31–33, resembles

Amœba villosa and *Pelomyxa palustris*, Greef, a form of it was described formerly as *Amœba sabulosa*, Leidy, Delaware, Pennsylvania, New Jersey, Wyoming.

Difflugia arcula, id. *l. c.* p. 116, pl. xv. figs. 34–37, pl. xvi. figs. 30 & 31, New Jersey, Pennsylvania. Perhaps a var. of *D. lobostoma*, merges into *D. globulosa*, *Centropyxis*, and *Arcella*.

Hyalosphenia tincta, id. *l. c.* p. 138, pl. xx. figs. 11–18, Pennsylvania, New Jersey; probably merges into *H. cuneata*, *elegans*, and *papilio*.

Heleopera, id. *l. c.* p. 162. Shell compressed, ovoid, composed of cancellated chitinous membrane, mouth inferior, terminal, large, transversely elliptical; based on *Difflugia sphagni*, Leidy, *l. c.* pl. xxvi. fig. 1–11, renamed *A. picta*. *H. petricola*, Leidy, *l. c.* p. 165, pl. xxvi. figs. 12–20, Pennsylvania, New Jersey.

Sphenoderia macrolepis, id. *l. c.* p. 232, New Jersey.

Pamphagus curvus, figs. 11 & 12, near Philadelphia, *avidus*, New Jersey, *id. l. c.* p. 196, pl. xxxiii. fig. 10.

Placocista, id. *l. c.* p. 221. Based on *Euglypha spinosa*, Carter, differing from true *Euglyphæ* in having the mouth entire and possessing articulated spines.

Euglypha tegulifera, Barnard, Am. Q. Micr. Journ. i. p. 85, pl. viii. fig. 4, America.

Echinopyxis tentorium, Barnard, and *E. hemispharica*, Barnard, *l. c.* p. 84, pl. viii. figs. 1 & 2, New York.

Eudamœba, Leidy, (8) p. 300. Based on *Amœba blattæ*, Bütschli, intermediate between *Amœba* and *Protamœba*.

Amœba cellarum, Joseph, Zool. Anz. ii. p. 306, from caves in Austria, manner of locomotion carefully described.

Anatomy and Physiology.

Plurality of nuclei in an unnamed Rhizopod which is described by E. Maupas, C. R. lxxxix. p. 252.

Structure of *Radiolaria*. Hertwig (7) agrees in the main with Hæckel's views on the morphology of the skeleton; also as to the propriety of distinguishing between the extra- and intra-capsular soft parts; but he finds a greater complexity in the structure than previous writers have done, especially in that of the membrane of the central capsule, and in the frequency of the occurrence of an internal vesicle. Four fundamental types are distinguished: (1) irregular, (2) spherical, (3) radial, (4) bilaterally-symmetrical. The spherical is the fundamental one of the four. The modifications of the central capsule require special attention in the study of the morphology of the group. The primary nucleus produces a generation of small secondary nuclei by three methods: (1) dichotomous division, (2) loss of nucleus and gemmation, (3) breaking up of the nucleolus, round the pieces of which new nuclei are formed. The yellow cells are perhaps parasitic. Reproduction takes place by dichotomous fission, as in *Tripyleæ* and the compound forms, and by formation of free germs, the latter method

probably occurring throughout the group. The group consists entirely of unicellular organisms. A genetic tree is given.

Pelagic *Foraminifera*, (4) p. 292. List of 17 known species; *Globigerinæ* from the surface have the long surface spines more often than those from the bottom. Surface specimens are generally smaller and thinner than the best developed bottom specimens. Facts tend to show that some species actually live at the surface and some at the bottom; possibly some surface *Globigerinæ* and *Orbulinæ* may live at the bottom as well. The tow-net used behind the trawl brought up many *Foraminifera*-tests containing the sarcode, *l. c.* p. 297.

Character of tubulation in branched *Foraminifera*, (5) p. 411.

Pores present in tests of the porcellanic *Foraminifera*, (4) p. 413.

H. G. Sorby finds the shells of *Foraminifera* to consist generally of calcite, some probably contain arragonite or phosphate of lime in addition; J. G. Soc. xxxv. pp. 60 & 64.

On this subject, *cf.* also Brady, suprà, *Hyperammina*, under "Genera, Species, &c., referred to," and *Cyclammina*, among "New Species."

Fossil Rhizopoda.

9. Möller, V. von. Die Foraminiferen des Russischen Kohlenkalks. Mém. Pétersb. xxvii. No. 5, pls. i.–vii.

H. A. Nicholson & R. Etheridge, jun., in a Monograph of the Silurian Fossils of the Girvan District, in Ayrshire, &c. (Edinburgh and London: 1878, fasc. i., 9 pls.), treat of the *Rhizopoda* and other groups. They discuss the affinities of *Nidulites*, and place it near *Receptaculites*. *Ischadites*, l. c. p. 19, has, perhaps, similar affinities.

Fossil *Saccammina*. Cf. H. B. Brady, in the preceding work, p. 21.

Fusulina, Möller, (9) p. 3. Notes on several fossil species from America.

Schwagerina, l. c. p. 6; *Cribrospira*, p. 11.

Bradyina, Von Möller, *l. c.* p. 9. Diagnosis modified; a number of small openings occur in the end-plate, besides the two semicircles of perforations.

Endothyra, Philipps, *l. c.* p. 12. Structure elucidated; new and other species described and figured.

Fusulinella, l. c. p. 21. New species described and figured.

Spirillina, Ehrenberg, *l. c.* p. 26. Four new species described and figured.

Tetraxis, Ehrb., *l. c.* p. 68, characterized. A new variety from the Russian carboniferous limestone.

Nodosinella, Brady, *l. c.* p. 73. Two spp. nn. from the Russian carboniferous limestone.

Archædiscus, Brady, *l. c.* p. 76. Variations of shell of *A. carreri*, Brady, occur according to age.

Ovulites. E. P. Wright, Q. J. Micr. Sci. xix. p. 442, enumerates the latest arguments for the Algal affinity of this organism.

Elaborate tables given of the distribution according to horizons and strata, of the Russian carboniferous *Foraminifera*; Möller, *l. c.* pp. 84–119.

Cribrostomum, g. n., *id. l. c.* p. 39; based on *Bigenerina patula*, Brady, *Textilaria eximia*, Eichwald, &c. Six new species described and figured from the carboniferous limestone of Russia. The individuals of the species vary much.

Girvanella, Nicholson & Etheridge, *op. cit.*, suprà, p. 23. Formed of minute tubules, flexuous, forming compact masses. *G. problematica*, iid. *l. c.* pl. ix. fig. 24, Silurian limestone, near Girvan, Ayrshire.

G. Berthelin, R. Z. (3) vii. p. 24, pl. i., gives a list of species, with notes and descriptions and figures of 7 new species, viz., *Ammodiscus pictonicum*; *Frondicularia cernua, paradoxa, occidentalis, Cristellaria prima, Rhabdogonium liasinum, Placentula pictonica*, and *Spirillina trochoides*, Middle Lias of La Vendée.

Simonelli, E. Nuovo genere de Rizopodi del Calcare a Nullipore delle vicinanze de S. Quirico d'Orcia. Atti Soc. Tosc. (P. v.) 1879, p. lxxvi. Cited from Zool. Jahr. Bericht, Naples, 1879.

Flagellata, Monads.

10. Robin, C. Recherches sur la reproduction gemmipare et fissipare des Noctiluques. J. de l'Anat. Phys. xiv. p. 563, pls. xxxv.–xli.; also in C. R. lxxxvi. p. 1482.

Zenker, O. Ueber das Vorkommen der *Cercomonas intestinalis* in Digestions Canal des Menschen und dessen Beziehung zu Diarrhœen. Deutsch. Zeitsch. f. prakt. Med. 1878, i. p. 1. Cited from JB. Anat. Physiol. vii. ii. p. 18.

L. Maggi, Atti Soc. Ital. xxi. p. 328, makes some remarks on the relation of chief types of the *Monera* to the cell-theory, as suggesting several methods of grouping them.

Genera and Species referred to.

Noctiluca miliaris, (10) pls. xxxv.–xli. For account of this paper, see Zool. Rec. xv. *Prot.* p. 13. The plates, which appear now for the first time, give the anatomy, changes of shape, and reproduction by fission and buds.

Noctiluca miliaris mounted successfully in sea-water; of orange-red colour in masses when dead. Sci. Goss. 1879, p. 113.

Codonosiga botrytis, Ehrb., var., (3) p. 566, fig. 37. The flagellum ends abruptly, not in a point. It is described as terminated superiorly by four cirri, sometimes united by a membrane, besides the flagellum. The cirri are homologous with the complete cup of the ordinary form of collar-celled Monads.

Vampyrella lateritia, (8) p. 253, pl. xlv. figs. 10–16. Observed to emit rays with pin-like heads, like those of *Acineta*.

Diplophrys archeri ? (8) p. 256, pl. xlv. figs. 7 & 8, in N. America.

Pelomyxa palustris stated by ENGELMANN, in a paper in Arch. ges. Phys. xix. p. 1 (cited from J. R. Micr. Soc. ii. p. 591), to become more lively when placed in the dark, and to contract when suddenly brought into the light.

Anisonema acinus, Bütschli: its secreted granules observed by W. Schmankewitsch, Zool. Anz. ii. p. 93, to become green under action of sunlight, and often to increase in size. These granules in this and allied forms are homologous with the stationary gonidia of *Chlorococcus*. The green colour is lost on re-oxygenation of the water, and its removal to a dark place. A delicate mycelium, afterwards dividing into short pieces, developed from a colourless monad, was probably a stage in the history of this species. It may also, *id. tom. cit.* p. 113, under certain conditions, take the form of fungus-spores or embryos of an *Alga*.

Chlamidomonas developed, *id. l. c.* p. 11, from *Amœba*, derived from spores of *Aspergillus*.

Euglena viridis, Sci. Goss. 1879, p. 256, observed to throw off its flagellum; also, pp. 136, 184, & 231, the flagellum is bulbed at the end.

Euglena viridis, figured, from Australia, Q. J. Micr. Soc. Victoria, i. p. 18, pl. i. fig. 16, by C. M. Maplestone; also a Monad, an *Astasia*, &c.

W. H. DALLINGER reported in Sci. Goss. 1879, p. 276, as expressing himself against the animal nature of *Bathybius*.

NEW GENERA AND SPECIES.

Protobathybius, Bessels, Die Amerikanische Nordpol-Expedition, p. 321. Differs from *Bathybius* in having no coccoliths; 90–94 fath., near lat. 79° 44′ N. and 79° 42′ N., long. about 70° 40′ W.

Peridinium stygium, Joseph, JB. schles. Ges. lvi. p. 73, and Zool. Anz. ii. p. 115. In stalactite cave, Adelsberg, Carniola. Has three distinct stages, the earliest of which represents the genus.

Gymnodinium, in the two latter stages sexual reproduction may take place. Conjugation does not lead to fusion of the two bodies; the nuclei reunite, and then again become separated. One or two new animals issue from each parent, and develop shells which are at first smooth. In another process, the whole of the parent cell may be resolved into germs.

Chlamydomonas tumida, Schneider, Z. wiss. Zool. xxx. suppl. p. 453, fig. 19. *C. radiosa*, id. *l. c.* p. 453, fig. 18. Both have a minute refracting body lying on the eye-spot.

A species belonging apparently to a new genus, but resembling in one condition *Tetrabana dujardini*, and in another *Anthophysa muelleri*, but possibly only a stage of some other species, is described by C. Haller, Z. wiss. Zool. xxxiii. p. 394, attached to the hinder extremities of Amphipod and Caprellid *Crustacea* of Italian Seas.

GREGARINIDA.

B. Gabriel, JB. schles. Ges. lvi. p. 120, is led by observation of *Gregarinæ* in the Earth-worms to the belief that certain of these develop directly out of protoplasmic bodies, which represent *Monera* in simplicity of structure, thereby passing over the amœboid stage, and are called by him primitive protoplasms.

Kobert, *tom. cit.* p. 139, has a short note on the *Psorospermiæ* of the Rabbit.

R. Hallez figures, Travaux de l'Institut Zoologique de Lille, fasc. ii. p. 85, pl. v. figs. 26–33, various forms of Gregarines found in *Planaria fusca*; and mentions, *l. c.* pl. v. fig. 34 & 35, some cysts visible to the naked eye, which are probably *Psorospermiæ*, and, p. 86, pl. v. fig. 36, some small amœboid masses, possibly a transition stage of a *Gregarina*.

F. Vejdowski, "Beiträge zur vergleichenden Morphologie der Anneliden." (*Gregarinæ*.) [Cited from Zool. Jahr. Bericht, Naples, 1879.]

C. Claus, in Arb. Zool. Inst. Wien. ii. (Gregarines in *Phromina* and *Phrominella*.

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.]

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* The total number of new genera recorded, including those of the Arachnida for 1878 omitted from vol. xv., is 976, as against the 1157 of the latter volume. These are divided as follows:—Mammalia, 27; Aves, 30; Reptilia, 28; Pisces, 16; Mollusca and Molluscoida, 74; Crustacea, 71; Myriopoda 8; Arachnida, 144; Insecta, 383; Vermes, 25; Echinodermata, 14; Cœlenterata, 90; Spongiida, 45; and Protozoa, 21. Apportioning the Arachnida [60 for vol. xv., 84 for the present one], there is an increase of 90 in the new genera of 1879 over those of 1878, omitting the Insecta, in which group the very much less number characterized has reduced the total.

I am requested by some of the Recorders to note that many of the new genera included in the excellent Index of Zool. J.S. Neap. for 1879 were not actually published in that year; to which remark may be added that, being the first of its series, that work does not include some in the present Index omitted from former volumes of Zool. Rec.—E. C. R.

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Eulitopus, *H. W. Bates*, Ins. 78
Euparagia, *Cresson*, Ins. 105
Euphyma ‖, *Baly*, Ins. 88 [*Baly*, Cryptocephalides, 1877]
Eupronoe, *Claus*, Crust. 34
Eurrhacus, *C. O. Waterhouse*, Ins. 49
Eurycolpus, *Reuter*, Ins. 235
Eurycyrtus, *Reuter*, Ins. 234
Eurydactylus ‖, *Sauvage*, Rept. 11 [*Lafertè*, Ins. 1851]
Eurypauropus, *Ryder*, Myr. 5
Euscelus ‖, *Claus*, Crust. 34 [*Germar*, Ins. 1833]
Eusiphonella, *Zittel*, Spong. 16
Eustalia, *Scudder*, Ins. 221
Eustena, *Baly*, Ins. 88
Eutimalphes, *Hæckel*, Cœl. 11
Eutimeta, *Hæckel*, Cœl. 11
Eutimium, *Hæckel*, Cœl. 11 [-mia, *Wallengren*, Ins. 1859]
Eutittha, *Thorell*, Arachn. 10
Eutyphis, *Claus*, Crust. 33
Excentricus, *Reuter*, Ins. 234
Exerodonta, *Brocchi*, Rept. 17

Feretrius, *Simon*, Arachn. 47
Flatipalpus, *Fairmaire*, Ins. 38
Floricola, *Elliott*, Aves 41
Fritzia, *Cambridge*, Arachn. 41

Gastrophanella, *Schmidt*, Spong. 12
Gaza, *Watson*, Moll. 55
Geckobia, *Mégnin*, Arachn. 25
Gegeneophis, *Peters*, Rept. 19
Genicopatagus, *Agassiz*, Ech. 7
Gerablattina, *Scudder*, Ins. 219
Geryones, *Hæckel*, Cœl. 14
Girvanella, *Nicholson*, Prot. 18
Glycera ‖, *Haswell*, Crust. 28 [*Savigny*, Vermes, 1817]
Glyptoxanthus, *Milne-Edwards*, Crust. 18
Gnampto[r]rhynchus, *Böhm*, Arachn. 51
Gnolus, *Simon*, Arachn. 38
Gobertina, *Bigot*, Ins. 195
Godlewskia, *Crosse*, Moll. 50
Gomalia, *Moore*, Ins. 145
Gonerda, *Moore*, Ins. 152
Goplana, *Wresniowski*, Crust. 30
Graffia, *Levinsen*, Verm. 4
Grumicha, (*St. Hilaire*) *F. Müller*, Ins. 205
Grumichella, *F. Müller*, Ins. 205
Grumichinha, *F. Müller*, Ins. 205
Gryne, *Simon*, Arachn. 47
Grypotherium, *Reinhardt*, Mamm. 26
Gustavia, *Kramer*, Arachn. 55
Gyas, *Simon*, Arachn. 49
Gylippus, *Simon*, Arachn. 45
Gymnocrinus, *Loriol*, Ech. 9
Gymnodinium, *Joseph*, Prot. 19
Gymnonotus ‖, *Chevrolat*, Ins. 71 [*Schneider*, Pisces, 1801]

Haldonia, *Duncan*, Cœl. 20
Hallomys, *Jentink*, Mamm. 23
Halocynthia, *Verrill*, Moll. 105
Hammacerus ‖, *Chevrolat*, Ins. 70 [*Laporte*, Insecta. 1833; *rectius*, Hammatocerus, *Burmeister*, Insecta, 1835]
Hanisa, *Moore*, Ins. 163
Haplobothris, *Bourgeois*, Ins. 51
Haplocheira [-chira], *Haswell*, Crust. 32
Haplogaster, *Chaudoir*, Ins. 22
Haplosyllis, *Langerhans*, Verm. 12
Haraspa, *Moore*, Ins. 156
Harmonia ‖, *Haswell*, Crust. 31 [*Mulsant*, Ins. 1846]
Harpi[r]rhynchus, *Mégnin*, Arachn. 25
Hebdomochondra, *Staudinger*, Ins. 170
Helenus, *F. B. White*, Ins. 233
Heleopera, *Leidy*, Prot. 16
Hellenus, *Milne-Edwards*, Crust. 20
Helotenthes, *Berg*, Ins. 240
Hematortyx, *Sharpe*, Aves, 58
Hemiastrella, *Carter*, Spong. 11
Hemilepistus, *Budde Lund*, Crust. 38
Hemityphis, *Claus*, Crust. 33
Henotesia, *Butler*, Ins. 142
Herimba, *Moore*, Ins. 153
Hermatoblattina, *Scudder*, Ins. 219
Hermeas, *Karsch*, Arachn. 8
Herpele, *Peters*, Rept. 19
Heterocorixa, *F. B. White*, Ins. 240
Heterocuma [-cyma], *Miers*, Crust. 27
Heteromyias, *Sharpe*, Aves, 47
Heterostom[atom]ya, *Bigot* Ins. 191
Heterozona, *Dall*, Moll. 58
Hexisopus, *Karsch*, Arachn. 46
Hexomma ‖, *Karsch*, Arachn. 15 [*Thorell*, Arachn. 1876]

Himala, *Moore*, Ins. 156
Himatella, *Zittel*, Spong. 16
Hindia, *Duncan*, Spong. 15
Hippospongia, *Schulze*, Spong. 9
Holastrella, *Carter*, Spong 15
Holcogaster, *Chaudoir*, Ins. 22
Holcopogon, *Staudinger*, Ins. 188
Holothele, *Karsch*, Arachn. 32
Homopterophagus, *Dale*, Arachn. 23
Hoplopactus, *Chevrolat*, Ins. 66
Hormosina, *Brady*, Prot. 15
Huttonia, *Cambridge*, Arachn. 35
Hyalocaulus, *Marshall*, Spong. 12
Hyalocylis, *Lacaze-Duthiers*, Moll. 40
Hygeophis, *Peters*, Rept. 19
Hypocistela, *F. Bates*, Ins. 60
Hypoleria, *Godman*, Ins. 136.
Hypomedon, *Mulsant*, Ins. 27
Hyposcada, *Godman*, Ins. 136
Hypselograpsus, *De Man*, Crust. 21

Iache, *Elliot*, Aves, 42
Icochæa, *Schiödte*, Crust. 38
Idioplasta, *Osten-Sacken*, Ins. 193
Imaus, *Moore*, Ins. 156
Inella, *Bayle*, Moll. 47
Inglisia, *Maskell*, Ins. 249
Inguridia, *Butler*, Ins. 159
Inopeplus, *C. O. Waterhouse*, Ins. 34
Inurois, *Butler*, Ins. 177
Irbisia, *Reuter*, Ins. 235
Irenium, *Hæckel*, Cœl. 12
Ischnoplax, *Dall*, Moll. 58
Iselma, *Haag*, Ins. 64
Ithygrammodon, *Osborn*, Mamm.20
Ive, *Mayer*, Crust. 41 [Iva, *Lubbock*, Crust. 1853]

Jaculella, *Brady*, Prot. 14
Jamwonus, *Harold*, Ins. 76
Jorunna, *Bergh*, Moll. 61

Kalabana, *Moore*, Ins. 177
Kettelia, *Butler*, Ins. 157
Klâboana, *Moore*, Ins. 150
Kophene, *Moore*, Ins. 159
Kosala, *Moore*, Ins. 163

Labetis, *C. O. Waterhouse*, Ins. 60
Labidostomma, *Kramer*, Arachn. 55
Labidurodes, *Dubrony*, Ins. 217
Labyrintholites, *Sinzow*, Spong. 15
Lada, *Wrześniowski*, Crust. 30 [-do, *Crotch*, Ins. 1867]
Lælapia, *Butler*, Ins. 152
Læmocoris, *Reuter*, Ins. 234
Lagenopsyche, *F. Müller*, Ins. 207
Lagnus, *L. Koch*, Arachn. 42
Lancaria, *Karsch*, Arachn. 37
Langia, *Hubrecht*, Verm. 5
Lasiocera ||, *Meyrick*, Ins. 183 [*Dejean*, Ins. 1831]
Laxita, *Butler*, Ins. 143
Lecanella, *Zittel*, Spong. 15
Lecytho[r]rynchus, *Böhm*, Arachn. 51
Lederia, *Reitter*, Ins. 61
Lepidametria, *Webster*, Verm. 13
Lepidopleurus ||, *Dall*, Moll. 59 [*Risso*, Moll. 1826; *Claparède*, Vermes, 1868]
Lepidoradsia, *Dall*, Moll. 59
Leptocteuus, *L. Koch*, Arachn. 16
Leptodopsis, *Haag*, Ins. 57
Leptodrassus, *Simon*, Arachn. 9
Lepto[r]rhabdium, *Kraatz*, Ins. 78
Leptotrichus, *Budde Lund*, Crust. 38
Letzneria, *Kraatz*, Ins. 78
Leuckartia ||, *Moniez*, Verm. 4 [*Claus*, Crust., *Agassiz*, Cœl. 1862]
Leucopterum, *Reuter*, Ins. 235 [-ra, *Hübner*, Ins. 1816]
Leurocephalus, *Osborn*, Mamm. 19
Libitia, *Simon*, Arachn. 48
Ligonipes, *Karsch*, Arachn. 18
Ligurinus ||, *Karsch*, Arachn. 18 [*Kaup*, Aves, 1829]
Lilia, *F. B. White*, Ins. 237
Limnocarcinus, *De Man*, Crust. 20
Linothele, *Karsch*, Arachn. 32
Liobagrus, *Hilgendorf*, Pisc. 18
Lipernes, *C. O. Waterhouse*, Ins. 48
Lipogomphus, *Berg*, Ins. 231
Lipostemmata, *Berg*, Ins. 232
Liriantha, *Hæckel*, Cœl. 14
Lisa, *Haag*, Ins. 60
Lissaulicus, *C. O. Waterhouse*, Ins. 54
Litargops, *Reitter*, Ins. 35
Lithomylaeris, *Scudder*, Ins. 218
Lizusa, *Hæckel*, Cœl. 9
Lizzella, *Hæckel*, Cœl. 9
Lobrathium, *Mulsant*, Ins. 27
Locharna, *Moore*, Ins. 156
Lonchocerus, *Chevrolat*, Ins. 71
Lophochernes, *Simon*, Arachn. 20
Lophospingus, *Cabanis*, Aves, 55
Lophoxanthus, *Milne-Edwards*, Crust. 19
Lucaina, *Duges*, Ins. 48
Luciocharax, *Steindachner*, Pisc. 19
Lycæopsis, *Claus*, Crust. 35

Lycauges, *Butler*, Ins. 177
Lycidas, *Karsch*, Arachn. 18
Lycodopsis, *Collett*, Pisc. 16
Lycodryas, *Günther*, Rept. 13
Lygidea, *Reuter*, Ins. 235 [-dium, *Milne-Edwards*, Crust. 1840]
Lyssidia, *Westwood*, Ins. 149

Macandrellus, *Dall*, Moll. 59
Macrocapsus, *Reuter*, Ins. 235
Macrocœloma, *Miers*, Crust. 17
Macrosargus, *Bigot*, Ins. 191
Mahanta, *Moore*, Ins. 163
Mahora, *Moore*, Ins. 156
Malachylodes, *Cope*, Rept. 17
Malacosoma ‖, *De Man*, Crust. 21 [*Hübner*, 1816, *Chevrolat*, 1834, Ins.]
Malacotes, *Reuter*, Ins. 234 [-ta, *Schuhmacher*, Crust. 1817]
Malthacosoma, *Reuter*, Ins. 235 [= Malaco-]
Manidia, *Westwood*, Ins. 149
Maracandus ‖, *Simon*, Arachn. 47 [-da, *McLachlan*, Ins. 1875]
Maratus, *Karsch*, Arachn. 18
Margaropus, *Karsch*, Arachn. 53
Margellium, *Hæckel*, Cœl. 9
Marmanema, *Hæckel*, Cœl. 13
Martarega, *F. B. White*, Ins. 240
Maryna, *Gruber*, Prot. 4
Masthletinus, *Reuter*, Ins. 228
Mastobunus, *Simon*, Arachn. 49
Mastosia, *Zittel*, Spong. 15
Matidia, *Thorell*, Arachn. 10
Maugerella, *Dall*, Moll. 58
Maurodactylus, *Reuter*, Ins. 234
Maxillaria, *Staudinger*, Ins. 183
Megacrex, *D'Albertis*, Aves, 59
Megalobasis, *Reuter*, Ins. 234
Megaloscelornis, *Lydekker*, Aves, 61
Megalosoma, *Fedrizzi*, Myr. 5
Megaperca, *Hilgendorf*, Pisc. 9
Megascol[eco]ides, *McCoy*, Verm. 15
Megasemum, *Kraatz*, Ins. 77 [-ma, *Hübner*, Ins. 1816]
Megastizus, *Patton*, Ins. 107
Megencephalon, *Osborn*, Mamm. 16
Melampyrus, *C. O. Waterhouse*, Ins. 49
Melanoxanthus, *Buckton*, Ins. 248
Melicertella, *Hæckel*, Cœl. 10
Melicertidium, *Hæckel*, Cœl. 10
Melicertissa, *Hæckel*, Cœl. 10
Melonella, *Zittel*, Spong. 15
Meniscomys, *Cope*, Mamm. 22
Mephistia, *J. Thomson*, Ins. 42
Merapioides, *Bigot*, Ins. 198
Merycopater, *Cope*, Mamm. 20
Mesoplectra, *Butler*, Ins. 174
Meso[r]rhinoceros, *Brandt*, Mamm. 18
Metamœus, *C. O. Waterhouse*, Ins. 50
Metastoma, *Strebel*, Moll. 85
Metecia, *Snellen*, Ins. 170
Meterythrops, *S. I. Smith*, Crust. 26
Metœcis, *Mabille*, Ins. 183 [-cus, *Dejean*, Ins. 1833, *Kröyer*, Crust. 1839]
Metopoctea, *Simon*, Arachn. 50
Metoponorthrus, *Budde Lund*, Crust. 38
Metriopelma, *Becker*, Arachn. 8
Metzgeria, *Norman*, Moll. 41
Micariaulax, *Becker*, Arachn. 33
Micariolepis, *Simon*, Arachn. 33
Micariosoma, *Simon*, Arachn. 11
Micracanthus ‖, *Sauvage*, Pisc. 15 [-tha, *Montrouzier*, Ins. 1861]
Microbembex, *Patton*, Ins. 107
Microconus, *Strebel*, Moll. 78
Microphyes, *Weise*, Ins. 71
Micropyga ‖, *Agassiz*, Ech. 6 [-ge, *Hawle & Corda*, Crust. 1847]
Micro[r]rhabdium, *Kraatz*, Ins. 78
Microsca, *Butler*, Ins. 180
Misgolas, *Karsch*, Arachn. 8
Mitrocomella, *Hæckel*, Cœl. 11
Mitrocomium, *Hæckel*, Cœl. 11
Mniocera, *Butler*, Ins. 177
Mombasius, *H. W. Bates*, Ins. 78
Monanus, *Sharp*, Ins. 34
Mopsus, *Karsch*, Arachn. 19
Morostoma, *Candèze*, Ins. 46
Mouchezia, *Vélain*, Moll. 39
Mummucia, *Simon*, Arachn. 46
Myatis, *F. Bates*, Ins. 57
Mydrosoma, *F. Smith*, Ins. 97
Mystides, *Théel*, Verm. 13

Nagunda, *Moore*, Ins. 156
Nasocoris, *Reuter*, Ins. 234
Nassophasis, *C. O. Waterhouse*, Ins. 73
Natta, *Karsch*, Arachn. 41
Nayaca, *Moore*, Ins. 152
Neaspilota, *Osten-Sacken*, Ins. 193
Nebo, *Simon*, Arachn. 20, 44
Nectopsyche, *F. Müller*, Ins. 205
Nec[yo]mylacris, *Scudder*, Ins. 218
Nematophorus, *Clarke*, Cœl. 6 [-ra, *Dejean*, Ins. 1833; *Gray*, Aves, 1840]
Neoanthias [Neanth-]. *Castelnau*, Pisc. 10

Neobule, *Haswell*, Crust. 29
Neoempheria, *Osten-Sacken*, Ins. 193
Neoeristicus, *Osten-Sacken*, Ins. 193
Neoexaireta [-exær-], *Osten-Sacken*, Ins. 193
Neoglaphyroptera, *Osten-Sacken*, Ins. 193
Neoidiotypa, *Osten-Sacken*, Ins. 193
Neoitamus, *Osten-Sacken*, Ins. 193
Neomochtherus, *Osten-Sacken*, Ins. 193
Neomyias, *Sharpe*, Aves, 48
Neo[r]rhynchus, *Milne-Edwards*, Crust. 16
Neorondania, *Osten-Sacken*, Ins. 193
Neovelia, *F. B. White*, Ins. 239
Neptunides, *J. Thomson*, Ins. 42
Niganda, *Moore*, Ins. 159
Nigrilauda, *Bogdanow*, Aves, 55
Nikæa, *Moore*, Ins. 149
Numenoides, *Butler*, Ins. 152
Nuttallina, *Dall*, Moll. 59
Nyassinus, *Westwood*, Ins. 42
Nyctophora, *Nicholson*, Cœl. 21

Oarces, *Simon*, Arachn. 38
Octocanna, *Hæckel*, Cœl. 12
Octonema [illegible], *Hæckel*, Cœl. 10 [*Martens*, Pisc. 1868]
Octorchandra, *Hæckel*, Cœl. 12
Octorchidium, *Hæckel*, Cœl. 12
Odonturus, *Karsch*, Arachn. 44 [-ra, *Rambur*, Ins. 1841]
Œstopis, *Distant*, Ins. 228
Oligoceras, *Schulze*, Spong. 9 [-ra, *Chevrolat*, Ins. 1834]
Oligolimax, *Fischer*, Moll. 67
Omicrus, *Sharp*, Ins. 25
Ompax, *Castelnau*, Pisc. 5 [-phax, *Guénée*, Ins. 1857]
Onychumenus, *Reuter*, Ins. 235
Oomima, *Berg*, Ins. 241
Opetionella, *Zittel*, Spong. 15
Ophioproctus, *Boulenger*, Rept. 7
Opisocardium, *Bayle*, Moll. 97
Opisthodonta, *Langerhans*, Verm. 12 [-odon, *Stein*, Prot. 1859; *Steindachner*, Rept. 1867]
Opisthoplatus [-tys], *Holmberg*, Arachn. 20
Opisthosyllis, *Langerhans*, Verm. 12
Opsamatus, *C. O. Waterhouse*, Ins. 78
Orchi[o]stoma, *Hæckel*, Cœl. 10
Ornithophila, *Rondani*, Ins. 200
Ortalis [illegible], *Wharton*, Aves, 59 [*Fallén*, Ins. 1810]
Orthocabera, *Butler*, Ins. 177
Orthopalame, *Hoek*, Crust. 32
Orthopeplus, *Horn*, Ins. 33
Oryctoblattina, *Scudder*, Ins. 219
Otophthalmus, *Chaudoir*, Ins. 22
Otostigmus, *Porat*, Myr. 3
Oxyorrhus, *Fischer*, Rept. 13
Oxytate, *L. Koch*, Arachn. 16

Pachyloides, *Holmberg*, Arachn. 20
Pachymelus, *F. Smith*, Ins. 101
Pachytilodia, *Zittel*, Spong. 16
Pachytriton, *Boulenger*, Rept. 18
Pæderidus, *Mulsant*, Ins. 28
Palæopithecus [illegible], *Lydekker*, Mamm. 10 [*Voigt*, Mamm. 1835]
Paleca, *Butler*, Ins. 159
Pallochiton, *Dall*, Moll. 59
Palpangula, *Staudinger*, Ins. 170
Pangora, *Moore*, Ins. 152
Paustrongylus, *Berg*, Ins. 237
Pantopsalis, *Simon*, Arachn. 50
Parabrachytes, *Distant*, Ins. 230
Paractius, *Levinsen*, Verm. 15 [-tis, *Milne-Edwards*, Cœl. 1857]
Paradiadema, *Distant*, Ins. 140
Paralepta, *Baly*, Ins. 85
Paralipsa, *Butler*, Ins. 183
Paralycæa, *Claus*, Crust. 35
Paranympha, *Butler*, Ins. 170
Parapagurus, *S. I. Smith*, Crust. 23
Paraphronima, *Claus*, Crust. 33
Parapronoe, *Claus*, Crust. 34
Parascelus, *Claus*, Crust. 34
Parastetha, *Baly*, Ins. 88
Parasymmictus, *Bigot*, Ins. 197
Parathoe, *Miers*, Crust. 17
Paratymolus, *Miers*, Crust. 22
Paratyphis, *Claus*, Crust. 33
Parazetes, *Slater*, Arachn. 51
Parectatosoma, *Wood-Mason*, Ins. 220
Paredrocoris, *Reuter*, Ins. 234
Parequula, *Steindachner*, Pisc. 12
Parœdura, *Günther*, Rept. 10
Parthenopoides, *Miers*, Crust. 18
Paryphes [illegible], *Kerschner*, Crust. 44 [*Burmeister*, Ins. 1835]
Pastocoris, *Reuter*, Ins. 235
Patulastra, *Pfeiffer*, Moll. 71
Patulopsis, *Strebel*, Moll. 69
Pectanthis, *Hæckel*, Cœl. 13
Pectis, *Hæckel*, Cœl. 13
Pectyllis, *Hæckel*, Cœl. 13
Pegantha, *Hæckel*, Cœl. 15
Pelagobia, *Greef*, Verm. 11
Pelmopoda, *Karsch*, Arachn. 39
Pelonectes [illegible], *Lataste*, Rept. 17 [*Fitzinger*, Rept. 1843]

Pelosina, *Brady*, Prot. 15
Peltopsyche, *F. Müller*, Ins. 207
Penuula, *Dole*, Aves, 59
Perenethis, *L. Koch*, Arachn. 16
Perissoderes, *C. O. Waterhouse*, Ins. 73
Peronella, *Zittel*, Spong. 16
Perthalycra, *Horn*, Ins. 33
Petachnum, *Hæckel*, Cœl. 13
Petalopoda, *Spangberg*, Ins. 244 [-pus, *Motschoulsky*, Ins. 1845; *Sars*, Crust. 1864]
Petasata, *Hæckel*, Cœl. 13
Petasus, *Hæckel*, Cœl. 13
Petrablattina, *Scudder*, Ins. 219
Petrovicus, *Karsch*, Arachn. 43
Phalacrophorus, *Greef*, Verm. 11
Pharetronema, *Sollas*, Spong. 10
Phareus, *Simon*, Arachn. 48
Phialis, *Hæckel*, Cœl. 11 [-la, *Wallengren*, Ins. 1860]
Phialium, *Hæckel*, Cœl. 11
Phronia[], *Webster*, Verm. 14 [*Winnertz*, Ins. 1863]
Phronim[at]opsis, *Claus*, Crust. 33
Phycosoma, *Cambridge*, Arachn. 36
Phylactella, *Hincks*, Moll. 111
Pimprana, *Moore*, Ins. 152
Pinacosterna, *Harold*, Ins. 81
Pirenopsis, *Brot*, Moll. 48
Placiphorella, *Dall*, Moll. 59
Placocista, *Leidy*, Prot. 16
Placonycha, *Horn*, Ins. 46
Planetolestes, *Arribálzaga*, Ins. 198
Platycepha, *Baly*, Ins. 86
Plat[y]eros, *Bourgeois*, Ins. 51
Platyesthus, *Mäklin*, Ins. 59 [Plat(y)esthes, *Waterhouse*, Ins. 1845]
Platypachys, *Chevrolat*, Ins. 72
Plectrofriugilla, *Bogdanow*, Aves, 54
Plectronella, *Sollas*, Spong. 10
Pleistacantha [Plist-], *Miers*, Crust. 15
Pleurolicus, *Cope*, Mamm. 24
Pleurosigynius, *Berg*, Ins. 237
Plusidia, *Butler*, Ins. 170
Poccesthes, *Chevrolat*, Ins. 71
Podosesia, *Möschler*, Ins. 148
Pogo[no]chætia [rectius Chætopogon], *Staudinger*, Ins. 188
Poliomyias, *Sharpe*, Aves, 48
Polycalpa, *Hæckel*, Cœl. 15
Polycanna, *Hæckel*, Cœl. 12
Polycheria, *Haswell*, Crust. 31
Polyscyphia, *Sinzow*, Spong. 15
Pomatocheles, *Miers*, Crust. 23
Pontodora, *Greef*, Verm. 11
Poritella, *Schmidt*, Spong. 12
Portia, *Karsch*, Arachn. 15
Powellia, *Maskell*, Ins. 249
Pramila, *Moore*, Ins. 148
Praticola[], *Strebel*, Moll. 79 [*Swainson*, 1837, -incola, *Koch*, 1816, Aves]
Prionechinus, *Agassiz*, Ech. 6
Prionophora[], *Meyrick*, Ins. 183 [*Dejean*, 1833, *Westwood*, 1848, and *Solier*, 1851, Ins.]
Procinura, *Cope*, Rept. 13
Progonoblattina, *Scudder*, Ins. 219
Pronototropis, *Reuter*, Ins. 234
Propalticus, *Sharp*, Ins. 35
Prosthetops, *F. H. Waterhouse*, Ins. 25
Protiara, *Hæckel*, Cœl. 8
Protina, *Brunner*, Ins. 222 [-nus, *Agassiz*, 1848, amending Proteinus, *Latreille*, Ins. 1796]
Protobathybius, *Besscls*, Prot. 19
Protosycon, *Zittel*, Spong. 16
Protus, *Simon*, Arachn. 47
Psathyropus, *L. Koch*, Arachn. 21
Psechrus, *Thorell*, Arachn. 12
Psephactus, *Harold*, Ins. 76
Pseudagapetus, *McLachlan*, Ins. 206
Pseudarcopagia, *Bertin*, Moll. 95
Pseudobium, *Mulsant*, Ins. 27
Pseudocalamobius, *Kraatz*, Ins. 81
Pseudocamaria, *F. Bates*, Ins. 58
Pseudogerygone, *Sharpe*, Aves, 48
Pseudolibania, *Stefani*, Moll. 66
Pseudolycæa, *Claus*, Crust. 35
Pseudomedon, *Mulsant*, Ins. 27
Pseudopallene, *Wilson*, Arachn. 23
Pseudophilyra, *Miers*, Crust. 22
Pseudopsyche, *Oberthür*, Ins. 159
Pseudoscada, *Godman*, Ins. 136
Pseudosclerosomus, *Chevrolat*, Ins. 54
Pseudotriphyllus, *Reitter*, Ins. 35
Pseudoxerophila, *Westerlund*, Moll. 73
Psilonesogena, *F. Bates*, Ins. 60
Psilo[r]rhabdium, *Kraatz*, Ins. 78
Pterocomma, *Buckton*, Ins. 248
Pteronema, *Hæckel*, Cœl. 9
Pycnochilus, *C. O. Waterhouse*, Ins. 58
Pycnoctenus, *L. Koch*, Arachn. 16
Pycnogyra, *Strebel*, Moll. 70
Pyresthesis, *Butler*, Arachn. 39.
Pyrgophysa, *Crosse*, Moll. 88

Rachia, *Moore*, Ins. 159
Radhica, *Moore*, Ins. 163
Rajendra, *Moore*, Ins. 152
Ratarda, *Moore*, Ins. 150
Retinella, *Shuttleworth*, Moll. 69

Rhampsinitus, *Simon*, Arachn. 50
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